Investigation and development of a rural-facing surgical curriculum framework

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Contents

Executive summary

Background

Although Australia is a highly urbanised society, 29% of Australians reside in rural, regional, or remote areas. On average, Australians living in rural and remote areas have a higher incidence of disease and injury, poorer health outcomes and live shorter lives compared with Australians living in metropolitan areas. The Australian National Medical Workforce Strategy 2021–2031 reported that in Australia the number of healthcare professionals per capita is adequate but maldistributed – only 12% of surgeons live and work rurally. In addition, 5 out of 9 specialties have less than 5% of surgeons based outside of urban areas. There is a perception that the present Surgical Education and Training Program provided by the Royal Australasian College of Surgeons (RACS) Specialty Training Boards tends to be urban focused, and so is not well contextualised to the rural, regional, and remote setting. The problem with an urban-focused training program is that it can unintentionally convert students who intend to work rurally into urban specialists. Conversely, positive rural exposure for students and Trainees of urban origin is strongly associated with urban-to-rural conversion, increased rural recruitment and long-term rural retention.

RACS has developed the Rural Health Equity Strategy that aims to improve health equity for remote, rural, and regional people in Australia and Aotearoa New Zealand. One action that has been reported from best evidence and endorsed by the Australian Medical Council is the development of a rural-facing surgical curriculum. This curriculum should be generalist in nature and provide knowledge and experience to prepare practitioners for the broader scope of clinical practice that is often required in rural areas. It should also provide skills in outreach, inreach and health service management. Clinical skills vary between specialties, so a professional skills curriculum that is generic across all 9 surgical specialties was chosen for the first phase of the curriculum development. This project aimed to identify the elements required in a rural professional skills curriculum framework to inform the rural-facing surgical curriculum.

Methods

The development of the rural-facing surgical curriculum framework encompassed 3 phases of research:

1. A rapid review to determine the elements required for rural surgical training programs; specifically, the essential elements of such a program and any missing elements according to surgeons and Trainees.
2. A Delphi study to determine the positive behaviour markers, methods of training, and potential challenges of the rural-facing surgical curriculum framework.
3. A co-design workshop involving rural surgical experts to obtain further information about the judgement and clinical decision making professional competency needed by surgeons in rural areas.

Regular engagement with a Working Group occurred throughout the project. The information gathered was collated and refined to produce a curriculum framework with suggested positive behavioural markers, learning outcomes, teaching and learning strategies, and assessment tools.

Results

The literature review showed that surgeons in the United States wanted more professional skills training during residency programs, especially in business and finance, mentorship, leadership, and communication. In Australia, surgical Trainees were concerned about the medicolegal aspects of rural surgery because of the broad nature of practice in the rural setting. Due to the limited information found during the rapid review, a Delphi study was used to develop concepts around suggested teaching methods and positive behaviours that help develop professional skills suited to the rural setting. With the nuances around extended scope of practice, and the many factors that contribute to decision-making, the co-design workshop focused on Judgement and Clinical Decision-Making in the rural setting, and generated specific positive behaviour markers, teaching and assessment strategies, and factors that need to be considered and assessed in the rural setting.

The results suggest that in rural surgical practice many surgeons extend their scope of practice because of the lack of other surgical specialties in their local context. Additionally, professional, social, and familial relationships have a significant impact on the decision-making process, because rural surgeons are more likely to interact with their local communities. Also, limited resources in rural settings can constrain treatment options—Trainees must

rely on local teams and teams from tertiary centres for support. These limitations can also lead to challenges with professional development and training.

Conclusion

Through a rapid review, a Delphi study, and a co-design workshop, a professional skills rural-facing surgical curriculum framework has been developed to help standardise the training outcomes of rural surgeons. This document can be used to guide and inform the development of a rural-facing curriculum that can be used across the 9 specialties, with the aim to counteract the maldistribution of surgeons and increase the rural workforce in years to come.

Abbreviations

ACGME	Accreditation Council for Graduate Medical Education
ACRRM	Australian College of Rural and Remote Medicine
ACS	American College of Surgeons
AICD	Australasian Institute of Company Directors
AMA	American Medical Association
ARST	Advanced Rural Skills Training
ATLS	Advanced Trauma Life Support
BP	blood pressure
CAGS	Canadian Association of General Surgeons
CCT	Certificate of Completion of Training
CME	continuing medical education
COM	College of Medicine
CPD	continued professional development
CRM	crisis resource management
CSCF	Clinical Service Capability Framework
CT	computerised tomography
DMS	Director Medical Services
DOPS	Direct Observation of Procedural Skills
DSTC	Definitive Surgical Trauma Care
EBAs	enterprise bargaining agreement
EBM	evidence-based medicine
ED	emergency department
EDMS	Executive Director Medical Services
EMST	early management of severe trauma
ENT	Otolaryngology, Ear, Nose and Throat Surgery

EPA	entrustable professional activities
ESB	English-speaking background
EUA	examination under anaesthetic
FACS	Fellowship of the American College of Surgeons
FARGP	Fellowship of Advanced Rural General Practice
FIFO	fly-in, fly-out
FRACS	Fellow of The Royal Australasian College of Surgeons
FREIDA	Fellowship and Residency Electronic Interactive Database
FRRHH	Faculty of Remote, Rural and Humanitarian Healthcare
FSSE	Foundation Skills for Surgical Educators
GI	gastrointestinal
GMC	General Medical Council
GP	general practitioner
GSA	General Surgery Australia
hb	haemoglobin
HDU	High Dependency Unit
ICU	Intensive Care Unit
IMG	International Medicine Graduate
ISCP	Intercollegiate Surgical Curriculum Programme
ISOBAR	identify, situation, observations, background, agreed plan, read back
IT	information technology
JCCA	Joint Consultative Committee on Anaesthesia
JMO	junior medical officer
M&Ms	Morbidity and Mortality Meetings
MDT	multidisciplinary team
MMM	Modified Monash Model
MSCTN	Multi-Specialty Community Training Network
NAIDOC	National Aborigines and Islander Day Observance Committee

NESB	non–English speaking background
NHS	National Health Service
NR	not reported
NTN	national training number
NTS	non-technical skills
NZ	New Zealand
OHNS	Otolaryngology Head and Neck Surgery
OT	occupational therapist
PFET	Post-Fellowship Education and Training
PGY	postgraduate year
PHO	Principles House Officer
PICO	population, intervention, comparators, and outcomes
PRISMA	Preferred Reporting Items for Systemic Reviews and Meta-Analyses
PSA	Provincial Surgeons of Australia
R&R	rescue and recovery
RACGP	The Royal Australian College of General Practitioners
RACS	Royal Australasian College of Surgeons
RCPSC	Royal College of Physicians and Surgeons of Canada
RCSEd	The Royal College of Surgeons Edinburgh
RFDS	Royal Flying Doctors Service
RGH	Rural General Hospital
RHM	Rural Hospital Medicine
ROMP	Rural Ontario Medical Training Program
RSS	Rural Surgery Section
RSTP	Rural Surgical Training Program
RTC	Rural Training Committee
SET	Surgical Education and Training
SHELF	Sheffield Elicitation Framework

SIMG	Specialist International Medical Graduate
SMART	specific, measurable, attainable, relevant, timely
STBs	Specialty Training Boards
STI	sexually transmitted infection
STP	Specialist Training Program
UK	United Kingdom
US	United States
VMO	visiting medical officer
WA	Western Australia

1. Introduction

In Australia, the Modified Monash Model (MMM) determines if a location is considered rural, remote, or very remote.[1] The MMM uses geographical remoteness and town population size to categorise locations on a scale of 1 to 7. Areas classified as Modified Monash 1 (MMM1) are major cities, and areas classified as MMM 2–7 are rural, remote, or very remote. This model has been in use by the Australian Government Department of Health since January 2020.[1]

Although Australia is a highly urbanised society, 29% of Australians reside in MMM 2–7 areas.[2] On average, Australians living in rural and remote areas have a higher incidence of disease and injury, poorer health outcomes and live shorter lives compared with Australians living in metropolitan areas. Factors leading to these health inequalities may include reduced access to healthcare, social determinants (such as income, education, and employment opportunities), higher rates of risky behaviours, and higher occupational and physical risk rates.[3]

Australians living in rural and remote areas may need to travel hundreds of kilometres to use health services. Access to transport (public and private) may be limited or even impossible at certain times of the year (i.e. roads may become impassable in wet weather).[4] The time, financial cost (petrol, accommodation, time away from work resulting in lost wages for patients and carers), and emotional cost (stress of being away from family and being in an unfamiliar setting) associated with travelling long distances are often deterrents to accessing healthcare.

Medicare statistics from 2017–18 on the number of primary (non-hospital, non-referral) healthcare services provided in major cities compared with rural, remote and very remote areas report a disparity that supports the issue of remote and rural inequity.[5] During this period, 6.3 services per capita were accessed in major cities.[5] The numbers of services provided per capita in inner (6.3) and outer regional (6.0) areas were not dissimilar. Remote areas averaged 4.9 services per capita and very remote just 3.6, suggesting greater distance may be a more significant deterrent.

Remoteness may affect outcomes for patients that use health services. Mortality rates of both men and women in rural and remote settings are 1.1 to 1.4 times higher than in metropolitan settings.[2,6] The cause of this appears to be a lack of specialists, including surgeons, rather than a lack of primary care providers.[7] For trauma patients especially, evidence has shown that a lack of proximity to trauma centres, or a lack of appropriate levels of care results in injuries from motor vehicle accidents being more likely to be fatal.[8] Mortality rates are also higher in areas with lower numbers of surgeons per locality.[8]

The Australian National Medical Workforce Strategy 2021–2031[9] reported that in Australia the number of healthcare professionals per capita is adequate but maldistributed. Only 12% of surgeons are living and working rurally, and 5 out of 9 specialties have less than 5% of surgeons based outside of urban areas.[10] Access to healthcare, in particular surgical care, in rural and remote communities has been recognised as an issue in Australia for decades, and is one of the main contributors to the difficulty of recruiting and maintaining a workforce in these areas.

To address this issue, in 1997 the Royal Australasian College of Surgeons (RACS) introduced its Rural Surgical Training Program (RSTP).[11] The RSTP enabled early recruitment of Trainees into the rural surgical workforce (in year one of the Surgical Education and Training (SET) Program).[11] These Trainees had access to a network of rural surgeons, with an individual mentor assigned to them to provide assistance throughout the program. As well as this, Trainees were incentivised with financial assistance for conferences and training courses.[12] The RSTP was available within the General Surgery Program only. It was initially hoped that the program would be extended to the other surgical specialties; however, this did not occur. Despite the positive impact of the RSTP, it was unable to fully meet the surgical workforce needs of rural and remote locations.

In 2020, RACS presented its Rural Health Equity Strategic Action Plan for patient-centred surgical care and a sustainable surgical workforce in remote, rural, and regional Australia and Aotearoa New Zealand. The strategy is based on the 4 phases of a surgical career, briefly outlined below.

- **Select for rural:** selection aims to recruit Trainees who are more likely to practise in a rural location after training. This includes those of rural origin, or with rural exposure during medical school or pre-SET work experience. Other measures include selecting those who value service to the community and health equity, minimising or removing selection criteria that are biased towards urban work experience, and the adoption of the RACS Aboriginal and Torres Strait Islander Surgical Trainee Selection Initiative.[2]
- **Train for rural:** the principle of this phase is to ensure that all graduating surgeons are competent in the generality of their speciality and all Trainees in all 9 specialty training programs have the opportunity for positive rural work experience, paired with a rural-facing curriculum.[10]
- **Retain for rural:** provision of support in the form of surgeon education, regulation, financial assistance, and personal and professional development.[13]
- **Collaborate for rural:** this phase focuses on engagement outside of RACS itself (i.e. with general practitioners (GPs), nurses and other remote medicine groups) and interdisciplinary training.[14]

Furthermore, the present SET curriculum provided by RACS Specialty Training Boards (STBs) tends to be urban focused, and as a result is not well contextualised to rural, regional, and remote settings. The problem with urban-focused training programs is that they can unintentionally convert students with intentions to work rurally into urban specialists. Conversely, positive rural exposure for urban-origin students and Trainees is strongly associated with urban-to-rural conversion, increased rural recruitment and long-term retention.[15]

It is important to ensure that the rural context is reflected in training and educational content. A proposed idea and an action within the RACS Rural Health Equity Strategic Action Plan was to develop a rural-facing surgical curriculum. A rural-facing surgical curriculum will help Trainees in Specialist Training Program (STP) rural posts to develop skills and competencies necessary to practise in rural, regional, and remote areas. This will increase the potential for rural training positions to result in rural surgeon recruitment and retention and will magnify the impact of positive rural work exposure.

A rural-facing surgical curriculum requires a curriculum framework to provide information about the required content and organise a plan and set of learning outcomes to define the content to be learnt. It must provide clear, definable standards outlining what the Trainees should know and be able to do. The curriculum framework underpins the specific learning outcomes, and the curriculum is then aligned and mapped to these learning outcomes, with the students assessed against these learning outcomes.

While the Rural Health Equity Strategic Action Plan is a multiphase Australian and Aotearoa New Zealand initiative, because of the funding conditions imposed as part of the Australian Department of Health Specialist Training Program, this report focuses on Australia only.

The current focus of the project is on the professional skills (non-technical skills) that are common to all 9 surgical specialties – specifically, those skills that are unique to the rural context or different from the urban context. The goal is to provide a rural curriculum framework for professional skills that the STBs can map to their existing curriculums or use as an additional section on top of their existing curriculums. These professional skills have been documented in the RACS Surgical Competence and Performance Guide, and include Collaboration and Teamwork, Communication, Cultural Competence and Cultural Safety, Health Advocacy, Judgement and Clinical Decision Making, Leadership and Management, Scholarship and Teaching, and Professionalism and Ethics.[16]

2. Aims and Objectives

The aims of this project are to:

1. Research the literature and consult rural surgical institutions on the importance of a rural-facing surgical curriculum, and to identify the necessary elements for both generic and specialty-specific rural-facing surgical curriculums.
2. Develop a rural-facing curriculum framework to inform the further development of a rural-facing surgical curriculum.
3. Develop suggestions for the next stages of the project, including curriculum refinement, and the process for STBs and RACS to implement the rural-facing surgical curriculum for Trainees in Rural STP posts.

The objectives of this project are to:

1. Complete a rapid review of peer-reviewed and grey literature to investigate the importance of a rural-facing surgical curriculum and determine the elements of both a generic and specialty-specific rural-facing curriculum. This includes
    a. a review to determine if there are any pre-existing rural-facing surgical curriculums and, if so, what these are comprised of
    b. an investigation of the required modules, subject outlines, and technical and professional competencies.
2. Complete a 3-round Delphi study to validate and reach consensus on proposed rural-facing surgical curriculum recommendations. The Delphi study also aimed to produce further recommendations, possibly including the development of reading lists, educational guides, and clinical assessments; management of resource-limited environments; skills for outreach and inreach; and activities and knowledge for rural practice and self-efficacy.
3. Design a rural-facing surgical curriculum in collaboration with the Working Group.
4. Complete an expert elicitation for the validation of the general rural-facing surgical curriculum.

3. Rapid Review

3.1 Introduction

The first stage of the research methodology was a rapid review of peer-reviewed and grey literature to investigate the importance of a rural-facing surgical curriculum and the elements of both a generic and a specialty-specific rural-facing curriculum. Due to the time constraints on this project, a rapid review was conducted rather than a full systematic review. Rapid reviews are a method of evidence gathering and synthesis where elements of systematic review methodology are modified or omitted, which allows information to be produced in a timely manner.[17] Rapid reviews may be susceptible to biased results because of the modifications or omissions from the systematic review process, but have been shown to have congruent findings with systematic reviews, and remain a valid research option when there are resource limitations.[18]

This rapid review aimed to identify the elements of rural surgical training programs used in developed countries to inform a discussion for developing a rural-facing curriculum framework that can be adapted and used across the 9 surgical specialties in Australia.

3.2 Methods

i) Research question(s)

Based on published peer-reviewed literature and grey literature, this rapid review aimed to determine:

1. What are the elements of rural surgical training programs?
2. What are the essential elements of rural surgical training programs according to surgeons and Trainees?
3. Are there any elements of rural surgical training programs that are missing according to surgeons and Trainees?

ii) Literature search strategy

This rapid review was conducted and reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.[19] One reviewer conducted a systematic literature search of 2 biomedical databases (Medline and Embase) to identify relevant literature. Searches were conducted on 12 May 2021 and were not date limited. No other methodological filters were applied to the searches. Pearling of pertinent publications was also conducted to ensure all relevant peer-reviewed articles were identified. A complete list of search terms and outputs is provided in Appendix A.

iii) Study selection

Inclusion criteria were defined a priori to guide study selection. Inclusion of English language–only articles were based on their relevance to the setting, intervention, comparator, and outcomes (PICO).

One reviewer screened all search results by title and abstract. A shortlist of potentially relevant articles was selected for full-text review by the same reviewer. A second reviewer checked a subset of the articles undergoing full-text review, and discrepancies were resolved by discussion.

Table 1: Study inclusion criteria

Setting	Developed countries (including, but not limited to, Australia, United States of America, Canada, United Kingdom, Ireland)
Intervention	Rural surgical training programs for surgical Trainees
Comparator	Not applicable
Outcomes	Elements of a rural surgical training program Essential elements of a rural surgical training program according to surgeons/Trainees Missing elements of a rural surgical training program according to surgeons/Trainees
Study design	Any study design which describes the elements of rural surgical training programs including (but not limited to) commentaries and narrative reviews, and surveys[a] of surgeons, Trainees and program directors regarding what is required in a rural surgical training program or when evaluating a rural surgical training program

Note
a = Surveys of 2 or more people were eligible for inclusion. Studies that included the opinion of a single author were excluded.

iv) Data Selection and extraction

Data were extracted by one reviewer using a standardised data extraction template. Data extracted included study author, year, location, details of the rural surgical training program and any other relevant key findings. A second reviewer double-checked a subset of extracted forms for accuracy.

Regarding the description of rural training programs, where more than one publication described the same program, reporting of the most recent publication took place first, with earlier studies only reported if they provided additional program details. Studies that were eligible for inclusion but not used to describe a program (because of duplication of information) were still listed as an 'included study'.

In addition, where details of a rural training program were reported in an included peer-reviewed study, efforts were made to crosscheck the data with the source program's/institution's website or database to ensure all details were up to date. If all details were not available online, it was assumed the data provided in the peer-reviewed study was accurate.

v) Quality appraisal of included studies

Many publication types were eligible for inclusion in this review, and so the included literature was not critically appraised.

vi) Data synthesis

Quantitative synthesis was not possible because of a lack of quantitative data about rural surgical training programs. Program characteristics and survey results have been summarised narratively.

3.3 Results

i) Literature search results

Overall, the database searches identified 2,453 articles. Two more were identified through pearling. Following the removal of duplicate studies, 2,423 articles underwent screening by title and abstract. From these, 158 were found to be eligible for full-text review. The literature search results, including a PRISMA flowchart for study selection, are provided in Appendix A.

The complete list of publications excluded via full-text review (n = 113) is provided in Appendix A. Reasons for exclusion included incorrect setting (e.g. developing countries), unrepresentative population (e.g. medical students) or inapplicable program type (e.g. postgraduate fellowship).

A total of 45 publications provided the evidence base for this rapid review. Of these, 25 studies provided descriptions of rural surgical training programs, 17 provided survey or questionnaire results, 2 provided descriptions of rural surgical training programs and survey or questionnaire results, and 1 was a scoping review regarding perceived training gaps for isolated surgeons.

ii) Included studies

Of the 25 studies describing rural curriculums or training programs, 22 were from the United States (US), 2 were from Australia and 1 was from Canada. Eight of the US studies were general reviews that provided a summary of the main elements or features of rural training programs. Other studies discussed the aspects of one or several programs individually.

Of the 17 surveys identified, 12 were from the US, 4 were from Australia and 1 was from Canada.

iii) Critical appraisal

Due to the nature of the rapid review, critical appraisal was not applicable.

iv) Australian programs

Two studies described the RSTP, funded by the Commonwealth government.[11,20] The RSTP was established in 1997 (and ceased in 2007) by RACS to support the recruitment and retention of rural surgeons for rural practice in a range of surgical specialties. The program existed within the General Surgery program and used existing General Surgery rotations. There were no selection criteria for entry into the program. Registrars rotated through specialty posts such as Paediatric Surgery, Orthopaedic Surgery, Colorectal Surgery, Breast Surgery or Vascular Surgery to prepare them for a non-metropolitan career. Each Trainee was allocated a rural mentor. No further details about the RSTP were provided in the 2 included studies.

v) Australian survey results

Four studies conducted surveys on different populations of Australian rural surgeons.[21-24] There were no common themes or research questions across the 4 studies. Two studies reviewed a specific rural training program or placement,[22,23] one was a general descriptive article with a survey component about rural surgery training in Victoria,[24] and the other examined neurotrauma surgical caseloads and training of Australian rural surgeons.[21] Across all 4 studies, all but 2 of the survey respondents were in the specialty of General Surgery (the others being in Orthopaedic Surgery and Paediatric Surgery).

Chong and Kiroff[23] conducted an online survey to review the RACS RSTP General Surgery Training Program between 2000 and 2006. This survey was sent to 2 groups of surgeons. The first, comprised surgeons who had obtained their RSTP General Surgery Fellowship between 2000 and 2006 (RSTP group). The second comprised a cohort of non-RSTP surgeons who had completed their Fellowship in the same period and were randomly selected from the RACS database (control group). The survey questions were not described within the article.[23]

In total, 69 participants completed the survey (48% response rate); 35 from the RSTP group and 34 controls. At the time of the survey, 15 RSTP surgeons were working full-time in non-metropolitan areas throughout Australia, compared with 6 in the control group.[23]

Twelve participants from the RSTP group and 4 controls reported performing procedures beyond the scope of General Surgery. Of these, 5 RSTP surgeons and 1 control surgeon performed operations beyond the scope of General Surgery daily. These surgical procedures included video-assisted Thoracic Surgery pleurodesis, thoracic sympathectomy, head and neck dissection, adenotonsillectomies and septoplasties.[23]

Of the 15 RSTP surgeons working full-time in non-metropolitan areas throughout Australia, 6 responded positively when asked whether the RSTP had adequately prepared its Trainees for rural work. Of the remaining surgeons, 1 answered: 'to an extent', 1 answered: 'unsure' and 7 responded negatively. Nine respondents were assigned a mentor during their residency, of which only 2 found the experience useful.[23]

When asked how the RSTP could be improved, respondents' comments included enabling greater proximity between mentors and Trainees, more autonomy in choosing training locations (to ensure a more rounded surgical experience), and creation of senior registrar or Fellow positions in rural hospitals.[23]

The authors acknowledged that little is known about what constitutes rural surgical practice. This, along with the broad scope of rural General Surgery, makes preparing surgeons for rural practice complicated. Furthermore, there is concern about professional isolation within rural surgery, which results in fewer opportunities for skills maintenance and peer review. This may lead to increased fears of medicolegal vulnerability, especially when surgeons are undertaking procedures outside of their traditional scope, sometimes without adequate medical, nursing, and technical backup. The authors also commented that there are difficulties for rural surgeons when obtaining advice and transferring critically ill patients to metropolitan centres.[23]

Bruening and Anthony et al[22] surveyed advanced General Surgery Trainees who completed a pilot rotation in Whyalla, South Australia. At the time of writing the publication, this location had a permanent population of 23,000 individuals and served another 10,000 in the surrounding region. The hospital had 2 resident General

Surgeons, 1 resident Orthopaedic surgeon and 1 resident Anaesthetist, with visiting surgeons providing the other subspecialty services. This rural rotation was one month in duration.[22]

Eight General Surgery Trainees who completed the rotation in Whyalla also completed the survey. Questions included the ideal duration for the rural rotation and overall ratings of the educational experience. After the rotation, 5 respondents felt that the ideal length of time for the rotation would be 3 months, 3 respondents felt that 6 months was the ideal time, 2 were unsure, and 1 felt that 1 month was the ideal duration for the rotation. When looking at the overall educational experience on a 10-point visual analogue scale, mentor supervision received a median rating of 9 (range 6–10), surgical skills teaching received 7 (range 3–9), clinical teaching received 8 (range 5–10), volume of clinical work received 6 (range 5–8) and range of pathology received 7 (range 5–10).[22]

The authors proposed that the minimum duration should be increased to 3 months; however, from an accreditation standpoint, a 6-month rotation would be the standard duration. After this pilot, a 6-month advanced training position has been adopted for the South Australian Riverland region.[22]

Faris[24] authored a descriptive article about the educational needs of a rural surgeon in Australia. The article included responses to a questionnaire mailed to surgeons in rural Victoria. The results revealed what rural surgeons fel their training should encompass. The survey data indicated that a residency rotation with rural surgical mentors may enhance the qualifications and interest of rural surgeons. Regarding the duration of advanced surgical training, the survey responses recognised that not all training for rural surgery (broad General Surgery and some specialty training) could be achieved in 4 years. The results indicated a strong recommendation for an additional 2 years of training after obtaining a RACS Fellowship (FRACS). When asked about content, the responses showed that broad General Surgery skills with training in specialties (especially Orthopaedic Surgery, Plastic and Reconstructive Surgery, Urology, Vascular Surgery, Paediatric Surgery and Cardiothoracic Surgery) are favoured. In addition, flexible curriculums that can be tailored to the interest and training of the surgeon, the needs of the community in which the surgeon will practise and the availability of specialist services in that community, are warranted.[24]

When asked about training location, respondents felt that General Surgery training for rural surgeons should be the same as the accredited training for advanced trainees in General Surgery and should occur in a teaching and regional hospital. At the time of publication of the article,[24] the Board in General Surgery had a hospital accreditation criterion that effectively excluded smaller hospitals. According to the authors of that article, the problem with this is that accrediting only hospitals with all the facilities of a teaching hospital may mean that graduating surgeons will only be fit to practise in hospitals with similar facilities (generally in urban areas). Regarding post-Fellowship training, the authors stated that this might include more specialty training, a position as a senior registrar in a country hospital, or an attachment to a rural practice as a Trainee; however, hospitals would need to provide funding to support this.[24]

Bishop and Drummond[21] prepared a survey that aimed to define the neurotrauma surgical caseload of non-neurosurgeons in rural Australia and the basic facilities for its surgical management. A component of this study was examining the level of Neurosurgery training received by rural surgeons and the subjective confidence of rural surgeons in surgical management of neurotrauma. A total of 343 survey responses (91% response rate) came from all surgeons on the register of the Division of Rural Surgery (RACS Rural Surgery Section). The survey was aimed only at rural surgeons who actively dealt with neurotrauma.

Of the 343 respondents, 341 were in General Surgery, 1 was in Orthopaedic Surgery and 1 was in Paediatric Surgery. The survey results showed that 36% of respondents had no training in Neurosurgery beyond a basic medical degree, 36% had trained in a neurosurgical resident position and 28% had trained in a neurosurgical registrar position. Of respondents, 61% had completed the 'Early Management of Severe Trauma' course and 15% had completed the 'Definitive Surgical Trauma Care' course. The authors noted that basic competencies expected for neurotrauma training in the General Surgery program would require at least some time spent training in a neurosurgical registrar position. However, only 28% of the respondents had Neurosurgery training more advanced than that of resident level. The authors concluded that although a significant volume of neurotrauma is managed surgically in rural Australia, neurotrauma training of rural surgeons has occurred on an ad hoc basis.[21]

In addition, the survey results revealed that confidence in managing neurosurgical procedures—including assessment of computed tomography images, performing burr hole and craniotomy procedures, and intracranial

pressure monitoring—significantly increased with distance from a neurosurgical centre. Of the 600 procedures documented in the survey, only 50 (8%–9%) were performed while a neurosurgeon was in telephone consultation.[21]

vi) Canadian programs

Two studies were identified describing a Canadian rural-focused curriculum.[25,26] The Multi-Specialty Community Training Network (MSCTN) was established in 1997 by the University of Ontario Faculty of Medicine and Dentistry in partnership with a variety of communities and physicians in the region. It was developed to provide specialty residents with the opportunity to perform part of their training in rural and regional settings. This was to encourage more specialists to practise in small and midsized communities and to increase the understanding of rural and regional patient care for all specialty residents and university teaching hospital faculty.[26] The 3 principle goals of the MSCTN are:

> '*1. to enhance the rural competence of specialist residents*
>
> *2. to provide exposure to rural and regional community medical practice in order to promote rural and regional specialist recruitment*
>
> *3. to increase the understanding of rural and regional patient care among all specialty residents and university hospital faculty*.'[25]

The learning objectives and evaluation tools for the MSCTN are based on the Royal College of Physicians and Surgeons of Canada (RCPSC) physician competency framework—CanMEDS. This framework describes the core abilities that physicians require to effectively meet the healthcare needs of the people they serve. They are incorporated into the RCPSC standards for curriculum, accreditation, evaluation, examination, and professional development. The 7 key elements of CanMEDS are: medical expert/clinical decision-maker, communicator, collaborator, manager, health advocate, scholar/learner, and professional/personal. These elements were modified for rural and regional practice and are used as the basis for an MSCTN resident evaluation (see Table B1 in Appendix B).[25] A similar framework is used by residents to evaluate their overall learning experience, and by their preceptors.[26]

Participating residents include those from 5-year postgraduate specialty residency training programs (Anaesthesia, General Surgery, Internal Medicine, Obstetrics and Gynaecology, Paediatric Surgery, Psychiatry, Pathology, Radiology and Community Medicine), except for Emergency Medicine.[26] Each department has several sites (with populations ranging from 7,500 to 75,000) and preceptors from which residents can choose. The Ontario Ministry of Health provides funding for preceptor teaching fees, and resident travel and accommodation. Participation in the program is optional, although all major department/division residents are encouraged to participate. Most residents who participate do so for 1–3 months and are in the third year of their 5-year training program.[26] Videoconference networking and library access is established at each site to avoid travel back to the main city for teaching rounds and library access. The scope of practice for all specialists participating in the MSCTN Rural Training Program is broader than that encountered in university specialty practice.[26]

vii) Canadian survey results

Two surveys were conducted on a population of Canadian rural surgeons.[25,27] Gillman[27] completed a survey of final-year Canadian-trained residents scheduled to sit the RCPSC certifying examination in General Surgery. The objective of the survey was to explore the perceived competencies of graduating General Surgery residents in Canada. The questionnaire assessed whether chief residents would book and independently perform various traditional General Surgery procedures plus a selection of procedures from other surgical disciplines (e.g. Orthopaedics, Obstetrics and Gynaecology, and Plastic surgery) that are commonly performed by general surgeons practising in rural or community environments.[27]

Sixty-four residents completed the survey (71% response rate), of which 20% planned to undertake rural General Surgery practice. Most of the residents (>90%) expressed comfort with the basic general surgical procedures, including laparoscopic cholecystectomy, appendectomy, mesh hernia repair, simple mastectomy, and hemorrhoidectomy. Residents were less comfortable with advanced laparoscopic or specialised general surgical procedures. Most residents indicated that they were not comfortable performing select procedures in Orthopaedic Surgery, Obstetrics and Gynaecology and Plastic Surgery. This result did not differ significantly for residents with an expressed interest in community or rural surgery versus the group as a whole.[27]

Further results showed that 100% of the residents would perform simple mastectomy and lumpectomy and 89% would perform sentinel lymph node biopsy but only 70% would perform a level I–II axillary dissection based on the sentinel lymph node biopsy findings. Within the realm of colorectal procedures, 84% would perform a low anterior resection or the abdominal component of an abdominal perineal resection; 55% would perform a perineal dissection; 95% would perform haemorrhoidectomy, banding or simple fistula management; 84% would perform a lateral internal sphincterotomy; 71% would undertake a distal gastrectomy with Billroth II reconstruction; 29% would perform a total gastrectomy if required; 97% would perform an open or laparoscopic cholangiogram; and 62% would perform an open common bile duct exploration. Although 94% of chief residents were comfortable performing inguinal herniorrhaphy with a mesh plug/patch, 24% stated that they would not perform a tissue repair.[27]

The authors stated that the variation in caseloads seen by rural practitioners far exceeds that seen by most urban surgeons, with a greater percentage of rural practitioners performing procedures within the fields Orthopaedic Surgery, Obstetrics and Gynaecology, and Plastic Surgery. The data indicated that most graduating surgical residents are not comfortable performing procedures outside the traditional scope of General Surgery, regardless of whether they plan to pursue fellowship training or community practice. The authors have suggested establishing a rural/community fellowship training program or rural/community General Surgery residency program.

Rourke and Frank[25] investigated the design, activities, and evaluation tools of CanMEDS as a framework for the MSCTN. The survey respondents (66 residents) rated the clarity and appropriateness of the MSCTN's objectives as high (average score of 5.37 on a Likert scale of 1–7 in the first year [1997–1998] and 6.13 in 2001–2002). The role of physicians as defined by CanMEDS has provided a useful framework for adopting learning objectives and evaluation tools for the University of Western Ontario's rural and regional MSCTN. The development of objectives designed to be relevant to the rural and regional setting has made them more useful to participating residents and preceptors.[25]

viii) United States of America programs

Of the 22 identified articles that described rural surgery training programs in the US, 8 provided a general summary or review of the elements of these programs.[7,28-34] Timmerman and Thambi-Pillai et al[34] outlined the 3 strategies proposed by the American College of Surgeons (ACS) to address the growing crisis of a lack of rural general surgeons in the US. The first strategy involves providing rural surgery opportunities to any resident interested in rural surgery during the 5–7 years of surgical training. In some institutions this includes a rural rotation in a community setting, generally 1–3 months in duration. These rotations may be elective or required as part of the General Surgery residency training, and tend to occur during the second to fourth years of residency.[31,34] During these rotations, residents connect with a rural surgeon mentor and get to perform a broad range of General Surgery and subspecialty procedures.[29,31] Other institutions have implemented a dedicated rural surgery track where up to 9 months of training, including rural surgery rotations and surgical subspecialty training, are provided to interested residents during their second through fourth years.[34] In some universities, these rural residency tracks are independent and students must apply directly, while in others they are embedded in the General Surgery residency program and do not require a separate application.[31] Another method, termed 'the immersion approach', involves residents spending an entire year in a rural community (instead of a research year) during the middle years of their residency. Residents spend the year in the rural community working alongside surgical subspecialists free of competing surgical specialty residents and gain considerable operative experience, including in endoscopy.[29,34]

The second strategy reported by Timmerman and Thambi-Pillai et al[34] to address the decline in rural surgeons is the creation of new surgical residencies with a primary focus on rural surgery. These programs are commonly located in more remote rural areas, have higher volumes of endoscopy and ambulatory surgical exposures, and lack subspecialty residents, which allows residents in General Surgery to gain experience in different specialties.[34] The third strategy, which is not of relevance to this review, is the creation of General Surgery fellowship opportunities.[34]

Several reviews of the different rural surgery programs or tracks within the US have been conducted.[33, 32, 28] In the review by Rossi and Rossi et al[33], members of the Advisory Council on Rural Surgery defined 4 primary components for successful rural surgical training, based on expert opinion and a literature review of articles that discussed needs assessments for rural surgical training.[33] These 4 components were:

- clinical experience in rural settings
- a robust diagnostic and therapeutic gastrointestinal experience
- exposure to diseases and procedures in surgical subspecialties
- an absence of competing surgical specialty learners in the rural rotation and/or the parent surgical residency.[33]

The review then identified existing rural programs from the American Medical Association (AMA) Fellowship and Residency Electronic Interactive Database (FREIDA) and a previous study[35], and grouped them according to their ability to provide these 4 components.

Similarly, Mercier and Skube et al[32] identified and reported rural surgical programs offered by the Accreditation Council for Graduate Medical Education (ACGME) and classified them as to whether they had an intrinsically rural surgery residency, an elective rural surgery rotation, or required a rural surgery rotation or designated rural residency. Only programs located in rural areas (defined as a population of ≤50,000 people) or those in which a rotation that was confirmed to be in a rural location was part of the curriculum were included.[32] Details of the rural training programs reported by Rossi and Rossi et al[33] and Mercier and Skube et al[32] with respect to length and year(s) of rotations, residents per year, population of rural location, whether surgical specialties and endoscopy are taught, and whether the programs are considered broad or basic have been summarised in Table B2 (Appendix B).

Finally, Avery Jr and Wallace[28] reviewed 11 rural surgery training programs in the US and described the components of the training programs including rotation length and subspecialty exposure. These are reported in Table B3 (Appendix B).

The remaining 14 studies provided details on one or more of the following rural surgical programs.

Bassett Healthcare, Cooperstown, New York

The Bassett Healthcare Rural Surgery Training Program was described in 9 included articles.[28,30,36-42] The Bassett Healthcare, Mithoefer Centre for Rural Surgery, located in Cooperstown, New York, was established in 2004 to train residents in General Surgery who are interested in practising in a rural area. The surgery experience is categorised into undergraduate, graduate and postgraduate groups.[36] A recent survey found that 70% of Bassett graduates who practise General Surgery remain in a rural area.[36] Residents in the rural track spend 2–3 months during the fourth postgraduate year (PGY) training alongside a Bassett graduate in rural practice.[39] The surgery residents are offered a broad-based General Surgery experience with no other competing fellows or subspecialty residents. Because of this, residents get extensive experience in Gynaecology and Obstetrics, Endoscopy, Neurosurgery, Urology, Cardiothoracic Surgery, Otolaryngology, Plastic Surgery and Hand Surgery throughout their residency training.[28,30] Senior residents are also given the opportunity to complete a 6-week rotation at Saranac Lake, New York, in a broad-based surgical practice in the Adirondack Mountains.[30,36] The student is directly supervised by a member of the attending staff throughout the rotation, with weekly feedback sessions and an exit interview with the course director.[43] The Bassett Healthcare program also offers post-residency mini-fellowships in rural surgery for graduates who need more exposure to surgical subspecialties and endoscopy. The fellowships are of variable length and are needs-driven to suit the applicant's desires and future goals.[30]

University of North Dakota, Grand Forks, North Dakota

The rural training track within the University of North Dakota's General Surgery residency program was described in 8 articles.[28-30,38,41,42,44,45] This program is based around broad exposure to General Surgery and the surgical subspecialties, with 9 months of training in surgical specialties and rural surgery rotations in PGY 2, 3 and 4 (PGY 1 and 5 are the same as the General Surgery track residents). Of the 9 months of rotations, 6 months are spent in subspecialties in which rural surgeons commonly perform cases,[46] and the management of emergency situations in these subspecialties is emphasised. During the rural surgery track rotations, the residents are generally expected to be on call when the attending subspecialty surgeon is on call. When the rural surgery rotation is located at the same campus as one of the core faculties, the resident may be required to take General

Surgery call; however, there will not be more than one day of General Surgery call per week during the rural rotation.[46]

There is a lack of other surgical residencies in the state of North Dakota and there are no other surgical Fellowships in the Department of Surgery or any other hospital in North Dakota.[30,44] This enables the residents to incorporate subspecialty procedures into their daily surgical routine. The program includes dedicated rotations in Anaesthesiology, Pathology, Plastic and Reconstructive Surgery, Orthopaedic Surgery, Otolaryngology Surgery and Urology.[30] These rotations are 2 or 3 months long and take place in Grand Forks or Fargo Hospital. During PGY 4, the residents complete a 2-month rotation in Paediatric Surgery at the Arnold Palmer Hospital for Women and Children in Orlando, Florida.[44]

A specific rural surgery experience is offered for 1 month during PGY 1 and PGY 2 in Park Rapids, Minnesota, where residents can perform more than 100 surgical cases, including advanced laparoscopic procedures.[44] The rural surgery track incorporates rural surgery, endoscopy, and specialty rotations (e.g. Plastic Surgery, Hand Surgery, Wound Management, Anaesthesia, Critical Care and Advanced Endoscopy).[45] The program is tailored for individual residents' needs based on their intended future practices.[30] Residents are able to request specific experiences in the specialties that may be required at their future practice location, and this is scheduled during PGY 4 and PGY 5.[44] The residents average more than 250 endoscopies by graduation, with experience in both upper and lower endoscopy.[44]

University of Tennessee College of Medicine, Chattanooga and Knoxville, Tennessee

Six studies described the 6-year General Surgery residency at the University of Tennessee at Chattanooga (comprising 5 clinical years and 1 research year).[28,30,37,38,41,42] This program offers a broad General Surgery and subspecialty program with all PGY 3 residents spending 3 months on a rural surgery rotation in Athens and Etowah, Tennessee.[28,30] General surgeons are responsible for mentoring the residents and providing them with rotations in General Surgery, Thoracic Surgery and Vascular Surgery, as well as providing exposure to Endocrine, Colorectal and Breast surgery; Caesarean Sections; and Urology, Gynaecology and Otolaryngology Surgery.[28,30,37] The surgical residents gain experience in diagnostic and therapeutic endoscopy and are provided office time dedicated to evaluating gastroenterological conditions.[30,37]

The university also offers a 5-year General Surgery residency in Knoxville. Due to limited Fellowship programs, General Surgery residents gain a broad exposure to General Surgery, Cardiothoracic Surgery, Vascular Surgery, Paediatric Surgery and the subspecialties.[47] This program has a 1-month elective at a rural or international location in PGY 3 and a 3-month rural rotation in PGY 4. Rotations include Gynaecology; experience with fractures, dislocations, hand injuries and other nonoperative Orthopaedics; and nonoperative Neurosurgery, due to the presence of a Level-1 trauma centre without Orthopaedic or Neurosurgery residency programs or residents.[48]

Oregon Health and Science University, Grants Pass, Oregon

Eleven studies described the Oregon Health and Science University General Surgery residency in Portland, Oregon.[28-30,38-42,45,49,50] The residency includes an optional 6–12-month rural surgery rotation in either Grants Pass or Coos Bay, Oregon.[51] This time is counted as clinical training by the American Board of Surgery. Two residents in PGY 4 can spend 12 months working with general surgeons at Asante Three Rivers Medical Centre, Grants Pass, where they gain exposure to surgical disease, General Surgery, Vascular Surgery, Endoscopy, Urology, Obstetrics and Gynaecology, and Orthopaedic Surgery cases.[51] The residents perform 300–500 cases during their year at Grants Pass.[52] Two PGY 3 or PGY 4 residents may do a 6-month rural rotation at the Bay Area Hospital, Coos Bay, where they gain exposure to General Surgery, Endoscopy, Minimally Invasive Surgery and other surgical subspecialties.[51] The hospital has rural general surgeons and multiple specialists,[52] with no other competing residents.[30] The residents also have their own morbidity and mortality conference and journal club, and participate in local educational opportunities and county medical societies.[29] The time spent in a rural location models what it would be like working in rural practice—in particular, working with partners, interacting with referring physicians, attending to billing and office management, and ensuring continuity of care.[45]

University of Utah, Salt Lake City, Utah

Four articles described the University of Utah's General Surgery residency program in Salt Lake City.[28-30,38] In 2007, a rural rotation was established to increase the exposure of residents in General Surgery to the rural setting. This 12-month rural rotation is available to one resident per year and is not accredited. The aim of the

program is to provide residents who are interested in rural surgery a year of exposure to procedures and issues unique to rural surgical practice.[53] The program also includes a 2-month experience at a rural hospital.[54]

In lieu of the PGY 3 research year, eligible residents in General Surgery can elect to spend one year completing a rural surgery fellowship at Ogden Regional Medical Center.[28] During this year, the resident has rotations in Anaesthesia, Gynaecology, Obstetrics, Orthopaedic Surgery, Urology, Gastroenterology, Thoracic Surgery, Plastic Surgery, Otolaryngology, Pulmonology, Emergency Medicine, Trauma and General Surgery.[30] The Ogden Regional Medical Center has a strong General Surgery department and subspecialty providers and no other competing surgical residents.

East Tennessee State University, Quiellen College of Medicine, Johnson City, Tennessee

Studies by Lockett and Browder[55] and Avery Jr and Wallace[28] describe the broad-based General Surgery residency program offered by East Tennessee State University at the Quillen College of Medicine.[28,55] The program uses 4 hospitals and offers experience in General Surgery and Vascular Surgery.[28] For residents interested in rural surgery, an optional year after PGY 3 or PGY 4 is offered in Orthopaedic Surgery, Urology, Otolaryngology/ENT (ear, nose and throat) Surgery and Gynaecology.[28,55]

University of Minnesota, Minnesota

Mercier and Skube et al[32] and Avery Jr and Wallace[28] describe the General Surgery rural training track offered at the University of Minnesota within the Essentia Health St Mary's Medical Center on Lake Superior in Duluth, Minnesota.

The first 3 years of this program cover General Surgery at the Twin Cities, with the last 2 years focusing on rural surgery at Essentia Health St Mary's Medical Center in Duluth.[28] Didactic educational experiences are delivered via videoconferencing so residents can attend and present at meetings, including morbidity and mortality conferences. The core curriculum is delivered locally in Duluth; some sessions are delivered via videoconference with the main resident cohort. Most formal testing is done with the entire university resident cohort in Minneapolis.

The clinical curriculum includes exposure of residents to the wide variety of surgical skills required in rural environments, including Obstetrics, Gynaecology, Endoscopy, Emergency and Trauma Surgery triage, Stabilisation and Transport, Otolaryngology, Urology, and Thoracic and Vascular surgery, in addition to General Surgery competencies.[32] Residents are part of the caesarean section call rotation at each site. They also interact with and support primary care colleagues such as family medicine physicians.

Residents spend at least 9 months over the course of 2 years at rural locations outside of Duluth, including Virginia (population 8,500; 3 general surgeons), Brainerd (population 13,500; 3 general surgeons) and Detroit Lakes (population 9,100; 1 general surgeon). The residents maintain the same rotation schedule as the other University of Minnesota residents during PGY 1–3.[32]

According to the university's website, all PGY 2 residents spend 5 to 6 weeks at Essentia Health. During this rotation, residents are involved in 60–100 General Surgery outpatient cases, on average, as well as being on call overnight and for caesarean section once per week. The goal of this short rural rotation is for all surgical residents to experience rural surgery—not just those who have chosen the dedicated rural training track.[56]

East Carolina University, Greenville, North Carolina

The East Carolina University Surgical Residency Program (sponsored by Vident Medical Center), incorporates a one-month community rural surgery rotation and elective at Edenton, North Carolina for PGY 4 residents.[28] The residents participate in clinical hospital and office care, operative management and consultations.[57]

University of Nebraska Medical Center, Omaha, Nebraska

The University of Nebraska General Surgery residency offers a one-month rural rotation in PGY 3 at the Great Plains Regional Medical Center in North Platte, Nebraska. The program incorporates extensive skills in minimally invasive General Surgery and Endoscopy.[28] Residents are exposed to a large variety of simple and complex open and minimally invasive General Surgery cases, along with extensive Endoscopy cases—upper and lower, diagnostic and therapeutic. The rural rotation has an approximate case volume of 80–100 cases, and also provides exposure to billing and coding practices in a private setting.[58]

In addition to the General Surgery rotation, the University of Nebraska Medical Center, Department of Otolaryngology, has offered a rural rotation since 2017. According to the website, rural otolaryngologists have very broad practices and are often asked to tackle complex cases without the support and resources of a large academic institution.[59]

University of Cincinnati, Cincinnati, Ohio

The University of Cincinnati program offers a rural surgery rotation at the Holzer Clinic in Gallipolis, Ohio, (population 7,000) as part of its 5-year residency. Santry and James[39] note that in PGY 3 residents work with a group of 4 general surgeons and subspecialists in Obstetrics and Gynaecology, Urology, and Plastic Surgery.[39] The program has since changed (according to the university's website) so that PGY 5 residents spend 2 months in the rural location, where they undertake ventral and inguinal hernia surgery, cholecystectomies, appendectomies, surgical management of ulcer disease, small bowel and colon resections, and endoscopies.[60]

University of Arizona, Tucson, Arizona

In 2002, the General Surgery program at the University of Arizona began offering a 6-week rural surgery elective during clinical year PGY 3 or PGY 4 at Tuba City Indian Health Hospital. According to the university's website, the rural surgery rotation is currently offered in PGY 2.[61] The rural elective includes General Surgery, Trauma, Endoscopy, Otolaryngology Surgery, Urology and Orthopaedic Surgery for adults and children. Residents are exposed to the beliefs of the Navajo Nation with regards to culturally safe medical and surgical care.[39]

ix) US survey results

Giles and Arnold et al[62] prepared a survey with the objective of documenting the experience of the rural surgery rotation provided by the University of Tennessee, College of Medicine, Chattanooga (described in Section 3.5viii).[62] Twelve residents who completed the rural surgery rotation between July 2006 and December 2008 responded to the survey. The residents reported that the rural surgery rotation was a highly valuable experience (mean score of 4.9 on a 5-point Likert scale). The residents felt that the rotation was fun and educational (mean score 4.8), the faculty attending took an interest in their education (mean score 4.8), and they

were given autonomy (mean score 4.6). The residents found the endoscopy experience very positive (mean score of 5).[62]

An additional 12 studies about the perceived training needs of general surgeons in the US were identified (published 1978–2021). One was a scoping review, and the others were cross-sectional surveys. When the specific surgeon specialty was listed, most of the respondents were rural general surgeons.

Scope of practice and training satisfaction

Breon and Scott-Conner et al[63] found that among rural surgeons in Iowa, 26% of all procedures performed in the study period were among those not required by the ACGME for graduation from an accredited General Surgery residency program.[63] These 'out of scope' procedures included Urology (3.5%), simple Orthopaedics (3.5%) and Gynaecology (18.5%). Overall, 71% of rural surgeons in Iowa who responded to the survey stated that they routinely perform surgeries outside the scope of their General Surgery residency training, compared to 21% of their urban counterparts. Furthermore, fewer rural surgeons (approximately 70%), compared with their urban counterparts (approximately 95%), felt that their residency program adequately prepared them for their current surgical practice.[63]

Similarly, Heneghan and Bordley et al[64] found that rural general surgeons had a substantially higher volume of Endoscopy, Gynaecology, Obstetrics and Urology cases compared with urban general surgeons; 80.4% of rural surgeons reported that their residency program had prepared them well for their current rural practice. Heneghan and Bordley et al[64] also suggested that current residency training programs in the US do not provide graduates with the skills needed for the breadth of practice required to provide surgical care in rural communities.[64]

Perceived training needs

Nealeigh and Kucera et al[65] completed a scoping review that analysed the perceived training gaps for surgeons working in isolated civilian and military populations. A total of 30 articles were included in this review. The most frequently reported technical skills gaps were in Orthopaedic Surgery (external fixator placement and hand trauma), Urology (nephrectomy/renal hilum and circumcision—both primary and revision), Obstetrics and

Gynaecology (caesarean section, uterine haemorrhage, hysterectomy, and ovarian pathology) and Otolaryngology (ENT training).[65]

Surgical training recommendations

Broad-based General Surgery

Five of the 11 surveys found that surgeons must be trained in a broad-based residency program, because rural general surgeons have a broader scope of practice than their urban counterparts.[64] Broad-based General Surgery residency programs were cited in Cook and Hughes et al[66], Deal and Cook et al[67], Heneghan and Bordley et al[64], Zuckerman and Doty et al[68] and Hughes et al.[69]

Cook and Hughes et al[66] found that 81% of survey respondents agreed that the ideal training for a young surgeon interested in a rural surgery career is General Surgery training with a dedicated rural track or significant rural experience. Only 4% reported that General Surgery with training in a formal subspecialty would be the ideal training. From these results, the authors suggested that surgeons in rural areas maintain broad-based General Surgery training with a strong focus on endoscopy.[66]

Deal and Cook et al[67] reported that the most common advice from respondents (34 individuals) was that young surgeons wanting to practise rurally should undertake broad-based training. Heneghan et al[64] stated that surgeons interested in rural practice need broad-based training to effectively practise in rural communities. Zuckerman et al[68] reported that many of those involved in general surgical education recommend broad-based training as a foundation for successful practice.

Lastly, Hughes and Cook et al[69] reported consensus among respondents about the need for broad surgery training. Responses such as ‘community based’, ‘broadly trained’, ‘bread and butter surgery’, ‘the fundamentals’, and ‘true General Surgery’ were used to describe the nature and scope of their practices. One respondent stated, ‘I think general surgeons in rural areas need to be much more broadly trained than a traditional General Surgery residency program allows’.[69]

Subspecialty training

Several studies surveyed surgeons and one study surveyed program directors about subspecialty training that would benefit rural surgeons in the US. Burkholder and Cofer[70] found that currently practising rural surgeons felt that additional training in the surgical subspecialties would have been beneficial. Cook and Hughes et al[66] found that the top 3 reasons surgeons recommended subspecialty training for residents interested in a rural or non-metropolitan career were acquiring technical skills, improving confidence, and improving one's ability to obtain hospital privileges. Discussion of these results follows.

Obstetrics and gynaecology

In six surveys respondents felt that rural surgeons would benefit from additional training in Obstetrics and Gynaecology during their residency programs.[64,67,70-73] Some of these studies listed specific surgical procedures (Table 2). The most frequent response was caesarean section.[64,67,72,73]

Table 2: Obstetrics and gynaecology procedures listed per study

Author	Procedure
Deal and Cook et al[67]	Caesarean section Emergent hysterectomy Tubal ligation Dilation and curettage
Heneghan and Bordley et al[64]	Caesarean section
Halverson and Hughes et al[73]	Caesarean section Endometrial ablation Ectopic pregnancy Management of ovarian torsion Management of ectopic pregnancy Management of postpartum haemorrhage Anal fistula plug
Landercasper and Bintz et al[72]	Caesarean section

Orthopaedic Surgery

Six surveys found that respondents felt that rural surgeons would benefit from additional training in Orthopaedic Surgery during their residency programs.[64,67,70-73] Specific surgical procedures are listed in Table 3.

Table 3: Orthopaedic Surgery procedures listed per study

Author	Procedure
Deal and Cook et al[67]	Carpal tunnel release[a] Ganglion cyst management Traumatic amputation Dislocation management Common fracture management
Halverson and Hughes et al[73]	Hip fracture management Carpal tunnel release Hand tendon repair
Landercasper and Bintz et al[72]	Hand surgery[a]

Note
a = In Australia, some of these procedures may be undertaken by other specialty surgeons.

Urology

Five studies found that respondents felt that rural surgeons would benefit from additional training in Urology during their residency programs.[64,67,70,71,73] The specific surgical procedures are listed in Table 4.

Table 4: Urology procedures listed per study

Author	Procedure
Deal and Cook et al[67]	Ureteral stent placement Suprapubic catheter placement Vasectomy Bladder suspension Cystoscopy
Halverson and Hughes et al[73]	Cystoscopy Urethral dilation Management of testicular torsion Suprapubic tube insertion Urethral stent insertion

Endoscopy

Five studies found that survey respondents would have liked more endoscopy training or experience and felt that this is vital for a future rural surgeon.[64,66-68,72]

Otolaryngology Ear Nose and Throat Surgery

Three studies recommended further subspecialty Otolaryngology Ear Nose and Throat Surgery training for rural surgery residents.[67,70,73] Deal et al[67] and Halverson et al[73] both recommended that training in tonsillectomy was important. Halverson et al[73] also recommended training in oesophagectomy.

Laparoscopy

Three studies recommended further training or experience in laparoscopy.[64,67,73]

Plastic surgery

Four studies recommended further training in Plastic Surgery,[64,67,71,73] with specific mention of simple rotational flap and complex laceration repair,[67] and facial laceration repair and excision of facial lesions.[73]

Other subspecialties

Other surveys recommended further training or experience during a General Surgery residency program for rural surgeons in Trauma and Critical Care,[66,67] Thoracic Surgery,[64,71] Vascular Surgery,[71] Neurosurgery,[71] Colorectal Surgery,[71] and Gastroenterology.[67]

Professional skills

Respondents in 2 surveys recommended more professional skills training during residency programs, including understanding business and finance, and mentorship,[67,73] and more training in leadership and communication.[73]

Survey of program directors

Burkholder and Cofer[70] conducted a survey of 58 directors of American surgery residency programs (response rate 24%). When asked whether a rural surgery curriculum was necessary to train a rural surgeon, the mean score (5-point Likert scale) for programs that had a curriculum in place was 3.95 compared with a mean score of

3.25 for programs not having a rural curriculum. Regarding rural curriculums, of the responding programs, 36.2% indicated that they had a rural curriculum in place, 62.1% did not have a rural curriculum in place and 1.7% gave no response.

Rossi and Wiegmann et al[35] conducted a survey to identify programs demonstrating commitment to training rural surgeons and their ability to provide 3–12 months of subspecialty training. The authors sent an electronic survey to all ACGME General Surgery residency programs in the US and Canada listed on the American Medical Association–sponsored FREIDA in 2016–2017 (FREIDA is commonly used by medical students to filter all ACGME programs by rural classification, and it filters programs that offer some form of rural surgical exposure). Of the 261 programs surveyed, 52 (19.9%) provided a response. Eleven of the programs had an established rural track and 15 were willing to customise a training program for residents interested in rural surgery. Seven of the established rural training programs were not included on the ACS website (this website lists General Surgery residencies that are tailored to train rural surgeons) and 3 programs were not included on FREIDA. The survey also identified an additional 14 rural training programs not identified by either the ACS website or FREIDA. In total, 44 programs identified by ACS, FREIDA and the survey state that they are able to accommodate rural surgical residents by providing the appropriate exposure and training (Table B4, Appendix B).[35]

3.4 Discussion

This rapid literature review was undertaken to examine elements of rural surgery curriculums for trainees in developed countries to inform discussion for developing a rural-facing surgical curriculum relevant to Australia for all 9 surgical specialties.

Publications in the peer-reviewed literature describing rural surgical curriculums or programs were mainly from the US. These US rural surgery programs were mostly within General Surgery training programs. Only one Canadian rural-focused curriculum—the MSCTN—was applicable to several specialties (Anaesthesia, General Surgery, Internal Medicine, Obstetrics, Paediatric Surgery and Psychiatry). There is no standardised US rural surgery curriculum. Some curriculums involve broad-based training with exposure to subspecialties and options for short-term rural surgical rotations, whereas others offer a devoted rural surgical track with an extended period spent

rurally. There has been no formal assessment to determine which of these methods, if any, is more successful in preparing rural surgeons.[33] It is unclear if the literature's indication that rural surgical curriculums mainly falling within the General Surgery specialty is representative of real life, or if other surgical specialties have rural curriculums that remain unpublished. The US literature also focuses heavily on the technical surgical skills required by rural surgeons and rarely describes whether professional skills specific to working rurally are taught to surgical residents. This may be due to a lack of relevant information in the published literature, or it may be due to professional skills not being a component of rural surgical training programs.

Within the Australian literature, the only rural training program described was the RACS RSTP, which was established within the General Surgery program to support the recruitment and retention of rural surgeons for rural practice. Graduates of this program felt underprepared for rural surgical practice and post-training they were commonly performing procedures outside of their traditional scope of practise.[23] Bishop and Drummond[21] reported that rural surgeons in Australia complete many neurosurgical cases, even though most had limited neurosurgical training. As Chong and Kiroff[23] noted, this complicates the training programs for rural Australian surgeons, as they frequently need to operate outside their scope. They also have difficulties obtaining advice about the transfer of critically ill patients and thus are exposed to a greater medicolegal vulnerability than their urban counterparts.

Little is known about caseload and operations performed in Australian rural surgery. It appears that a rural surgeon in Australia needs a broad scope of General Surgery training, with specialty training in Orthopaedic Surgery, Plastic and Reconstructive, Urology, Vascular, Paediatric and Cardiothoracic Surgery being favourable. Further training in Neurosurgery has also been suggested. Difficulties in maintaining skills, obtaining peer review, and dealing with medicolegal vulnerabilities are ongoing issues. In addition to the technical skills required to become a competent surgeon, professional skills are an integral component of a robust surgical curriculum, and improve patient care and surgical safety.[74] In Australia, these skills are currently being taught in an ad hoc manner and are highly influenced by the location, experience and mentorship of the Trainee. Standardising the professional skills required for surgical practice, especially in a rural environment, and including them in the training curriculum, would ensure no surgical Trainee is disadvantaged in their future practice.

Of the 17 surveys and 1 scoping review included in this rapid review, the majority were from the US and most of the respondents were general surgeons. The survey responses emphasised the scope of rural surgical practice, training satisfaction, perceived training needs and specific training recommendations. Most of the information relates to the technical skills required for rural surgical practice – notably the broad scope of technical skills needed and the subspecialty procedures that would be advantageous for rural surgeons. Five of the surveys found that rural surgeons need a broad-based residency training plus additional training in subspecialty fields such as Obstetrics and Gynaecology, Urology, Endoscopy, Otolaryngology Surgery, Laparoscopy, Plastic Surgery, Trauma and Critical Care, Thoracic Surgery, Vascular Surgery, Neurosurgery, Colorectal Surgery, and Gastroenterology.

In Canada, varying caseloads are seen in rural surgery, with a greater percentage of procedures falling into the realms of Orthopaedic Surgery, Obstetrics and Gynaecology, and Plastic Surgery, when compared to urban centres. Most graduating surgical residents are reportedly not comfortable performing procedures outside the traditional scope of General Surgery.[27] The MSCTN, established by the University of Western Ontario Faculty of Medicine and Dentistry, was developed to provide rural and regional training opportunities for residents from different specialties. It specifically reports on the required professional skill competencies that rural surgeons need to acquire. Its clarity and appropriateness were rated highly by residents.[25] The method for teaching these core professional competencies was not reported.

Two US surveys noted professional skills that would benefit rural surgeons, including business and finance, mentorship, and leadership and communication. Three US programs described trainee experiences that may indicate professional skills are learnt informally through different exposures – for example, when treating patients from different cultural groups, when interacting with colleagues with different skills (e.g. GPs) and when attending to administrative tasks such as billing and office management.[32,39,45] Given that the majority of surveys (and program descriptions) were from the US, where rural curriculums involve spending time training in a rural hospital, the failure to mention the teaching of professional skills might be because it is assumed that these skills are acquired during the work experience as on-the-job training, and so are not discussed in the details of the curriculum, whereas technical skills are.

The applicability of US-based curriculums is uncertain owing to the different style of surgical education and surgical practice in Australia. For example, the number of years after graduation before doctors can take up a surgical training position differs—Australian doctors must complete a one-year internship after medical school, whereas US doctors can commence surgical training immediately.[75] There are also differences in working hours – US surgical residents are limited to an 80-hour work week,[75] compared with Australian doctors, who work 50–60 hours with a maximum of 65 hours of clinical training per week averaged over a 4-week period.[76] The influence of this on the structure of the training program and the competency of a surgeon working in a rural position after their surgical training is unknown. The different definitions of 'rural' used by different countries also makes the applicability of curriculums uncertain. In Australia, the definition of rural, remote or isolated is any area outside the major cities.[1] This definition is also used in the US, where rural is described as any population, housing or territory not in an urban area.[77] However, the US has a much larger population than Australia, so 'rural' townships may be much larger in the US than in Australia, with larger support networks for rural surgeons.

While elements of surgical curriculums have been identified in this review, it is unclear how relevant or applicable these are without appraisal by surgeons who have graduated from these rural surgery programs and have subsequently commenced rural practice. As discussed above, of the surveys identified in this rapid review, only one related to the usefulness of an existing rural training program for surgeons who participated in rural training; 2 described the opinions of graduate surgeons who completed the specific training programs. As noted, the opinions of the rurally practising graduates of the RACS RSTP were not overly favourable.[23] Of individuals who had recently undertaken a rural surgery program, trainees who completed the Whyalla rotation in South Australia found the experience to be of a high educational standard.[22] Furthermore, residents who completed the University of Tennessee, Chattanooga, rural rotation also found the experience highly valuable.[62] The adequacy of these programs for practising rural surgeons is yet to be examined. Further research into graduate surgeons would be highly beneficial for future curriculum development.

As this was a rapid review, there were limitations in the search methodology compared with a full systematic review, such as limits on search terms and the number of databases searched. It is possible that some relevant studies may have been missed. Of note, no curriculums or surveys were identified from the United Kingdom (UK), and some of the curriculum descriptions were from articles published several years ago. While efforts were made

to crosscheck published data against websites of the program or institution, not every program could be identified, and some websites provided limited information. Since publication, some curriculums may have ceased, or elements of some curriculums may have changed.

Another limitation is that most of the descriptions of rural surgical curriculums and surveys on requirements in rural surgical curriculums focused on technical skills. Little information was identified on professional skills components of rural surgical curriculums, including communication, leadership, finance, practice management, and legal and regulatory issues that are relevant to rural practices.

Grey literature was consulted to fill the gaps identified in the peer-reviewed literature (Appendix C). Grey literature searches were broader than the peer-reviewed literature search. They included medical curriculums with a rural focus, but only those from Australia and Aotearoa New Zealand.

The grey literature identified reflected the peer-reviewed literature, with limited information found on rural-focused surgical curriculums. Of interest, the Royal College of Surgeons Edinburgh (RCSEd) in the UK launched a new faculty in 2018, now renamed the Faculty of Remote, Rural and Humanitarian Healthcare (FRRHH). FRRHH is currently developing a capabilities framework to form the basis for education and assessment of rural, remote, and humanitarian healthcare workers. In addition, the UK's Intercollegiate Surgical Curriculum Programme (ISCP) has released updated surgical curriculums for a variety of specialties (August 2021). The General Surgery curriculum notes that an optional module will be available in rural and remote surgery during phase 2 of training. The technical skills and competencies for this module are outlined in the curriculum.

In contrast to rural-focused surgical curriculums, there is a significant amount of information on rural-focused medical curriculums from Australia and Aotearoa New Zealand. These rural-focused medical curriculums (published online), detail the competencies required under different domains of rural and remote practice. Some of these competencies may be relevant to surgeons working rurally.

The peer-reviewed and grey literature searches were designed to identify rural-focused curriculums for surgical Trainees. Owing to interest expressed by the Working Group, additional information on post-fellowship rural

training programs, positions, grants, and scholarships (designed to further develop skills required by surgeons to work rurally) was included (Appendix D). Post-fellowship programs for rural surgery, ranging from 7 weeks to 2 years in duration, were identified in Australia, Aotearoa New Zealand, the UK and the US. As with the trainee curriculums, these rural surgical programs focused on the development of technical skills in different subspecialties. Some programs enabled Fellows to tailor training to their personal requirements (e.g. select specialties based on practice location), while others exposed the Fellow to several surgical specialties. In addition, a range of eLearning and in-person courses were identified on specific topics tailored to rural practice, including Trauma Management, Neurotrauma, Ophthalmology, Plastic and Reconstructive Surgery and Orthopaedics. The only identified post-fellowship course that covered professional skills was an FRRHH webinar on thriving and surviving in remote and rural surgery. The webinar discussed issues such as keeping up with current practice in different specialties, operating on friends and relatives, and dealing with complications.

Overall, this rapid review has revealed several gaps in the literature and highlighted areas that may benefit from further research. It is imperative to firstly determine the success of current rural training programs/tracks, which will assist in modelling future rural curriculums, then determine which areas have been overlooked in the current training programs, as reported by residents, trainees, and graduates. Understanding which technical and professional skills are needed for the Australian rural surgical cohort will determine which competencies to include in an Australian rural-facing surgical curriculum.

3.5 Conclusion

The peer-reviewed literature on rural surgical curriculums for trainees is dominated by publications from the US describing rural programs or tracks within general surgery. No information on rural surgical programs in England, Ireland or Wales was identified. Descriptions of the identified programs focused on training duration for residents in a rural hospital and the technical skills to be acquired (beyond the scope of the General Surgery program). There was little information about the professional components of rural surgical curriculums or how they are taught. Despite all identified rural surgical programs incorporating a rural rotation, no consensus exists in the

literature on the optimum length of such a rotation for surgical Trainees. This should be considered when designing an Australian curriculum.

A lack of information about rural-focused curriculums for surgical Trainees was apparent in both the peer-reviewed evidence and the grey literature. Australian and Aotearoa New Zealand rural medical curriculums are freely available on the internet, and some of the competencies in these medical curriculums may be relevant when designing a rural surgical curriculum.

A survey of Australian surgeons who practise in rural locations would be the best way to determine the technical and non-technical (professional) skills required by Australian rural surgeons. This could then be fed into development of rural surgical curriculum.

3.6 Summary

The overarching aim of this section was to complete a rapid review of peer-reviewed and grey literature to investigate the importance of a rural-facing surgical curriculum and the elements of both generic and specialty-specific rural-facing curriculums. It was hoped that the review would uncover pre-existing rural-facing surgical curriculums and find suggested content, modules, subject outlines, and technical and professional competencies listed.

Unfortunately, published literature describing the details of rural surgical curriculums/tracks, the specific professional skills of importance to rural surgeons, and the essential training requirements of Australian rural surgeons were not found. Further work is required to determine these important elements.

The peer-reviewed literature about rural surgical curriculums for Trainees was found to lack detail and was dominated by publications from the US describing rural programs or tracks with General Surgery programs. These programs were broad and included exposure to endoscopy and various subspecialties, and incorporated training experience at a rural hospital. Two programs incorporated professional skills formally as part of their rural curriculum. Two surveys indicated rural surgical Trainees wanted a greater amount of professional skills training.

Further research must be conducted to effectively inform the rural-facing curriculum framework for Australian surgical Trainees. Australian surgeons practising in rural locations, and those with experience in rural surgical practice, should be consulted to determine which technical and professional skills are required or beneficial in a rural-facing surgical curriculum.

Further research that is beyond the scope of this project would be to survey Trainees who are exiting current rural training programs to obtain more detailed information to gauge the success of existing programs and identify training omissions.

4. Delphi Study

4.1 Introduction

Delphi studies work towards identifying a consensus position on a specific question (or set of questions) by exploring the knowledge and experience of experts in the field.[78] A Delphi study generates qualitative and quantitative data by asking experts their opinions on one or more issues during a series of rounds of discussion. The questions are refined each round based on findings from the previous round, which allows the study to evolve over time.[78] The actual design of a Delphi is highly variable in regard to the question structure (e.g. open-ended or scale responses), the number of rounds, and the definition of a consensus.

As previously mentioned, the rapid review did not uncover the level of information expected regarding rural-facing surgical curriculums and, specifically, professional skills associated with the rural setting. This limited the knowledge base available to create a rural-facing surgical curriculum framework.

The next phase of the project was to complete a Delphi study, seeking the opinions and consensus of a group of rural surgical experts on the proposed rural-facing surgical curriculum recommendations, which were based on the rapid review results. The Delphi study was originally planned to produce further recommendations, which may have included the development of reading lists, educational guides, clinical assessments, management of resources-limited environments, skills for outreach and inreach, activities and knowledge for rural placement, and self-efficacy. However, at the time of the Delphi study more fundamental questions remained to be answered, so it was used to determine some of the key requirements of a professional surgical skills curriculum in the rural setting. This would create the foundations on which the curriculum framework could be built.

A Delphi study in this instance was a valid research design choice because it gathered the opinion of many rural surgical experts, could be done flexibly online (which accommodated the experts' timetables and COVID-19 travel restrictions) and could generate many ideas and initial concepts for the rural-facing surgical curriculum.

4.2 Aims and objectives

The aim of the Delphi study was to generate key information that can be used to structure the rural-facing surgical curriculum framework. For example, information about key behaviour markers for the professional skills competency, suggested teaching strategies, and any potential challenges with implementing or teaching the professional skills.

The objectives of the Delphi study were to;

1. Reach a consensus about the required positive behaviour markers for each of the 8 professional skills and competencies as described in the RACS Surgical Competence and Performance Guide[16]
2. Reach a consensus about methods of guiding Trainees to build skills in each of the 8 professional skills and competencies
3. Reach a consensus about potential challenges in the rural setting for each of the 8 professional skills and competencies
4. Reach a consensus about what other factors and information may be beneficial for the development of a rural-facing surgical curriculum.

4.3 Methods

i) Participants

Between June and July 2021, 28 individuals were invited to participate via email in the RACS investigation and development of a rural-facing surgical curriculum Delphi study. These individuals represented the surgical specialties of General Surgery, Orthopaedic Surgery, Urology, Otolaryngology Head and Neck

Surgery, Paediatric Surgery, Neurosurgery, and Vascular Surgery. The following groups were also represented in the selected participants: Academy of Surgical Educators; Rural Surgery Section; General Surgery STB; Otolaryngology Head and Neck Surgery STB; Vascular STB; Paediatric STB; Urology STB Military Surgeon Section. The participants provided consent by return email.

ii) Round 1

Round 1 of the Delphi study was conducted on SurveyMonkey (Momentive Inc, California, US) and consisted of 34 questions (Table 5). It opened on 19 July 2021 and was due to close on 28 July 2021; however, an extension was granted until 3 August 2021. Instructions were provided to the participants via the SurveyMonkey website on an introductory page to the survey. All questions were open-ended, and the participants were informed they could either complete it via structured sentences or in dot-point form. The survey did not need to be completed in a single sitting. The questions were based around each of the 8 professional skills and competencies, with a further 'general question' section at the end. One researcher placed the responses into groups by theme and documented these; this process was repeated by 2 other researchers for a sample of the responses to validate the groupings. If a specific theme was stated more than twice, a general statement encompassing the information was created by the researcher and the number of Delphi responses that informed that statement was documented.

Table 5: Delphi Round 1 questions

Professional skills and competencies–based questions	
Collaboration and Teamwork	Please describe examples of positive behaviour markers demonstrating Collaboration and Teamwork in the context of the rural setting.
	How do you guide Trainees to acquire skills in Collaboration and Teamwork in the context of the rural setting?
	What challenges might be encountered in delivering this competency in a rural setting?
Communication	Please describe examples of positive behaviour markers demonstrating Communication in the context of the rural setting.
	How do you guide Trainees to acquire skills in Communication in the context of the rural setting?
	What challenges might be encountered in delivering this competency in a rural setting?

Cultural Competence and Cultural Safety	Please describe examples of positive behaviour markers demonstrating Cultural Competence and Cultural Safety in the context of the rural setting.
	How do you guide Trainees to acquire skills in Cultural Competence and Cultural Safety in the rural setting?
	What challenges might be encountered in delivering this competency in the rural setting?
Scholarship and Teaching	Please describe examples of positive behaviour markers demonstrating Scholarship and Teaching in the context of the rural setting.
	How do you guide Trainees to acquire skills in Scholarship and Teaching in the rural setting?
	What challenges might be encountered in delivering this competency in a rural setting?
Health Advocacy	Please describe examples of positive behaviour markers demonstrating Health Advocacy in the context of the rural setting.
	How do you guide Trainees to acquire skills in Health Advocacy in the rural setting?
	What challenges might be encountered in delivering this competency in a rural setting?
Judgement and Clinical Decision-Making	Please describe examples of positive behaviour markers demonstrating Judgement and Clinical Decision-Making in the context of the rural setting.
	How do you guide Trainees to acquire skills and confidence in Judgement and Clinical Decision-Making in the context of a rural setting?
	How do you make the decision to perform surgical procedures in the context of a rural setting in the following situations: • Infrequent or high-risk procedures within your scope? • Procedures outside your regular scope of practice but in which you have had training? • Procedures that you have had little or no previous experience in? How do you make the decision to NOT perform a surgical procedure (and therefore to transfer a patient for care elsewhere?) How does your answer to the question above differ depending on emergency or elective context?
	What challenges might be encountered in delivering this competency in a rural setting?
Leadership and Management	Please describe examples of positive behaviour markers demonstrating Leadership and Management in the context of the rural setting.
	How do you guide Trainees to acquire skills in Leadership and Management in the rural setting?
	What challenges might be encountered in delivering this competency in a rural setting?
Professionalism and Ethics	Please describe examples of positive behaviour markers demonstrating Professionalism and Ethics in the context of the rural setting.
	How do you guide Trainees to acquire skills in Professionalism and Ethics in the rural setting?

	What challenges might be encountered in delivering this competency in a rural setting?
General questions	
	Are there any additional professional skills or competencies that would be needed in a rural surgical setting?
	From your experience what could be added as part of a rural-facing curriculum to complement the existing SET curriculums, covering the 9 surgical specialties, to better prepare SET Trainees for independent rural practice?
	How could a rural-facing curriculum help develop confidence and competence in SET Trainees providing surgical care to rural patients?
	Reflecting on your own training, what helped you develop confidence in rural surgical practice?

Abbreviations
SET = Surgical Education and Training

iii) Round 2

Round 2 of the Delphi survey was also conducted online via SurveyMonkey. It was sent to the 25 individuals who completed Round 1. The survey was due to close on 12 September, but due to a lower than anticipated response rate, a global extension was provided, and the latest response received was on 19 September. All responses were included in the data analysis.

The overall number of questions was 265 and these were grouped into 9 categories, based on the RACS professional skills competencies and a general category. These competencies included Collaboration and Teamwork, Communication, Cultural Competence and Cultural Safety, Scholarship and Teaching, Health Advocacy, Judgement and Clinical Decision-Making, Leadership and Management, Professionalism and Ethics, as per Round 1.

The questions were based on the results from Round 1. They incorporated the common themes and asked the participants to rank their agreement with various statements on a 7-point Likert scale (with an option to not respond). The 7-point Likert scale was chosen as there is evidence that Likert scales with more options provide greater reliability during surveys, but this begins to plateau at 7-points.[79] According to a study by Diefenbach and Weinstein et al[80] comparing 2-point, 5-point, 7-point, 9-point, 11-point, 12-point and percentage (100 point), the 7-point Likert scale emerged as the best overall and was reported

by participants as being the most accurate and the easiest to use; no scale performed significantly better than the 7-point Likert scale.[80]. Finstad[79] reported that 7-point Likert scales can be a sensitive and robust measure and found that a 7-point Likert is more likely to reflect a respondent's true subjective evaluation of a questionnaire than other scales and represents a 'sweet spot' in survey construction.

iv) Consensus definition

The methodology for defining consensus was based on the article by Diamond and Grant et al[81], 'Defining consensus: A systematic review recommends methodologic criteria for reporting Delphi studies'. This study found 2 common definitions for consensus, these being:

- percentage agreement (conducted in 25 studies)
- proportion of ratings within a range (conducted in 16 studies).

The present Delphi study used the proportion of ratings within a range, with the ratings coming from 7-point Likert scales.[81] Diamond and Grant et al[81] reported that the median threshold for consensus was 75% agreement (range 50% to 75%); therefore, a threshold of 75% agreement, defined before data were collected, was used. A response from the top 3 (somewhat agree, mostly agree, strongly agree) was taken as a vote for inclusion of a statement, and a response from the bottom 3 (somewhat disagree, mostly disagree, strongly disagree) was a vote for exclusion. Consensus on a topic occurred when 75% or more of responses agreed on inclusion or exclusion. There was the possibility of a third round of discussion if required; however, this was not used because of the very small number of statements that did not reach a consensus for inclusion or exclusion.

4.4 Results

i) Round 1

Twenty-eight individuals were invited to complete the survey. Two withdrew from the study and one did not complete the survey (a completion rate of 89%). The full set of verbatim answers and broad themes can be found in Appendix E. The main themes and frequencies of statements relating to these themes for each question are documented in Tables 6 to 11.

Table 6: Collaboration and Teamwork main themes

Please describe examples of positive behaviour markers demonstrating Collaboration and Teamwork in the context of the rural setting	Number of responses
Good communication skills (spoken and written) and willingness to communicate with a number of multidisciplinary staff—for example, specialists, nurses, theatre staff	16
Interdisciplinary collaboration and service planning and collaboration between specialists	8
Working with allied health staff (physiotherapist/occupational therapist) and other healthcare professionals is key in any setting	4
Asking for advice and sharing decision-making	3
Building relationships with tertiary hospitals and colleagues in tertiary hospitals	2
Communications with general practitioners	2
Communication with general practitioner anaesthetists	2
Use of technologies and telecommunications	2
How do you guide Trainees to acquire skills in Collaboration and Teamwork in the context of the rural setting?	
Role modelling and setting an example	9
Good mentoring from experienced rural surgeons and in particular explaining importance of collaboration	7
Encourage and provide feedback regarding good support, communication, and positive behaviour	4
Communication with general practitioners is essential	4
Rural placement and support from experienced mentors	4
Close and constant monitoring with reviews of progress	3
Clear management plan and discharge summary which has been discussed with the patient, with or without their family	2
Multidisciplinary training is important to the Trainee but also the health service	2
The skills are transferrable and are not different from working in a metropolitan setting	2
What challenges might be encountered in delivering this competency in a rural setting?	
The availability of resources—for example, course availability, backfill of position, needing help from hospital and health authorities	6
Short-term rotations and high turnover of staff	5
Heavy workload and time constraints; there needs to be a strategy to manage the on-call issues	4
Isolation and geographic distance from larger cities	3
Attitudes from Trainees from non-regional or remote areas	3
Occasionally lack of exposure to 'major cases' and General Surgery	2

Table 7: Communication main themes

Please describe examples of positive behaviour markers demonstrating Communication in the context of the rural setting	Number of responses
Taking enough time to talk with patients, families, and carers at times of consultation, having enough time to get the full story and encouraging the patients to ask questions	5
Include patients and family to keep them all informed during all patient interactions—for example, times of consultation and after discharge	5
Using sound verbal and non-verbal communication, adapting communication to context, and using appropriate language with patients and relatives	4
Allowing cultural decision-making in care planning	3
Being aware of significant cultural differences between the Trainee and her/his patient	3
Using interpreters, sign language or family members when required	3
Being inclusive and approachable and ensuring interactions are undertaken in a safe space	3
All of the communication markers as described in the guide are relevant/important. Communication is a generic skill—it is not different whether you are in rural or metropolitan context	3
Communicate effectively within the team	3
General practitioner liaison in the rural setting is particularly important	3
Communication with Indigenous patients may require extra time	2
Consultation with other disciplines	2
How do you guide Trainees to acquire skills in Communication in the context of the rural setting?	
Demonstration, role modelling, and setting an example	9
Encourage the Trainee to listen, form connections outside the hospital, learn some words used by Aboriginal people in locality and lead ward rounds with the consultant observing	5
Formal and informal feedback	5
Spend time independently in outpatient, emergency departments and wards, and practise with case presentations and meetings—that is, practise is more important than theoretical advice	4
Indigenous cultural courses and cultural induction program relevant to the local population	3
Same way they should acquire communication skills anywhere	2
What challenges might be encountered in delivering this competency in a rural setting?	
No great barriers or difficulties specific to the rural setting	3
Poor workplace culture—for example, consultant not coming in or caring, Trainee not wanting to listen to advice, Trainees stressed and being harassed by some consultants	3

Constant change of personnel—for example, fly-in, fly-out healthcare workers	2
Large number of Trainees are born overseas or may be IMGs, which can increase the cultural divide. Both the communication sometimes of both parties in a second language and lack of understanding of rural Australia can further exacerbate communication gaps	2
A lack of understanding of the community's attitude to seeking medical attention and cultural beliefs	2

Abbreviations
IMGs = international Medical Graduates

Table 8: Cultural Competence and Cultural Safety main themes

Please describe examples of positive behaviour markers demonstrating Cultural Competence and Cultural Safety in the context of the rural setting	Number of responses
Inquisitive mind and a respectful curiosity to learn more about different cultures and personal backgrounds of her/his colleagues and patients, especially local context and cultural norms	7
Acknowledges/recognises own biases	5
Involvement of family members in management	4
Understanding Indigenous people in rural settings and striking a balance between best practice and appropriate cultural care	3
Being respectful of all backgrounds, sexual orientations, and religions	3
Awareness of how culture may affect compliance and having the ability to tweak patient management plans to address the patient's concerns—for example, allowing patient to leave hospital for sorry business, changing antibiotics to oral, making alternative dress-change plans, etc.	3
Teamwork and collaboration	3
Awareness and use of Indigenous liaison officers	2
Racism when encountered should be called out	2
Listen carefully to patient responses	2
Trainee aware of cultural differences of multicultural staff	2
How do you guide Trainees to acquire skills in Cultural Competence and Cultural Safety in the context of the rural setting?	
Formal cultural awareness training	9
Leading by example, being a positive role model	8
Mentoring and being available for advice	4
Exposure and rural lived experience	3
Providing feedback	2
What challenges might be encountered in delivering this competency in a rural setting?	

Racism and intolerance	4
Rural training may lead to more exposure to patients and colleagues with different cultural backgrounds and needs and may lead to more opportunity to learn	2
Language skills and issues	2

Table 9: Scholarship and Teaching main themes

Please describe examples of positive behaviour markers demonstrating Scholarship and Teaching in the context of the rural setting	Number of responses
Being up to date with literature and engaging in a journal club	8
Willingness and making time to teach; this can include during ward rounds, in-services, formalised tutorials and lectures as well as non-traditional teaching opportunities such as giving talks to community groups and GP registrars	8
Being actively involved in research as well as multicentre, collaborative research	6
Attendance at a variety of teaching and training opportunities including attending and presenting at conferences, CPD, M&Ms across all specialties and workforces	6
Need to be motivated for self-learning, which includes reading, teaching, studying and research regarding pathologies and procedures	4
Questioning/inquisitive personality/enquiring mind with an emphasis on lifelong learning and a natural curiosity across specialists to avoid over reliance on 'consult' mentality	4
Focus and practising evidence-based medicine	2
Networking with city specialists and interactions with consultants and Trainees	2
Not dissimilar to any other settings (metro or rural)—you need to be involved in teaching your juniors. See RACS surgical competence and performance framework. Little difference in principles in rural setting	2
How do you guide Trainees to acquire skills in Scholarship and Teaching in the context of the rural setting?	
Role modelling the attitude of ongoing learning, teaching about self-reflection as a way of improvement in surgical practice	6
Actively look for and offer opportunities, and support research and audit projects	4
Enable opportunity for teaching, research and discussion of literature and give responsibility to Trainee to organise and present at educational meetings	4
Encourage attendance, presentation, and contribution at all teaching sessions from grand rounds to 10-minute teaching topics and encourage participation in journal clubs	3
Use of appropriate mentoring and feedback	2
What challenges might be encountered in delivering this competency in a rural setting?	

Time off to attend conferences if limited number of Trainees in the rotation and need to cover clinical work—rostering limitation	7
Isolation and distance to attend face-to-face opportunity and RACS does not conduct many courses outside major centres. I don't think RACS has an appreciation of the difficulty and costs of attending courses from the more remote areas	7
Workload of surgeons and on-call commitments making learning opportunities and research difficult	4
Trainee loneliness, isolation, depression, and lack of motivation	4
Potentially fewer teaching opportunities—for example, with no outpatient clinics, smaller scope of procedures, certain areas conducive to more specialists areas	3
Need more study leave and a greater allowance	2
COVID and the increasing use of telemedicine and online forums have shifted this space	2

Abbreviations
CPD = continued professional development, M&Ms = Morbidity and Mortality Meetings, RACS = Royal Australasian College of Surgeons

Table 10: Health Advocacy main themes

Please describe examples of positive behaviour markers demonstrating Health Advocacy in the context of the rural setting	Number of responses
Looking after own wellbeing including health lifestyle choices, regular exercise, work/life balance, strategies to relieve pressure, having a GP, good personal hygiene and being able to recognise signs of fatigue and fatigue management	7
Awareness of the needs of the community and barriers to healthcare delivery in rural settings and understand how they impact on health outcomes for example; recognise GP services are so limited in some areas that specialists take on the role for following up results and treatment coordination	5
Attempting to understand the rural community and their disadvantages and having close contact with community leaders, service clubs and media (printed and electronic) to disseminate factual health information	5
Identify and address health issues in patients—for example, encouraging patients to stop smoking, setting up adequate services to meet demand, diabetes management, obesity management	5
Appropriate informed consent with options including second opinion and providing all clinical records, X-rays and laboratory results for second opinion/transfer of care	2
Links with multidisciplinary teams in metropolitan areas to present and discuss complex cases	2
How do you guide Trainees to acquire skills in Health Advocacy in the context of the rural setting?	
Lead by example—for example, demonstrate counselling with Trainee on ward round, showing a willingness to speak with relatives and patients	8
Advocate and initiate health promotion activities	3

Mentorship and pointing out relevant cases when they arise	3
Presentation of cases at MDT	3
Understanding health outcomes and awareness of patient at risk in early discharge if no local services; adherence to robust but not onerous follow up	2
Encourage Trainee to be involved with outreach services with consultants	2
Trainee is always encouraged to advocate for the patients and offer help/access support services for patients interested to make changes	2
What challenges might be encountered in delivering this competency in a rural setting?	
Lack of resources in the rural setting	5
Limitations of time with busy clinical case load and difficulty accessing care within limited timeframe available for appointments	3
Lack of engagement and reluctance from patients, families, and care supporters	3
Lack of engagement from other team members and mentor around Health Advocacy	2

Abbreviations
GP = General Practitioner, MDT = multidisciplinary team

Table 11: Judgement and Clinical Decision-making main themes

Please describe examples of positive behaviour markers demonstrating Judgement and Clinical Decision-making in the context of the rural setting	Number of responses
Being honest and self-aware and acknowledging when your limits have been reached and knowing when to transfer	8
Early consultation and clear processes for transferring patients	5
Maintenance of CPD; being prepared to take advice and read up on something	5
Practice audits to have data on procedures and their outcomes	4
Appropriate timeliness of discussion with consultants	4
Early involvement of subspecialty and involvement in MDT meetings	4
Good knowledge of patients and results	4
Situational awareness and being aware of local resources	3
Outline preoperative, operative, and postoperative care, including timeline and recovery milestones	3
Sensible diagnoses and suggested management plan	3
Uses available information to effectively prioritise acute and elective patient assessment	3
Appropriate use of tests and investigations and developing strict protocols for following up all tests and investigations	2
How do you guide Trainees to acquire skills and confidence in Judgement and Clinical Decision-Making in the context of the rural setting?	

Mentorship, discussion and providing opportunity to assess and discuss management plans	7
Educational opportunities including videos, workshops, journal clubs, attendance at M&Ms and attendance at relevant courses such as cultural safety, communication skills, medicolegal aspects of decision-making	6
Simulation scenarios	4
Role modelling and personal example	3
Trainee interested in rural practice should have access to subspecialty terms	2
How do you make the decision to perform surgical procedures in the context of a rural setting in the following situations:	
1. Infrequent or high-risk procedures within your scope	
Appropriateness of the procedure in the given setting and resources available including staff, instrumentation, suitable anaesthetists	11
Consult and discussion with appropriate colleagues for their opinion	9
Discussion with colleagues in tertiary centres	4
Discussion with patients with or without risks and benefits of having procedures in a rural setting	4
Even if infrequent, there must be an appropriate skill mix, and it must be a procedure you have experience and training in and ensure currency of practice	3
Consult with anaesthetist, nurses, executives, and patient/family	3
Care preoperative planning and clinical decision-making	3
Read documentation regarding the case	3
Only with appropriate post-op and critical care back up	2
Perform with colleague assisting	2
2. Procedures outside your regular scope of practice but in which you have had training	
Generally, avoid unless retrieval not available to manage an urgent condition	5
Perform lifesaving/damage-control surgery under advice from subspecialty surgeon in tertiary unit	3
Discuss with EDMS	2
In consultation with credentialing	2
3. Procedures that you have had little or no previous experience in	
Only perform if life threatening and too unstable to transfer	12
Discussion with local and tertiary colleagues before commencement	11
Only perform if life threatening, under the guidance of a metropolitan specialist or subspecialty surgeon	6
4. How do you make the decision to NOT perform a surgical procedure (and therefore transfer a patient for care elsewhere)?	

Non-emergency setting—the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) as well as the necessary support structures (ICU, HDU, specialist nursing care); if one or several of these are deficient for a certain condition then I will refer the patent on to receive care elsewhere	10
Non-emergency setting—the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) and whether the procedure fits into the Clinical Service Capability Framework of the hospital	5
If the patient can be transferred safely and there is no urgency	4
This would be dependent on the experience (or no experience), skills, area of expertise and what facilities are available at the hospital	4
Does the combination of procedure and co-morbidity raise concerns and would the outcomes of the patient be better if treated in a larger hospital	4
Discuss with subspecialty via phone	2
If the patient can be transferred safely	2
I would consider onward referral to reduce stresses on myself at the hospital	2
5. How does your answer to the question above differ depending on emergency or elective context?	
In emergency circumstances, timing becomes critical, and delay in management must be matched against health risks of transfer being greater than those of intervention in less-than-optimal conditions. In general, if I assess that there could be a risk to life or quality of life, I will take on procedures with as much support as I can gather	10
Would engage and get advice from remote colleagues to guide me—for example, a discussion with a referral centre subspecialist even while performing emergency procedures	3
Transfers to tertiary centres are more common for elective procedures—for example, there have been occasions where I have had to perform a thoracotomy for trauma, but I would never consider performing an elective thoracotomy	3
For elective procedures, there is no excuse for performing procedures outside one's personal scope of practice and experience whether this occurs in the rural or metropolitan setting	2
Depends on the patient's stability and availability of transfer for example, acuity and likelihood of deterioration if transferred. Mode of transfer available. Distance to transfer	2
What challenges might be encountered in delivering this competency in a rural setting?	
These situations mostly arise in rural setting with challenges more frequently encountered—for example, smaller hospitals, smaller volumes, fewer specialists with super specialisation. Less easy to transfer elsewhere due to remoteness and in a time-appropriate manner. So, in this context, these skills are more reliably learnt and experiences in these settings	5

Good relationships with colleagues and peers are paramount. The Trainee may have a lack of professional networks with specialists to provide timely advice. Trainees need to know who they can transfer to if outside their facility. There needs to be a strong link with the tertiary hospitals or bigger hospitals in the catchment	4
Resource limitations	4
It is a higher-level experience that probably needs individualisation. It is straightforward with the elective cases—just have the Trainees sit on the MDT meetings and learn by osmosis. The other cases are firstly rare and secondly unique, so it is difficult to teach the decision-making in this setting	4
Back up and support limitations by other departments, peers and health service support—for example, anaesthesia and medical administration	3
Registrars tend to be too timid and the range of operations they can do out of training too narrow perhaps for rural setting. This results in increasing transfer of care in the last 20–30 years. High-risk Trainees may develop a sense that rural centres can't do things and rely on transfers to tertiary centres and fail to appreciate how much gets done locally without transfer	2
Lack of support from tertiary centres	2
Perceived expertise and competency with tertiary surgeons not aware of the local skill available and requesting unnecessary transfer	2
Logistics of transfer in a time-appropriate manner for example, remoteness, costs, logistics with family and patients	2

Abbreviations
CPD = continued professional development, EDMS = Executive Director Medical Services, HDU = High Dependency Unit, ICU = intensive care unit, M&Ms = Morbidity and Mortality Meetings, MDT = multidisciplinary team

ii) Round 2

Of the 25 participants surveyed, 23 participated in the survey (92% response rate), with a completion rate of 80%. The statements with a consensus for inclusion or exclusion are presented below in Tables 12 to 20. Full results can be found in Appendix F. The Working Group also included specific statements throughout the competencies which the experts could rate on the 7-point Likert scale. These additional statements are themes the Working Group thought were missed by the Delphi participants in Round 1. These statements were only in the Judgement and Clinical Decision-Making competency and have been flagged with an asterisk (*) within the tables.

Collaboration and Teamwork

There were 9 statements overall about the positive behaviour markers that demonstrate Collaboration and Teamwork in the context of the rural setting. Consensus was reached for all of them (percentage of consensus = 100%). There were 8 statements about methods of guiding Trainees to acquire skills in Collaboration and Teamwork in a rural context. Consensus was reached on 7 of them (percentage of consensus = 88%). There were 7 statements about the challenges that might be encountered in delivering this competency in a rural setting. Consensus was reached on 3 of them (percentage consensus = 43%). In total, consensus was reached on 19 of the 24 statements (percentage of consensus = 79%) across Collaboration and Teamwork. The statements for which consensus was reached are reported in Table 12.

Table 12: Collaboration and Teamwork Delphi Round 2 consensus statements

Collaboration and Teamwork		
Statement	Consensus (agree or disagree)	Level of agreement (%)
Positive behaviour markers demonstrating Collaboration and Teamwork in the context of the rural setting		
Good communication skills (spoken and written) and willingness to communicate with multidisciplinary staff—for example, doctors from other disciplines including general practitioners, nurses, allied health professionals, Aboriginal and Torres Strait Islander Health Workers, technical and administration staff	Agree	100
Building administrative and clinical peer relationships between rural and referral hospitals including tertiary hospitals	Agree	100
Communicating, collaborating, and sharing care with general practitioners	Agree	100
Communication with general practitioner Anaesthetists—for example, regarding the suitability for patient care at a regional centre versus transfer	Agree	100
Interdisciplinary collaboration and service planning and collaboration between specialists	Agree	100
Asking for advice and multidisciplinary teamwork and decision-making	Agree	96
Use of emerging technologies and telecommunication tools to delivery healthcare	Agree	92
Use of telecommunication to facilitate communication within a healthcare team	Agree	92
Collaboration and team care arrangements with allied health staff (physiotherapists/occupational therapists) and other healthcare professionals	Agree	92

Methods of guiding Trainee to acquire these skills in Collaboration and Teamwork in the context of the rural setting		
Supervising surgeon being a positive role model and setting a positive example	Agree	100
Encouragement, skilled feedback and self-reflection regarding positive support, communication, and behaviour with review of progress	Agree	100
Skilled mentoring from experienced rural surgeons who explain the importance of collaboration	Agree	100
Rural work experience for the Trainee	Agree	100
Ensuring management plan on discharge negotiated with primary care team and communicated in a timely way in writing, and for critical problems, verbally	Agree	96
Multidisciplinary training as it benefits the surgeon as they learn more about other groups in the hospital and acquire skills in other specialities	Agree	96
Giving Trainee responsibility for communicating with general practitioners	Agree	92
The Challenges that might be encountered in delivering this competency in a rural setting		
Lack of human resources to replace Trainee during travel away from rural setting to attend face-to-face courses	Agree	83
Attitudes from Trainees from non-rural settings—for example, urban Trainee's not understanding the rural setting and the attitudes within rural hospitals	Agree	83
Heavy workload and time constraints of the supervisor/mentors	Agree	79

Communication

There were 12 statements about the positive behaviour markers that demonstrate Communication in the context of the rural setting. Consensus was reached on all (percentage of consensus = 100%). Regarding the methods of guiding Trainees to acquire skills in Communication in a rural context, there were 8 statements; consensus was reached on 7 (percentage of consensus = 88%). Regarding the challenges that might be encountered in delivering this competency in a rural setting, there were 6 statements; consensus was reached on 4 (percentage of consensus = 67%). In total, consensus was reached on 23 of the 26 statements (percentage of consensus = 88%) across Communication. The statements for which consensus was reached are reported in Table 13.

Table 13: Communication Round 2 Delphi consensus statements

Communication		
Statement	Consensus (agree or disagree)	Level of agreement (%)
Positive behaviour markers demonstrating Communication in the context of the rural setting		
Taking enough time to talk with patients, families, and carers at times of consultation; having enough time to get the full story and encouraging the patients to ask questions	Agree	100
Contributing to a culturally safe and inclusive environment for patient and the healthcare team	Agree	100
Keeping patients and family informed during all patient interactions—for example, times of consultation, and after discharge	Agree	100
Communicating effectively within a team	Agree	100
Timely and effective general practitioner liaison to facilitate continuity of care	Agree	100
Consultation and collaboration with other disciplines	Agree	100
Allowing extra time to communicate with Aboriginal and Torres Strait Islander patients	Agree	96
Allowing for cultural decision-making in care planning	Agree	96
Self-reflection and awareness of cultural differences between the Trainee and their patient	Agree	96
For patients with English as a second language, using interpreters or where culturally appropriate, family or community members	Agree	96
Patient-centred verbal and non-verbal communication, tailored to the patient and their family, their culture, and their context	Agree	96
All the communication markers are described in the RACS Surgical Competence and Performance Guide. Communication is a generic skill—it is not different whether you are in rural or metropolitan setting	Agree	78
Methods of guiding Trainee to acquire these skills in Communication in the context of the rural setting		
Providing demonstrations, role modelling, and setting an example of positive communication skills and behaviour	Agree	100
Providing formal feedback (e.g. using feedback tools) and informal ad hoc feedback (e.g. on-the-job feedback) to the Trainee	Agree	100
Spend time independently in outpatient, emergency departments and wards, and practise with case presentations and meetings—that is, practise is more important than theoretical advice	Agree	100

Listening/learning/forming connections with the community, about the people/place/context you are working in	Agree	96
Perform entrustable professional activities, like the Trainee leading ward rounds with consultant observing	Agree	96
The same way they should acquire communication skills anywhere whether it be a rural or metropolitan area	Agree	91
Participating in Aboriginal and Torres Strait Islander cultural courses and cultural induction programs which are relevant to the local population	Agree	83
The Challenges that might be encountered in delivering this competency in a rural setting		
Constant change of personnel, including consultant and senior staff and fly-in, fly-out healthcare workers	Agree	83
Lack of Trainee knowledge of local culture can impact communication	Agree	83
A lack of training and understanding of patient and community cultural context relevant to seeking and participating in healthcare	Agree	78
Poor workplace culture—for example, disengaged supervisors or Trainees, bullying/discrimination/harassment, overwork or unsafe hours	Agree	78

Abbreviations
RACS = Royal Australasian College of Surgeons

Cultural Competence and Cultural Safety

There were 11 statements about positive behaviour markers that demonstrate Cultural Competence and Cultural Safety in the context of the rural setting; consensus was reached on all (percentage of consensus = 100%). Regarding the methods of guiding Trainees to acquire skills in Cultural Competence and Cultural Safety in a rural context, there were 5 statements; consensus was reached on 4 (percentage of consensus = 80%). Regarding the challenges that might be encountered in delivering this competency in a rural setting, there were 3 statements; consensus was reached on 2 (percentage consensus = 67%). The combined statistics for the Cultural Competence and Cultural Safety resulted in 19 statements in total; consensus was reached on 17 (percentage of consensus = 89%). The statements for which consensus was reached are reported in Table 14.

Table 14: Cultural Competence and Cultural Safety Round 2 Delphi consensus statements

Cultural Competence and Cultural Safety		
Statement	Consensus (agree or disagree)	Level of agreement (%)
Positive behaviour markers demonstrating Cultural Competence and Cultural Safety in the context of the rural setting		
Having an inquisitive mind and a respectful curiosity to learn more about different cultures and personal backgrounds of their colleagues and patients, especially local context and cultural norms	Agree	100
Being respectful of all elements of human diversity	Agree	100
Awareness of how culture may affect compliance and having the ability to modify patient management plans to address the patient's concerns—for example, allowing a patient to leave hospital for sorry business, changing antibiotics to oral, making alternative dress-change plans etc.	Agree	100
Involvement of family and community members where desired by patient or where culturally appropriate or requested by patient	Agree	100
Listening carefully to patient responses	Agree	100
Trainee being aware of cultural difference of multicultural staff	Agree	100
Awareness and use of Aboriginal and Torres Strait Islander liaison officers	Agree	95
Understanding Aboriginal and Torres Strait Islander people in rural settings and negotiating a balance between protocol-driven ideal care and appropriate cultural care	Agree	95
Cultural self-reflection: recognising own culture, experience, and biases	Agree	95
Teamwork and collaboration	Agree	95
Contributing to a diverse and inclusive culture—for example, by calling out racism when it is encountered	Agree	90
Methods of guiding Trainee to acquire these skills in Cultural Competence and Cultural Safety in the context of the rural setting		
Exposure of rural lived experience	Agree	100
Supervisors leading by positive example, and being a positive role model	Agree	100
Supervisors mentoring and being available for advice	Agree	100
Supervisor providing feedback to Trainees	Agree	100
The Challenges that might be encountered in delivering this competency in a rural setting		
Language skills	Agree	86
Racism and intolerance	Agree	76

Scholarship and Teaching

There were 10 statements about positive behaviour markers that demonstrate Scholarship and Teaching in the context of the rural setting; consensus was reached for 9 (percentage of consensus = 90%). Regarding the methods of guiding Trainees to acquire skills in Scholarship and Teaching in a rural context, there were 5 statements; consensus was reached for 4 (percentage of consensus = 80%). Regarding the challenges that might be encountered in delivering this competency in a rural setting, there were 9 statements; consensus was reached for (percentage of consensus = 67%). The combined statistics for the Scholarship and Teaching resulted in 24 statements in total; consensus was reached for 19 (total percentage of consensus = 79%). The statements for which consensus was reached are reported in Table 15.

Table 15: Scholarship and Teaching Round 2 Delphi consensus statements

Scholarship and Teaching		
Statement	Consensus (agree or disagree)	Level of agreement (%)
Positive behaviour markers demonstrating Scholarship and Teaching in the context of the rural setting		
Attending a variety of teaching and training opportunities—for example, attending and presenting at conferences, continued professional development, morbidity and mortality meetings across all specialties and workforce meetings	Agree	100
Being motivated for self-learning including reading, teaching, studying and research	Agree	100
Willingness and making time to teach. This can include ward rounds, in-services, formalised tutorials and lectures as well as non-traditional teaching opportunities such as giving talks to community groups and general practitioner registrars	Agree	100
Having a questioning/inquisitive personality/enquiring mind with an emphasis on lifelong learning and a natural curiosity across specialties to avoid over reliance on 'consult' mentality	Agree	100
Networking with metropolitan specialists and interactions with consultants and Trainees	Agree	100
Being involved in teaching juniors	Agree	100
Being up to date with literature and engaging in journal clubs	Agree	95
Being actively involved in research including multicentre and collaborative research	Agree	90

Methods of guiding Trainee to acquire these skills in Scholarship and Teaching in the context of the rural setting		
Actively looking for and offering opportunities and support for research and audit projects	Agree	90
Encouraging attendance presentation, and contribution at all teaching sessions—for instance, grand rounds, 10-minute teaching topics	Agree	85
Enabling opportunities for teaching, research and discussion of literature and giving responsibility to Trainees to organise and present at educational meetings	Agree	85
Use of skilled mentoring and feedback	Agree	75
The Challenges that might be encountered in delivering this competency in a rural setting		
Time off to attend conferences if limited number of Trainees in the rotation and need to cover clinical work; this includes rostering limitations	Agree	90
Workload of surgeons and on-call commitments make learning opportunities and research difficult	Agree	90
Geographic isolation and distance to attend face-to-face opportunities	Agree	85
Trainees needing more study	Agree	75
Rural Trainees needing a greater study allowance due to incurring higher costs of travel to attend courses	Agree	75
Isolation from peers and social networks during rural rotations	Agree	75

Health Advocacy

There were 6 statements about positive behaviour markers that demonstrate Health Advocacy in the context of the rural setting; consensus was reached on all (percentage of consensus = 100%). Regarding the methods of guiding Trainees to acquire skills in Health Advocacy in a rural context, there were 7 statements, and consensus was reached on all (percentage of consensus = 100%). Regarding the challenges that might be encountered in delivering this competency in a rural setting, there were 4 statements; consensus was reached on 2 (percentage of consensus = 50%). The combined statistics for Health Advocacy resulted in 17 statements in total; consensus was reached on 15 (percentage of consensus = 88%). The statements on which consensus was reached are reported in Table 16.

Table 16: Health Advocacy Round 2 Delphi consensus statements

Health Advocacy		
Statement	Consensus (agree or disagree)	Level of agreement (%)
Positive behaviour markers demonstrating Health Advocacy in the context of the rural setting		
Awareness of the needs of the community and barriers to healthcare delivery in rural settings, and understanding how they impact on health outcomes—for example, recognising that GP services are so limited in some areas that specialists take on the role for following up results, and treatment coordination	Agree	100
Attempting to understand the rural community and their disadvantages, and having close contact with community leaders, service clubs and media (print and electronic) to disseminate factual health information	Agree	100
Looking after own wellbeing including health lifestyle choices, regular exercise, work/life balance, strategies to relieve pressure, having a GP, good personal hygiene and being able to recognise signs of fatigue and fatigue management	Agree	100
Identifying and addressing health issues in patients—for example, encouraging patients to stop smoking, setting up adequate services to meet demand, diabetes management, obesity management	Agree	100
Gaining appropriate informed consent with options including second opinion and providing all clinical records, X-rays and laboratory results for second opinion/transfer of care	Agree	95
Links with multidisciplinary teams in metropolitan areas to present and discuss complex cases	Agree	95
Methods of guiding Trainee to acquire these skills in Health Advocacy in the context of the rural setting		
Having Trainee understand health outcomes and awareness of patients at risk in early discharge if no local services are available	Agree	100
Supervisors leading by example—for example, demonstrating counselling with Trainee on ward round, showing a willingness to speak with relatives and patients	Agree	100
Supervisor mentorship and pointing out relevant cases when they arise	Agree	100
Encouraging Trainees to be involved with outreach services with consultants	Agree	100
Presentation of cases at multidisciplinary team meetings	Agree	100
Encouragement of Trainee to advocate for the patients and offer help/access support services for patient interested in making changes	Agree	100
Having Trainees advocate and initiate health promotion activities	Agree	90

The Challenges that might be encountered in delivering this competency in a rural setting		
Lack of resources in the rural setting	Agree	85
Limitations of time with busy clinical case load and difficulty accessing care within limited timeframe available for appointments	Agree	80

Abbreviations
GP = general practitioner

Judgement and Clinical Decision-Making

There were 12 statements about the positive behaviour markers that demonstrate Judgement and Clinical Decision-Making in the context of the rural setting; consensus was reached on all (percentage of consensus = 100%). Regarding the methods of guiding Trainees to acquire skills in Judgement and Clinical Decision-Making in a rural context, there were 5 statements; consensus was reached on all (percentage of consensus = 100%). Regarding the challenges that might be encountered in delivering this competency in a rural setting, there were 11 statements, and consensus was reached on 8 (percentage of consensus = 73%).

The Judgement and Clinical Decision-Making competency had additional questions about nuanced surgical scenarios. They looked at how rural surgeons make the decision to perform surgical procedures in the context of the rural setting in several situations:

- For infrequent or high-risk procedures there were 11 statements; consensus was reached on 10 (percentage of consensus = 91%).
- For procedures outside your regular scope but in which you have had training, there were 5 statements; consensus was reached on 2 (percentage of consensus = 40%).
- For procedures that you have had little or no experience in, there were 4 statements; consensus was reached on 3 (percentage of consensus = 75%).
- For how to make the decision to not perform a surgical procedure (and therefore transfer a patient for care elsewhere), there were 8 statements; consensus was reached on 7 (percentage of consensus = 88%).
- When asked how decisions differ depending on emergency or elective context, there were 6 questions; consensus was reached on 5 (percentage of consensus = 83%).

In total, there were 62 statements for Judgement and Clinical Decision-Making, and consensus was reached on 52, (percentage of consensus = 84%). The statements for which consensus was reached are reported in Table 17.

Table 17: Judgement and Clinical Decision-Making Round 2 Delphi consensus statements

Judgement and Clinical Decision-Making		
Statement	Consensus (agree or disagree)	Level of agreement (%)
Positive behaviour markers demonstrating Judgement and Clinical Decision-Making in the context of the rural setting		
Having situational awareness and being aware of local resources	Agree	100
Being honest and self-aware an acknowledging when your limits have been reached and knowing when to transfer	Agree	100
Early consultation and clear processes for transferring patients	Agree	100
Outline preoperative, operative, and postoperative care, including timeline and recovery milestones	Agree	100
Practice audits to have data on procedures and their outcomes	Agree	100
Appropriate timeliness of discussion with consultants	Agree	100
Early involvement of subspecialty and involvement in multidisciplinary team meetings	Agree	100
Sensible diagnoses and suggested management plans	Agree	100
Good knowledge of patient and results	Agree	100
Using available information to effectively prioritise acute and elective patient assessment	Agree	100
Appropriate use of tests and investigations and developing strict protocols for following up tests and investigations	Agree	100
Maintenance of continued professional development; being prepared to take advice and read up on something	Agree	100
Methods of guiding Trainee to acquire these skills in Judgement and Clinical Decision-Making in the context of the rural setting		
Mentorship, discussion and providing opportunity to assess and discuss management plans	Agree	100
Supervisor role modelling and setting a personal example	Agree	100
Access to subspecialty terms for Trainees interested in rural practice	Agree	100

Trainee engaging in educational opportunities—for example, videos, workshops, journal clubs, attendance at morbidity and mortality meetings, and attendance at relevant courses such as cultural safety, communication skills, medicolegal aspects of decision-making	Agree	95
Simulation scenarios	Agree	85
The Challenges that might be encountered in delivering this competency in a rural setting		
These situations mostly arise in rural settings with challenges more frequently encountered—for example, smaller hospitals, smaller volumes, fewer specialists with super specialisation. Less easy to transfer elsewhere due to remoteness and in a time-appropriate manner. In this context these skills are more reliably learnt and experienced in these rural settings	Agree	95
Logistics of transfer in a time-appropriate manner—for example, remoteness, costs, logistics with family and patients	Agree	90
Trainees need to know who they can transfer to if outside their facility. The Trainee may lack a strong link with the tertiary hospitals or bigger hospitals in the catchment	Agree	85
Risk-averse Trainees may develop a sense that rural centres cannot do certain procedures and rely on transfers to tertiary centres and fail to appreciate how much gets done locally without transfer	Agree	85
Resource limitations in a rural setting	Agree	80
Back up and support limitations by other departments, peers, and health service support—for example, anaesthesia and medical administration	Agree	80
Lack of support from tertiary centres	Agree	75
Perceived expertise and competency with tertiary surgeons not aware of the local skill available and requesting unnecessary transfer	Agree	75
How do you make the decision to perform surgical procedures in the context of the rural setting in the following situations?		
Infrequent or high-risk procedures		
Consult and discuss with appropriate colleagues for their opinion	Agree	100
Discuss with colleagues in tertiary centres	Agree	100
Careful preoperative planning and clinical decision-making	Agree	100
Read documentation regarding the case	Agree	100
Discuss with patient the risks and benefits of having procedures in a rural setting	Agree	100
Consider appropriateness of the procedure in the given setting and resources available including staff, instrumentation, suitable anaesthetists	Agree	100
*This decision is for the surgeon to make, rather than considering the patient	Disagree	95
Consultation with anaesthetist, nurses, executives, and patient/family	Agree	95

Even if infrequent, there must be an appropriate skill mix, and it must be a procedure you have experience and training in and ensure currency of practice	Agree	90
Perform with colleagues assisting	Agree	90
Only with appropriate postoperative care and critical care back up	Agree	85
Procedures outside your regular scope of practice but in which you have had training		
I would perform lifesaving/damage-*control surgery under guidance from subspecialty surgeon in tertiary unit	Agree	95
This decision is for the surgeon to make, rather than considering the patient	Disagree	90
Procedures that you have had little or no previous experience in		
Only perform is life threatening, under the guidance of a metropolitan specialist or subspecialty surgeon	Agree	95
Discussion with local and tertiary colleagues before commencement	Agree	95
Only perform if life threatening and too unstable to transfer	Agree	90
How do you make the decision to NOT perform a surgical procedure (and therefore transfer a patient for care elsewhere)		
If the patient can be transferred safely and there is no urgency	Agree	95
In a non-emergency setting, the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) as well as the necessary support structures (ICU, HDU, specialist nursing care); if one or several of these are deficient for a certain condition then I will refer the patient on to receive care elsewhere	Agree	95
I consider the combination of procedure and co-morbidity and whether this raises concerns, and whether the outcomes of the patient would be better if treated in a larger hospital	Agree	95
This would be dependent on the experience (or no experience), skills, area of expertise and what facilities are available at the hospital	Agree	85
I would discuss with subspecialty via phone	Agree	85
*This decision is for the surgeon to make, rather than considering the patient	Disagree	80
Non-emergency setting—the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) and whether the procedure fits into the Clinical Services Capability Framework of the hospital	Agree	80
How does your answer to the question differ depending on emergency or elective context?		
In emergency circumstances, training becomes critical, and delay in management must be matched against health risks of transfer being greater than intervention in less-than-optimal	Agree	95

conditions. In general, if I assess that there could be a risk to life or quality of life, I will take on procedures with as much support as I can gather		
I would engage and get advice from remote colleagues to guide me—for example, a discussion with a referral centre subspecialist even while performing emergency procedures	Agree	95
Transfer to a tertiary centre is more common for elective procedures—for example, there have been occasions where I have had to perform a thoracotomy for trauma, but I would never consider performing an elective thoracotomy	Agree	90
Depends on the patient's stability and availability of transfer—for example, acuity and likelihood of deterioration if transferred. Mode of transfer available. Distance to transfer	Agree	90
This decision is for the surgeon to make, rather than considering the patient	Disagree	80
For elective procedures there is no excuse for performing procedures outside one's personal scope of practice and experience whether this occurs in the rural or metropolitan setting	Agree	75

Abbreviations
HDU = high dependency unit, ICU = intensive care unit

Leadership and Management

There were 3 statements about the positive behaviour markers that demonstrate Leadership and Management in the context of the rural setting; consensus was reached on all (percentage of consensus = 100%). Regarding the methods of guiding Trainees to acquire skills in Leadership and Management in a rural context, there were 8 statements; consensus was reached on all (percentage of consensus = 100%). Regarding the challenges that might be encountered in delivering this competency in a rural setting there were 4 statements; consensus was reached on 1 (percentage of consensus = 25%). The combined statistics for the Leadership and Management resulted in 15 statements; consensus was reached on 12, (percentage of consensus = 80%). The statements for which consensus was reached are reported in Table 18.

Table 18: Leadership and Management Round 2 Delphi consensus statements

Leadership and Management		
Statement	Consensus (agree or disagree)	Level of agreement (%)
Positive behaviour markers demonstrating Leadership and Management in the context of the rural setting		
Involvement in hospital and health network management	Agree	100
Ability to adjust leadership style to the setting—for example, small hospitals and rural situations	Agree	100
Effective communication with administration and team members	Agree	95
Methods of guiding Trainee to acquire these skills in Leadership and Management in the context of the rural setting		
Given the Trainee opportunity to take on leadership responsibilities—for example, lead ward rounds, manage the roster, and mentor juniors, lead in discussion and planning	Agree	100
Providing exposure to the Trainee with the granting of increasing responsibility and progressive independence	Agree	100
Supervisors leading by example and positive role modelling	Agree	100
As a supervisor, sharing information and experiences (within the bounds of confidentiality and the interest of health services)	Agree	100
Mentorship and teaching Trainees to look for solutions	Agree	100
Encourage and get the Trainee involved in administration roles, projects and specific tasks that need a collaborative approach (such as auditing a certain condition/auditing theatre flow)	Agee	95
Review and feedback, making time to evaluate performance and correcting observed inappropriate behaviour	Agree	95
Encourage additional study—for example, Leadership and Management courses, Clinical Risk Management training, and if they have a serious interest in management or governance, and appropriate management course or Australian Institute of Company Directors Course	Agree	80
The Challenges that might be encountered in delivering this competency in a rural setting		
Dependence on senior leadership in hospital or health networks—for example, it would be difficult with a non-responsive, overly bureaucratic management structure/team	Agree	75

Professionalism and Ethics

There were 9 statements about the positive behaviour markers that demonstrate Professionalism and Ethics in the context of the rural setting; consensus was reached on all (percentage of consensus = 100%). Regarding the methods of guiding Trainees to acquire skills in Professionalism and

Ethics in a rural context, there was a total of 5 statements; consensus was reached on all (percentage of consensus = 100%). Regarding the challenges that might be encountered in delivering this competency in a rural setting there was a total of 6 statements; consensus was reached on 2 (percentage of consensus = 33%). The combined statistics for the Professionalism and Ethics resulted in 20 statements in total; consensus was reached on 16, (percentage of consensus = 80%). The statements for which consensus was reached are reported in Table 19.

Table 19: Professionalism and Ethics Round 2 Delphi results

Professionalism and Ethics		
Statement	Consensus (agree or disagree)	Level of agreement (%)
Positive behaviour markers demonstrating Professionalism and Ethics in the context of the rural setting		
Honesty and integrity	Agree	100
Patient-centred approach and respecting patient autonomy	Agree	100
Good time management skills—for example, starting meetings and surgeries on time	Agree	100
Equal management of private and public patients	Agree	100
Being trustworthy and respectful of confidentiality. Must protect patient rights and information—for instance, everyone knows everyone in the rural setting, and confidentiality is even more crucial as you encounter more and more people in your town as patients	Agree	100
Accepting and ensuring effective communication with diverse ethnic, cultural, religious and language groups	Agree	100
Respect for colleagues and fostering an environment of collegiality	Agree	100
Role modelling good, ethical behaviour in the community	Agree	100
There are no differences when compared to a metropolitan setting	Agree	75
Methods of guiding Trainee to acquire these skills in Professionalism and Ethics in the context of the rural setting		
Supervisor role modelling and setting an example of highly ethical and professional behaviour	Agree	100
Providing mentorship to the Trainee	Agree	100
Providing regular feedback, Trainee assessment and being proactive—for instance, regular feedback if Trainees standards fall short of those expected	Agree	100
Encouraging and fostering involvement in the local community and introducing Trainee to community leaders	Agree	90

Encouraging the Trainee to attend appropriate courses	Agree	75
The Challenges that might be encountered in delivering this competency in a rural setting		
Understanding what responsible financial decisions for the hospital are and most importantly the patient—for example, don't order scans that are not needed since Trainees are not always the ones making fiscal decisions	Agree	80
Ability to separate clinical from social and family networks, the Trainee needs to manage this carefully as they may cross boundaries or create conflicts of interest	Agree	75

General questions

There were 4 general questions that were asked of the Delphi participants. Firstly, regarding if there are any professional skills or competencies that could be needed in a rural surgical setting, there were 6 statements, and consensus was reached on all (percentage of consensus = 100%). There were 6 statements about what could have been added as part of a rural-facing surgical curriculum to complement the existing SET, covering the 9 surgical specialties, to better prepare SET Trainees for independent rural practice. Consensus was reached for all 9 (percentage of consensus = 100%). Regarding how a rural-facing surgical curriculum could help develop confidence and competence in SET Trainees providing surgical care to rural patients, there were 6 statements; consensus was reach on 5 (percentage of consensus = 83%). The last question was, 'Reflecting on your own training, what helped you develop confidence in a rural surgical practice?' Consensus was reached for all 7 statements associated with this question (percentage of consensus = 100%). The statements for which consensus was reached are reported in Table 20.

Table 20: General Questions Round 2 Delphi consensus statements

General questions		
Statement	Consensus (agree or disagree)	Level of agreement (%)
The following statements have been provided regarding if there are any additional professional skills or competencies that could be needed in a rural surgical setting		
Rural Trainees need a more general skillset, with skills outside their regular specialty to compensate for less specialised practices	Agree	100

Rural Trainees need to learn to establish good, supportive, professional networks and referral pathways with larger hospitals, urban hospitals, and subspecialists	Agree	100
Rural Trainees need flexibility and adaptability, adjusting their practice to the local level of care available	Agree	100
Rural Trainees need social skills and situational awareness	Agree	100
Rural Trainees need no additional professional skills or competencies	Disagree	90
Rural Trainees need the ability to cope with isolation and being alone	Agree	85
The following statements have been provided regarding what could be added as part of a rural-facing surgical curriculum to complement the existing SET curriculums, covering the 9 surgical specialties, to better prepare SET Trainees for independent rural practice		
Trainees need exposure to rural areas	Agree	100
Trainees need to understand the difficulties faced by rural practitioners and shake the belief that excellence is only available in cities	Agree	100
Posting to other specialties (cross-specialty training) would be key for rural-inclined Trainee surgeons—for example, a rotation in Vascular Surgery, Neurosurgery, Plastic and Reconstructive Surgery, ENT, Cardiothoracic Surgery and Urology	Agree	100
Trainees need a structured training opportunity for technical and non-technical skills to expand a generalised (generalist) skillset	Agree	95
Trainees need training in communication technology and networking with colleagues	Agree	85
Surgeons in rural areas need to same non-technical skills as their city counterparts and everything that is in the General Surgery curriculum is applicable to rural training	Agree	75
The following statements have been provided regarding how a rural-facing curriculum could help develop confidence and competence in SET Trainees providing surgical care to rural patients		
Referral hospital surgeons should be challenged to foster close relationships with regional surgeons/Trainees and teach the Trainees how to ask for help	Agree	100
Trainees should have better exposure to rural practice, both education and rural practice and experience	Agree	100
Trainees should be made aware of the immense difference they are making by working in the rural setting	Agree	95
More technical training and help during their training would give Trainees a broader capability without sacrificing depths, a better prepared skillset, and behaviour patterns suitable for smaller departments, and would provide a local context, with surgeons being specifically trained to meet the needs and demands of rural population	Agree	95

It could help Trainees appropriately apply information and communication technology to delivering healthcare safety and with appropriate privacy, and improve telemedicine support from subspecialists	Agree	90
The following statements have been provided regarding reflecting on your own training, what helped you develop confidence in a rural surgical practice		
Exposure to multiple surgical specialties during training for a broad and intensive surgical training experience. Training in General Surgery, Orthopaedic Surgery, burns/plastics, Urology, Neurosurgery, and Cardiothoracic Surgery	Agree	90
Training outside of a capital city and gaining rural exposure	Agree	85
Role modelling after rural surgeons and having good mentors to guide how to best manage rural practice	Agree	85
Having supportive working environments and having strong relationships/networks with surgeons within the same specialty, and with other specialties	Agree	90
Very busy and rigorous training jobs prior to moving to a regional area	Agree	75
Formal linkage and working visits to major centres and regional hospitals. This allows for procedure specific training, being able to discuss cases, joining a multidisciplinary team, taking more complex cases, and provide locum relief	Agree	85
Finding a mentor organically is more beneficial than having an assigned a mentor	Agree	75

Abbreviations
ENT = Otolaryngology Ear Nose and Throat surgery, SET = Surgical Education and Training

4.5 Summary

Two Delphi rounds were completed between 19 July and 19 September 2021. A third round was not needed because few responses did not reach a consensus. Overall, consensus was reached on 98% of positive behaviour marker statements, 91% of methods for guiding Trainees, and 51% of statements regarding challenges in the rural setting.

The challenges that might be encountered had the lowest level of agreement (or disagreement) among all the categories. This low level of consensus may be due to the diverse nature of challenges across many different rural settings. The challenges were mainly gathered to help with the implementation phase of the

rural-facing surgical curriculum framework (discussed in Section 9). Any challenges that reached a consensus can be used to inform learning outcomes, when applicable.

There were a handful of statements that reached a consensus of disagreement. These included the statement, 'This decision is for the surgeon to make rather than considering the patient' in the Judgement and Clinical Decision-Making competency. The consensus to disagree occurred when:

- making decisions around performing infrequent or high-risk procedures
- making decisions around procedures outside your regular scope of practice but in which you have had training
- considering how to make the decision to not perform a surgical procedure
- thinking about how this decision depends on an emergency or elective context.

Interestingly, this statement did not reach consensus when considering:

- procedures that you have had little or no previous experience in.

These questions were included by the Working Group and were based around the information gathered in the rapid review about practising outside your general scope of practice and outside your specialty in the rural setting, and about the medicolegal concerns this raises in the rural setting. The resultant information will be used as either learning outcomes or teaching and assessment tools within the final curriculum framework, because they are extremely relevant to the rural and regional context.

Some of the common themes that arose during the Delphi study regarding the positive behaviour markers were about relationship dynamics in the rural setting. This included the importance of developing relationships with local surgeons and surgeons in tertiary centres, but also the nuances of treating patients with a familial or social relationship to the surgeon (especially when considering judgement and clinical decision-making competency). Communication and relationships with rural GPs was frequently mentioned during the Delphi study, which highlighted the crucial issues of communication and teamwork in the rural setting. Building and maintaining relationships must be a major component of the rural-facing surgical curriculum framework. Furthermore, resources were a common challenge in the rural setting

across many of the competencies. Constraints can include staffing, equipment, transfer options, and time. Care and management planning are important issues for rural surgeons as is the need for continued professional development; both should also be highlighted in the curriculum framework as areas of importance.

There were some common themes around guiding the Trainees; these were reported in Round 1 and reached consensus in Round 2. They included positive role modelling, skilled feedback, mentoring, and encouragement. The study was intended to generate data on more novel techniques to guide Trainees, because one of the goals of creating a rural-facing surgical curriculum framework is to make sure that all Trainees develop the required professional skills to work rurally. Ideally, a standardised method of training should be proposed, but this was only infrequently considered during the Delphi study.

The data from the Delphi study was used to inform learning outcomes for each of the competencies, and the advice on guiding Trainees will be used to inform the teaching and learning strategies and activities for the rural-facing surgical curriculum framework.

4.6 Conclusion

The Delphi study was performed to guide the development of the rural-facing surgical curriculum framework and generate the first round of information about the positive behaviour markers reflecting the professional skills and teaching strategies in the rural setting. Further refining of information gathered about all 8 professional competencies is needed, and more focus must be placed on the Judgement and Clinical Decision-Making competency. This competency reflects the concerns associated with the medicolegal aspects of rural surgery and the broad scope of practice that was reported during the rapid review.

5. Sheffield Elicitation Framework versus co-design workshop

5.1 Introduction

The original research plan of this project proposed that the third stage of research be a Sheffield Elicitation Framework (SHELF) method with the goal of validating the rural-facing surgical curriculum that was developed using the information gathered in the rapid review and the Delphi study. SHELF is a formalised, documented procedure for obtaining probabilistic judgements (the decision process of evaluating the likelihood of a particular event happening), in this case, by a group of experts nominated by the STBs, Rural Surgery groups, and the Academy of Surgical Educators.

As this research progressed from the rapid review to the Delphi study it became clear that the SHELF exercise may be unfit for purpose and not the most suitable research methodology for developing the rural-facing surgical curriculum framework. The research group, with the approval of the Working Group, made the decision that a co-design workshop was a better choice of research methodology.

The following section describes the study designs of both a SHELF and a co-design methodology. It compares their strengths and weaknesses and explains why the proposed research design and methodology was changed from the original research proposal.

5.2 SHELF

SHELF is an expert knowledge elicitation protocol which provides a transparent and rigorous approach to capturing judgements from many experts about one or more uncertain quantities. In this instance, it was the probability of issues arising from the acceptance and use of a rural-facing surgical curriculum framework. The process is achieved through facilitated group discussions, with the goal of reaching a consensus distribution using a behavioural aggregation process. SHELF provides a framework for capturing the experts' information and includes disclosing the experts' backgrounds and any conflicts of interest. Further, a dossier is provided to the experts with key information to underpin their judgements. SHELF uses a comprehensive set of questions that are created to cover everything a user of the elicitation exercise needs to know before using the results to obtain a decision. An elicitation exercise carried out using SHELF is designed to be performed by a group of experts guided by a facilitator.[82]

During SHELF, the experts are asked to form their own quantitative judgements after the quantity of interest has been discussed, and then a group consensus distribution is suggested to the facilitator by the experts using lineal opinion pooling with equal weights. Both the individual fitted distributions and the potential consensus distribution can be displayed to the group and discussions are encouraged as to whether the consensus distribution is valid. During SHELF, the experts have opportunities to contribute to discussion and to revise their judgements. Since its inception, SHELF has been widely used in health economics and medicine.[82] The aim of SHELF is to create a probability distribution that the experts are satisfied captures their beliefs.[82] As mentioned, for this research project, the goal was to determine the probability distribution of issues arising from a rural-facing surgical curriculum framework.

Several strengths and weaknesses of SHELF have been cited;[83] these have been considered in the light of the current research focus.

i) Strengths and weaknesses

Strengths

1. The main benefit of SHELF is the ability to quantify expert knowledge into a probability distribution that can be used in a Bayesian framework (Bayesian inference being a method of statistical inference in which Bayes' theorem is used to update the probability for a hypothesis as more evidence or information becomes available).[84]

   By omitting SHELF, we will not obtain data about the probabilistic judgements of the likelihoods of issues with certain elements of the curriculum.

   With the drafted rural-facing surgical curriculum framework, this would be very useful information that may reduce the risk of complications in the future and may even lead to changes in the design of the curriculum to mitigate the risks.

2. SHELF provides a relatively transparent calculation and communication of the probability of success.

   SHELF may highlight not only the rationale for believing in the likely success of a rural-facing surgical framework but also the gaps in knowledge and the sources of uncertainty. Dallow and Best et al[83] reported that, having used prior elicitation and assurance in multiple projects, they believe SHELF had enabled a more robust discussion and, where necessary, led to changes in development plans where risk mitigation was needed. When developing a rural-facing surgical curriculum, SHELF may expose inherent issues with the curriculum or its implementation, and then guide the development process in a new direction.

3. SHELF can lead to improvements in study designs.

   The elicitation process has been reported to facilitate rich and scientifically driven reviews of evidence, enabling a more robust collective understanding and decision-making process. Although experts have the same data in front of them, they are often independently formulating different conclusions. SHELF may have been incredibly useful earlier in this project, because the analysis of the Delphi was quite subjective and may have been interpreted differently by a group of experts.

Weaknesses

1. SHELF findings can be more based on aspiration than belief.

   During the elicitation process, the experts may have brought bias into the research by providing the facilitator with the answers they want, rather than genuine best estimates of the true probability. Dallow and Best et al[83] reported that, experts often struggle in pharmaceutical expert elicitations with the concept of eliciting the 'true' treatment effects, and risk bringing sampling uncertainty and aspirational beliefs into the expert elicitation. In the case of this current project, this may have led to the experts stating the judgements that they wished to be true, rather than what the true probabilistic judgements may have been. This could have led to inaccurate results about the probability of any potential issues with the new rural-facing surgical curriculum.

2. SHELF results can be guided by over-optimism.

   The facilitators need to ensure that the experts do not intentionally give over-optimistic views. Over-optimistic views can be brought on by a desire for a successfully implemented curriculum—experts may be too optimistic about how successful the program may be or the probability of issues that they may face. This can be resolved by the facilitator documenting or being aware of the conflicts of interest at the beginning of the SHELF.

3. SHELF research design is only interested in a single quantity of interest.

   The aim of the SHELF was to find the quantity of interest, which is the uncertain quantity, based on the probabilistic judgement on issues with the designed rural surgical curriculum framework. The actual scope of the SHELF is quite narrow and will not elicit a great deal of information that could benefit the design process of the rural-facing surgical curriculum framework, which is the stage of research to which SHELF is to contribute. It was deemed more important that the experts help develop the curriculum framework, rather than work out a judgement for a quantitative figure of probability of potential issues.

4. SHELF can have challenges reaching a consensus.

   SHELF defines what is called a consensus prior, using a behavioural aggregation approach. Dallow and Best et al[83] report that sometimes experts cannot put aside their beliefs and sometimes there are fundamental and valid differences in opinion. However, ultimately, failure to reach a consensus has not proved to be a major issue, provided that the elicitation exercise can

formulate why differences occur. Dallow and Best et al[83] reported that eliciting 2 (or more) separate priors based on differing opinions, and providing a clear supporting rationale for each, can be very helpful to decision-makers and governance boards, so that open and transparent reviews of risk can then be held based on the feedback from the elicitation. In the current research, it is only within our scope to have one SHELF workshop, so differing opinions may lead to a null result.

5. SHELF requires a certain level of statistical knowledge—experts may misunderstand statistical quantities
    a. The experts must complete any training needed to give them a good understanding of probability and other statistical terms (e.g. quartiles), or the expert elicitation would not be successful. Clarity in the training of experts to ensure that they understood statistical concepts is critical to minimise such risks.
    b. As the experts that we have recruited were very busy and had many responsibilities, we would have been relying on them taking time to complete the training and understand the statistics behind SHELF. This was a large task and in hindsight it was a good decision to not ask them to complete any prior training—most barely had time to read the dossier provided.
6. There are practical and logistical challenges with prior elicitation, including running elicitation sessions where experts are located.
    a. Given the psychological aspect of the SHELF workshops, face-to-face interaction is preferable. However, due to COVID-19, we were unable to have all the experts in the same location and elicitation was to be conducted over Zoom (Zoom Video Communication, San Jose, California, United States). Dallow and Best et al[83] reported that it is ideal to have a facilitator at each location to assist the lead facilitator in managing and 'reading the room'. For the originally proposed SHELF it was planned to use a single facilitator working remotely, which may have given rise to in less than ideal results.

ii) SHELF summary

Overall, SHELF has many strengths and weaknesses that can affect the validity of the resulting probability distribution (in this case, whether there will be issues with the use and implementation of a rural-facing surgical curriculum framework once it had been drafted). The biggest weakness when looking at the development of the curriculum framework was that, from the first and second stages of the research (the rapid review and the Delphi study), the questions that needed to be answered were not related to probability. The project was at the stage of designing and finalising the content required for the curriculum framework. For this, SHELF was not an appropriate study design. For this reason, we changed the research design to a co-design workshop, which was deemed more appropriate to help design the curriculum.

5.3 Co-design workshop

Co-design workshops, also known as co-production workshops, are a process of designing and delivering services in partnership between funders, service providers, and the intended users or audience of the service.[85] The premise is that an individual's needs are better met when they are involved in an equal and reciprocal relationship with professionals and others to complete tasks and projects.[86] Boyle and Coote et al[86] defines a co-design process as 'co-production means delivering public services in an equal and reciprocal relationship between professionals, people using the service, their families, and their neighbours. Where activities are co-produced in this way, both services and neighbourhoods become far more effective agents of change'.

Co-design works best without a strictly defined methodology, which can inhibit creativity and innovation; this means that each co-design will be different, and the process is developed to suit the circumstances. Co-design can be achieved through a myriad of activities, processes, and tools, but most co-designs have some features in common:

- Recognising people as assets: transforming the perception of people from passive recipients of services and burdens on the system into one where they are equal partners in designing and delivering services.
- Building on existing capabilities: altering the delivery model of public services from a deficit approach to one that provides opportunities to recognise and grow people's capabilities and actively support them to put these to use with individuals and communities.
- Mutuality and reciprocity: offering people a range of incentives to engage, which enable them to work in reciprocal relationships with professionals and with each other, where there are mutual responsibilities and expectations.
- Peer support networks: engaging peer and personal networks alongside professionals as the best way of transferring knowledge and supporting change.
- Blurring distinction: blurring the distinctions between professionals and recipients, and between producers and consumers of services, by reconfiguring the way services are developed and delivered.
- Facilitating rather than delivering: enabling public service agencies to become catalysts and facilitators of change rather than central providers of services themselves.[86]

Co-design is an appropriate research design in most cases where new services are being commissioned, innovation is being encouraged, and many potential providers are being commissioned.[85] Co-designs are also very effective in developing new approaches to difficult problems, which will be useful for helping develop a rural-facing surgical curriculum framework.

For a co-design workshop, the first step is defining and making sure that everyone knows the scope and intent of the process.[85] Co-designs are also very effective in developing new approaches to difficult problems, which will be useful for helping develop a rural-facing surgical curriculum framework. There are many ways to facilitate a co-design workshop, these include:

- brainstorming and identifying problems and solutions, while suspending judgements to encourage creative ideas to emerge from groups

- writing down options on sticky notes and moving them around into categories to help organise ideas visually and identify emerging themes
- weighing up the benefits of each option for different groups of stakeholders and checking that they are SMART (specific, measurable, attainable, relevant, timely)
- using quality circles, which is a participatory management technique that brings people together in groups to find solutions to organisational problems
- using voting systems to help participants make decisions
- encouraging informal discussions leading to natural consensus.

For the current project, it was proposed that a co-design workshop could consist of a facilitated workshop with the experts who had agreed to be a part of SHELF. These individuals have the goal of developing ideas for the rural-facing surgical curriculum framework. As with the plan for SHELF, the experts will be provided with an evidence dossier, which will include all the evidence gathered from the rapid review and the Delphi study.

i) Strengths and weaknesses of co-design workshop

Strengths

1. Those involved own and see more value in the rural-facing curriculum framework.
    a. The mutual respect which is intrinsic to a co-design approach has direct benefits to all individuals and organisations participating. It encourages greater buy-in and ownership of the products which emerge. As the individuals who are creating the framework and would be teaching it or directly benefiting from it, the surgeons may feel an increased level of motivation to implement it in the rural setting, which would be highly favourable to the Trainees.
    b. Implementing a co-design workshop may also shift the intrinsic power imbalance between funders, providers, and recipients, and it may lead to a sharing of responsibility and restore a level of control to those who otherwise may have very little.
    c. Co-design workshops can incorporate many topics and areas of interest.

d. Co-design workshops can have a broad scope of content that the experts are required to get through. Unlike SHELF, during the co-design workshops the experts can help with the curriculum framework, work through potential issues with implementation, brainstorm strategies for implementation and discuss other aspects of the rural-facing surgical curriculum framework that would not be discussed during SHELF.

2. There will be increased capacity and impact for the final piece of work.
    a. Bringing together different kinds of expertise means that a greater range of opinions can be explored, more challenges can be addressed, and unintended consequences can be identified and mitigated.
    b. The co-design process may make the people implementing the framework more aware of available external support, which will help make it effective and successful.
3. Opinions from individuals working in the area the curriculum framework will be used.
    a. During a co-design process, individuals who work in a relevant area can be highly involved in the development of new policies, procedures and projects that are important to them.
    b. Individuals who work in a rural surgical environment know what does and does not work in this environment. By using their knowledge, we can create a strong rural-facing surgical curriculum, which may lead to fewer issues with implementation and may also have more desirable results for the surgical Trainees.

Weaknesses

In the scholarly field of co-design research, there are ongoing debates about how co-design approaches are applied, interpreted, and evaluated.[87] There is also a lack of rigorous evaluation of the effectiveness and cost-effectives of co-designed interventions and policies.[88] Oliver and Kothari et al[89] reported some of the co-design disadvantages, which have been documented and expanded below in the context of the rural-facing surgical curriculum research.

1. Rural surgical experts are not homogeneous in their views.

    This means the experts can disagree with the decisions that will be made during the development of the rural-facing surgical curriculum or may disagree with the final product.

2. Dominant individuals can take over during the workshop.

   The co-design discussion can be dominated by a few individuals. Well-trained facilitators must make sure that all the experts are engaged in the co-design process. If there is not a facilitator or a balanced discussion, this can lead to a power imbalance which defeats the purpose of a co-design where all individuals involved must be available to influence the decisions.

3. The stakeholders and researchers may have different priorities and values.
    a. Participants must be clear on whose behalf they speak (in this case, it will be the surgical boards or educational providers they represent) and be supported to do so.
    b. To increase credibility, the participants must be seen as valued and relevant sources of knowledge. It is critical that the participants know the scope and intent so that everyone is working on the same page.
4. There may be little agreement about the importance of the research.

   A finding from the Delphi study is that some of the experts do not feel that a rural-facing surgical curriculum framework is a worthwhile exercise, and this attitude may come into the co-design workshop, which could affect the integrity of the co-design process and the final curriculum framework.

5. Experts may want to share findings before the researchers are ready.

   As the experts will be so closely involved in the curriculum framework development, they may wish to share the results externally before they have had the appropriate approval from the governing bodies.

6. People may be investing time and resources into relationships with no guaranteed output.

   There is a risk that there may not be a product arising from the single rural-facing surgical workshop scheduled.

7. Practical costs of a co-design workshop.
    a. A co-design workshop can be expensive, because it required the presence and time of many individuals who will not be on site and have other primary responsibilities. There is also the need for facilitators with experience in co-design. However, the project budget previously allocated to the SHELF can be reassigned to this.

b. One advantage of completing a co-design workshop during the COVID-19 pandemic is that it must be completed online due to travel restrictions, reducing the need for travel reimbursement.

8. Co-design research can be regarded as partisan, biased and 'light weight', producing nothing of substance.
    a. Due to the nature of co-design, it can be seen as less rigorous than other study designs.
    b. Scenarios in which participants were asked for input can be 'cherry picked' to suit the research agenda, especially when contributions are not treated transparently or systematically.

5.4 Conclusion

The original plan for this project was to find evidence about rural surgical curriculums during the rapid review component of this project, then consolidate what should be included in the curriculum framework during the Delphi study and determine the probabilistic judgement of any issues that may arise with the content and during the use and implementation phase during the SHELF workshop. At the time when the SHELF was due to be conducted, the project was still in the data collection stage, because the rapid review provided very little foundation information about what should or should not be included in the framework. This meant that the Delphi study was used to generate the first level of content that may be required in a rural-facing surgical curriculum framework, the methods that could be used to deliver this content, and what challenges may be encountered with the curriculum framework once it has been implemented. Therefore, because the next stage needed to further develop the rural-facing surgical curriculum framework, the research and scope of the workshop needed to be broad. For this, SHELF would have been of little value.

As the experts were already organised for the SHELF workshop, it was decided that a co-design workshop would be a beneficial study design, and that it was an ideal way to include the expertise from the experts in the development phase of the curriculum. It was decided that it would also be beneficial to

get the experts' opinions and discuss the challenges around implementation and uptake of the curriculum framework in the rural setting and with the STBs. Having experts in the development phase of a curriculum framework is also recommended by the International Bureau of Education Developing and Implementing Curriculum Frameworks guide.[90]

Regarding the weaknesses of a co-design workshop, it was decided that an external professional facilitator would mediate any disagreement and help guide the workshop and ensure all individuals had equal opportunities to contribute. A clear scope and intention were also set before the workshop, which aimed to resolve the differing priorities and values. Regarding the timing, holding one co-design workshop was likely to create more relevant information than a single SHELF workshop, because the workshop was for curriculum development, which is broad in nature. In addition, all of the secondary benefits of SHELF (e.g. communication of success, improvements in study design, deeper understanding of the research topic) can be undertaken more formally and in conjunction with a broader scope in the co-design workshop.

Therefore, it was proposed by the research team, and accepted by the Working Group, that the next stage of the research project be a co-design workshop. The co-design workshop did not increase the workload of any of the recruited experts nor impact the project timelines.

6. Co-design workshops

1.1. Introduction

Co-design research designs are based around solving complex or potentially controversial issues with communities to deliver projects, build trust and aid the implementation of a project. Through the rapid review, the Delphi study, and the monthly Working Group meetings, it was decided that the Judgement and Clinical Decision-Making competency was the most contentious topic and had areas that the Working Group felt were not covered in adequate detail during the Delphi study. It was also noted that, in the rapid review, many citations reported that rural surgeons need to have a broad scope of practice and be able to complete procedures outside their training specialty. Australian rural surgeons were often concerned by the medicolegal aspects of this, making Judgement and Clinical Decision-Making a highly relevant topic in the rural context. Therefore, further information was needed to create a curriculum framework that would be fit for purpose. For these reasons, the Working Group decided that Judgement and Clinical Decision-Making would be the focus of the co-design workshops.

6.1 Purpose, aims and objectives

i) Purpose

The purpose of the co-design workshop was to use the knowledge of rural surgical experts to find out the factors involved in the Judgement and Clinical Decision-Making competency in a rural setting. The potential positive behavioural markers determined by the Delphi study needed to be further refined, and a greater level of detail was required to develop specific learning outcomes that are relevant to the rural surgical context.

ii) Aim of the workshops

These workshops aimed to define rural-specific learning outcomes and assessment strategies for the Judgement and Clinical Decision-Making competency for the RACS rural-facing surgical curriculum framework.

iii) Objectives of the workshop

The Co-design workshops had 6 overall objectives, to:

1. define the factors that arise from rural-specific challenges and situations regarding the demonstration of the Judgement and Clinical Decision-Making competency—for example, factors that are disproportionately more impactful on patients' outcomes in a rural setting compared to an urban setting, such as weather for transfers, distance from tertiary hospitals, hospital and staffing resources
2. devise positive behaviour markers and decision-making factors for a rural-specific surgical environment
3. devise rural-specific learning outcomes based on the decision-making factors and positive behaviour markers. (Learning outcomes are user-friendly statements of the knowledge, skills and abilities individual Trainees should possess and demonstrate upon completion of the learning experience or sequence of learning experiences)
4. generate ideas for teaching strategies for the learning outcomes
5. generate ideas for the observation and assessment of the learning outcomes
6. generate ideas about potential challenges with the implementation of the framework in a rural setting.

6.2 Methods

i) Workshops

Two co-design workshops were completed; one on the evening of Friday 22 October 2021 and one on Friday 19 November 2021; both ran for 2.5 hours. An external facilitation company provided 2 facilitators

(Authentic Co-design, Melbourne, Australia) to facilitate the workshops, which allowed the research team to focus on the content and ask questions during the discussion. The workshops were conducted via Zoom due to COVID-19 travel restrictions and, with participants consent, the workshops were recorded. The recordings were shared between the facilitators and the research team using the Zoom cloud; recordings were not stored on any personal or work-related devices.

ii) Participants

Thirteen participants took part after being nominated by the Working Group or their surgical specialty board. The participants represented the following specialties:

- General Surgery
- Otolaryngology Head and Neck Surgery
- Orthopaedic Surgery
- Paediatric Surgery
- Urology
- Vascular Surgery.

They came from the following groups and organisations:

- Military Surgeon Section
- Rural Surgery Section
- Australian Board in General Surgery
- Board of Otolaryngology Head and Neck Surgery
- Board of Paediatric Surgery
- Board of Urology
- Board of Vascular Surgery
- Rural Health Equity Steering Committee
- SET Representatives.

Via return email to RACS, participants agreed to participate and consented to the workshops being recorded. They were contacted via email and phone in the lead-up to the workshops.

iii) Evidence dossier

Two weeks before the first co-design workshop, all the invited expert panellists were sent an evidence dossier via email. The dossier was provided so the participants had access to all the data and information related to the current project (including rapid review and Delphi study findings). This was originally an essential component of the SHELF methodology, which remained for the co-design workshop, as it was agreed by the Working Group and research team that it would still be a beneficial task and deliverable for the co-design workshop participants. The complete evidence dossier can be found in Appendix G.

iv) Workshop 1

Workshop 1 was held on 22 October 2021. Several activities were devised to help gather information for the 6 objectives.

Activity 1

The expert panellists were presented with a clinical scenario and asked to list factors that needed to be considered when working in a rural hospital. This task was to collect information on Objective 1: Define the factors that arise from rural-specific challenges and situations regarding the demonstration of the Judgement and Clinical Decision-Making competency—for example, factors that are disproportionately more impactful on patients' outcomes in a rural setting compared to an urban setting, such as weather for transfers, distance from tertiary hospitals, hospital and staffing resources. The clinical scenario is presented in Figure 1.

The participants were provided with a link to a Google JamBoard (Alphabet Inc, California, US), this allowed the participants to document their thinking on virtual sticky notes and to work in their own space. Ten minutes was then provided for a group discussion and debrief, and to allow for further clarification for the researcher when required. The Google JamBoard Data and group discussion data were transcribed and underwent thematic analysis.

You are working in a rural hospital approximately 4 hours by road to the nearest tertiary hospital. There are limited critical care facilities in this hospital, and currently, you are the only surgeon on duty. The weather has been particularly stormy the last week, and the hospital has been very busy with injuries resulting from vehicle collisions and personal accidents. A 32-year-old man, who you recognise as the teacher of one of your children, with no significant past medical history presents as the unrestrained driver of an older, mid-sized, 4-door sedan involved in a severe head-on motor vehicle collision with a large tree. Upon emergency department examination and CT, you find he has a large complex liver laceration extending completely through the medial segment of the left lobe and into the lateral segment of the right lobe, with no other significant internal injuries. The patient is initially shocked and after 2 litres of crystalloid his pulse still 120, BP holding at 100 and hb just came back at 65, abdomen tense and tender. His family have arrived at the hospital and are questioning whether he should/could be transferred to a tertiary hospital, and it has been some time since you have performed a liver procedure.

Abbreviations
BP = blood pressure, CT = computerised tomography, hb = haemoglobin
Figure 1: Co-design rural-specific surgical scenario

Activity 2

The co-design workshop participants were presented with the behavioural markers for the Judgement and Clinical Decision-Making competency that the Delphi study reached consensus on. The experts were then asked about their first thoughts regarding the behavioural markers—for example, their first thoughts on wording and whether the behavioural marker is relevant or not. They were also asked to describe if there are additional positive and negative behaviour markers for the Judgement and Clinical Decision-Making competency. Again, this was completed in Google JamBoard and 10 minutes was allocated for a group discussion, both of which were transcribed and presented in Section 6.3. Further, the facilitators used a Mentimeter poll (Mentimeter, Sweden) to determine the level of agreement with the suggested behavioural markers and the importance of these in a rural environment. There was a discussion surrounding these results.

Activity 3

Activity 3 focused around expanding the behavioural markers and creating ideas around potential learning outcomes. The experts were presented with the behavioural markers and were asked to describe observable learning outcomes for each. The experts were also asked to describe teaching activities that would foster positive learning environments and positive outcomes. This was again completed on a

Google JamBoard and via a group discussion. The data from the JamBoard and group discussion was transcribed and are presented in the Section 6.3.

v) After Workshop 1

After the completion of Workshop 1, all the information was collated and compiled. For Activity 1, the information was themed, and for Activity 2, it was redesigned and presented in a clear manner. Any statement that was an action or observable tasks was converted to a learning outcome; these learning outcomes were presented to the Working Group. The findings document was sent to the co-design workshop participants one week before the second workshop.

vi) Workshop 2

Workshop 2 was held on 19 November 2021.

Activity 1

Activity 1 focused on the behavioural markers and learning outcomes created from Workshop 1. We asked the experts to describe why the presented behavioural markers and learning outcomes are important and/or specific to the rural context. This task was completed because the Working Group asked the research group to determine why the devised learning outcomes from the first co-design workshop were specific to the rural area, with the goal of not diluting the curriculum framework with outcomes that could also be applicable to the urban setting. The experts were also asked to brainstorm some potential assessment tools that could be used to assess the Trainees for these learning outcomes and behavioural markers; a list of commonly used SET assessment tools was provided to the experts for reference.

The experts were again provided with a link to forms to complete; this time Google Slides (Alphabet Inc, California, US) was used to enable more extensive writing. The Google Slides were each assigned to specific experts, allowing the research team to determine the author of each statement. Every half-hour a

group discussion was initiated by the facilitators. The information from each of the experts was collated and transcribed after the workshop.

Activity 2

Near the end of the workshop, a group discussion was initiated around the potential challenges with the implementation phase of the project. Any relevant topics that arose during the discussion were transcribed.

vii) After Workshop 2

After the completion of the second workshop, all the information for each behavioural marker/learning outcome was compiled into a single document. The curriculum framework was amended based on the feedback provided by the experts.

6.3 Results

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i) Workshop 1

Ten experts attended Workshop 1.

Workshop 1: Activity 1

The raw data that was generated on the Google JamBoard was collated into themes, and the results are presented in Appendix I. Some statements have been listed more than once as they could be assigned to several themes. If abbreviations were used during the co-design workshop documentation, these words have been written in full for ease of reading. These factors were incorporated into teaching and learning strategies to be used to create specific learning outcomes.

Workshop 1: Activity 2

Table 21 shows the data from the co-design workshop discussion and the Google JamBoard. The statements have been grouped according to results from the Delphi study (these were on the Google JamBoard slides for the participants to see), general statements, and statements about wording. The participants were also given the opportunity to suggest further positive markers. The data in Table 21 is transcribed verbatim from the Google JamBoard.

Table 21: Co-design Workshop 1: Activity 2—findings

Comments of questions about these behavioural markers			
Behavioural markers	Delphi results	Comment or question	Suggested change of wording
Having situational awareness and being aware of local resources	Demonstrates an understanding of what is occurring around themselves in the healthcare and rural context, and understands the availability (or lack thereof) of resources in the rural surgical setting—for instance, staff resources and surgical resources	Local resources of each facility	Consider rewording—external factors
		Service profile of hospital	Possibly split into 2 separate behavioural markers
		Very important…what you can and can't do, knowing available resources	If these are to be used as learning objectives in a curriculum, I think they should be phrased as a verb stating what a Trainee can do. Is that what a 'behavioural marker' is for?
		Situational—in terms of consultation??	

		How team is working, are nursing staff comfortable and confident. Regular input with anaesthetists	
Being honest and self-aware and acknowledging when your limits have been reached	Trainee demonstrates honesty and self-awareness and can acknowledge when their professional or personal limits have been reached, this incorporates knowing when to transfer or refer to a colleague	Most important marker	Not sure about the honest part
		Acknowledging one's skills and limitations is very important	
		Ask for help appropriately	
		Cross over with situational awareness. Being aware of your clinical/technical expertise and skills. Very important in regional setting	
		Nobody wants a dishonest colleague. Honesty is a bit binary, however	
		If the Trainee is not self-aware, this is a red flag that they shouldn't go any further. It is the most dangerous thing. It is possible to be a self-aware narcissist	
	The Trainee conducts early consultation and has clear processes for transferring patients when required	Does this one relate more to communication	

Conducts clear and detailed surgical planning	Trainees outline preoperative, operative, and postoperative care, including timeline and recovery milestones	Pre-trauma huddle	
		Follow theatre protocols	
		Debriefs after trauma	
		Prioritise according to a fluid situation	
		Important because there is larger room for error in rural area	
		Especially if procedure may not be commonly performed in regional centre	
		Sounds kind of generic/stock-standard	
Participates in a multidisciplinary team environment	Trainees work closely with colleagues and multidisciplinary team, which includes the appropriate timeliness of discussion with consultants and the early involvement of subspecialists and involvement in multidisciplinary team meetings	Who do you think needs to be involved in multidisciplinary discussions? When should these happen?	
		Very important—can be difficult in rural areas where you have to create your own MDT with tertiary centres	
		Think it needs to be broader than the recognised MDT. Like it or not the surgeon is leader in a lot of things and had to drive MDT whether it is cancer MDT, ward	

		planning meeting, patient discharge planning. Stomal care and advice. The diabetic foot clinic	
		MDT is collegiate interaction important for patient care and practitioner care (PD support and improves isolation)	
Conducts practice audits	Trainee conducts practice audits to have data on procedures and their outcomes	We need to be careful in not overburdening rural surgeons with increased audit requirements compared to metro	
		For rural surgeons, personal audit but also involvement with metropolitan M&Ms/audits is also important	
		What is scope of practice, and does it differ between surgeons and institutions—how are these determined and measured?	
		Are there variations in scope of practice for a single surgeon between elective and emergency surgery and why	
		Contributes to a national/binational or craft group audits where available	
		Rural surgeons are excluded from these	
Participates in continued professional development	Trainee maintains their participation in formal continued professional development and is prepared to take advice and read evidence and information on required topics	How can rural surgeons keep up with CPD… what are the limitations, availability of support for rural surgeons to keep this up?	

		Make deliberate decision to prioritise CPD time	
Patient-centred care	Trainee has a good understanding of their patients, and their patients results	Takes patients' needs and preferences into account	Important—patient autonomy in their care—what does the patient want, shared decision-making
		Considers family/social background	Surgeons being an educator. The practitioner's role is a resource in treating the patient
		Considers family and cultural factors in decisions	
		Put patients' safety and outcome over own comfort/ease	
		Travel distance availability of accommodation	
		Infrastructure/equipment availability vs invasiveness of the procedure and patients' preference	
Clinical decision-making	Trainee makes sensible diagnoses and suggested management plans	Clear, logical decision-making	
	Trainees appropriately use tests and investigations and develop strict protocols for following up tests and investigations	Takes history, examination, investigation, patient factors and local resources into account in decision-making	
	Trainees use available information to effectively prioritise acute and elective patient assessments	Ability to make a decision but also understands that with stabilisation or deterioration decisions may need to be adjusted to suit the scenario as it changes	
		Patient factors, clinical skills available	

Abbreviations
CPD = continued professional development, M&M = Morbidity and Mortality, MDT = multidisciplinary team, PD = professional development

Activity 2

The expert panellists suggested 2 further positive behavioural markers for the Judgement and Clinical Decision-Making competency:

1. Needs to consider if there is a particular member of the team who has a much closer relationship to the patient or family and whether they should continue to be involved or whether there are alternative staff members.
2. Learns and adapts based on previous clinical experiences.

Figure 2 shows the level of agreements of importance of each of the behavioural markers in the rural setting. In the conversation about these, some of the experts discussed why 'participates in a multidisciplinary team environment' was rated the lowest. The reasons are:

1. 'It is just not as important as the others. Being a surgeon is always a team game and there are a whole lot of other things that are more important.'
2. 'There are more important individual attributes that we would like to see.'

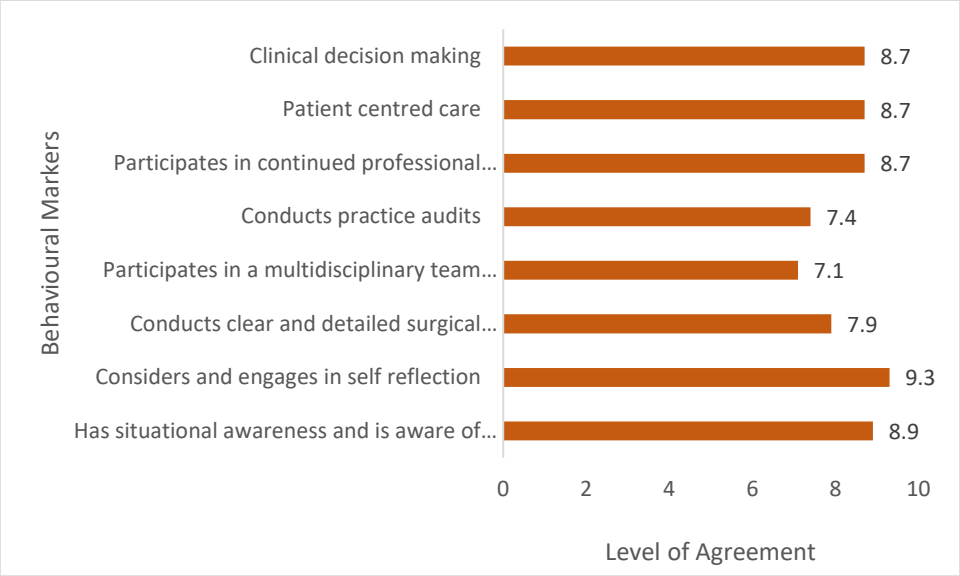


Figure 2: Mentimeter poll results

Workshop 1: Activity 3

For this task, each behavioural marker heading was provided, and the participants had to fill in information under each of the headings. The statements provided have been written verbatim from what was documented on the Google JamBoard; the results can be found in Tables 22–31. These statements have also been converted into learning outcomes for the draft framework for the Judgement and Clinical Decision-Making competency, which can be found in Appendix J.

Table 22: Co-design Workshop 1: Activity 3—'situational awareness' findings

Situational Awareness		
Examples of good practice (in a rural setting)	Examples of poor practice in a rural setting	How might good practice be taught? How might this be learnt?
Understands own ability, time, own and hospital/infrastructure and resources	Practises without reference to colleagues	Mentorship
Knows what is available to them in terms of resources—an anaesthetic/physician/theatre/colleagues	Offering procedures not feasible at rural regional centres	Organise outreach clinics from tertiary centres to local hospital
Listens to theatre conversation to gauge teams' comfort	Being unapproachable	Feedback
Keep and intermittent eye/ear on monitor	Inadequate organisational/prioritising skills	Monthly discussions of complex cases with other surgeons-senior and junior
Leadership	Does consider resources; staffing equipment, post-op care/support transfer capabilities	Open discussions when things don't go so well; reflection, analysis
Modelling	No/poor professional ties/relationships with tertiary centres/colleagues	Case base, scenario, role playing
Develops a relationship with colleagues across all craft groups to facilitate teamwork	Never consults with receiving centres	Sharing clinical cases and outcomes
Open, ongoing communication throughout pre/intra-/post-op phase with team (operative and anaesthetic; medical/nursing/ tech support)		Get Trainee to actually talk through what they feel is needed for case, ongoing case and then work out if it available

Considers the patient's procedures if elective (time critical/non-time critical) vs urgent		Apprenticeship

Table 23: Co-design Workshop 1: Activity 3—'engages in self-reflection' findings

Engages in self-reflection		
Examples of good practice (in a rural setting)	Examples of poor practice in a rural setting	How might good practice be taught? How might this be learnt?
Able to identify areas of their own practice that require improvements and implement actions to address	Blames their registrar/resident	I call it shit cape every day before you go home you have to take it off at the door and go over what went well and what didn't for the day and leave it at the door
Learns from adverse events/complications that occur	More driven by ego or concerns about what people might say, as opposed to making sound clinical assessment	Case diary with reflection and discussion with colleagues
Takes time to reflect on what worked and what didn't when things go badly and when things go well	Makes same mistake repeatedly	
Engages with how colleagues view a particular clinical situation and takes advice	Blames other for poor outcomes	
Accepts constructive criticism	Unit has ongoing conflict between surgeons	

Table 24: Co-design Workshop 1: Activity 3—'conducts clear and detailed surgical planning' findings

Conducts clear and detailed surgical planning		
Examples of good practice (in a rural setting)	Examples of poor practice in a rural setting	How might good practice be taught? How might this be learnt?
Respect	Not aware of patient's history, examination, and investigation results prior to operation	Explicit laying out of expectation and formal review of planning preoperatively

Communicates treatment plans, and any changes as they occur, with the whole treating team	Expects others to work out what is happening within patients from operating lists/booking forms	Modelling through outpatient clinics etc.—not all states have surgical outpatients
Communicates promptly with GP's/allied health		
Communicates resources requirements for individual patients in a manner that enables equipment/preparation for surgery to occur without drama		
Able to adapt their surgical plan if new information becomes available		
Aware and able to foresee any difficulties that may arise during the operation and has made potential plans to deal with these		
Provides rationale for evidence for surgical decision made		

Abbreviations
GP = general practitioner

Table 25: Co-design Workshop 1: Activity 3—'participates in a multidisciplinary team environment' findings

Participates in a multidisciplinary team environment		
Examples of good practice (in a rural setting)	Examples of poor practice in a rural setting	How might good practice be taught? How might this be learnt?
Interacts with more than one surgeon/practitioner	Make solo decision-making without consulting others	Ensuring Trainee run MDT meeting
Engages team in discussion and decisions; ensures everyone comfortable proceeding to the next step; if not, encourage contacting relevant expertise/support from elsewhere (e.g. patient unstable, needs laparotomy; GP anaesthetist not confident—needs to elicit support from tertiary anaesthetist)	Fails to consider PATS or cancer services when referring	As a consultant tagging along as a Trainee runs a ward round etc.

Engages with nursing staff, administration, and allied health staff actively	May transfer patient out when there is another practitioner in the region who could perform the required procedure	Administrative education within training
	Ignores or dismisses colleagues, or other health professionals	Giving Trainees the opportunity to run a theatre/trauma team and coordinate themselves
	Fails to discuss patient cases/peer audits	Didactic
	Fails to top audit with broader peers or outside of immediate practice	

Abbreviations
GP = general practitioner, MDT = multidisciplinary team, PATS = Patient Assistance Transport Scheme

Table 26: Co-design Workshop 1: Activity 3—'conducts practice audits' findings

Conducts practice audits		
Examples of good practice (in a rural setting)	Examples of poor practice in a rural setting	How might good practice be taught? How might this be learnt?
Actively promotes whole-of-hospital audit rather than surgical outcomes	Audit performed but not acted upon	Attendance at PSA to see importance. Becomes collaborative with other rural surgeons
Contributes to audit to larger regional or specialty groups	Not aware of own units surgical outcomes and how this compared to other centres	PSA attendance—develops networks to facilitate looking at how one practises
Changes practice as a result of audit	Never closes the audit loop	Didactic
Engages with other surgical members of surgical and multidisciplinary team to achieve quality improvement		

Abbreviations
PSA = Provincial Surgeons of Australia

Table 27: Co-design Workshop 1: Activity 3—'participates in continued professional development' findings

Participates in continued professional development		
Examples of good practice (in a rural setting)	Examples of poor practice in a rural setting	How might good practice be taught? How might this be learnt?
Participates in audit practices or other units within hospital as well their own unit	Isolates self	Regular journal club—often smaller groups in rural/regional areas; involve students and JMOs

Links to larger meetings	Not seen at meetings	Hosting social events that have an educational component
Engages in practices to improve hospital performance i.e. root cause analysis of management errors	Rigid in practice; doesn't acknowledge new concepts Trainees/juniors bring to the table/enquire about	
Active engagement in new/improved skill acquisition; attendance at lap colorectal, lap hernia, rib fixation, updates in colonoscopy workshop etc.	Unable to participate in CPD events due to travel income loss	
	Continuing to use outdated practice (e.g. repairs/anastomosis instead of damage-control surgery)	

Abbreviations
CPD = continued professional development, JMO = junior medical officer

Table 28: Co-design Workshop 1: Activity 3—'patient-centred care' findings

Patient-centred care		
Examples of good practice (in a rural setting)	Examples of poor practice in a rural setting	How might good practice be taught? How might this be learnt?
Acknowledging historical context and some patient's relationships with the hospital based on this	Unable to visualise a good patient outcome difference from their own concept	Care based discussions
Respecting patient's wishes—autonomy	Unwilling to depart from clinical guidelines to accommodate patient preference or circumstance	Cultural immersion experiences
Developing a good rapport with patients	Fails to consider travel/financial implications when on referring	Become the patient for a week
Travel where there is not a regular service and virtual consultations, communications via extra methods is important	Labelling/negative associations if patients do not complete episodes of care	Cultural awareness sessions based around common scenarios
Recognising cultural considerations; acknowledging variations in reasons for some patients not completing care episode (familial obligations, sorry business)		Role playing

Being a good communicator and educator		
Considers other methods of communication/mediums/factsheets/websites, with the aim of education and shared decision-making		
Respecting patients' preferences for location of care if appropriate		
Recognising/defining levels of care/advanced directives		
Ensuring communication occurs in patients first language; including consenting to procedures and discussions about care to ensure patient has the correct information to determine their level of risk if not completing care episode		
Calling out and discussing racism (individual, systemic)		
Understanding cultural considerations of end-of-life care and often importance of dying on country		

Table 29: Co-design Workshop 1: Activity 3—'participates in a multidisciplinary team environment' findings

Clinical decision-making		
Examples of good practice (in a rural setting)	Examples of poor practice in a rural setting	How might good practice be taught? How might this be learnt?
Involved in teaching to improve unit/MDT performance	Does not consider other MDT opinions when it comes to decision-making	Good initial orientation
Understanding what the patient wants	Using narrow range of data to make decisions	
Knowledge of significant local disease patterns	Struggles to explain reasons behind clinical decisions/management decisions	
Able to present clear, logical history, findings, provisional diagnosis and	Does not participate in CPD to maintain currency of practice	

formulate an investigation and treatment plan		
	Not considering relevant environment and social factors in decision-making	

Abbreviations
CPD = continued professional development, MDT = multidisciplinary team

Table 30: Co-design Workshop 1: Activity 3—'additional marker: relationships' findings

Additional marker: Relationships		
Examples of good practice (in a rural setting)	Examples of poor practice in a rural setting	How might good practice be taught? How might this be learnt?
Ability to work with a broad range of different levels of staff	Not being able to interact with non-clinical staff	Training by simulates environment and scenarios
Inspires confidence in others with decision-making		Communication, socialisation, extra hospital activities

Table 31: Co-design Workshop 1: Activity 3—'additional marker: administration' findings

Additional marker: Administration		
Examples of good practice (in a rural setting)	Examples of poor practice in a rural setting	How might good practice be taught? How might this be learnt?
Prepared to take on administration duties		

Additional information arose from the conversation during this task. Some of the discussion is documented in Figure 3 in question-and-answer format.

Question: Do you think you will be more likely to communicate with non-clinical staff in a rural hospital.

Answer from multiple participants:

- Absolutely, the smaller the hospital, the more likely you will know everyone in the hospital. It can be a challenge for urban surgeons to work in a smaller bubble.
- In big city environments there are more tiers to the hierarchy and more things for you to do. In urban hospitals you come in and operate and then head out, the additional work is very hands off.
- During one of their last accreditations, the accreditor laughed that you had to position your own patients; urban surgeons wouldn't even know how to position their patients.

Question: How well prepared are rural surgeons if they have moved to a rural area

Answer from multiple participants:

- There are some major skills that need to be acquired. In an urban environment, it is easier to perform an operation when you are being assisted by a consultant. In a rural setting you can have an inexperienced assistant—at times you must show them what is needed to complete the operation. Junior assistants may be assisting but may be unfamiliar with what they are doing. It's a very different environment.
- A significant part is rural adaptability, and this depends on the person. When there is no one else that is skilled to be able to do a task, you will have to do it.
- One of the experts commented that the whole situation needs to be right from the outset. When they are supervising their Trainee, they want them to be aware of everything—for example, if someone else is positioning the patient. Can't completely outsource everything. Ego comes into it.
- It goes broader than just surgical assistance too, you don't have oncology nurses or coordinating nurses who pulls everything together. There is a whole lot of planning for every case that goes on, if you forget to do it, the wheels fall off very quickly.

Figure 3: Conversation during co-design workshop 1

After Workshop 1

From the information presented in Tables 22–31 and Figure 3, the examples of good and poor practice were reworded and shaped into learning outcomes for each of the behaviour markers. Additionally, methods of guiding the Trainees have been listed at the bottom of each table. The draft curriculum framework can be found in Appendix J.

ii) Workshop 2

Workshop 2: Activity 1

The verbatim results from Activity 1 of Co-design Workshop 2 can be found in Appendix K. During the co-design workshop each participant had their own Google slide to complete their responses in. For clarity these have been compiled into a single table.

Workshop 2: Activity 2

Most of the discussion that occurred regarding the challenges of implementing a rural-facing surgical curriculum was beyond the scope of the current project. They key topics and themes from the activity are presented in Appendix H.

6.4 Summary

Two facilitated co-design workshops were completed; one on 22 October and one on 19 November 2021, each running for 2.5 hours. The attendance at the first workshop was high; however, the numbers dropped significantly for the second workshop, which may have affected the validity of the findings.

The first activity the participants were presented with was a clinical scenario in which they were asked to list factors that must be considered when working in a rural hospital. The purpose of this activity was to gather information that could be included in case scenarios for teaching and learning activities and also for the Rural Context component of the rural-facing surgical curriculum, which can be found in Section 7 of this report. The main themes that arose during Activity 1 as factors to be considered were:

- the urgency of the need for treatment and the stability of the patient
- communication with the family and patient
- staffing resources
- damage-control surgery
- anaesthetic resources

- communication with colleagues
- transfer factors
- non-staff resources
- interpersonal relationships between the patient and surgeon, and the patient and other staff
- potential self-harm due to the mechanisms of the injury (specific to the clinical scenario provided)
- confidence of the surgeon
- clinical and technical factors
- other patients within the hospital
- death of the patient.

Through the first workshop the experts were also asked to comment on the examples of good behaviour and poor behaviour regarding each of the behavioural markers. These responses were then used to draft the rural-facing surgical curriculum for the Judgement and Clinical Decision-Making competency.

During the second workshop, the experts were asked to review the presented learning outcomes and comment if there were any suggested changes of wording, suggested assessment tools, and if they felt the learning outcomes presented were relevant for the rural context. The purpose of this question was to make sure learning outcomes that were applicable in both the rural and metropolitan setting were omitted to not dilute the curriculum. From these results there were numerous changes of wording that were applied and can be seen in Section 7.5. The most common assessment tool listed was the 360-degree evaluation form, but it was noted that the 360-degree evaluations are onerous to deliver, and experts noted that there has been resistance to use this form due to the administration workload associated with it. It should also be noted that many learning outcomes had no suggested assessment tools, so further work and research is required to determine the best assessment method.

As to whether the learning outcome was relevant to the rural context, no learning outcomes were deemed by consensus to be irrelevant, so all were taken through to the next stage of the project. In regard to the challenges associated with the implementation phase, most of the discussion was out of scope and spoke more about the technical skills, but a common theme was early engagement with the relevant

stakeholders—for example, the jurisdictions, subspecialist societies and specialty boards—for the dissemination of the rural-facing surgical curriculum. This will be relevant to the next steps reported in Section 9.

From the rapid review, the Delphi study and the co-design workshops, the data was taken into the next stage of the project, which was developing a draft of the rural-facing curriculum framework.

7. Rural-facing surgical curriculum framework

7.1 Introduction

The next stage of the project was to collate all the findings from the rapid review, Delphi study, co-design workshops and use them to create the rural-facing surgical curriculum framework. The following section defines how this was completed and presents the finalised framework.

7.2 Purpose of this curriculum framework

This curriculum framework is intended to be used as a guide and a support document for the rural-facing surgical curriculum. The framework provides suggested behavioural markers and learning outcomes, along with learning, teaching and assessment strategies that can be implemented or modified based on the needs and requirements of the rural Trainees in Australia.

7.3 Objectives

The objectives for this section of the report are:

1. determine which surgical Trainees this curriculum framework is intended for
2. determine who is the target audience for this curriculum framework
3. devise and finalise the content including competencies, behavioural markers, learning outcomes and assessment tools
4. complete the presentation of the rural-facing surgical curriculum framework.

i) Objective 1—Determine which surgical Trainees this curriculum framework is intended for

Through discussion with the Working Group members, it was determined that the target Trainees for the rural-facing surgical curriculum were any surgical SET Trainees that are undertaking a rural rotation and/or have an interest in a career in rural surgery. As there is no defined SET year in which Trainees may undertake a rural rotation, it was decided that the learning outcomes would be grouped into 2 categories: 'Key Learning Outcomes' and 'Desirable Learning Outcomes'. The Key Learning Outcomes were set at a level that was achievable for Trainees at an early SET level, where the Desirable Learning Outcomes may be achieved at a mid-to-late SET level.

ii) Objective 2—Determine the target audience for the rural-facing surgical curriculum framework

Through discussion with the Working Group, it was decided that the target audiences for this finalised rural-facing surgical curriculum framework—and for this complete report—are as follows:

- RACS Board of Surgical Education and Training
- Rural Health Equity Steering Committee
- Australian Government Department of Health
- Specialist Training Program Officers
- Board of Cardiothoracic Surgery
- Australian Board of General Surgery
- Board of Neurosurgery
- Board of Paediatric Surgery
- Board of Otolaryngology Head and Neck Surgery
- Australian Board of Plastic and Reconstructive Surgery
- Board of Urology
- Board of Vascular Surgery

- Australian Orthopaedic Association Federal Training Committee.

These groups will be able to use the framework to further develop a rural-facing surgical curriculum or implement the information within their current curriculums for surgical Trainees who are on a rural placement. Please refer to 'Next Steps' in Section 9.

iii) Objective 3—Devise and finalise the content including competencies, behavioural markers, learning outcomes, assessment tools

Through discussion with the Working Group early in the process, it was decided that the curriculum framework was going to be based on the professional skills that were listed in the RACS Surgical Competence and Performance Guide.[16] The competencies are:

- Collaboration and Teamwork
- Communication
- Cultural Competence and Cultural Safety
- Health Advocacy
- Judgement and Clinical Decision-Making
- Leadership and Management
- Scholarship and Teaching
- Professionalism and Ethics.

The Working Group also noted that it would be beneficial to devote a competency within the curriculum to key non-clinical information that should be learnt for each rural rotation by SET Trainees. Examples include number of beds in a hospital and allied health staff available in the hospital and in the community. This competency was called the Rural Context competency; further details of this can be found in Section 7.5.

7.4 Developing the behavioural markers, learning outcomes and assessment tools for the 8 professional competencies

All competencies (except Judgement and Clinical Decision-Making and Rural Context)

For all the competencies except the Judgement and Clinical Decision-Making and the General Rural Knowledge section, the processes for creating the behavioural markers, learning outcomes and assessment tools were strongly based on the results of the Delphi study. The positive behavioural markers that went through to the second round of the Delphi study for which consensus was reached were separated from the rest of the statements and were grouped together based on common themes. Using the elements from all the themed statements, a behavioural marker descriptor encompassing the positive behaviours was described. The specific positive behaviour markers were rewritten to be based on a verb (making them action statements) and were measurable, so could be used as learning outcomes.

The learning outcomes and behavioural markers were reviewed by the Working Group for accuracy, clarity, and rural relevance. When developing assessment tools, for these competencies the data came from the small number of Delphi study responses and predominantly from the Working Group's meetings and formal review of the work. The learning outcomes were compared to the draft professional skills curriculum currently being developed by RACS, and duplicates were removed. Once all the behavioural markers and learning outcomes were drafted, each was checked to make sure it was in the correct competency. The curriculum framework is presented in Section 7.5.

Judgement and Clinical Decision-Making

The Judgement and Clinical Decision-Making framework was developed using a different method, because it was a topic that needed further open discussion. The methodology was initially the same as described in Section 7.4 (all competencies) and was strongly based on the results of the Delphi study. As reported earlier, the positive behavioural markers that went through to the second round of the Delphi

study and reached a consensus were separated from the rest of the statements and were grouped together based on common themes. These formed the major behavioural markers.

As reported in Section 6, the co-design was used to further refine the learning outcomes and assessment tools for this professional competency. During the co-design workshop process, further positive (and negative) behaviour markers were brainstormed and converted into learning outcomes. These learning outcomes were further refined and confirmed by the co-design workshop participants and then sent to the Working Group for review.

During the co-design workshop, the expert panellists also suggested assessment tools that they believed could be used to assess these skills; these were further refined by the Working Group. The Working Group suggested that there should be 1 to 2 assessment tools that can assess all the competencies, rather than overloading the supervisors with the excessive administration and training required to learn more tools. (This may be reconsidered in future work.) For this version of the curriculum framework, suggested assessment strategies incorporating all relevant and feasible suggestions have been documented. The curriculum framework is presented in Section 7.5.

Rural Context

Through discussion with the Working Group, it was agreed that it would be beneficial to have an additional section of the curriculum that focused on general healthcare, demographics of the rural rotation, cultural information, and resource knowledge. This information would lead to the SET Trainee having an understanding of the context that they are working in. To develop this section of the rural-facing surgical curriculum, information was incorporated from the rapid review, the Delphi study, the co-design workshops, and through consultation with the Working Group members. This component of the curriculum can be found in Section 7.5.

Decision-making chart

During the Delphi study, within the Judgement and Clinical Decision-Making competency, the participants were asked a series of questions about how they make the decision to perform a surgical procedure when the procedure is:

- an infrequent or high-risk procedure that is within their scope
- a procedure outside their regular scope but in which they have had training
- a procedure of which they have had little or no previous experience.

There were 2 related questions:

- How do you make the decision to NOT perform a surgical procedure (and therefore transfer a patient for care elsewhere)?
- How does your answer to the question above differ depending on emergency context?

The answers provided were very case specific and so were not well suited for use as learning outcomes. It was decided to change the format of these findings into a learning tool that could also be used during assessment. Section 7.6 shows the decision-making chart, which is a flow chart of circumstances to aid the decision-making process of rural surgical Trainees.

7.5 Rural-Facing Surgical Curriculum Framework

Collaboration and Teamwork

Works cooperatively with surgeons, Trainees, and other health professionals to develop a shared picture of the clinical situation, and facilitates appropriate task delegation to ensure the delivery of safe, effective, and efficient surgical care. Works collaboratively to optimise teamwork and a patient-centred care plan. Understands the increased interdependence of the local team in the rural setting including, but not limited to, other surgeons, anaesthetists, and allied health staff.

Behavioural Marker	**Learning Outcomes**	
	Key Outcomes	**Desirable Outcomes**
Understands the role of general practitioners in the rural setting Works together with general practitioners within and outside the hospital to ensure optimal healthcare for rural patients and understands the workload and time constraints of general practitioners in the rural context	• Consults with general practitioners when required	• Leads the communication with general practitioners • Facilitates collaboration and shared decision-making with general practitioners • Shares healthcare management with general practitioners when appropriate
Recognises importance of relationships between hospitals, within a rural region and outside the region Works towards developing strategies to build reciprocal peer relationships with smaller rural and larger referral hospitals for the purpose of offering and receiving guidance from fellow healthcare workers, including specialists and subspecialist surgeons, and for accepting and organising patient transfers	• Discusses treatment options and management plans with surgical teams from tertiary hospitals	• Supports healthcare and surgeons within smaller hospitals • Facilitates administrative and clinical peer relationships between rural and referral hospitals including tertiary hospitals • Conducts consultation with receiving centres before and after patient transfer • Establishes networks and relationships with colleagues locally, regionally and in tertiary centres
Understands the role of nurses and allied health practitioners in the rural setting, including those with extended scope of practice Actively learns and engages with nurses and allied health practitioners with additional qualifications and credentials, and understands their roles within the hospital—for example, rural and isolated practice nurses, nurse practitioners, and nurse surgical assistants	• Describe the responsibilities and privileges of rural and isolated practice nurses • Describe the responsibilities and privileges of nurse practitioners • Describe the responsibilities and privileges of nurse surgical assistants	

Suggested Learning Opportunities/Strategies	The Trainee: • prepares or oversees the preparation of succinct handover documents in the rural setting. This can include discharge summaries completed on the day of discharge and verbal communication with general practitioner during admission or discharge for critical issues • engages in multidisciplinary training—for example, with other surgical specialties to engage with and gain a better understanding of other groups within the hospital in the rural setting • engages in rural work experience • communicates with general practitioners or specialist anaesthetist, as appropriate, about the suitability of patient care at a regional, rural or remote centre versus a patient transfer • coordinates shared decision-making with surgical teams from tertiary hospitals
Suggested Teaching Strategies	• Consultant introduces Trainee to key healthcare staff and models constructive, timely shared decision-making and handover • Trainee works with and observes rural surgeons • Supervisor conducts review and discussion of correspondence with general practitioners and others
Suggested Assessment Strategies	Assessment may include: • a 360 Degree Evaluation Form, drawing on individuals from the whole healthcare team including general practitioners in primary care • direct observation of the content and tone of written and verbal communication with healthcare team members, invites self-reflection and provides timely and specific feedback • a review and discussion of correspondence with general practitioners and others

Communication

Communicates effectively in a culturally competent manner with patients, families, carers, colleagues and others involved in health services in order to facilitate the provision of high-quality healthcare. Operates with respect, denouncing unprofessional conduct including discrimination, bullying and harassment.

Behavioural Marker	**Learning Outcomes**	
	Key Outcomes	**Desirable Outcomes**
Advocates for sufficient time for consultation Ensures consults are long enough to get the full medical history, and allow the patient, families, and carers to ask questions. Trainee also understands the needs of, and allows extra time to communicate with, Aboriginal and Torres Strait Islander patients, and works alongside Aboriginal Liaison Officers	• Allows extra time to communicate with Aboriginal and Torres Strait Islander patients • Allows appropriate time for consultations	
Contributes to a culturally safe and inclusive environment for patients and the healthcare team Allows for cultural factors during consultation and decision-making and is aware of cultural differences between patients, and between the Trainee and the patients they treat	• Proactively offers to use interpreters for consultation with patients for whom English is not the first language	• Demonstrates a consideration of cultural factors in healthcare management and care planning • Demonstrates self-awareness of cultural differences between themselves and their patients • Demonstrates an understanding of the diverse nature of humans and doesn't make assumptions about cultural differences (or lack thereof)
Patient-centred verbal and non-verbal communication Ensures that all communication is tailored to the patient, their family, their culture, and their context. Keeps patients and family informed during all patient interactions—for example, at times of consultation, and after discharge	• Communicates information in a manner the patient understands	• Assists with medical comprehension for patients and family • Proactively involves and works with interpreters
Communicates effectively within a team Effectively communicatees and collaborates with other disciplines including general practitioners, nurses, allied health practitioners, Aboriginal Liaison Officers, and administrators	• Demonstrates timely and effective liaison with general practitioner • Demonstrates timely and effective liaison with Allied Health practitioners, community nurses and nurse practitioners	

	• Consults and collaborates with individuals from their team and other medical disciplines	
Understands the importance of emerging technologies for communicating and delivering healthcare Works towards using emerging technologies and telecommunication tools to deliver healthcare services, facilitate communication within a healthcare team, and make healthcare in a rural context more accessible	• Demonstrates an ability to deliver healthcare services via telehealth using video or telephone services; takes into consideration patients' digital health literacy and access to internet and smart phone • Offers telehealth as an option to all patients to increase accessibility • Uses Indigenous language interpreter app and Indigenous health information websites to aid communication and understanding when needed	**Desirable Outcomes** • Actively uses telecommunications to facilitate communication within their healthcare team

Suggested Learning Opportunities/strategies	The Trainee: • actively investigates the context of healthcare for the remote, rural and regional location they are in • performs EPAs • participates in Aboriginal and Torres Strait Islander cultural courses and cultural induction programs—The Aboriginal and Torres Strait Islander Health and Cultural Safety eLearning program course 1 and course 2 • is actively involved in outpatient clinics, emergency departments and wards, and practice, including care presentations and meetings • where possible, facilitates appropriate timing of consultations to allow for enough time to talk with patients, families and carers • engages in self-reflection and demonstrates awareness of cultural differences between themselves and their patients • organises interpreters where appropriate for patients for whom English is not their preferred language • includes patients and family in healthcare correspondence and ensures they understand what is being discussed • actively looks to use emerging technologies and telecommunications tools to deliver healthcare services, and seeks to find ways to make healthcare in the rural environment more accessible and affordable • uses appropriate technologies to communicate with the healthcare team in a rural, remote or regional setting • educates patients to use technology to allow appropriate communication
Suggested Teaching Strategies	• Supervisor provides demonstration of positive behaviour markers in the clinical setting • Supervisor and Trainee seek feedback from the interpreters who were involved with the Trainees consultation • Trainee participates in co-consultation with skilled consultants • Trainee undertakes recommending online training in telehealth consultation for Avant and RACGP

Suggested Assessment Strategies	Assessment may include: • formal feedback using a feedback tool such as CEX and informal ad hoc feedback (for example on-the-job feedback) to the Trainee • testing the Trainee using clinical examination (CEX) • reviewing the interpreter/allied health worker feedback form • reviewing clinical correspondence—for example, communication with general practitioners • reviewing the 360 Assessment Form • reviewing operation reports • testing the written and verbal communication domains in the marking matrix of FEX questions • observing the Trainee, or delegates direct observation, and ensures timely and specific feedback is provided by the observer • evaluating multisource feedback, including patient feedback regarding Trainee communication • the Trainee's self-reflection

Abbreviations

CEX = clinical examination, EPA = entrustable professional activities, FEX = Fellowship examination, RACGP = Royal Australian College of General Practitioners

Cultural Competence and Cultural Safety

Demonstrates a willingness to embrace diversity among all patients, families, carers and the healthcare team, and respects the values, beliefs and traditions of individual cultural backgrounds that are different from their own. Promotes self-reflection, acknowledges their own biases, prejudices and stereotypes and works to mitigate their effects. Promotes a safe and inclusive healthcare environment and works to eliminate health inequities.

Behavioural Marker	**Learning Outcomes**	
	Key Outcomes	**Desirable Outcomes**
Promotes Cultural Competence and Cultural Safety within the rural health system to achieve equitable healthcare for Aboriginal and Torres Strait Islander people Understands the special status of Aboriginal and Torres Strait Islander peoples in rural Australia, and actively works to develop personal Cultural Competence and Cultural Safety skills to achieve optimal health outcomes. Also understands the specific healthcare needs and considerations of Aboriginal and Torres Strait Islander people living in rural areas	• Engages Aboriginal and Torres Strait Islander liaison officers where appropriate	• Demonstrates an understanding of the healthcare needs of Aboriginal and Torres Strait Islander people in rural settings • Demonstrates the ability to negotiate a balance between protocol-driven care and appropriate cultural care
Has an interest in cultural competency and cultural safety for all cultures and understands how personal biases have the potential to impact healthcare management Has an inquisitive mind and a respectful curiosity about different cultures and the personal backgrounds of their colleagues and patients, and understands that different rural settings may have differing cultural norms.	• Manages own personal beliefs and biases during interactions with patients • Ensures that all proposed management plans are acceptable to the patient and their culture	
Fosters a safe and respectful healthcare environment for all patients, families, and carers Is respectful of all elements of human diversity and contributes to a diverse and inclusive culture and is aware that culture may affect patient management	• Shows respect to all individuals regardless of cultural background • Demonstrates ability to modify patient management plans based on cultural reasons	• Demonstrates awareness of how culture may affect treatment compliance • Demonstrates leadership and engages colleagues and patients when racist behaviour is witnessed
Suggested Learning Opportunities/Strategies	The Trainee: • has exposure to a lived rural experience, including rural surgical rotation • engages in cultural self-reflection and takes time to recognise own culture, experiences, and biases • engages in opportunity for cultural awareness activities on Country with local First Nations organisations • undertakes the RACS Aboriginal and Torres Strait Islander Health and Cultural Safety eLearning program courses 1 to 4 • learns about the local region and cultural norms and takes these into consideration with patient management and care planning	

	• takes cultural reasons into account to modify patient management plans to improve patient outcomes (for example, by allowing a patient to leave hospital for sorry business, changing antibiotics to oral, and making alternative dress-change plans) • during patient management and communication, involves family and community members when desired by the patient or when culturally appropriate (when patient initiates and consents)
Suggested Teaching Strategies	• The supervisor demonstrates positive behaviour markers through patient interaction and clinical practice • The Trainee receives positive mentoring to support the development of Cultural Competence and Cultural Safety • Supervisor provides feedback • Feedback is invited from Aboriginal Liaison Officers, allied health workers or interpreters, as appropriate • The Trainee receives Cultural Competence and Cultural Safety training by Aboriginal Liaison Officers, local Aboriginal Medical Services or Traditional Owners • The Trainee is encouraged to undertake RACS intercultural competence and Indigenous Health online courses
Suggested Assessment Strategies	Assessment may include: • testing Cultural Competence and Cultural Safety in CEX • formal feedback from Aboriginal Liaison Officer and allied health workers ensuring the Trainee completes Cultural Competence courses • direct observation of the Trainee, followed by timely and specific feedback • evaluation of multisource feedback, including feedback from patients

Abbreviations

CEX = clinical examinations, RACS = Royal Australasian College of Surgeons

Health Advocacy

Identifies and responds to the health needs and expectations of patients, families, carers and members of the healthcare team. Responds to the health needs of communities and the health system by supporting rational, evidence-based measures to improve health outcomes in the wider community. Promotes cultural competence and safety to improve health outcomes in the broader community.

Behavioural Marker	**Learning Outcomes**	
	Key Outcomes	**Desirable Outcomes**
Awareness of the needs of the community and barriers to healthcare delivery in a rural setting Understands how the needs of the community and barriers to healthcare delivery in a rural setting impact on health outcomes, and understands the needs of surgeons in rural areas	• Evaluates general practitioner services in the local, rural, or regional areas • Engages general practitioners to assist with patient management • Knows the range of surgical services and skill of surgical personnel in the local area	• Demonstrates ability to be a treatment coordinator for the patient • Discusses the rural community of placement and potential barriers and enablers to their health management
Ensures the patient continues to have options and aims to expand the options of healthcare in a rural setting Assists patients to gain a second opinion and provides all necessary documentation for this to happen	• Gains appropriate informed consent to supply other medical officers with clinical records, X-rays, and laboratory results for second opinion/transfer of care • Demonstrates an ability to work with multidisciplinary teams in metropolitan areas to present and discuss complex cases	
Recognises the impact of holistic care in for health and actively tries to educate patients under their care Identifies and addresses health issues in patients—for example, encourages patients to stop smoking, sets up adequate services to meet demand, provides diabetes or obesity management	• Optimises practical interventions and educational strategies to minimise the impact of lifestyle factors on health and health outcomes	
Cares about the wellbeing of colleagues and themselves Looks after their own wellbeing and the promotes the wellbeing of colleagues	• Recognises signs of fatigue and is able to implement fatigue management strategies for both themselves and colleagues • Maintains healthy lifestyle choices to benefit personal health and be a positive role model for the community	

Recognises the social and economic determinants of health and actively looks for ways to improve accessibility and affordability The Trainee considers the impact of their management plan on the patient's social and economic context and involves other services when needed—for example, social work	• Identifies when a social worker may be required to assist with patient management	

Suggested Learning Opportunities/Strategies	The Trainee: • uses discharge planning to learn of the likely home circumstances of patients and the availability of community supports • is encouraged advocate and initiate health promotions activities • includes social and structural domains during presentations of cases at multidisciplinary team meetings • were appropriate, is encouraged to advocate for the patients and offer help/access to support services for patients interested in making change • follows up results for patients
Suggested Teaching Strategies	• The supervisor elicits and demonstrates the importance of psychological and social history and its impact on overall care of the patient • Trainees are involved with outreach services with consultants • The supervisor considers and discusses systemic and societal factors in audits, and includes them in audit recommendations
Suggested Assessment Tools	Assessment may include: • testing the psychosocial domains in CEX and case presentations • adding social determinants of health-based questions to the written section of FEX

Abbreviations

CEX = clinical examinations, FEX = Fellowship examinations

Judgement and Clinical Decision-Making

Makes informed and timely decisions regarding assessment, diagnosis, preoperative preparation, surgical management and postoperative follow up. Encourages preventative health measures to optimise patient outcomes. Promotes culturally competent and culturally safe behaviours. Understands that surgery is not always the best option for patients.

Behavioural Marker	**Learning Outcomes**	
	Key Outcomes	**Desirable Outcomes**
Has situational awareness and is aware of local resources Demonstrates an understanding of what is occurring around themselves in the rural healthcare context, and understands the availability (or lack thereof) of resources in the rural surgical setting	• Demonstrates insight into own capabilities and proactively seeks guidance from consultants, and informs them when extenuating circumstances influence management planning • Open to guidance and advice from colleagues	• Discusses the potential limitations of surgical practice in rural and regional settings recognising these are contextual to each location and the specific clinical situation • Understands the need for, and seeks to establish networks for, consultation, shared care, and transfer as appropriate
Considers and engages in self-reflection Trainee demonstrates honesty and self-awareness and can acknowledge when their professional or personal limits have been reached. This incorporates knowing when to transfer or refer to a colleague	• Evaluates adverse events and complications that occur during, or as a result of, surgery	• Proactively seeks opportunities to work with colleagues to acquire exposure and expertise in complex cases or to extend scope of expertise to become more appropriate to a rural or regional setting
Conducts clear and detailed surgical planning Trainee outlines preoperative, operative, and postoperative care, including timeline and recovery milestones The Trainee recognises cases that may need transfer and has clear processes consultation and transfer	• Discusses treatment plans, and any changes as they occur, with the whole treating team • Discusses resource requirements for individual patients in a manner that enables timely equipment/preparation for surgery lists and ensures resources are available locally before commencing treatment • Discusses rationale for and evidence for surgical decisions that are made	• Anticipates and describes possible difficulties and has contingency plans to deal with these
Participates in a multidisciplinary team environment Trainee works closely with colleagues in multidisciplinary teams	• Proactively engages with a multidisciplinary team when appropriate • Facilitates timely engagement with subspecialists and other rural surgeons in difficult clinical scenarios	• Actively engages with nursing staff, administration, and allied health staff, and advocates for ensuring the hospital supports the patient • Actively engages in team building within the hospital and greater health community

	• Ensures patient transfers are appropriate by investigating the network of local surgeons determine available capability	
Conducts practice audits Trainee is actively involved with practice audits	• Uses results of clinical audit, compares outcomes with other rural/regional hospitals and modifies practice (if required) accordingly	• Participates in personal, unit and whole-of-hospital audit • Contributes to audits within larger regional or specialty groups • Discusses the surgical outcomes of surgical unit and comprehends how this compares to other centres • Engages with recommended systemic and clinical changes arising from audits • Engages in practices to improve hospital performance (for example, reflective practice)
Patient-centred care and shared decision-making Trainee has a good understanding of their patients, and their patients' results Trainee takes patient needs, preferences, family/social background and situation into account Trainee is open and facilitates shared decision-making with patient	• Evaluates and acknowledges the relationship the patient has with the hospital and modifies management accordingly • Evaluates, selects, and facilitates appropriate treatment pathways that respect patient wishes and autonomy • Establishes and respects patient preference for location of care, if appropriate • Understands cultural considerations about end-of-life care	
Clinical decision-making Trainee makes appropriate diagnoses and provisional management plans Trainee uses available information to effectively prioritise acute and elective patient pathways Trainee appropriately uses tests and investigations and develops protocols for following up tests and investigations	• Demonstrates clear, logical, and thorough clinical decision-making based on all available information • Demonstrates the ability to explain and justify reasons behind clinical decisions and management decisions • Considers and articulates relevant environmental and social factors in decision-making	

		• Demonstrates flexibility and innovation to safely accommodate the absence of local clinical resources • Ensures everyone is comfortable in a decision-making process and its outcome; if not, encourages contacting relevant expertise/support from elsewhere	
Suggested Learning Opportunities/Strategies	The Trainee: • participates in simulation scenarios that incorporate Judgement and Clinical Decision-Making factors relevant to rural practice • engages in education opportunities—for example, videos, workshops, journal clubs, attendance at morbidity and mortality meetings, and attendance at relevant courses such as cultural safety, communication skills, medicolegal aspects of decision-making in rural practice • is provided access to subspecialty terms for Trainees interested in rural practice • completes the RACS 'Clinical Decision-Making' 4-hour professional development course • approaches the management of every patient in both elective and acute setting as a learning opportunity • uses every presentation of a case to the consultant at handover, to consult in another discipline or at a clinical meeting as a learning opportunity by using self-reflection, asking for feedback, and actively seeking new knowledge		
Suggested Teaching Strategies	• Mentors guide Trainees towards positive behaviour markers regarding Judgement and Clinical Decision-Making in the rural environment • The supervisor demonstrates positive behaviour markers regarding Judgement and Clinical Decision-Making in the rural, regional and remote environment • The supervisor and Trainee use routine clinical case presentations as a teaching opportunity • The supervisor proactively assigns the Trainee new elective outpatient cases for subsequent presentations • The supervisor uses significant decision points as teaching opportunities • The Trainee is provided practice Fellowship examination written papers, as well as marking and feedback • The Trainee is provided practice Fellowship examination vivas with feedback • The supervisor and colleagues audit the Trainee's presentations with a focus on the Judgement and Clinical Decision-Making competency		
Suggested Assessment Tools	Assessment may include: • role playing encompassing Judgement and Clinical Decision-Making factors in rural, remote or regional environment • one or more reflective case studies in which the patient's mechanism of injury is specific to their rural context or their management plan was significantly impacted by cultural considerations, resource limitations or location/distance to care, or by constraints in the local setting, or where a patient's intended transfer to a larger centre had to be modified due to weather conditions affecting flights or making roads impassable • formal scheduled CEX on case presentations in outpatient clinics, ward rounds and emergency patients • Trainee undertakes self-reflection and completes a goal-planning form • CEX on handover presentations and for presentations at audit meetings • incorporating Judgement and Clinical Decision-Making competency into DOPS		

	• self-directed assessment • reviews of entrustable professional activities • completion of a formative and summative Trainee assessment form • goal setting and review • Fellowship examination

Abbreviations

CEX = clinical examinations, DOPS = direct observation of procedural skills, RACS = Royal Australasian College of Surgeons

Leadership and Management

Leading, providing direction, promoting high standards, matching resources to demand for services, and showing respect for all member of staff. Encourages leadership across all levels of the team.

Behavioural Marker	**Learning Outcomes**	
	Key Outcomes	**Desirable Outcomes**
Involvement in hospital and health network management Has effective communication with hospital administration and team members and is involved in hospital and health network management	• Demonstrates ability to adjust leadership style to the setting • Demonstrates competency in administration duties in a rural surgery context	• Engages in hospital and health network management
Helps establish and maintains professional networks and referral pathways with larger and urban hospitals and subspecialists Works towards being a leader in generating support and referral pathways both personally and for the hospital to improve the healthcare of the rural patients	• Implements strategies for referral pathways for patients in their local health networks • Articulates the importance of having a support network of specialists and subspecialists when working in a rural environment	• Establishes professional networks both locally and within smaller rural hospitals and larger metropolitan hospitals
Be a supportive referral hospital for smaller centres Be an approachable figure in the healthcare system for colleagues in smaller hospitals to approach for support and professional networks	• Provides support, when appropriate, to colleagues	

Suggested Learning Opportunities/strategies	The Trainee: • is involved in administration roles, projects and specific tasks that need a collaborative approach (such as auditing a certain condition/auditing theatre flow) • undertakes additional study—for example, Leadership and Management courses and Clinical Risk Management training
Suggested Teaching Strategies	• The Trainee is given with the opportunity to take on leadership responsibilities—for example, leading ward rounds, managing the roster, mentoring juniors, and leading in discussion and planning • The Trainee is exposed to Leadership and Management by granting increasing responsibility and progressive independence • The supervisor leads by example and provides positive role modelling • The supervisor shares information and experiences with the Trainee (within the bounds of confidentiality and privacy, and within the interest of the health service) • The supervisor and colleagues provide review and feedback, making time to evaluate performance of specific leadership tasks
Suggested Assessment Tools	Assessment may include: • formative and summative term assessments • using Leadership and Management scenarios in written questions on Fellowship exams • adding a Leadership and Management stream in Fellowship exam viva scenarios

	• the mark from a formal report about a Leadership and Management project (which can be a required task for completion of training) • reviewing Management and Leadership competency as part of term evaluations • completing a 360 Degree Evaluation Form with input from support staff for attributes such as approachability

Scholarship and Teaching

As scholars and teachers, surgeons demonstrate a lifelong commitment to surgical practice through reflective learning and the creation, dissemination, application and translation of medical knowledge for optimal patient outcomes.

Behavioural Marker	**Learning Outcomes**	
	Key Outcomes	**Desirable Outcomes**
Commits to basing practice on sound scientific principles Engages in the principles of evidence-based practise to inform clinical management and decision-making processes	• Demonstrates the ability to interpret original research and apply it in the local surgical context • Justifies new or less-common practices using sound, evidence-based arguments	
Engages in research to improve surgical practice Is actively involved in research, especially research that may benefit the rural community, including multicentre and collaborative research	• Undertakes research relevant to surgical practice	
Shows commitment to lifelong learning Has a questioning/inquisitive and enquiring mind with an emphasis on lifelong learning and a natural curiosity across specialities to minimise uninformed consults Is engaged with local researchers or with a research network; is aware of rural health research networks and publications—for example, the Spinifex network and the *Australian Journal of Remote and Rural Health*	• Stays up to date with literature and engages in journal clubs • Engages with a variety of teaching and training opportunities • Leads self-learning including reading, teaching, studying and research • Regularly participates in local and national scientific meetings relevant to local practice.	
Teaches, supervises, and participates in assessment Facilitates the education of students, Trainees, colleagues and other health professionals using structured and unstructured teaching strategies	• Teaches junior colleagues using appropriate teaching tools • Engages in supervision, teaching and assessment • Implements a variety of strategies to teach others including ward rounds, in-services, formalised tutorials, and lectures, along with	

	informal teaching opportunities such as giving talks to community groups	
Engages with other specialists and hospitals to improve surgical practice Networks and engages with consultants and Trainees to further improve knowledge and surgical skills	• Engages with consultants to further improve knowledge and surgical skills • Communicates and liaises with surgical Trainees to share knowledge	
Participates in continued professional development Trainee maintains their participation in formal continues professional development and is prepared to take advice and read evidence and information on required topics	• Uses, creates, and participates in training and learning opportunities	

Suggested Learning Opportunities/strategies	The Trainee: • attends, presents, and contributes to (or helps develop) local teaching activities such as grand rounds, 10-minute teaching topics and journal clubs • undertakes a formal teaching course—for example, Foundation Skills and Surgical Educators (FSSE) • develops a lifelong interest in surgical education and training • assists with instructing a skills course • participates in a journal club • attends scientific meetings and skills courses • undertakes online courses and study programs • undertakes a formal education qualification • establishes academic links to facilitate local research • steers case discussion to consider relevant evidence
Suggested Teaching Strategies	• The Trainee is proved skilled mentoring in Scholarship and Teaching • The supervisor and relevant staff provide skilled feedback to the Trainee • Appropriately skilled supervisors and other academic staff provide support and feedback • The supervisor proactively looks for and offers opportunities and support for research and audit projects • The supervisor and Trainee join RACS Clinical Trials Network of Australia and New Zealand • The Trainee undertakes education courses—for example, FSSE and formal education qualifications
Suggested Assessment Tools	Assessment may include: • evaluating the Trainee's ability to interpret evidence in FEX (written or viva) • acceptance of research project outcomes as a paper or presentation (for example, passing peer review) • reviewing the Trainee's Scholarship and Teaching as a domain in DOPS or CEX

Abbreviations

CEX = clinical examination, DOPS = direct observation of procedural skills, FEX = Fellowship examination, FSSE = Foundation Skills for Surgical Educators, RACS = Royal Australasian College of Surgeons

Professionalism and Ethics

Demonstrates commitment to patients, the community and the profession through the ethical practice of surgery and demonstration of Cultural Competence and Cultural Safety

Behavioural Marker	**Learning Outcomes**	
	Key Outcomes	**Desirable Outcomes**
Understands the professionalism and ethical nuances of working in a rural setting Understands that confidentiality of patients is complex and nuanced in rural settings	• Understands that the surgeon must protect the patient's rights and information, which is especially important because rural towns are small and people are less anonymous • Recognises that if no suitable surgeon is available, or the procedure is non-elective, you may need to perform procedures and you need to have a plan on how to manage the care of individuals you have personal relationships with • Recognises and describe how you might manage distressed staff if they have a personal relationship with your patient • Maintains honesty and integrity in all elements of surgical practice	
Ensures patients are cared for in a professional and ethical manner Takes a patient-centred approach and respects autonomy and provides equal management and care of private and public patients	• Self-reflects on potential biases that may be introduced in patient management and care • Demonstrates patient-centred care by treating patients with compassion; shows respect for patients' rights	
Behaves in a respectful and culturally competent manner towards colleagues and the team Accepts and ensures effective communication with diverse ethnic, cultural, religious and language groups	• Respects colleagues and fosters an environment of collegiality	

Behaves in a professional manner in the workplace and the community Role models good, ethical behaviour in the workplace and in the community	Implements time management skills—for example, starting meetings and surgeries on time • Maintains a professional manner in both the hospital and the community	

Suggested Learning Opportunities/strategies	The Trainee • participates in simulation scenarios that incorporate Professionalism and Ethics factors relevant to rural practice • becomes involved within the local community and works alongside community leaders
S**uggested Teaching Strategies**	• The supervisor recommends and encourages the Trainee to attend appropriate courses • The supervisor role models and sets an example of highly ethical and professional behaviour • The supervisor encourages and fosters involvement in the local community and introduces the Trainee to community leaders • Relevant staff provide mentorship to the Trainee • The supervisor and relevant staff provide regular and proactive feedback to the Trainee
Suggested Assessment Tools	Assessment may include: • incorporating a Professionalism and Ethics scenario into Fellowship exam written questions • adding a Professionalism and Ethics steam in Fellowship exams viva scenarios • assessing the Trainee's reports on case studies with Professionalism and Ethics components • reviewing the Trainee's entrustable professional activities

Rural Context

To work competently and confidently in a rural or regional environment it is desirable that the surgical Trainees understand information about the system, resources, culture, community, scope of practice, and decision-making processes of their local context. Below is the desired learning outcomes that a surgical Trainee should obtain before and during their rural or regional rotation. Note that not all learning outcomes will be applicable to every rural or regional context.

Area of Interest	Learning Outcomes

Healthcare System
 	
The Trainee should understand the structure, and components, of health services in their local context
	Local Health Network
	• Is this a cross-border health service, and if so, which state guidelines/rules do you follow?
	  o What implications are there relating to this location?
	• Are there public outpatient clinics or just private rooms?
	Unit
	• What is the structure of the team?
	• Who are the members of the team?
	  o consultant names
	  o contact details
	  o specialists' interests
	  o roles
	  o registrars
	  o residents
	• Who makes up the surgical team?
	  o anaesthetist
	  o surgical assistant
	  o central sterile service department
	  o Perioperative
	  o biomedical
	  o surgical ward
	  o outpatient: public clinic, private rooms
	  o pain services
	• Are there elective surgical bookings?

	• Who organises emergency cases during and after hours? **Emergency department** • Who are the staff in the emergency department? • What is the capability of the department? **Critical care** • Is there an Intensive Care Unit? • What is its capacity? • Who are the staff in the Intensive Care Unit? **Health services** • How many beds are in the hospital? • What are the specialist wards? • What services are available locally? • What services are available by telemedicine? **Practitioners** • What medicine disciplines have practitioners in the hospital? • What medical disciplines are available locally? • What visiting services are available • What nursing specialties are available? **Allied health** • What allied health service are available within the hospital? o physiotherapy o occupational therapy o speech pathology o psychology o Dietetics o exercise physiology o audiology o hand therapy • What allied health services are available in the community? **Medical training** • What rural medical schools are in the local region?

	• What multidisciplinary training hubs are in the local region? • What universities are in the local region? • What medical training providers are in the local region? **Healthcare network** • Incoming o What is the catchment area? o What services refer/transfer to the local region? o What are the travel times/modes? o What services do they have and why do they transfer to the local region? • Outgoing o Where do you transfer patients who exceed the local capacity? o What are the travel times/travel modes for transfer? o Who do you refer to in specialties not represented in the local area? ▪ stroke and cardiac networks ▪ burns networks ▪ paediatric networks ▪ cleft networks ▪ cancer referral pathways • Local o Primary care facilities ▪ Who are the local general practitioners? Are there Aboriginal community health services? ▪ What is the primary health network? o Private healthcare ▪ Are there private hospitals in the local region? ▪ Are there private rooms in the local hospital? **Professional networking opportunities** • Are there regular meetings? • Are there peer communities of practice? • Is there research being conducted in the local region? • Are there cross disciplinary/interdisciplinary meetings? **Learning opportunities**

	• Are there learning opportunities/continued professional development opportunities in the local region? **Administration** • Who does the administration for your surgical department? **Billing structure** • Is the emergency department public or private billing? o How much does an emergency department visit cost? • How much does it cost a patient to be seen in a private room?

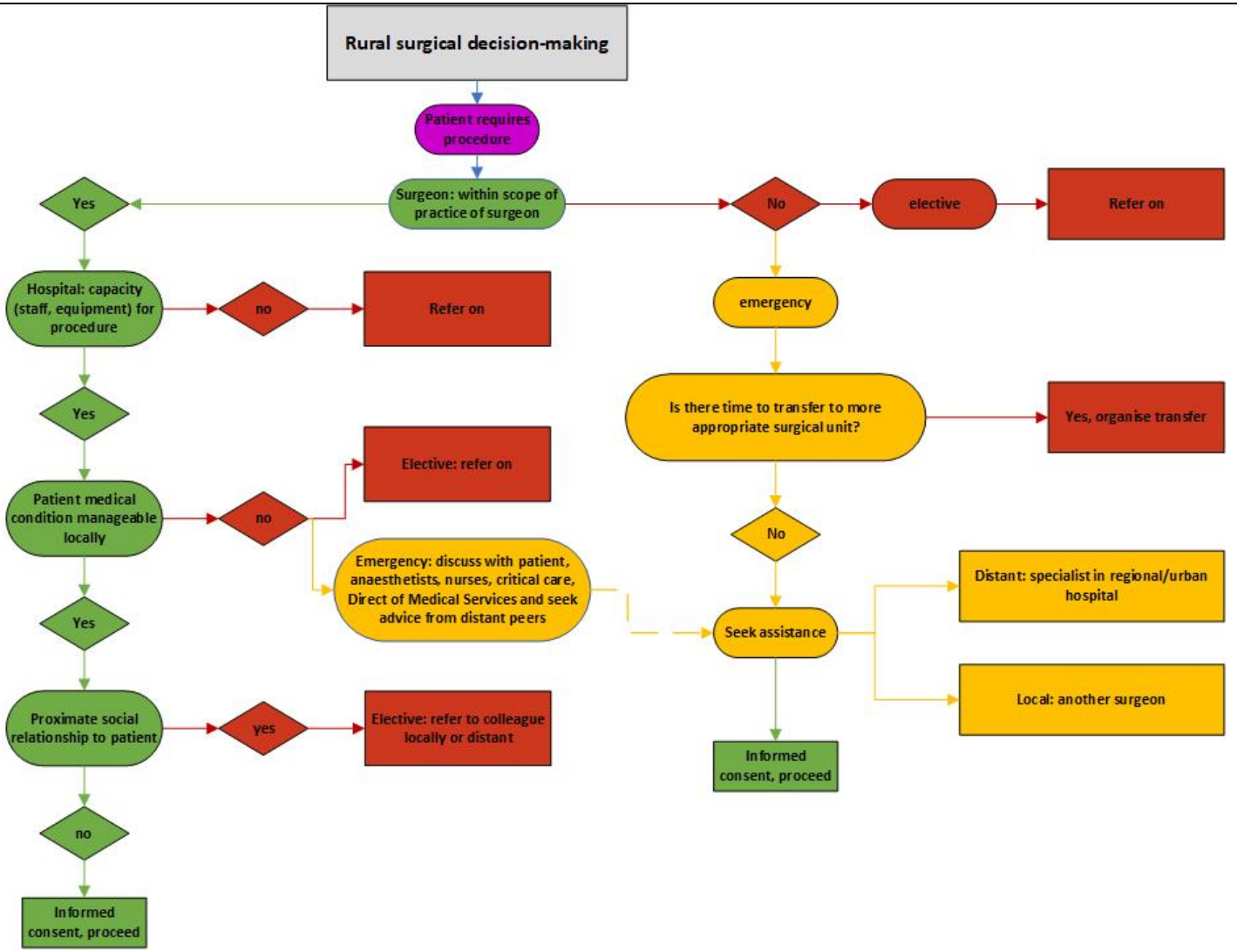
Local Resources
 	
The Trainee should understand the resources that are available in the local region
	Diagnostics
	• What are the pathology services available?
	• What radiology services are available?
	  o Is contrast radiology always available?
	  o Is interventional radiology available?
	  o Is nuclear medicine available?
	  o Is image-guided core biopsy/fine needle aspiration available?
	  o Who reports the diagnostic imaging (onsite, offsite, in/out of hours)?
	• What are the likely turnaround times for results?
	• What do you need to do if you need diagnostics not offered in the local region?
	Patient transfer and retrieval services
	• What urgent and non-urgent patient transfer options or retrieval services are there to bring patients to your hospital or to transfer from your hospital to a larger centre? Or from the roadside/site in case of trauma?
	• What is the process for organising patient transfers or retrieval?
	• What weather factors affect decision-making for patient transfer or retrieval?
	Blood services
	• What blood services are available in the local services
	Interpreters
	• What interpretation services are available in your local region?
	• What can you do if you need an interpretation service that is not available in your local region?
	• How are telephone interpreters accessed?
	• What local languages are prevalent?
	• Are these languages included in the Indigenous Translator Application?

Culture/Community	**Location**

The Trainee should understand the local culture and community of the local region to understands the sociological aspects of their patients and patient demographics	• What are the boundaries of the local region and what are the closest major towns and capital cities? • What is the history of the local region? • What Modified Monash Model classification is the region/town? **Culture (especially Aboriginal and Torres Strait Islander)** • Who are the traditional owners of the local region? • Who are the Elders? • What is the traditional language/s spoken in the local region? **Industries** • What are the local industries? • What are the local employment sections? • What are the local employment opportunities? • Are there any common injuries or health conditions associated with these industries? **Recreation** • What are popular recreation activities in the local region? • Are there any common injuries or health conditions associated with these popular recreation activities? **Seasons** • What are the weather conditions in the different seasons of the local region? • Are there common injuries or illnesses that are associated with the different seasons? **Demographic data** • What is the median age of the local region? • What are common languages and cultures of the local region? • What is the general socioeconomic status of individuals in the local region? **Health and welfare** • Who is the local region benchmarked against? • What are the strengths of the local region? • What are the challenges of the local region? • What are the common patterns of injuries? • What is the disease prevalence's in the local region? • What are the common health problems in the local region?
Scope of Practice	What is the scope of practice for your discipline in the current setting? Does your discipline engage in narrow, broad, or extended scope of practice?

In the local region, what is the scope of practice of their specific surgical specialty?	
Decision-making Process What are the decision-making processes of the surgical specialties in the local region?	Are the decision-making processes in the local region unfamiliar or unusual? How do they differ from urban hospitals? Why do they differ from urban hospitals?

7.6 Decision-making chart



8. Discussion

RACS is committed to ensuring equitable access to surgery for all individuals; however, a lack of surgeons in rural locations in Australia has been an ongoing challenge. To address this issue, RACS presented its Rural Health Equity Strategy for patient-centred surgical care and a sustainable surgical workforce in remote, rural, and regional Australia and Aotearoa New Zealand. This strategy recognises that there are several important aspects when addressing a shortage of rural surgeons, including selecting people more likely to practise rurally;[2] providing a rural training experience paired with a rural curriculum that provides Trainees with the skills and knowledge they need to practise rurally;[10] retaining rural surgeons by supporting them in terms of education and personal and professional development;[13] and ensuring collaboration of rural surgeons with other healthcare providers such as GPs, nurses and remote medicine groups.[14]

This project was developed to research and develop the rural-facing curriculum for surgical Trainees. As a first step it was deemed important to create a generic professional skills curriculum that could be used across the 9 surgical specialties. The project encompassed a rapid review, a Delphi study, 2 facilitated co-design workshops and regular consultation with a Working Group that was comprised of individuals engaged in rural surgery and education from across Australia. Funding requirements meant this project focused on rural training in Australia; with further refinement, it may be beneficial for Aotearoa New Zealand.

The first stage of the project was the rapid literature review, which was undertaken to examine elements of rural surgery curriculums for trainees in developed countries. The review aimed to help outline what is needed to be included in the Australian rural professional skills curriculum for all 9 surgical specialties.

The publications found during the rapid review describing the rural surgical curriculums or programs were mainly from the US and most were conducted within the General Surgery programs. The US programs focused heavily on technical skills and rarely described professional skills.

Within the Australian literature, the only rural training program described was the RACS RSTP, which was established within the General Surgery program to support the recruitment and retention of rural surgeons for rural practice. Graduates of this program felt underprepared for rural surgical practice, and post-training they were commonly performing procedures outside of their traditional scope.[23] Bishop and Drummond[21] reported that rural surgeons in Australia complete many neurosurgical cases, even though the majority had limited neurosurgical training. Chong and Kiroff[23] noted that defining a training program for rural Australian surgeons is difficult because they frequently need to operate outside their scope, and they have difficulties obtaining advice regarding the transfer of critically ill patients— and so are exposed to greater medicolegal vulnerability than their urban counterparts. We deemed the issue of scope of practice to be vitally important to include in the curriculum framework for this current project.

Little is known about what constitutes Australian rural surgery practise regarding caseload and operations performed. From the evidence, it appears that a rural surgeon in Australia needs a broad scope of General Surgery training, plus specialty training in Orthopaedic Surgery, Plastic and Reconstructive Surgery, Urology, Vascular Surgery, Paediatric Surgery and Cardiothoracic Surgery. Further training in Neurosurgery has also been suggested. Furthermore, difficulties in skills maintenance, peer review and medicolegal vulnerabilities are ongoing issues. Beyond the technical skills required to become a competent surgeon, professional skills are an integral component of a robust surgical curriculum, and in turn improve patient care and surgical safety.[74] In Australia, these skills are currently being taught in an ad hoc manner that depends on the location, experience and mentorship of the Trainee. Standardising the professional skills required for surgical practice, especially in a rural environment, and including them in the training curriculum, would ensure no surgical Trainee is disadvantaged in their future practice.

Based on the information that was gathered during the rapid review and the limitations of the studies, there was limited information to use for the Delphi study. This led to the Delphi study being used to generate the baseline knowledge about the content that should be included in the development rural-facing curriculum framework.

The Delphi study questions were formulated to generate information around the positive behaviour markers demonstrating each of the professional competencies, suggestions for guiding Trainees to acquire skills, and the challenges that might be encountered in delivering the competencies in a rural setting. The responses for the positive behaviour markers were used to create first drafts of the learning outcomes that were taken through to later stages of the project. Among the statements to guide the Trainees, a frequently suggested method of teaching in the rural environment was mentorship and role modelling, which are quite variable and can lead to significant variations in the quality of the training that the SET Trainee receives. One of the goals of this project was to create equity among the training received by surgical Trainees in different rural rotations. Research into the best training methods, and how to implement them with greater standardisation, would benefit rural (and potentially metropolitan) practices.

Even though the curriculum was to focus specifically on professional skills competencies and requirements, technical skills were a common theme in the Delphi study, with the participants reaching consensus on several statements:

- Rural Trainees need a more general skillset, with skills outside their regular specialty, to compensate for less specialised practices (100% agreement).
- Posting to other specialties (cross-specialty training) would be key for rural-inclined Trainee surgeons—for example, rotation in Vascular Surgery, Neurosurgery, Plastic and Reconstructive Surgery, ENT, Cardiothoracic Surgery and Urology (100% agreement).
- Trainees need a structured training opportunity to gain technical and non-technical skills to expand a generalised (generalist) skillset (95% agreement).
- Trainees should receive more technical training and help during their training, to develop broader capability without sacrificing depth. This promotes a skillset and behaviour patterns suitable for smaller departments, and would provide local context, with surgeons being specifically trained to meet the needs and demands of a rural population (95% agreement).
- Exposure to many surgical specialties during training is needed for a broad and intensive surgical training experience. Training is needed in General Surgery, Orthopaedic Surgery, Burns/Plastic Surgery, Urology, Neurosurgery, and Cardiothoracic Surgery (90% agreement).

These statements and levels of agreement highlight that there may be a need to further research a rural technical skills curriculum among the specialties. Overall, the Delphi study provided strong baseline data to begin to develop the rural curriculum framework. However, through Working Group discussion and the findings regarding the broad scope of practice rural surgeons face, it was found that the Judgement and Clinical Decision-Making competency required further insight, and the Working Group reached a consensus that this should be the topic of discussion in the co-design workshops.

The 2 facilitated co-design workshops allowed for extensive in-depth discussion around what factors must be considered when making decisions in a rural, regional, or remote surgical environment, and provided great insight into the learning outcomes that could be used and are relevant to a rural or regional setting. The discussion around the challenges went out of scope but did mention the importance of collaborating with the Specialist Training Boards, the subspecialists societies, and the jurisdictions to make sure they appreciate and understand the importance of the rural-facing surgical curriculum and show interest in using it when their Trainees are on a rural or regional rotation.

Of note, during the workshop administration, one rural surgeon dropped out of the co-design workshop group as he wanted to focus on the technical skills for rural training—he felt they were of much more importance than the professional skills. In addition, as in the Delphi study, although off-topic, the technical skills did arise in discussion quite frequently among the rural experts in the co-design workshops. In particular, the discussion revolved around the need for broad training requirements for rural surgeons (which did arise in many sources from Australia and the US during the rapid review), demonstrating that there may be a need for further research about the technical skills required of rural surgeons.

With all the data provided during the 3 stages of research, a novel rural-facing surgical curriculum framework was developed. The information contained within the curriculum framework can be applied across all 9 specialties and across any rural setting to develop a relevant and useful rural-facing surgical curriculum. However, due to the time constraints of the project, only limited information could be provided about the assessment and teaching strategies, as the goal was to use the phases of the research to find

novel teaching and assessment tools. This may be achieved through further research, followed by pilot studies of the effectiveness and feasibility of these devised tools. At the current stage, suggested learning, teaching, and assessment strategies have been documented.

Some of the strengths of this project were the diverse and rigorous nature of the research, the breadth and number of different rural surgical experts, and the ongoing support of, and consultation with, the surgical and educational experts in the Working Group. As reported throughout this report, many stages of research were used to develop the curriculum framework, which led to a broad population of individuals contributing to the behavioural markers and learning outcomes. As most of the work was based on a consensus opinion, there was a reduced risk of individual biases influencing the results. Another strength of this project was the breadth of experts who provided opinions through all stages of the project. Each research stage had contributions from different individuals, and Neurosurgery was the only specialty that was not represented in either the Working Group, the Delphi study participants, or the co-design workshops. Even though no Neurosurgery representatives contributed to the curriculum framework during the development stage, it would be beneficial to get their input on the final curriculum framework. A further strength of the program was the ongoing support, collaboration, and consultation with the members of the Working Group. They were able to provide expert guidance at each phase of the project, including research design, result analysis and framework development.

Some of the weaknesses of this project have already been discussed. One was the rapid review, which may have led to potentially relevant published literature being missed due to the restricted search strategy. A further weakness was the length of time provided to do the project— because of a delay in funding, only 10 months was available to complete all stages of research and then develop the curriculum, which led to changes in the research design (systematic review changed to rapid review) and limited the time available for developing ideas for teaching and assessment strategies and tools.

A further weakness was that rural rotations can occur at any stage of SET training—early, mid or late stage. Therefore, the learning outcomes must be pitched at the right level to be achievable by all SET levels, but not too easy for, or irrelevant to, late SET Trainees. This variable timing of rural rotations is a

fact of rural surgical rotations and cannot be changed, so the framework was developed with both key and desirable learning outcomes to mitigate this issue.

As reported throughout this discussion, considerable future research is needed and should be done (if possible) in due course. First is the need to develop more assessment and teaching strategies, and tools for rural surgical rotations; these will aim to standardise the content being taught, whether by online courses, video mentoring or assessment, or other novel strategies. Furthermore, based on the opinions of the surgeons' involved, further research must be conducted into the technical skills required of rural surgeons and whether the current training curriculums are appropriate to deliver the required training needs.

9. Next Steps

9.1 Introduction

As this document was developed to inform the development of a rural-facing surgical curriculum, further work is required to create a fit-for-purpose, usable, curriculum that will be presented to the relevant stakeholders such as the STBs. This section of the report will describe the immediate next steps, and potential future research to deal with gaps in the data in this project.

9.2 Further refining of the current document

The curriculum framework in its current form includes all the behavioural markers and learning outcomes that were reported through the research process; the document is large and detailed. The Working Group has reported that this curriculum framework is diluted with behavioural markers and learning outcomes that are not specific to the rural setting and thus weaken its rural relevance. RACS is also currently in the process of creating a generic, professional skills curriculum. This current rural-facing surgical curriculum framework must be refined so that the learning outcomes and behavioural markers that are specifically different in the rural setting (compared to the urban setting) are separated to generate a more user-friendly document that highlights the most important, rural-specific aspects of the rural-facing surgical curriculum framework.

Furthermore, upon review and discussion by the Working Group, the Cultural Competence and Cultural Safety section of the framework will be omitted. The reasoning behind this is that this area is well addressed by other groups within RACS involved in Indigenous health. The RACS Indigenous Health Committee have been working more aggressively in this area and have engaged with the relevant stakeholders—such as Indigenous Australian and Torres Strait Islander groups—and have more knowledge and authority to present in this area. For example, RACS has developed the Aboriginal and

Torres Strait Islander Health and Cultural Safety eLearning program[91] for all Fellows, Trainees, Specialist International Medical Graduates (SIMGs) and junior doctors to use. These courses provide the knowledge and skills to support both the implementation and assessment of the Cultural Competence and Cultural Safety competency.

Further refinement that has been suggested is the focus on the Rural Context section of the framework and the decision-making pathways. The Working Group involved in this project found these sections more useful and rurally specific than the professional skills competency section. Refining the focus of the curriculum framework will be completed to make these sections the focus of the curriculum moving forward.

9.3 Presentation and usability of the curriculum framework and curriculum

The consensus from review and discussion by the Working Group was that a written curriculum document may not be the most useful tool for surgical Trainees and their supervisors. Innovative approaches must be used, including online training modules and mobile device applications. It has been suggested that the curriculum could be made available as a web-based teaching tool, with check boxes and dropdown menus to navigate to specific topics. Furthermore, a directory application could be developed for the rural context curriculum; Trainees could gather the information required for a competency but also use it as a handy directory to quickly locate relevant information—for example, referral services or contact details for specific specialists within the hospital.

Discussion has also revolved around the teaching and assessment strategies associated with this curriculum. As documented in the Delphi study, staffing resources can be an issue in the rural setting. One aim that will benefit both the supervisors and surgical Trainees is to generate standardised methods of teaching and assessment, ones that do not increase the workload of the surgical supervisor. One suggestion is mandatory online modules, which consist of teaching materials and written assessments

that the Trainees can do in their own time without relying on their supervisor. Another example is case scenarios (Appendix L) which incorporate many of the rural-specific factors that have found to be of importance during this project. The decision-making tree could be used as a teaching tool, and within the online modules as a formative assessment activity. More thoughts and considerations need to occur to develop innovative strategies for the curriculum.

9.4 Development of an engagement plan

With the required further refinements, the curriculum framework and curriculum will be at the stage where stakeholder engagement needs to occur. The Working Group suggested engaging with the Rural Health Equity Steering Committee and its Advisory Group, because they have representatives from all the key groups that must be involved—for example, the STBs of the 9 surgical specialties. During the research process, Neurosurgery did not have any representatives in the Delphi study, the co-design workshop, or the Working Group. It is crucial that this group be engaged so that all surgical specialities agree with the work that has been completed.

9.5 Future research

There have been noticeable gaps in the literature which this study has exposed as areas for future research. Through the rapid review, Delphi study, and co-design workshops it was shown that rural practice required a broad scope of practice and many experts felt that a technical skills rural curriculum would be highly beneficial. Future research could ask the following questions to help develop a rural-facing technical skills curriculum for the Australia population:

- Does the current SET curriculum ensure graduates have the generalised skill set required for rural practice?
- What fundamental skills would a surgeon of your specialty need to practise in a rural context, in addition to the skills required by an urban surgeon?
- What fundamental skills are shared across all 9 specialties and are required for rural practice?

- What skills within your specialty area of expertise do you feel a rural surgeon of another specialty needs to have that you could teach to a rural surgeon (e.g. the guide to acute neurotrauma in remote and rural Australia, written by the Neurosurgical Society of Australia)?

Furthermore, the ideal situation in rural practice would be that all teaching and assessment strategies are standardised to allow for equitable learning experiences for rural SET Trainees. Further research into standardised training methods for use in the rural setting, including novel teaching and assessment tools, should be conducted. This could include pilot studies of the effectiveness and feasibility of the devised tools.

It would be useful to survey Trainees who are in current rural training programs to obtain more detailed information to gauge the success of existing programs globally and identify training omissions. This information could then be used to further refine and guide the development of training programs for rural surgeons.

10. Conclusion

Although Australia is a highly urbanised society, 29% of Australians live in regional, remote, or rural areas. However, it was reported that only 12% of surgeons are living or working rurally. Through a rapid review, a Delphi study, and a co-design workshop, a professional skills rural-facing surgical curriculum framework has been developed to help standardise the training outcomes of rural surgeons. Further development is required to convert this document into a usable rural-facing surgical curriculum, and future research in the fields of teaching and assessment strategies would be of great benefit. This document provides fundamental information that can be used across the 9 specialties to inform and develop a rural-facing surgical curriculum to counteract the maldistribution of surgeons and increase the rural workforce in years to come.

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12. Appendices

Appendix A. Search strategy and results

Search strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations, Daily and Versions(R) 1946 to 10 May 2021.

Search date: 12 May 2021

#	Term	Hits
1	exp Curriculum/	88,203
2	exp Education, Medical/	170,558
3	exp Education, Medical, Graduate/	72,783
4	curricular.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	6,154
5	curriculars.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	3
6	curriculum.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	99,841

7	curricula.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	871
8	curricula.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	16,550
9	curriculas.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	10
10	education.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	945,633
11	program.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	529,214
12	programs.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept	393,226

	word, rare disease supplementary concept word, unique identifier, synonyms]	
13	track.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	55,711
14	tracks.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	11,621
15	training.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	479,329
16	skill.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	44,831
17	skills.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	187,292
18	course.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept	579,461

	word, rare disease supplementary concept word, unique identifier, synonyms]	
19	courses.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	77,274
20	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19	2,565,781
21	exp Rural Health/	23,607
22	exp Rural Health Services/	13,228
23	rural.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	176,062
24	21 or 22 or 23	176,062
25	exp General Surgery/	39,547
26	surgery.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	2,749,620
27	surgical.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1,414,051

28	surgeon.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	98,468
29	surgeons.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	142,699
30	25 or 26 or 27 or 28 or 29	3,217,679
31	20 and 24 and 30	2,118
32	case report.kf,pt,ti.	259,491
33	case reports.kf,pt,ti.	2,179,915
34	32 or 33	2,228,418
35	(exp animals/ or exp animal experimentation/ or exp models animal/ or exp vertebrates/) not (exp humans/ or exp human experimentation/)	4,824,987
36	31 not 34	2,063
37	36 not 35	2,059

Database: Embase 1974 to 7 May 2021

Search date: 12 May 2021

#	Term	Hits
1	exp curriculum/	92,403
2	exp curriculum development/	4,910
3	exp education/	1,502,214

4	curricular.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	8,110
5	curriculars.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	2
6	curriculum.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	114,458
7	curricula.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	1,323
8	curricula.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	20,615
9	curriculas.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	9
10	track.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	76,496
11	tracks.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	15,454
12	program.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	988,598

13	programs.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	390,242
14	training.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	685,997
15	skill.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	149,054
16	skills.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	222,525
17	course.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	1,192,618
18	courses.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	108,973
19	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18	4,108,877
20	exp rural health/	1,424
21	exp rural health care/	1,4167
22	rural.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	207,521
23	20 or 21 or 22	207,521
24	exp surgery/	5,099,393
25	exp general surgery/	1,6937

26	surgery.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	3,757,642
27	surgical.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	1,768,963
28	surgeon.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	242,171
29	surgeons.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word]	229,056
30	24 or 25 or 26 or 27 or 28 or 29	6,080,158
31	19 and 23 and 30	4, 510
32	limit 31 to exclude medline journals	394

Study selection flow chart

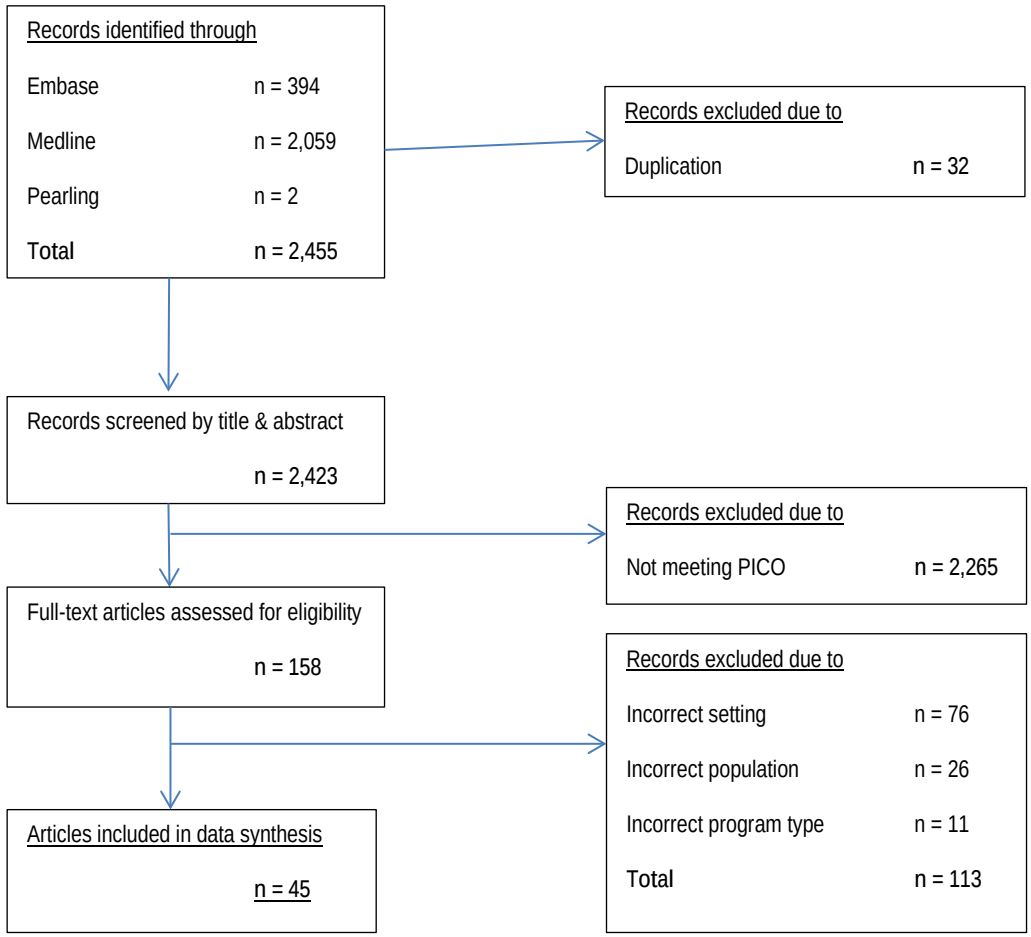

Figure A1 PRISMA flow chart of study inclusion

List of excluded studies

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Appendix B. Additional information

Table B1: Multi-Specialty Community Training Network (MSCTN) learning objectives, modified from CanMEDS Framework, specific to rural and remote training

Medical/expert/clinical decision-maker 'Know and do the right thing.'	Identify the knowledge and skills required for a rural/community-based practice and note how they differ from urban practice. Identify limitations and demonstrate use of referral resources appropriately. Demonstrate diagnostic and therapeutic skills for ethical and effective evidence-based patient care within the context and limitations of the rural/community environment. Identify peer review, audit, and other methods of assessing one's own practice and rural/community patient care.
Communicator 'Communication is the key to success.'	Identify particular health care challenges and difficulties from a rural/community patient's cultural and geographic context. Demonstrate good interviewing and communication skills with patients. Demonstrate effective communication with all members of the rural/community health care team as member, coordinator, and leader.
Collaborator 'Don't get swamped.'	Identify and use local community resources, programs, and distant referral resource and clinical-support networks. Demonstrate collaboration as community consultant with both local family physicians and tertiary care subspecialists. Identify when and how to effectively transfer patients from smaller referring centres, to tertiary care centres.
Manager 'Keep the CEO off your back.'	Identify effective practice management appropriate for rural/community practice. Identify strategies to develop your referral base. Identify and discuss benefits and risks of investigations and treatments available locally, regionally, and at tertiary care centres.
Health advocate 'You can make a difference in your community!'	Demonstrate preventative health care and health promotion. Advocate for accessible and appropriate rural health care. Identify existing and potential resources to meet the unique needs of your community patients.

Scholar/learner 'Yes, you can be a scholar in the country.'	Identify and develop strategies for self-directed, life-long learning strategies including use of distance education to maintain up-to-date and competent skills relevant to a rural/community setting. Identify clinical research appropriate to one's scope of practice, interests, and rural/community setting.
Professional/personal 'Remember yourself, your partner, and your children.'	Identify and experience the joys and challenges of rural/community medical practice and life. Identify and develop strategies to balance personal, family, and professional needs and demands. Demonstrate positive attitude and working relationships with patients, staff, administration, and colleagues.

Source
Rourke[26]

Table B2: List of US rural surgery programs and their components

Name of program[a]	Location of rural rotation[b]	Population of rural location[b]	Rural duration (months)[b]	Residents per year[b]	PGY[bc]	Broad or basic program[d]	Surgical specialties taught[e]	Endoscopy taught[e]	No competing learners[e]
Bassett Health Care, Cooperstown, New York	Cooperstown, New York	NR	Entire residency	NR	All	Broad	√	√	√
Conemaugh Medical Center, Johnstown, Pennsylvania	Johnstown, Pennsylvania	NR	Entire residency	NR	All	Broad	√	√	√
Gundersen Lutheran Health System, LaCrosse, Wisconsin	Prairie du Chien, Wisconsin	<10,000	4	3	3, 4	Broad	√	√	√
Mayo Clinic College of Medicine and Science, Rochester	Owatonna, Minnesota Red Wing, Minnesota Mankato, Minnesota	<30,000 <20,000 <40,000	6–12	10	3, 4, 5	Broad	√	√	√
Oregon Health and Science University, Portland	Grants Pass & Coos Bay, Oregon	<40,000	6–12	13	4	Broad	√	√	√
Southern Illinois University, Springfield	Carbondale, Illinois	<30,000	4	4	3, 4	Broad	√	√	√
University of Minnesota, Duluth	NR	NR	24	NR	NR	Broad	√	√	√
University of North Dakota, Grand Forks	Minot, North Dakota	<50,000	9	4	3	Broad	√	√	√
University of South Dakota School of Medicine, Sioux Falls	Yankton, South Dakota	<20,000	4	3	2, 4	Broad	√	√	√
University of Tennessee Medical Center, Knoxville	Morristown, Tennessee	<30,000	2	5	4	Broad	√	√	√
University of New Mexico School of Medicine, Albuquerque	Alamogardo, New Mexico	<40,000	2	6	3	Broad	√	√	√
University of Wisconsin, Madison	Neenah, Wisconsin Waupan, Wisconsin	<30,000 <20,000	12–18	6	2, 3, 4, 5	Broad	√	√	√
Baylor College of Medicine, Houston	NR	NR	1.5	NR	NR	Basic		√	
Carilion Clinic, Virginia Tech	Blacksburg, Virginia	<50,000	6	4	4, 5	Basic		√	
Central Iowa Health System (Iowa Methodist Medical Center)	Pella, Iowa	<20,000	1	4	4	Basic	√	√	
Indiana University	Corydon, Indiana	<10,000	2	10	3, 4	Basic		√	

Name of program[a]	Location of rural rotation[b]	Population of rural location[b]	Rural duration (months)[b]	Residents per year[b]	PGY[bc]	Broad or basic program[d]	Surgical specialties taught[e]	Endoscopy taught[e]	No competing learners[e]
Ochsner Clinic Foundation, New Orleans	Houma, Louisiana	<40,000	8.5	6	1, 2, 3, 4, 5	Basic		√	
Medical Center of Central Georgia/Mercer University	Cordele, Georgia	<20,000	2	4	2	Basic		√	√
Medical University of South Carolina, Charleston	Florence, South Carolina	<40,000	4	5	2, 4	Basic		√	
University of Arizona COM, Tuscon	Tuba City, Arizona	<10,000	5	8	2	Basic		√	√
University of California, Davis	South Lake Tahoe, California	<30,000	3	9	4	Basic	√	√	
University of Colorado, Denver/Aurora	Montrose, Colorado	<20,000	1	10	4	Basic		√	
University of Illinois, Peoria	Canton, Illinois	<20,000	4	8	1, 2, 3, 4	Basic		√	
University of Iowa Hospitals & Clinics, Iowa City	Mason City, Iowa	<30,000	2	6	3	Basic		√	
University of Kentucky COM, Louisville	Morehead, Kentucky	<10,000	3	7	2	Basic		√	
University of Louisville School of Medicine	Madisonville, Kentucky	<20,000	4	9	2, 3, 4	Basic	√	√	
University of Massachusetts, Worcester	Milford, Massachusetts	<30,000	2	6	3	Basic		√	
University of Mississippi Medical Center, Jackson	Tupelo, Mississippi	<40,000	5	5	3, 4	Basic	√	√	
University of Oklahoma Health, Science Center, Oklahoma City	Elk City, Oklahoma	<20,000	1	5	3	Basic		√	
University of Oklahoma School of Community Medicine, Tulsa	Stillwater, Oklahoma	<50,000	6	4	3	Basic		√	√
University of Tennessee, Chattanooga	Athens and Etowah, Tennessee	<20,000	3	5	3	Basic		√	
University of Virginia, Charlottesville	Fishersville, Virginia	<10,000	1	6	4	Basic		√	

Abbreviations

COM = College of Medicine, NR = not reported, PGY = postgraduate year, US = United States

Notes

a = The specialty rotations for those programs shaded in grey are provided in B3

b = As reported in Mercier and Skube et al[32]

c = Postgraduate year during which residents participate in rural rotations

d = As defined by Rossi and Rossi et al[33]. Broad is defined as programs which contain all of the 4 components deemed necessary for a rural training program: 1) clinical experience in rural setting, 2) robust diagnostic and therapeutic gastrointestinal endoscopy experience, 3) exposure to diseases and procedures in surgical subspecialties, and 4) absence of competing surgical specialty learners in the rural rotation and/or the parent surgical residency. Basic is defined as programs that contain some but not all of the 4 components.
e = As reported in Rossi and Rossi et al[33]
List of rural surgery programs are derived from Rossi and Rossi et al[33]. They are all within General Surgery. Details provided in this table were not crosschecked.
Source
Rossi and Rossi et al[33], Mercier and Skube et al[32]

Table B3: Rotations for some of the rural surgery training programs listed in Table B2

Program	Oregon Health & Science University, Portland, Oregon	Gundersen Lutheran Medical Center, LaCrosse, Wisonsin	University of North Dakota, Grand Forks, North Dakota	Bassett Medical Center, Cooperstown, New York	University of Tennessee College of Medicine, Knoxville, Tennessee	University of Tennessee College of Medicine, Chattanooga, Tennessee	University of Minnesota, Duluth, Minnesota
General Surgery	√	√	√	√	√	√	√
Gynaecology	√	√	√		√		√
Orthopaedics	√	√	√	√	√		
Urology	√	√	√	√			
Ear, Nose and Throat	√	√	√	√			
Endoscopy	√	√	√				√
Obstetrics	√	√	√				√
Emergency	√	√					√
Rural	√	√	√	√		√	√
Trauma		√			√		√
Critical Care		√					
Neurosurgery		√		√			
Plastics		√		√			
Cardiothoracic		√		√			
Thoracic						√	√
Vascular						√	√
Oncology		√					

Notes
Details provided in this table were not crosschecked.
Source
Avery Jr and Wallace[28]

Table B4: List of institutions with an established rural training track taken from the ACS website or the Fellowship and Residency Electronic Interactive Database, as well as surveyed institutions with an existing rural exposure or those willing to customise an exposure

Institutions with rural training identified from the ACS website (12 programs)	Institutes with rural training identified from FREIDA (29 programs)	Surveyed institutes which indicated an existing rural exposure (11 programs)	Surveyed institutes willing to customise a rural exposure (15 programs)
University of Minnesota, Duluth	University of Minnesota Program	University of Minnesota Program	Vidant/East Carolina, Greenville, NC
University of Nebraska Medical Center	University of Nebraska Medical Center	Bassett Medical Center Program	Summa Health Center, Akron OH Virginia Tech-
Bassett Healthcare, Cooperstown, NY	Bassett Medical Center program	Gundersen Lutheran Health System,	Carilion
East Carolina University, Greenville, NC	Vidant Medical Center/East Carolina	Lacrosse, WI	Hennepin County Medical Center, Minneapolis,
University of North Dakota, Grand Forks	University of North Dakota Program	University of Wisconsin Hospital and	MN
Oregon Health Science University, Portland	Oregon health and Science University	Clinics Program	Wright State University
East Tennessee State University, Johnson City	University of Tennessee Medical Center of Knoxville	University of New Mexico, Albuquerque	Maine Medical Center, Portland, ME
University of Tennessee Medical Center,	Program	University of Louisville, Louisville, KY	Kaiser Permanente, Los Angeles, CA
Knoxville	University of Tennessee, Chattanooga	University of Illinois COM, Peoria, IL	Texas Tech University Permian Basin, Odessa,
University of Tennessee, Chattanooga	Gundersen Lutheran Medical Foundation Program	Palmetto Health, Columbia, SC	TX
University of Utah, Salt Lake City	University of Wisconsin Hospital and Clinics Program	Baylor, Houston, TX	New Hanover Regional Medical Center,
Gundersen Lutheran Health System, Lacrosse,	University of New Mexico	Mayo Clinic, Rochester, MN	Wilmington, NC
WI	University of Louisville	SUNY Upstate Medical University,	Massachusetts Genera; Hospital, Boston, MA
University of Wisconsin School of Medicine	Baylor College of Medicine Program	Syracuse, NY	Arrowhead Regional Medical Center
and Public Health	Mayo Clinic College of Medicine and Science (Rochester)		Iowa Methodist Medical Center
	Program		University of Kentucky, Lexington, KY
	Wright State University		West Virginia University, Morgantown
	Iowa Methodist Medical Center Program		Grand Strand Medical Center, Charleston

	University of Kentucky University of California (Davis) Health System Program University of Colorado Program WellStar Atlanta Medical Center Program Medical Center of Central Georgia/Mercer University School of Medicine Program University of Kansas School of Medicine Program Southern Illinois University Program University of Oklahoma Health Sciences Center Program Icahn School of Medicine Mount Sinai Program St Vincent Hospitals and Health Care Center Program York Hospital Program University of South Dakota School of Medicine Program		

Abbreviations

ACS = American College of Surgeons, CA = California, FREIDA = Fellowship and Residency Electronic Interactive Database, IL = Illinois, KY = Kentucky, MA = Massachusetts, ME = Maine, MN = Minnesota, NC = North Carolina, NY = New York, SC = South Carolina, SUNY = State University of New York, TX = Texas, WI = Wisconsin

Notes

Details provided in this table were not crosschecked.

Source

Rossi and Wiegmann et al[35]

Appendix C. Grey literature

Aim

To fill the gaps identified from the peer-reviewed literature search with regards to both technical and non-technical skills curriculums relevant to rural practice, particularly for those countries under-represented in the peer-reviewed literature review and those most relevant to Australian rural surgical practice. The countries in which grey literature was sought were Australia, Aotearoa New Zealand, Canada and the UK.

Search strategy

Grey literature was obtained via 3 methods to provide details on rural curriculums, both surgical and medical, with the following caveats:

- Details on technical skills were obtained only from rural surgical training curriculums/programs from Australia, Aotearoa New Zealand, Canada and the UK.
- Details on non-technical skills were obtained from both rural surgical curriculums (Australia, Aotearoa New Zealand, Canada and the UK) and rural medical curriculums (Australia and Aotearoa New Zealand only).

Method 1: Targeted website searches

The following colleges/associations (Table C1) were searched via their website's search function (where possible) using the terms 'rural', 'regional', 'remote' and 'curriculum'. If no search function was available, manual searching of the website was performed.

Table C1: Grey literature targeted website searches conducted 29 June 2021, 30 June 2021 and 5 July 2021

Australia	Website
The Royal Australian College of General Practitioners	https://www.racgp.org.au/
Australian College of Rural and Remote Medicine	https://www.acrrm.org.au/
Aotearoa New Zealand	**Website**
New Zealand Association of General Surgeons	https://www.nzags.co.nz/
The Royal New Zealand College of General Practitioners	https://www.rnzcgp.org.nz/
Provincial and Territorial Medical Colleges of Canada	**Website**
Royal College of Physicians and Surgeons of Canada	https://www.royalcollege.ca/rcsite/home-e
The College of Physicians and Surgeons of British Columbia	https://www.cpsbc.ca/
The College of Physicians and Surgeons of Alberta	https://cpsa.ca/
The College of Physicians and Surgeons of New Brunswick	https://cpsnb.org/en/
The College of Physicians and Surgeons of Saskatchewan	https://www.cps.sk.ca/imis
The College of Physicians and Surgeons of Newfoundland and Labrador	https://www.cpsnl.ca/web/cpsnl
The College of Physicians and Surgeons of Ontario	https://www.cpso.on.ca/
The College of Physicians and Surgeons of Manitoba	http://www.cpsm.mb.ca/
The College of Physicians and Surgeons of Nova Scotia	https://cpsns.ns.ca/
Surgical Colleges of the United Kingdom	**Website**
Royal College of Surgeons of Edinburgh	https://www.rcsed.ac.uk/
Royal College of Surgeons of England	https://www.rcseng.ac.uk/
Royal College of Surgeons of Ireland	https://www.rcsi.com/dublin
The Association of Surgeons of Great Britain and Ireland	https://www.asgbi.org.uk/
The Joint Committee on Intercollegiate Examinations	https://www.jcie.org.uk/Content/content.aspx
Intercollegiate Surgical Curriculum Programme	https://www.iscp.ac.uk/
Joint Committee on Surgical Training	https://www.jcst.org/
Viking Surgeons Association	https://www.vikingsurgeons.net/

Method 2: Targeted Google phrase searches

Targeted Google searches were conducted using the phrases listed in Table C2. The first 3 pages of Google search results were screened only.

Table C2: Phrases searched in Google (www.google.com.au, search dates reported per search term)

Keyword	Phrase	Date searched
Rural	Preceptor evaluation rural surgery	5/7/21
	Preceptor assessment rural surgery	5/7/21
	Rural surgery curriculum	5/7/21
	Rural surgical curriculum	6/7/21
	Rural surgery training	6/7/21
	Rural surgery programs	6/7/21
	Rural surgery programmes	6/7/21
	Rural surgery education	5/7/21
Provincial	Preceptor evaluation provincial surgery	12/7/21
	Preceptor assessment provincial surgery	17/7/21
	Provincial surgery curriculum	12/7/21
	Provincial surgical curriculum	12/7/21
	Provincial surgery training	12/7/21
	Provincial surgery programs	13/7/21
	Provincial surgery programmes	13/7/21
	Provincial surgery education	13/7/21
Remote	Preceptor evaluation remote surgery	13/7/21
	Preceptor assessment remote surgery	13/7/21
	Remote surgery curriculum	13/7/21
	Remote surgical curriculum	13/7/21
	Remote surgery training	13/7/21
	Remote surgery programs	13/7/21
	Remote surgery programmes	13/7/21
	Remote surgery education	13/7/21
Regional	Preceptor evaluation regional surgery	13/7/21
	Preceptor assessment regional surgery	13/7/21
	Regional surgery curriculum	13/7/21
	Regional surgical curriculum	14/7/21
	Regional surgery training	14/7/21
	Regional surgery programs	14/7/21
	Regional surgery programmes	14/7/21

Method 3: Sources provided by expert Working Group

A list of pertinent websites, journals, textbooks, and peer-reviewed articles was provided by the Working Group (Table C3). These sources were screened for relevant information. Only the first 5 pages of search results were screened.

Table C3: Sources identified by the Working Group, searched 29 July 2021 and 2 August 2021

Source	Website(s)/link	Search method used
Federation Rural Australian Medical Educators (FRAME)	https://ausframe.org/	Manual search of publications and resources list
Medical Deans of Australia and New Zealand	https://medicaldeans.org.au/ https://www1.health.gov.au/internet/main/publishing.nsf/Content/rural-health-multidisciplinary-training	Searched terms rural, remote & curriculum
Western Australia Country Health Service	https://ww2.health.wa.gov.au/About-us/WA-Country-Health-Service https://www.wacountry.health.wa.gov.au/Our-workforce/Work-with-us	Searched terms curriculum & rural
Australian Government Doctor Connect	https://www.health.gov.au/initiatives-and-programs/doctorconnect	Searched terms rural, remote & curriculum
Textbook/Australian Rural Health Education Network (ARHEN) 'A textbook of Australian Rural Health'	https://arhen.org.au/wp-content/uploads/2019/09/Text_Book_of_Australian_Rural_Health.pdf	Searched terms curriculum, skills & competencies
Textbook 'Australia's Rural, Remote and Indigenous Health'	https://www.booktopia.com.au/australia-s-rural-remote-and-indigenous-health-janie-dade-smith/book/9780729542418.html?	Unable to review resource
Australian Medical Assistance Teams (AUSMAT) and National Trauma Centre	https://www.nationaltraumacentre.nt.gov.au/courses	Manual search of upcoming courses offered with a rural focus
Australian Journal of Rural and Remote Health	https://www.rrh.org.au/	Searched terms curriculum, competency/ies & skills with filters of 'education' & 'Australasia'
Australian Government Department of Health	https://www.health.gov.au/	Searched terms rural, surgery, curriculum & competencies
Australian Capital Territory Health	https://health.act.gov.au/	Searched terms rural, surgery, curriculum & competencies
New South Wales Health	https://www.health.nsw.gov.au/	Searched terms rural, surgery, curriculum & competencies
Department of Health Northern Territory	https://health.nt.gov.au/	Searched terms rural, surgery, curriculum & competencies
Queensland Health	https://www.health.qld.gov.au/	Searched terms rural, surgery, curriculum & competencies
South Australian Health	https://www.sahealth.sa.gov.au/	Searched terms rural, surgery, curriculum & competencies
Department of Health Tasmania	https://www.health.tas.gov.au/	Searched terms rural, surgery, curriculum & competencies

Source	Website(s)/link	Search method used
Department of Health and Human Services Victoria	https://www.dhhs.vic.gov.au/	Searched terms rural, surgery, curriculum & competencies
Western Australia Health	https://healthywa.wa.gov.au/	Searched terms rural, surgery, curriculum & competencies
Journal article Blattner K, Stokes T, Nixon G. A scope of practice that works 'out here': exploring the effects of a changing medical regulatory environment on a rural New Zealand health service. Rural and Remote Health 2019; 19: 5442.	Blattner and Nixon 2019	Full text review
Journal article Bonney A, Mullan J, Hammond A, et al. A case study of the experiences of junior medical officers in EDs of metropolitan and rural hospitals. Australian Journal of Rural Health 2019; 00:1-6	Bonney et al 2019	Full text review
Journal article Martiniuk AL, Colbran R, Ramsden R, et al. Capability... what's in a word? Rural Doctors Network of New South Wales Australia is shifting to focus on the capability of rural health professionals. Rural and Remote Health 2020; 20: 5633.	Martiniuk et al 2020	Full text review
Report by Grattan Institute 'Coming out of COVID-19 lockdown. The next steps for Australian healthcare.'	Duckett 2020	Searched terms rural & remote

Summary of findings

Additional rural training program details are reported below by country.

Australia

No other Australian surgical training programs specific to a rural setting were identified in the grey literature. GP training in Australia with a rural focus can be obtained through 2 avenues. Training through the Royal Australian College of General Practitioners (RACGP) involves completion of an additional 12 months of Advanced Rural Skills Training (ARST) following the core 3 years of GP training.[92] This provides a Fellowship of Advanced Rural General Practice (FARGP). This additional 12 months of ARST can be undertaken in a range of disciplines that address the needs of rural and remote communities, including

Aboriginal and Torres Strait Islander health, Anaesthesia, Child Health, Mental Health, Surgery, Emergency Medicine, Obstetrics and Palliative Care.[93] Some of these disciplines provide details of the competencies and learning outcomes expected in their curriculums, some of which are non-technical and may be relevant to any specialty in a rural location. Details of these are provided in Table C4, C5, C6, and Table C7.

It should be noted that the FARGP is being amended to align with the national Rural Generalist Medicine training pathway and will be replaced by a 4-year standalone Rural Generalist Fellowship with an updated curriculum. These changes to the FARGP are anticipated to start from January 2022.[94]

Table C4: Fellowship in Advanced Rural General Practice (FARGP) curriculum for GP surgery

Domain 1—Communication skills and the patient doctor relationships	
Outcome	Performance Criteria
1.1 Communicate with patients, relatives, staff and others to understand the effects and alternatives to surgery	1.1.1 Demonstrate a holistic approach to identifying issues of most importance to patients' health and management. 1.1.2 Discuss options for surgery or non-surgery, including conservative management, with patients. 1.1.3 Complete appropriate patient records. 1.1.4 Obtain informed consent.
1.2 Manage potentially challenging or difficult situations in diagnosis, with at-risk patients and with suboptimal results from surgery.	1.2.1 Identify stress and grief symptoms in staff members, patients and their relatives and friends, and provide empathic and culturally appropriate support and follow-up.
1.3 Record patient information accurately in a way that facilitates future patient care	1.3.1 Take accurate and comprehensive patient records and complete relevant documentation as appropriate to the situation.
Domain 2—Applied professional knowledge and skills	
Outcome	Performance Criteria
2.1 Use current, and develop new, surgical skills and techniques.	2.1.1 Demonstrate surgical techniques that are appropriate to the skill level of the GP and the context of the situation. 2.1.2 Identify areas where GP surgical skills can be enhanced. 2.1.3 Perform a range of common surgical procedures, initially under supervision, leading to independent practice
2.2 Demonstrate clinical skills required to diagnose and manage common surgical conditions.	2.2.1 Take an accurate and detailed surgical history. 2.2.2 Perform a physical examination. 2.2.3 Demonstrate skills in the preoperative and postoperative management of a range of surgical conditions and their associated complications. 2.2.4 Demonstrate a process of confident decision-making via case history and examination. 2.2.5 Complete quarterly audit of surgical case logbook.
2.3 Work effectively as part of a multidisciplinary team in the emergency and intensive care management of seriously ill patients.	2.3.1 Provide a problem-solving approach to the appropriate early management of patients with trauma. 2.3.2 Provide evidence of effective management of surgical crises and complications. 2.3.3 Take actions and provide advice appropriate to the situation and team skill-mix.
Domain 3—Population health and the context of general practice	
Outcome	Performance Criteria
3.1 Address health risks to individuals and communities.	3.1.1 Identify trends and patterns in surgical presentations in the context of the community. 3.1.2 Demonstrate a planning process to address such trends and patterns.
3.2 Provide GP surgical services appropriate for the community	3.2.1 Identify the role of other healthcare professionals in the community. 3.2.2 Demonstrate a flexible approach to the health management of those with cultural and social differences. 3.2.3 Identify and document the scope of surgical services that can be safely provided in the community. 3.2.4 Identify local processes/policies to ensure available health resources are used efficiently.
Domain 4—Professional and ethical role	
Outcome	Performance Criteria

4.1 Build referral networks.	4.1.1 Establish and utilise a comprehensive professional and emergency referral network.
4.2 Practise GP self-care, self-evaluation and professional development.	4.2.1 Identify own strengths and limitations as a GP surgical proceduralist. 4.2.2 Identify the risks for a GP surgical proceduralist working in professional and/or geographical isolation. 4.2.3 List available resources and referral agencies, professional support networks and organisations to support improved self-care and self-reliance. 4.2.4 Identify professional development needs and opportunities and participate in professional development activities relevant to GP surgery.
4.3 Ensure delivery of patient-centred care.	4.3.1 Identify surgical services that best meet the needs of the patient. 4.3.2 Provide surgical services that are in the best interests of the patient.
Domain 5—Organisational and legal dimensions	
Outcome	Performance Criteria
5.1 Complete appropriate documentation relevant to the patient and the context.	5.1.1 Write legally appropriate and medically effective patient records. 5.1.2 Complete reports according to jurisdictional, legal and legislative requirements. 5.1.3 Write reports required in the care of a surgical patient. 5.1.4 Identify the legal responsibilities regarding reporting of notifiable disease, birth, death and autopsy.
5.2 Obtain informed consent for all GP surgical procedures.	5.2.1 List the key components and legal requirements when obtaining informed consent, with regards to jurisdictional requirements and best practice guidelines.

Abbreviations
GP = general practitioner
Source
The Royal Australian College of General Practitioners[95]

Table C5: Fellowship in Advanced Rural General Practice (FARGP) curriculum for GP Anaesthesia

Domain 1—Communication skills and the patient doctor relationships
The JCCA registrar will be able to: • establish and utilise a comprehensive professional referral network • demonstrate an understanding of the physical and mental states which may influence conduct of anaesthesia • outline the influence of emotional, psychological and social factors on an individual's response to pain (acute and chronic) • demonstrate an ability to communicate and cooperate with a range of rural specialist anaesthetists in the provision of safe anaesthetic services • demonstrate an understanding of the emotional impact of patients undergoing surgery and provide supportive counselling • demonstrate an ability to communicate effectively with frightened and uncooperative adults and children
Domain 2—Applied professional knowledge and skills
The JCCA registrar will be able to: • develop the clinical skills required to competently manage safe anaesthesia practice in a rural GP setting • demonstrate confidence to make decisions and accept the outcomes of those decisions working within his/her own scope of practice • utilise a problem-solving approach

• demonstrate clinical skills required for appropriate preoperative assessment and care of patients • identify features of the preoperative assessment which will require specialist anaesthesia services and refer appropriately • use and maintain a range of equipment required for general anaesthesia and monitoring • induce and maintain unconsciousness and provide intraoperative analgesia • administer and reverse muscle relaxation safely • administer local, topical and regional anaesthesia • describe the principles of common or important operations requiring anaesthesia and their appropriateness in rural GP anaesthesia practice • provide post-anaesthesia care • demonstrate knowledge of, and ability to care for, all aspects of a patient's respiratory system, including recognition of problems, and use of oxygen, ventilators and artificial airways • manage acute pain and chronic cancer and non-cancer pain • effectively manage patients of all ages suffering from cardiac or respiratory arrest • assess a patient's suitability for transportation • stabilise, support and organise safe transportation for the critically ill patient • demonstrate an ability to predict preoperative, intraoperative and postoperative anaesthesia risks, consulting with a specialist anaesthetist and referring when necessary.
Domain 4—Professional and ethical role
The JCCA registrar will be able to: • demonstrate an understanding of the particular needs and difficulties in maintaining confidentiality in small communities • critically review relevant literature, analysing and utilising it appropriately in the workplace • develop skills in balancing the caseload and demands of working in isolation in a rural practice with social and personal responsibilities • develop an understanding of the principles of small business management appropriate to a rural general practice • demonstrate an ability to establish professional networks and organisations, and utilise available rural resources and referral agencies • develop a commitment to continuing self-directed learning and professional development sufficient to provide quality anaesthesia care • demonstrate an attitude of adaptability to changes in anaesthetic practice relevant to safer rural anaesthesia • develop the appropriate skills for self-care and self-reliance • demonstrate awareness of current Australian New Zealand College of Anaesthetists standards for anaesthesia practice (College professional documents) and act in ways consistent with these standards • work effectively as part of a multidisciplinary team
Domain 5—Organisational and legal dimensions
The JCCA registrar will be able to: • outline legal responsibilities regarding notification of disease, birth, death and autopsy, and related documents • demonstrate his/her responsibility in relation to obtaining informed consent • demonstrate an understanding of the social/domestic prerequisites for day surgery

Abbreviations

GP = general practitioner, JCCA = Joint Consultative Committee on Anaesthesia

Source

The Joint Consultative Committee on Anaesthesia (JCCA)[96]

Table C6: Fellowship in Advanced Rural General Practice (FARGP) curriculum for Palliative Care

Domain 1—Communication skills and the patient doctor relationships	
Outcome	Performance Criteria
1.1 Effective and appropriate communication skills are demonstrated	1.1.1 Establish a therapeutic and supportive relationship with patients and their families based on trust, empathy and confidentiality with an understanding of the importance of family and carer relationships in the context of palliative care 1.1.2 Demonstrate focused, flexible and appropriate communication with patients and their families in discussing palliative, prognostic and end-of-life issues 1.1.3 In a sensitive manner, explore palliative patients' concerns across the various domains of health 1.1.4 Modify communication with palliative patients and their families who are from culturally and linguistically diverse backgrounds 1.1.5 Modify communication with palliative patients and their families who are from Aboriginal and Torres Strait Islander backgrounds 1.1.6 Communicate and consult effectively within and across a multidisciplinary palliative care team 1.1.7 Educate health professionals involved in the patient's care on palliative and end-of-life care and other associated topics, as appropriate 1.1.8 Exhibit a willingness to talk openly about death and dying with patients, family, other health professionals and the general community
1.2 High-quality holistic healthcare is delivered to people accessing palliative care	1.2.1 Work as part of a multidisciplinary team to offer safe palliative healthcare to patients with a terminal illness 1.2.2 Manage complex palliative health issues as part of a multidisciplinary team 1.2.3 Develop a comprehensive professional referral network 1.2.4 Acknowledge and accommodate the role of spirituality for the patient and the family 1.2.5 Discuss end-of-life issues with the patient and their carer(s)/family, including advanced care directives/planning to clarify the patient's wishes
Domain 2—Applied professional knowledge and skills	
Outcome	Performance Criteria
2.1 A holistic approach to palliative care is used	2.1.1 Describe the experience of life-limiting illness from the perspective of the patient and their family and the meaning and consequences of illness to the patient and their family 2.1.2 Describe the natural history and role of disease-specific treatments in the management of progressive life-limiting illness 2.1.3 Practice culturally appropriate palliative care 2.1.4 Use evidence-based pathophysiology and symptom management to address the range of physical, psychological and spiritual issues relating to life-limiting illness and terminal decline
2.2 Management is appropriate for the person and their symptoms	2.2.1 Develop rapport with the palliative patient, their family and carer(s) 2.2.2 Manage challenging circumstances 2.2.3 Manage concomitant clinical problems and comorbidities 2.2.4 Assess risk factors for terminal decline 2.2.5 Use the correct phenomenology for palliative and end-of-life care 2.2.6 Identify relevant cultural, ethnic and societal issues around death and dying, and their impact on the practice of palliative medicine
2.3 A number of palliative therapies are used appropriately	2.3.1 Assess the patient and their situation to manage symptoms, as well as concurrent and new medical diagnoses 2.3.2 Manage pain effectively, utilising both nonpharmacological and pharmacological means

	2.3.3 Describe the benefits, precautions and common adverse effects of a range of different evidence-based therapies 2.3.4 Prescribe medication safely and appropriately based on the known pharmacology and best available evidence 2.3.5 Communicate medication issues clearly and concisely to patients, their families and carers 2.3.6 Prioritise appropriate investigations and management
2.4 A number of management strategies are developed	2.4.1 Use a model of care that focuses on managing symptoms and optimising quality of life 2.4.2 Employ pharmacotherapy for the full spectrum of palliative medicine issues 2.4.3 Provide supportive counselling to patients and their families 2.4.4 Recognise and manage emergencies as they arise in the context of palliative and end-of-life care 2.4.5 Manage patients within the context of their life 2.4.6 Make a plan for managing deterioration and for crisis intervention that falls outside the expected clinical course of the life-limiting illness 2.4.7 Demonstrate continuity of care for the long-term health of the patient to ensure optimum quality of life 2.4.8 Outline the criteria for transfer of palliative patients to and from hospital
Domain 3—Population health and the context of general practice	
3.1 People with a palliative care issue who live in rural and remote areas receive appropriate and timely care	3.1.1 Work effectively with people with palliative care needs within their current social, cultural and economic settings 3.1.2 Describe relevant cultural, ethnic and societal issues around death and dying, and their impact on the practise of palliative medicine 3.1.3 Advocate for equity of access to multidisciplinary palliative care services 3.1.4 Advocate to address the determinants of the experience of illness, dying and bereavement 3.1.5 Advocate for access for those from disadvantaged groups and their families/carers
3.2 Health information is disseminated through relevant networks and organisations	3.2.1 Collaborate with relevant organisations involved in the area of palliative care 3.2.2 Collaborate with other relevant organisations 3.2.3 Promote palliative care services in the health systems in which they work 3.2.4 Identify the differing palliative care resources in rural and remote areas 3.2.5 Provide ongoing professional development sessions to other rural health professionals, staff, consumers and members of the community
3.3 Health service provision, policies and activities are initiated and undertaken	3.3.1 Use or develop relevant guidelines for health service provision in rural and remote areas that may be missing or in need of reform 3.3.2 Involve consumers and consumer groups, and carers and carer groups in developments and initiatives in health service provision 3.3.3 Provide information to the community about palliative care issues as a means of reducing the associated stigma and negative connotations 3.3.4 Effectively utilise available healthcare resources 3.3.5 Describe palliative care budgetary and human resource limitations 3.3.6 Negotiate prudent usage of palliative resources 3.3.7 Describe and implement, where appropriate, policies and standards for palliative care
Domain 4—Professional and ethical role	
Outcome	Performance Criteria
4.1 Ethical practices and behaviour relevant to palliative care are applied	4.1.1 Maintain professional standards of behaviour when managing palliative patients 4.1.2 Manage patient wishes to decline treatment 4.1.3 Manage ethical issues and conflicts in patient care 4.1.4 Recognise, analyse and address ethical issues in clinical practice

	4.1.5 Discuss the unique emotional and spiritual issues that arise for a palliative patient 4.1.6 Advocate strongly for patient needs, including accessing best practice resources
4.2 Appropriate self-care and reflection is practised	4.2.1 Describe the personal stresses involved in caring for the dying 4.2.2 Identify strategies for establishing, maintaining and improving self-awareness when interacting with patients with palliative care issues 4.2.3 List and discuss self-care strategies that protect and minimise potential personal impacts associated with high levels of disadvantage that occur in a palliative care setting 4.2.4 Identify own personal beliefs and those of one's culture and society, and the impact that these have on the ability to deal with death and dying 4.2.5 Describe how personal beliefs can impact on the interactions between the doctor, the patients and their families 4.2.6 Explain how the losses and grief of patients and their families can influence a doctor's ability to deal with their own losses, and vice versa 4.2.7 Learn when to seek personal support for dealing with the emotional and existential issues that inevitably arise when providing palliative care 4.2.8 Develop a network of supports that are tailored to the unique needs of the doctor
4.3 The patient's needs are advocated for	4.3.1 Advocate strongly for individual patient needs, including accessing best practice resources 4.3.2 Advocate for the needs of social groups and cultures within the community 4.3.3 Recognise the value of patients and communities participating fully in decision-making regarding palliative care issues 4.3.4 Contribute to a 'healthy' and normalising experience of dying and bereavement with patients, families and communities
Domain 5—Organisational and legal dimensions	
Outcome	Performance Criteria
5.1 Legal and legislative requirements for palliative care are accessed and applied	5.1.1 Apply relevant legislative and administrative requirements 5.1.2 Define and describe the use of power of attorney, enduring guardian and advance care directives and negotiate these appropriately 5.1.3 Identify state legal issues associated with end-of-life care 5.1.4 Describe identification and certification of death, and surrounding legal issues 5.1.5 Demonstrate professionally acceptable standards of documentation and report-writing in the care of patients needing palliative care 5.1.6 Undertake regular audits of management practices in dealing with patients needing palliative care and their families/carers 5.1.7 Make accurate, comprehensive and contemporaneous patient records 5.1.8 Complete relevant documentation as appropriate to the situation
5.2 Palliative care networks are established and supported	5.2.1 Establish a professional palliative care network 5.2.2 Access the metropolitan palliative care services for clinical, academic, research, literature, hotline and legal services 5.2.3 Develop and use resources and processes to ensure continuity of care for patients with palliative care issues 5.2.4 Outline the range of support services for the carers of people with palliative care needs 5.2.5 Structure the clinic/practice to accommodate patients with palliative care issues
5.3 Collaborate effectively among multidisciplinary health professionals	5.3.1 Involve team members in interdisciplinary meetings to maximise relevant contributions 5.3.2 Organise and implement a treatment plan through collaboration with team members and other colleagues
5.4 Utilise time and resources effectively	5.4.1 Manage time effectively 5.4.2 Prioritise tasks and perform tasks in a timely manner 5.4.3 Exhibit flexibility in responding to unexpected urgent events 5.4.4 Access opportunities for de-briefing or professional supervision

	5.4.5 Facilitate access to relevant appliances and aids to daily living for patients with palliative care issues

Source

The Royal Australian College of General Practitioners[97]

Table C7: Fellowship in Advanced Rural General Practice (FARGP) curriculum for Aboriginal and Torres Strait Islander Health

Domain 1—Communication skills and the patient doctor relationships	
Outcome	Performance Criteria
1.1 Offer Aboriginal and Torres Strait Islander peoples services where culture, history, family and community are key considerations in doctor-patient interaction.	1.1.1 Identify how past experiences of the health system may influence Aboriginal and Torres Strait Islander people's current health and wellbeing, beliefs and behaviours. 1.1.2 Describe how the world view of Aboriginal and Torres Strait Islander peoples may impact on presentations to, and interactions with, doctors and health services
1.2 Deliver culturally safe medical care to Aboriginal and Torres Strait Islander peoples.	1.2.1 Demonstrate effective communication strategies to build trust with Aboriginal and Torres Strait Islander peoples. 1.2.2 Demonstrate ability to work in partnership with Aboriginal and Torres Strait Islander peoples to deliver appropriate and safe healthcare. 1.2.3 Describe how Aboriginal and Torres Strait Islander culture is context specific, and awareness of aspects that have wider applicability.
Domain 2—Applied professional knowledge and skills	
Outcome	Performance Criteria
2.1 Deliver high-quality medical care to Aboriginal and Torres Strait Islander peoples.	2.1.1 Identify current evidence-based, best practice guidelines for prevention, diagnosis and management of conditions with specific implications for Aboriginal and Torres Strait Islander peoples living in a rural and remote setting. 2.1.2 Describe management of complex health presentations as part of a multidisciplinary team. 2.1.3 Discuss how the provision of opportunistic care to Aboriginal and Torres Strait Islander peoples can be enhanced with emerging technologies.
2.2 Work effectively with others to deliver high-quality holistic care to Aboriginal and Torres Strait Islander peoples.	2.2.1 Work as part of a multidisciplinary team to offer culturally safe health services to Aboriginal and Torres Strait Islander peoples. 2.2.2 Identify strategies to increase the involvement of Aboriginal and Torres Strait Islander health workers in the provision of health services to Aboriginal and Torres Strait Islander peoples. 2.2.3 Identify strategies to involve family and community in the provision of health services to Aboriginal and Torres Strait Islander peoples.
Domain 3—Population health and the context of general practice	
Outcome	Performance Criteria
3.1 Work effectively with Aboriginal and Torres Strait Islander peoples within the current and historical context of healthcare and other relevant service delivery	3.1.1 Critically review the impact of successive government policies and interventions on the health and wellbeing of Aboriginal and Torres Strait Islander peoples, with particular emphasis on how this has impacted rural and remote communities. 3.1.2 Assess and critically analyse racism and the impacts it has on the health of an individual, a family and/or a community. 3.1.3 Describe the social determinants of health impacting Aboriginal and Torres Strait Islander peoples in the local context.
3.2 Use population health data and approaches when working with Aboriginal and Torres Strait Islander peoples	3.2.1 Describe population health approaches that are relevant to Aboriginal and Torres Strait Islander peoples in the local context. 3.2.2 Analyse population health data that informs service or practice development. 3.2.3 Identify local population health issues and their impact on Aboriginal and Torres Strait Islander peoples.
Domain 4—Professional and ethical role	
Outcome	Performance Criteria
4.1 Work to promote a culturally appropriate healthcare setting for Aboriginal and Torres Strait Islander peoples.	4.1.1 Describe the role of the GP as a teacher, learner and researcher in an Aboriginal and Torres Strait Islander health setting. 4.1.2 Discuss the role of a cultural educator and mentor in the improvement of the health of Aboriginal and Torres Strait Islander peoples.

	4.1.3 Indicate the ways in which positive interactions can be optimised between Aboriginal and Torres Strait Islander peoples and their healthcare provider/s, taking into account differing world views. 4.1.4 Outline and discuss strategies that address inequity and racism in the delivery of quality healthcare to Aboriginal and Torres Strait Islander peoples.
4.2 Practise appropriate self-care and reflection while working with Aboriginal and Torres Strait Islander peoples.	4.2.1 Identify strategies for establishing, maintaining and improving self-awareness and cultural competence when interacting with Aboriginal and Torres Strait Islander peoples. 4.2.2 List and discuss self-care strategies that protect against and minimise potential personal impacts associated with high levels of disadvantage that occur in an Aboriginal and Torres Strait Islander health setting.
Domain 5—Organisational and legal dimensions	
Outcome	Performance Criteria
5.1 Deliver legal and ethical healthcare to Aboriginal and Torres Strait Islander peoples	5.1.1 Outline potential ethical dilemmas in sharing health information about an Aboriginal and Torres Strait Islander patient with family, community members and others in a multidisciplinary team.
5.2 Monitor and improve legal and ethical approaches to the delivery of healthcare to Aboriginal and Torres Strait Islander peoples.	5.2.1 Detail the processes to monitor adherence to relevant government and regulatory guidelines in the context of delivering healthcare to Aboriginal and Torres Strait Islander peoples
5.3 Work within the structures and service delivery processes of an ACCHS.	5.3.1 Present an overview of the governance arrangements in an ACCHS. 5.3.2 Discuss the role of the GP working in an ACCHS.
5.4 Deliver a service that addresses and reaches target population health objectives.	5.4.1 Explore and present solutions on how to deliver appropriate and quality services to geographically isolated populations. 5.4.2 Describe the importance of the target populations in the context of the service. 5.4.3 Describe the ways in which target population health objectives are addressed and met.

Abbreviations

ACCHS = Aboriginal Community Controlled Health Services, GP = general practitioner

Source

The Royal Australian College of General Practitioners[98]

GP training with a rural focus can also be obtained with the Australian College of Rural and Remote Medicine (ACRRM). The Rural Generalist Curriculum at the ACRRM consists of Core Generalist Training (3 years) and Advanced Specialised Training (1 year) components.[99]

ACRRM states that the core clinical training curriculum for junior doctors defines the scope and standards for independent general practice anywhere in Australia but it has a particular focus on rural and remote settings. The curriculum has 7 domains of rural and remote general practice, which provide the framework for organising the abilities required in core clinical training. These domains and the abilities associated with each of them are described in Table C8. Domain 7 (practice medicine in the rural and remote context) is of relevance to a rural surgical curriculum.

Table C8: Australian College of Rural and Remote Medicine Core Clinical Training Curriculum, Junior Doctor

Domain 1: Provide medical care in the ambulatory and community setting *Themes: Patient-centred clinical assessment, clinical reasoning, clinical management*
Abilities
1. Establish a doctor–patient relationship and use a patient-centred approach to care
2. Obtain a clinical history that reflects contextual issues, including presenting problems, epidemiology, culture and geographic location
3. Perform a problem-focused physical examination relevant to clinical history and risks, epidemiology and cultural context
4. Use specialised clinical equipment as required for further assessment and to interpret findings
5. Order and/or perform diagnostic tests where required to confirm a diagnosis, monitor medical care and/or exclude treatable or serious conditions
6. Apply diagnostic reasoning to arrive at one or more provisional diagnoses, considering uncommon but clinically important differential diagnoses in balance with common or important conditions
7. Communicate findings of clinical assessment effectively and sensitively to the patient and/or carer
8. Formulate a management plan in concert with the patient and/or carer, judiciously applying best evidence and the advice of expert colleagues
9. Identify and manage comorbidities in the patient and effectively communicate these to the patient and/or carer
10. Ensure safe and appropriate prescribing of medications and treatment options in the clinical context
11. Manage uncertainty and the need to evaluate the risks versus the benefits of clinical decisions
12. Refer, facilitate and coordinate access to specialised medical and diagnostic and other health and social support services
13. Provide and/or arrange follow-up and continuing medical care
Domain 2: Provide care in the hospital setting *Themes: Medical care of admitted patients, medical leadership in a hospital team, health care quality and safety*
Abilities
1. Manage admission of patients to hospital in accordance with institutional policies
2. Develop, implement and maintain a management plan for hospitalised patients in concert with the patient and/or carer
3. Apply relevant checklists and clinical management pathways
4. Monitor clinical progress, regularly re-evaluate the problem list and modify management accordingly
5. Maintain a clinically relevant plan of fluid, electrolyte and blood product use with relevant pathology testing
6. Order and perform a range of diagnostic and therapeutic procedures
7. Maintain timely and accurate patient documentation in hospital records including drug prescription and administration
8. Communicate effectively with the health care team, patient and/or carer including effective clinical handover

9. Recognise and respond early to the deteriorating patient 10. Anticipate and judiciously arrange safe patient transfer to other facilities, considering clinical indications, service capabilities, patient preferences, transportation and geography 11. Participate in early, planned and multidisciplinary discharge planning 12. Contribute medical expertise and leadership in a hospital team 13. Provide direct and remote clinical supervision and support to nurses, junior medical staff and students
Domain 3: Respond to medical emergencies *Themes: Initial assessment and triage, emergency medical intervention, communication and planning*
Abilities 1. Undertake initial assessment and triage of patients with acute or life-threatening conditions 2. Stabilise critically ill patients and provide primary and secondary care 3. Provide definitive emergency resuscitation and management across the lifespan in keeping with clinical need, own capabilities and local context and resources 4. Perform required emergency procedures 5. Arrange and/or perform emergency patient transport or evacuation when needed 6. Demonstrate resourcefulness in knowing how to access and use available resources 7. Communicate effectively at a distance with consulting or receiving clinical personnel 8. Participate in the implementation of disaster plans, and post-incident analysis and debriefing 9. Provide inter-professional team leadership in emergency care that includes quality assurance and risk management assessment
Domain 4: Apply a population health approach *Themes: Community health assessment, population-level health intervention, evaluation of health care, collaboration with agencies*
Abilities 1. Analyse the social, environmental, economic and occupational determinants of health that affect the community burden of disease and access to health-related services 2. Apply a population health approach that is relevant to the clinical practice profile 3. Integrate evidence-based prevention, early detection and health maintenance activities into practice at a systems level 4. Provide continuity and coordination of care for own practice population 5. Evaluate quality of health care for practice populations 6. Fulfil reporting requirements in relation to statutory notification of health conditions 7. Access and collaborate with agencies responsible for key population health functions including public health services, employer groups and local government *8.* Participate as a medical advocate in the design, implementation and evaluation of interventions that address determinants of population health
Domain 5: Address the health care needs of culturally diverse and disadvantaged groups *Themes: Differing epidemiology, cultural safety and respect, working with groups to improve health outcomes*
Abilities 1. Apply knowledge of the differing profiles of disease and health risks among culturally diverse and disadvantaged groups 2. Communicate effectively and in a culturally safe manner, using interpreters, key community contacts and networks as appropriate 3. Reflect on own assumptions, cultural beliefs and emotional reactions in providing culturally safe care 4. Apply principles of partnership, community ownership, consultation, capacity building, reciprocity and respect to health care delivery, health surveillance and research 5. Harness the resources available in the healthcare team, the local community and family to improve outcomes of care 6. Work with culturally diverse and disadvantaged groups to address barriers in access to health services and improve the determinants of health
Domain 6: Practise medicine within an ethical, intellectual and professional framework *Themes: Ethical practice, professional obligations, intellectual engagement including teaching and research*
Abilities 1. Ensure safety, privacy and confidentiality in patient care 2. Maintain appropriate professional boundaries 3. Be aware of duty of care issues arising from providing healthcare to self, family, colleagues, patients and the community

4. Recognise unprofessional behaviour and signs of the practitioner in difficulty among colleagues and respond according to ethical guidelines and statutory requirements 5. Keep clinical documentation in accordance with legal and professional standards 6. Demonstrate commitment to teamwork, collaboration, coordination and continuity of care 7. Contribute to the management of human and financial resources within a health service 8. Work within relevant national and state legislation and professional and ethical guidelines 9. Provide accurate and ethical certification when required for sickness, employment, social benefits and other purposes 10. Manage, appraise and assess own performance in the provision of medical care for patients 11. Develop and apply strategies for self-care, personal support and caring for family 12. Teach and clinically supervise health students, junior doctors and other health professionals 13. Engage in continuous learning and professional development 14. Critically appraise and apply relevant research
Domain 7: Practise medicine in the rural and remote context *Themes: Resourcefulness, flexibility, teamwork and technology, responsiveness to context*
Abilities 1. Demonstrate resourcefulness, independence and self-reliance while working effectively in geographic, social and professional isolation 2. Provide effective clinical care when away from ready access to specialist medical, diagnostic and allied health services 3. Arrange referral to distant services in concert with the patient and/or carer, considering the balance of potential benefits, harms and costs 4. Seek direct and distant clinical supervision and support for other rural and remote health care personnel as required 5. Use information and communication technology to provide medical care or facilitate access to specialised care for patients 6. Use information and communication technology to network and exchange information with distant colleagues 7. Respect local community norms and values in own life and work practices 8. Identify and acquire extended knowledge and skills as may be required to meet healthcare needs of the local population

Source
Australian College of Rural and Remote Medicine[100]

Registrars must demonstrate meeting all competencies at the core generalist standard and then choose one specialised area for their final year. The specialised areas include: Aboriginal and Torres Strait Islander people's health, Academic Practice, Adult Internal Medicine, Anaesthesia, Emergency Medicine, Mental Health, Obstetrics and Gynaecology, Paediatrics, Palliative Care, Population Health, Remote Medicine and Surgery. The curriculums for anaesthesia and obstetrics are identical to the equivalent RACGP ARST curriculums. The competencies defined in the curriculums for Aboriginal and Torres Strait Islander people's health, Emergency Medicine, Paediatrics, Remote Medicine, Adult Internal Medicine, Palliative Care and Surgery are outlined in Table C8. Domain 8 (provide safe medical care while working in geographic and professional isolation) is of relevance to a rural surgical curriculum.

Table C9: Competencies required under the 8 domains of rural and remote practice as defined in the Rural Generalist Training Course handbook and Advanced Specialised Training Course handbooks offered by the Australian College of Rural and Remote Medicine

Domain 1: Provide expert medical care in all rural contexts		
• Establish a doctor–patient relationship • Use a patient-centred approach to care • Obtain a relevant and focused history using a logical and structured approach aiming to rule in and rule out relevant differential diagnoses within a patient's presentation • Perform an appropriate physical examination across all age groups, elicit clinical signs and interpret physical findings • Provide patient care in the home, nursing home and other sites away from the main health service		
Competencies	Core Generalist	Advanced Specialist—Surgery, Paediatrics, Adult Internal Medicine and Palliative Care
Diagnose and manage common and important conditions in rural primary, secondary and emergency settings	Provides patient with most plausible diagnoses based on evidence gathered. Negotiates individual evidence-based management plan, considering impact of the condition and proposed management on the patient's lifestyle/function.	Diagnoses and manages less common or more complex, acute and chronic conditions with consideration of clinical services capability. Autonomously delivers a defined scope of specialised clinical practice.
Appropriately order, perform and interpret diagnostic investigations	Judiciously orders investigations with the risks and benefits of investigations explained to the patient. Able to explain how each investigation contributes to the patient's management. Assists with development of robust and efficient systems to ensure that results are interpreted and communicated to patients.	Performs and interprets a broader range of diagnostic investigations as identified in the relevant syllabus and within clinical services capability.
Ensure safe and appropriate prescribing of medications and non-pharmacological treatment options	Reviews and revises own patterns of prescribing to improve quality and safety. Performs non-pharmacological treatment options from Core.	Delivers a broader range of pharmacological and non-pharmacological treatment options as identified in the relevant syllabus and within clinical services capability.
Formulate an appropriate management plan, incorporate specialist practitioners' advice or referral where applicable	Arranges referrals in concert with the patient and/or carer, considering the balance of potential benefits, harms and costs.	Works with a team on- and off-site to provide specialised clinical care.
Demonstrate commitment to teamwork, collaboration, coordination and continuity of care	Provides leadership and participates as a respectful team member with local and distant teams to optimise quality patient care. Works collaboratively, including during challenging situations and transitions of care. Negotiates and manages conflict amongst the healthcare team	Provides leadership for the defined scope of specialised clinical practice.
Domain 2: Provide primary care		
• Apply diagnostic reasoning to undifferentiated health problems in an un-referred patient population • Provide patient care across the lifespan from birth through to end of life • Manage common presentations and conditions in primary care • Provide longitudinal care, managing individuals' diverse range of problems across extended time periods		

• Perform primary care diagnostic and therapeutic procedures • Effectively manage time pressure and decision fatigue during general practice consultations • Provide continuous, consistent and coordinated chronic disease management for individuals with chronic conditions • Undertake preventive activities such as screening, immunisation and health education in opportunistic and programmatic ways • Provide cost-conscious care for patients, the service and the healthcare system • Provide general and specific health checks, medical assessments and travel medicine consultations		
Domain 3: Provide secondary medical care		
• Manage common conditions requiring inpatient care in appropriate settings • Maintain a clinically relevant plan of fluid, electrolyte and blood product use with relevant pathology testing • Perform secondary care diagnostic and therapeutic procedures • Recognise and respond early to the deteriorating patient • Communicate effectively with the healthcare team, including effective handover • Anticipate and judiciously arrange safe patient transfer to other facilities • Undertake early discharge planning, involving the multidisciplinary team		
Domain 4: Respond to medical emergencies		
Competencies	Core Generalist	Advanced Specialist—Emergency Medicine
Recognise severe, acute and life-threatening conditions and provide initial resuscitation and stabilisation	Recognises, provides and coordinates care for acutely ill patients within local community. Stabilises emergency presentations with support of an experienced colleague onsite or offsite if required.	Recognises, provides and coordinates care for acutely ill patients within local and regional networks. Stabilises critically ill patients and provides primary and secondary care for emergency conditions independently.
Provide definitive emergency management across the lifespan in keeping with clinical need, own capabilities, local context and resources	Develops and implements appropriate diagnostic and therapeutic management plans for common acute conditions. Arranges appropriate transitions of care.	Provides definitive emergency medical care including emergency medicine procedural interventions for individual patients across all presentations and all age groups. Liaises with other specialty services for higher complexity conditions if necessary.
Perform emergency diagnostic and therapeutic procedures	Institutes protection of the airway and adequate oxygenation when the airway and/or ventilation is compromised. Provides initial time-critical management (with onsite or distant guidance if required) of shocked patients including alternate vascular access, timely fluid and/or transfusion management, relevant therapeutic measures, ancillary life support measures, interpretation of common investigations, timely admission or onward referral for definitive management.	Institutes protection of the airway including advanced airway techniques and adequate oxygenation when the airway and/or ventilation is compromised, including use of non-invasive and invasive mechanical ventilators. Provides initial time-critical management of shocked patients including difficult vascular access, inotrope support, timely fluid and/or transfusion management, relevant therapeutic measures, and ancillary life support measures. Interprets complex investigations including point-of-care ultrasound, timely admission or onward referral for definitive management. Provides complex pain management including procedural sedation, continuous infusions, regional anaesthesia and nerve blocks.

Interpret common pathology, imaging and other diagnostic modalities relevant to emergency management	Recognises important features of common injuries and pathological conditions on ECG, pathology and radiology. Recognises the need for transfer for higher-level care and diagnostics.	Recognises important features of less common injuries and pathological conditions on ECG, pathology, radiology and sonography. Arranges timely transfer for higher-level care and complex diagnostics.
Activate or support emergency patient retrieval, transport or evacuation when needed	Coordinates preparation of patients requiring transfer. Communicates effectively with retrieval and higher-level medical services for timely transfer and ongoing care.	Advises on clinical management and logistics of inward transfers. Prepares patients for transfer. Undertakes invasive monitoring and other procedures necessary for transfer. Assists with inward and outward transfers if required.
Provide interprofessional team leadership in emergency care that includes resource allocation, risk management assessment, quality assurance, team debriefing and self-care	Leads an interprofessional team to implement advanced life support for children and adults.	Provides leadership and management for a rural emergency department. Establishes and maintains appropriate emergency department systems and procedures.
Utilise assistance and/or guidance from other specialist practitioners and services as required	Effectively evaluates the role of colleague support in managing patient outcomes. Has awareness of own skills/knowledge limitations and local resources.	Knows when and how to seek advice and assistance. Has an established network of colleagues and other specialist practitioners to provide timely guidance and advice on complex patient management. Has detailed knowledge of local skills and resources limitations.
Domain 5: Apply a population health approach		
• Analyse the social, environmental, economic and occupational determinants of health that affect the community • Describe the local community profile, including health, age groups, ethnicity, occupations • Apply a population health approach that is relevant to the community profile • Integrate evidence-based prevention, early detection and health maintenance activities into practise at a population level • Fulfil reporting requirements in relation to statutory notification of health conditions • Participate in disaster planning and implementation of disaster plans, and post-incident analysis and debriefing		
Domain 6: Work with Aboriginal, Torres Strait Islander and other culturally diverse communities to improve health and wellbeing		
Competencies	Core Generalist	Advanced Specialist Course—Aboriginal and Torres Strait Islander Health
Understand diverse local health practices and their benefits for communities	Sound knowledge of health practices and benefits for communities.	Knowledge of health practices in local community Knows how these health practices are accessed, partnered with and utilised
Apply principles of partnership, community ownership, consultation, capacity building, reciprocity and respect to healthcare access and delivery, health surveillance and research	Works alongside culturally diverse groups to address health issues.	Forms meaningful collective action partnerships with the community Engages the resources available in the health care team and the local community to improve outcomes of care Seeks out and engages regularly with a cultural mentor

Deliver culturally safe care to Aboriginal and Torres Strait Islander peoples and other cultural groups	Delivers culturally safe care, taking into account their own cultural values and those of different cultural groups. Reflects and seeks feedback on own provision of culturally safe care. Engages interpreters and community contacts as appropriate	Takes a proactive approach working with local community and staff, demonstrating leadership to advocate for culturally safe working clinics free of racism. Contributes to systemic evaluation to improve the provision of culturally safe care. Teaches, mentors and clinically supervises other doctors in how to conduct themselves in a culturally safe and effective manner.
Domain 7: Practise medicine within an ethical, intellectual and professional framework		
• Work within relevant national and state legislation and professional and ethical guidelines • Keep clinical documentation in accordance with legal and professional standards • Provide cost-effective patient care through judicious use of resources by balancing own duty to individual patients with own duty to society • Manage, appraise and assess own performance in the provision of medical care for patients • Participate in quality and safety improvement and risk management activities • Teach and clinically supervise health students, junior doctors and other health professionals • Recognise unprofessional behaviour and signs of the practitioner in difficulty among colleagues and respond according to ethical guidelines and statutory requirements • Contribute to the management of human and financial resources within a health service • Provide leadership in professional practice • Engage in continuous learning and professional development • Critically appraise and apply relevant research		
Domain 8: Provide safe medical care while working in geographic and professional isolation		
Competencies	Core Generalist	Advanced Specialist—Emergency Medicine
Demonstrate resourcefulness, independence and self-reliance while working effectively in geographic and professional isolation	Independently provides effective clinical care when distant from medical services.	Provides comprehensive care of emergency, acute and chronic illness presentations in the context of professional isolation, in concert with community expectations and effective public health strategies.
Develop and apply strategies for self-care, personal support and caring for family	Ensures time for other interests outside of clinical medicine. Looks after own health care needs.	
Establish a community network while maintaining appropriate personal and professional boundaries	Considers continuity of care and importance of long-term doctor–patient relationship in small town context. Considers need for confidentiality in small and close community town context.	Works with communities to build capacity.
Establish, maintain and utilise professional networks to assist with safe, optimum patient care	Has developed an ongoing support network. Maintains regular contact with network through face-to-face and virtual means.	Takes a leadership role in local healthcare, including ensuring that local health professionals are working to the limits of their scope of practice and through utilisation of communication technology to access specialist support.
Provide safe, effective clinical care when away from ready access to specialist medical, diagnostic and allied health services	Works in partnership with the patient and with consideration of own expertise, local resources, support and transport to provide access to specialist medical, diagnostic and allied health services Manages time and patient priorities working across facilities such as general practice,	Ensures that policies and procedures are in place to ensure optimum care, pre-hospital care, retrieval care and appropriate advice when required. Regularly reviews policies and procedures and oversees rehearsal of clinical management through scenario and skills practice.

	hospital, nursing home and ED. Recognises and manages conditions more commonly found in rural environments.	
Use information and communication technology to assist in diagnosis, monitoring and provision of medical care or to facilitate access to specialised care for patients	Independently uses information and communication technology to provide medical care or to facilitate access to specialised care for patients.	
Identify and acquire extended knowledge and skills as may be required to meet healthcare needs of the local population	Has developed skills and knowledge in response to community needs.	Has extended skills and knowledge in response to community need.

Abbreviations

ECG = echocardiogram, ED = emergency department

Sources

Australian College of Rural and Remote Medicine[99]
Australian College of Rural and Remote Medicine[101]
Australian College of Rural and Remote Medicine[102]
Australian College of Rural and Remote Medicine[103]
Australian College of Rural and Remote Medicine[104]
Australian College of Rural and Remote Medicine[105]
Australian College of Rural and Remote Medicine[106]

In addition to extracting the competencies of these Advanced Specialised Training courses, the knowledge and skills for the Remote Medicine Course have been extracted as some of these may be generic to all specialties working rurally (Table C10).

Table C10: Knowledge and skills learned as part of Advanced Specialised Training in Remote Medicine at the ACRRM

Knowledge
1. Discuss public health issues relevant to remote communities, including: • infrastructure, public health surveillance and procedures • disease control initiatives, environmental health issues • water supply, sewerage systems, water testing • power supply and generator maintenance • triage and mortuary requirements for postmortems for forensic and coroner cases
2. Describe occupation and personal health and safety issues relevant to remote communities, including: • occupational medicine issues • personal safety issues and security
3. Identify links between social factors and health outcomes in a community, including: • impact of poverty, nutrition, housing, education and employment opportunities, family relationships, social support, transport and control over one's life • Barker hypothesis and health outcomes in adulthood • principles of ethical practice in a remote community, including: o respecting different cultural frameworks for determining ethical behaviour o understanding the ethical principles underlying the care of chronically ill patients in remote practice—informed consent, confidentiality, autonomy and issues associated with dying o respecting a patient's right to refuse, or vary treatment, o understanding local issues that might impact upon the decision to treat a person locally or refer
4. Discuss the nature of remote communities and of medical practice in these environments, including: • sociology of remote communities • treating self, family, pets and those you know and work with • having a greater responsibility of care • using different protocols appropriately • management skills and professional networks • strategies for reducing professional and personal isolation and burnout
5. Detail protocols for establishing a donor panel to use in an emergency, including managing a walk-in blood bank to take blood by donation
6. Identify how to arrange for locum cover for planned leave and emergencies
Skills
1. Provide primary, secondary and emergency care for a remote community
2. Provide effective clinical care when away from ready access to specialist medical, diagnostic and allied health services
3. Identify community health needs and develop additional skills required to meet these
4. Diagnose and manage a remotely located patient over the telephone or radio, including: • assessing the capabilities of the person with the patient and ascertaining their understanding of the problems and the logistics • taking a comprehensive history including where language may be a communication barrier • giving appropriate instructions to nurses, Aboriginal health workers, other healthcare workers, and people with no medical training, including administration of medication and other treatments e.g. from Royal Flying Doctor or ship medical chest • assessing the logistics and resources involved in managing or stabilising and transporting a patient if required • referring the patient appropriately as per protocols
5. Stabilise, prepare, evacuate or retrieve patients, including: • familiarisation with local procedures and key contacts for aeromedical transfers • performing acute management and triage • ability to maintain the patient during retrieval, including understanding of altitude physiology and stabilisation

• improvisation and novel methods of medical care • conducting a risk management assessment • managing logistical and resource considerations • accessing a specialist network and environment • lighting an airstrip at night and checking the airstrip • understanding daylight and weather reports and providing these to retrievers
6. Advocate on behalf of remote communities, including: • understanding its cultural, social, political and familial contexts • talking to government and making submissions to government agencies • administration and healthcare planning • adopting a direct advocacy role where appropriate • participating in relevant working parties and committees • being multiskilled and community-aware • undertaking an educational role, i.e. empowering the community and training staff and support colleagues to encourage their continued service.
7. Maintain a personal and professional balance in a remote context including: • dealing with boundary issues, especially when caring for patients who might also be friends, family, or colleagues • showing an ability to fill multiple roles, such as professional colleague, friend, confidant, manager, parent, administrator, doctor • being critically self-reflective, with a demonstrated capacity to learn from mistakes through reflection and feedback • undertaking critical incident debriefing as required • dealing with ethical dilemmas of isolation and community enmeshment, especially following a traumatic incident or natural disaster. • planning breaks for recreational and professional development leave • seeking professional assistance and support when required
8. Competent and independent performance of the procedural skills listed in the Procedural Skills Logbook and those skills specific to individual remote community or type of health service

Source
Australian College of Rural and Remote Medicine[104]

The Faculty of Medicine at the University of Queensland has established 8 Mayne Academies responsible for promoting research and education in each of their respective disciplines.[107] One of these is 'The Mayne Academy of Rural and Remote Medicine'. The Rural and Remote Medicine placement provides the opportunity for third-year medical students to understand and experience clinical practice among populations and/or communities that face equity challenges with health service delivery. The technical and non-technical skills expected from graduates of this course are outlined in Table C11.

Table C11: University of Queensland Rural and Remote Medicine learning objectives

Doctor and society
• describe the context and general nature of rural and remote medical practice • explain the diversity of conditions seen in rural practice • recognise the unique health concerns and illnesses in the rural environment • identify rural diseases including zoonoses • appreciate the depth of clinical responsibility in rural practice • understand technologies that support a rural practitioner (telehealth, social media)
Culture
• identify the implications of rural culture, values and lifestyle for rural and remote medical practice

• develop cultural awareness of people of Indigenous background and understand the impact on health of this heritage • appreciate rural community activities including the importance of differences as compared to metropolitan or major urban centres
Clinical management and reasoning
• diagnose and manage common rural health practice problems • apply clinical reasoning to balance the benefits of transfer with benefits of local treatment • manage with raised capacity uncertainty in clinical practice
Clinical skills and procedures
• acquire experience in procedural skills • acquire experience in consultation skills • experience complete continuity of care in the rural context • organise transfer out via aeromedical and road retrieval services • develop a framework to gain and maintain confidence in performing lifesaving emergency procedures that are seldom required (defibrillation, intraosseous, chest drain)
Teamwork and ethics
• understand and appreciate interprofessional healthcare and services in the rural environment • appreciate the significance of the professional and ethical role of the rural doctor, particularly in relation to confidentiality in the local community • behave in ways that acknowledge the ethical complexity of practice and follow professional and ethical codes

Source
The University of Queensland[108]

Aotearoa New Zealand

Searches of the New Zealand Association of General Surgeons (NZAGS) curriculum revealed no mention of rural or remote surgery except for in the General Surgery technical curriculum module where, under head/brain, it states that knowledge of craniotomy and craniectomy is required in late surgical education and training (SET) for rural practice.[109] In its strategic plan for 2017–2020, NZAGS states that it is to ensure all trainees experience a rotation to a rural position.[110]

Rural Hospital Medicine (which is a sub faculty of the Royal New Zealand College of General Practitioners) in Aotearoa New Zealand has a curriculum divided into 6 domains that encompass the rural hospital context, communication, clinical expertise, professionalism, scholarship, and leadership and management.[111] The core capabilities, technical and non-technical, listed under each of these domains are listed in Table C12.

The key performance areas, as listed on The Royal New Zealand College of General Practitioners website, include:[111]

- understand the context of rural hospital care
- communicate with patients and other professionals in ways that facilitate optimal patient care

- use clinical judgement to assess, diagnose, treat and manage patients in a rural hospital context
- demonstrate cultural competency in the rural context
- manage clinical uncertainty
- work effectively with others to facilitate optimal care in a rural setting
- make appropriate and safe decisions regarding referral and transfer of patients and recognise the limits of personal expertise
- use available resources wisely to maximise health outcomes
- recognise and address inequities in health access and outcomes
- develop and maintain personal and professional integrity and behaviours that support effective patient care
- participate in and contribute to the development of systems for the provision of quality care
- contribute to population health
- demonstrate leadership and management skills in the rural hospital context
- undertake continued professional development as a rural hospital specialist
- contribute to the profession of rural hospital medicine.

These key performance areas are assessed through a variety of methods such as academic papers, reflective portfolios, supervisor reports, StAMPS (Structured Assessment Using Multiple Patient Scenarios) and fellowship assessment visits.[111]

Table C12: Capabilities required under the 6 domains listed in the Rural Hospital Medicine Core Curriculum Statement of the Royal New Zealand College of General Practitioners

Domain 1
Rural hospital context
Fellows of the Division of RHM are able to: • understand and apply the principles of Te Tiriti o Waitangi/Treaty of Waitangi to RHM. • understand the role of the rural hospital in the broader continuum of health care. • recognise that all New Zealand rural hospitals are unique in the range and level of services they provide to their community. • understand the issues surrounding the appropriate resourcing of rural hospitals, including diagnostic services, equipment, drugs and personnel. • act as an effective member of the rural hospital multidisciplinary team. • develop effective working relationships with other providers such as GPs, visiting specialists and referral-hospital staff. • provide direct and distant clinical supervision and support for other rural health care personnel. • provide both acute and longitudinal care of patients in the rural hospital in collaboration with primary care and specialist services.

- provide effective and safe clinical care where diagnostic resources are not readily available.
- refer appropriately to the referral hospital with an understanding of those issues that can impact on the decision to treat locally or refer, including patient (and family/whānau)
- preference, resource availability, transport availability, and potential benefits and harms.
- communicate effectively with the patient and their family/whānau when referral is being considered, to provide relevant information such that they are able to make an informed decision about their desired location and level of care.
- develop an understanding of the disease incidence, treatment patterns and referral rates of the local hospital, and how these may differ from other rural hospitals.
- contribute to wider aspects of rural hospital function, including but not limited to strategic planning, accreditation processes, teaching and disaster management planning, and contribute to national awareness of rural hospital function.
- demonstrate resourcefulness, independence and self-reliance while working effectively in geographical, social and professional isolation.
- become effective members of rural communities.
- practise in a manner that recognises the realities of rural health and community life.

Health equity and Māori health capabilities

Fellows of the Division of RHM are able to:

- understand tikanga Māori values, holistic models and concepts of health and healthcare, and the strengths derived from these.
- develop expertise in consultation skills with Māori and the ability to work within tikanga Māori models of care.
- understand the epidemiology of Māori health in New Zealand and the relationship to common disease patterns in the wider New Zealand community.
- recognise, assess and manage health issues in rural Māori communities.
- understand the role of Māori healthcare workers in the delivery of healthcare to Māori people.
- work with rural communities and health services to address inequities in health access and outcomes for rural Māori patients.
- develop an understanding of the cultural, social and political values of the rural hospital and the community it serves.
- work with culturally diverse and disadvantaged groups to address barriers to access to health services.

Domain 2

Communication

Fellows of the Division of RHM are able to:

- develop rapport and trust with patients and their families/whānau, establishing patient-centred relationships that respect their needs, concerns, beliefs and expectations.
- obtain informed consent from the patient for any assessment, treatment or procedure.
- communicate findings of clinical assessment effectively and sensitively to the patient and their family/whānau.
- make use of official interpreters, key hospital or community contacts and/or interpreter tools/devices where language barriers exist between the medical team and the patient and their family/whānau.
- educate the patient and their family/whānau about their clinical condition/s, provide relevant information and negotiate management plans, including short- and long-term goals.
- communicate effectively with other health professionals and providers to ensure best possible outcomes for patients, including effective clinical handover to team members and the primary care provider, timely and quality communications with involved parties where transfer is anticipated, and shared-care arrangements with referral-hospital health professionals, with clear understandings of each other's role and responsibilities.
- make appropriate use of e-health and telehealth resources to provide effective patient care and facilitate access to specialist knowledge and advice.
- effectively manage challenging situations, such as patient aggression, grief, anger and/or confusion; misunderstandings; conveying bad news; and formal and informal complaints.

Cultural competence

Fellows of the Division of RHM are able to:

- understand culturally safe practice and reflect on their own assumptions, cultural beliefs and emotional reactions in providing culturally safe care.
- develop the appropriate attitudes, knowledge and skills to work successfully with patients of different cultural backgrounds.

- relate effectively to patients and families/whānau of diverse life stages, cultural backgrounds, gender identity, sexuality, socioeconomic status, and personal (including religious and spiritual) beliefs.
- understand how a patient's cultural characteristics or issues might impact on disease prevalence, clinical presentation, access to health services, clinical management, patient outcomes and the doctor–patient relationship.
- contribute to creating a culturally inclusive environment at the rural hospital.
- engage with the local rural community, with respect for its norms and values.

Domain 3

Clinical expertise

Fellows of the Division of RHM are able to:

- recognise the levels and limits of their own knowledge and skills in relation to the different specialty areas.
- understand the pathophysiological basis of diseases that commonly present to rural hospitals and the pharmacology of medications used in the treatment of these diseases.
- understand the rationale, risks and benefits for the procedural techniques commonly performed in rural hospital practice.
- understand the uses and limitations of imaging techniques.
- undertake early triage, assessment and management of patients with acute or life-threatening conditions.
- take an informative history, conduct a competent physical examination, undertake relevant investigations and procedures, and determine an appropriate management plan for patients presenting to rural hospitals.
- refine the working diagnosis over time through clinical reasoning and the use of investigations, while co-managing the risks associated with uncertainty, such as incorrect diagnosis and management.
- understand the likely course of major illnesses and use this together with knowledge of their own and local resource limitations to make appropriate, timely and safe decisions to refer and transfer the patient.
- decide on the appropriate means of transport, accompanying escort and resources required for safe inter-hospital transfer, taking into consideration the clinical situation, service and transport capabilities, patient (and family/whānau) preferences and local geography.
- develop skills in the management of complex cases with limited resources, including diagnostic imaging and laboratory services, and allied health, specialist medical and nursing staff.
- use evidence-based medicine to guide clinical decision-making.
- understand the importance of continuity and coordination of care.
- undertake early multidisciplinary discharge planning.

Domain 4

Professionalism

Fellows of the Division of RHM are able to:

- demonstrate attitudes and behaviour to a standard expected of a medical practitioner.
- display insight into and knowledge of the impact of their own attitudes, values and behaviour on their clinical practice and professional relationships.
- recognise the impact of their professional role on self and family, and develop and apply strategies for self-care, personal support and caring for family.
- demonstrate cultural competence in all aspects of practice.
- demonstrate a commitment to the principles of coordination of care and the provision of continuity of care.
- be aware of duty of care issues arising from providing medical care to self, family, friends, colleagues and acquaintances, such that care is provided in a professional and ethical manner.
- understand and reflect on issues around confidentiality, privacy, and the involvement of family/whānau in patient care in rural communities, and the importance of establishing protocols that outline confidentiality and integrity requirements to staff.
- ensure valid and informed consent is obtained when undertaking assessment and procedures.
- advocate for patients and colleagues where necessary.
- adhere to medicolegal requirements of patient record management and maintain timely and accurate patient documentation in hospital records, including drug prescription and administration and follow-up of diagnostic results.
- recognise and manage clinical risk in all aspects of patient care and develop robust strategies for safely dealing with clinical uncertainty.
- develop an understanding of the incidence and effects of medical error in the rural hospital context and the systems designed to monitor, investigate and reduce associated harm.

• understand the structures of institutional and clinical governance within the rural hospital and actively participate in them. • plan for and engage in professional development activities, including planning the direction of their personal career. • display a commitment to self-directed learning, continuing education, peer review and the conduct of quality assurance activities. • participate as a medical advocate in the design, implementation and evaluation of interventions that address determinants of population health. • provide collegial support for peers, including formal Medical Council of New Zealand collegial relationships and supervision for other doctors working in the scope of RHM. • develop professional networks and take on roles that contribute to the profession.
Domain 5
Scholarship
Fellows of the Division of RHM are able to: • appraise and reflect on personal clinical performance, seek and identify ways to meet personal learning needs, engage in the learning process and evaluate outcomes. • identify and acquire extended knowledge and skills as may be required to meet health care needs of the local population. • find and make use of available resources for patient information and support, such as print, electronic information, and local organisations and support groups. • develop skills and knowledge in research methodology and critical appraisal to inform evidence-based clinical decision-making. • facilitate the education and training of undergraduate trainees, junior doctors and other health professionals. • contribute to the development of rural hospital clinical guidelines and continuing system improvements within their hospital/s, and contribute to the development of regional and national guidelines. • where appropriate, undertake research, publish and present papers relevant to RHM. • where appropriate, undertake academic leadership roles.
Domain 6
Leadership and management
Fellows of the Division of RHM are able to: • contribute medical expertise and leadership to the hospital team. • develop and maintain a good working relationship with primary care teams, local referral-hospital acute services, ambulance services, mental health services and other individuals or agencies. • demonstrate commitment to teamwork, collaboration with specialist teams, and coordination and continuity of care. • engage with multidisciplinary colleagues in systems and infrastructure management and planning, demonstrating leadership where appropriate. • use leadership skills to initiate appropriate change to enhance the quality of care for patients. • assist in the development of hospital protocols and policies. • participate in institutional quality and safety improvement and risk management activities. • participate in the development and implementation of disaster plans, post-incident analysis and debriefing. • contribute to the management of human and financial resources within a health service. • recognise the difference between management and governance in rural hospitals and contribute actively within governance teams.

Abbreviations
GP = general practitioner, RHM = rural hospital medicine
Source
The New Zealand College of General Practitioners[112]

Canada

The Canadian Association of General Surgeons (CAGS) website lists 2 General Surgery training residencies that note a rural rotation or rural focus.

Northern Ontario School of Medicine General Surgery Residency Program

The Northern Ontario School of Medicine General Surgery Residency Program is described on the CAGS website as a small program with more surgeons willing to teach than residents available to be taught. As such, residents are often welcome in the operating room of other surgical specialties such as Urology, Vascular Surgery, Obstetrics and Gynaecology. The location of Northern Ontario is described as being unique as it spans such a large geographic area and the comorbidities of the population are diverse, given the variable access to healthcare of the population.[113]

The residents spend the majority of their first year in Sudbury or Thunder Bay.[114] Following this, rotations are available at the following community sites: Sault-Ste-Marie, Huntsville, North Bay, Timmins, Ottawa and Hamilton.[114] Residents in the program are typically the only residents on site and have the opportunity to work with all surgeons at the site. The surgeons working at these sites are reported to have a broader scope of practice, with the General Surgery residents exposed to caesarean sections, carpal tunnel release, vasectomies and other procedures.[113] Learning objectives across the 5-year program include a variety of technical skills and competencies, and 'intrinsic skills' in professionalism, health advocacy, scholarship, communication, collaboration and management/leadership.[115]

Rural Ontario Medical Training Program (ROMP)

The Rural Ontario Medical Training Program (ROMP) offered by the University of Toronto is described on the CAGS website as a residency program with a rural focus, which organises both core and elective rotations within the ROMP region.[116,117]

United Kingdom

The Viking Surgeons are an association of remote and rural surgeons working in rural general hospitals in the Highlands and Islands of Scotland, rural areas of Northern Ireland, the Isle of Man and Iceland.[118] Their website notes that there is no subspecialty in remote and rural surgery recognised in the UK but several posts in the east of Scotland are available for 6-month rotations in rural and remote surgery. It further notes that relevant training can be obtained for individuals studying General Surgery who are interested in remote and rural surgery. Trainees interested in remote and rural surgery can spend part of

their core training (2 years in total) in emergency medicine, Orthopaedics and Trauma, Urology or Cardiothoracic Surgery. Following this, specialist training years 3 to 6 can be undertaken for Breast Surgery, Vascular Surgery and Paediatric Surgery. A remote and rural fellowship is available for 1–2 years in Inverness and Aberdeen.[119]

In 2016, the RCSEd published the report *Standards Informing Delivery of Care in Rural Surgery*, which made training recommendations for rural general hospitals in Scotland while noting that the principles in the report may extend to the rest of the UK.[120] This included the recommendation that provision should be made for general surgery trainees in Scotland to have the opportunity to spend 4 months in a rural general hospital.[120] It is unclear whether these recommendations were implemented.

In November 2018, the RCSEd launched the Faculty of Remote and Rural Healthcare. In 2020 it incorporated humanitarian into its structure to become the Faculty of Remote, Rural and Humanitarian Healthcare (FRRHH).[121] The Faculty of Remote, Rural and Humanitarian Healthcare is currently developing a capabilities framework for remote, rural and humanitarian healthcare, which will be relevant across multiple roles, environments and geographical locations. The framework will form the basis for education and assessment. It is anticipated that it will be launched by the end of 2021.[122]

The overarching aims of the framework are to:[123]

- define the scope of practice and capabilities for both medical and non-medical personnel delivering healthcare in remote and rural environments
- produce a structured and inclusive framework to practically regulate the scope of practice and capabilities of these medical and non-medical personnel
- inform and use appropriate definitions of remote and rural healthcare
- inform the process of assessing and awarding FRRHH membership or Fellow status (and post-nominals) to individuals from January 2021 until the development of formal assessments/examinations
- provide external education course providers with a suitable foundation with which to align, to assist with quality assurance and accreditation by FRRHH

- inform the development of clinical examinations in remote and rural healthcare
- provide healthcare teams with a foundation against which their skills can be mapped to ensure patient safety and healthcare practitioner support
- provide a set of capabilities that can be applied to different roles, skill levels and contexts within the remote and rural healthcare environment.

ISCP has recently published a new General Surgical Curriculum (4 August 2021) which, in addition to trainees in UK, will also be followed by trainees in General Surgery in the Republic of Ireland. On page 6, under phase 2 of General Surgery training, it notes an optional module will be available in Rural and Remote Surgery allowing trainees to gain exposure in areas that may be pursued further with some post-certification training: 'such training will develop competencies in the interdisciplinary Rural and Remote Surgery, where General Surgery contributes only 30% of the scope of the role.[124]

The knowledge and clinical skills required for the rural surgery module are outlined in Table C13. No rural module was identified in the curriculums of any of the other surgical specialties listed.

Table C13: Knowledge and technical skills required for the Remote and Rural Surgery module of the General Surgery curriculum, August 2021 (UK Intercollegiate Surgical Curriculum Programme)

Remote and Rural	Phase 2
Cranial Trauma	
Management of head-injured patients Competency in the management of head-injured patients	*
Craniomaxillofacial Trauma	
Facial fractures Competency in the assessment of a patient with suspected facial fracture and appropriate referral	*
Obstetrics and Gynaecology	
Obstetrics Competency in the organisation and management of delivery including caesarean section and its complications Gynaecology Competency in the management of common gynaecological emergencies and the management of early pregnancy complications	* *
Ophthalmology	
Ability to deal with common minor eye emergencies and refer serious problems appropriately	*
Otolaryngology	
Paediatric otolaryngology Competency in the initial management of children with ENT problems Adult otolaryngology Competency in the assessment and initial management of patients with neck pathology Otology Competency in the assessment and initial management of patients with ear problems Rhinology	* * *

Competency in the assessment and initial management of patients with nasal trauma and epistaxis	*
Plastic surgery	
Competency in the assessment and initial management of patients with burns	*
Trauma and Orthopaedics	
Trauma Competency in the assessment and initial management of patients with soft tissue and bony injuries of the limbs Orthopaedics Competency in the assessment and initial management of patients with acute presentation of orthopaedic pathology	* *
Urology	
Stone disease Competency in the assessment and initial management of patients presenting with renal tract calculi Urinary tract obstruction Competency in the assessment and initial management of patient presenting with lower urinary tract symptoms or retention Urinary tract infections Competency in the assessment and management of patients with urinary tract infection and genital tract infections Urological oncology Competency in the initial assessment and management of patients presenting with urological cancer Andrology Competency in the assessment and counselling of a man requesting a vasectomy Emergency urology Competency in the assessment and initial management of patients presenting with acute urological disease Trauma to the urinary tract Competency in the assessment and initial management of patients presenting with genitourinary trauma	* * * * * * *
Technical skills	
Craniotomy for supratentorial extradural haematoma	1
Closed manipulation of nasal bones and septum	1
Emergency lower segment caesarean section	1
Manual removal of retained placenta	1
Exploration of genital tract, cervical laceration repair	1
EUA, repair perineal trauma	1
Evacuation of retained products of conception	1
Laparoscopic and open salpingectomy for ectopic pregnancy	1
Diagnostic laparoscopy	2
Laparoscopy and open oophorectomy for torsion	1
Nasal cautery	2
EUA nose	2
Appropriate nasal packing in a child	2
Endotracheal intubation	3
Suturing of pinna	2
Split skin graft	1
Manipulation under anaesthetic of appropriate fracture	2
Reduction of dislocations dependent on site	2
Trigger finger release	2
Aspiration/injection knee joint	2
Ingrowing toenail operation	2
Endoscopic fragmentation of bladder calculi	1
Open removal bladder calculi	1

Rigid cystoscopy, retrograde ureterogram, insertion of JJ stent	2
Bladder neck incision	1
Percutaneous insertion of suprapubic catheter	2
Optical urethrotomy	1
Transurethral resection of the prostate	1
Flexible cystoscopy	3
Transrectal ultrasound and biopsy	1
Cystoscopy and biopsy	2
Cystoscopy and diathermy bladder lesion	1
Vasectomy	2
Surgical exploration for torsions of testis, with fixation	2
Circumcision	3

Abbreviations

ENT = ear, nose and throat, EUA = examination under anaesthetic

Notes

* indicates that knowledge and clinical skills are required to the level appropriate with the phase of training within any given module. Procedures highlighted in bold represent index cases.

Source

The Intercollegiate Surgical Curriculum Programme[124]

Appendix D. Rural-focused post-fellowship training

Aim

To identify existing rural-focused post-fellowship training programs for surgeons in the countries already described in the rapid review. Where possible, details of the program (i.e. length of training and training location), as well as the technical and non-technical skills taught will be described briefly.

Information regarding post-fellowship training positions, grants and/or scholarships designed to further develop skills for rural surgery will also be reported.

The countries of interest include Australia, Aotearoa New Zealand, Canada, the UK, Ireland, and the US.

Search strategy

Peer-reviewed literature and grey literature were searched using the rapid and pragmatic methodology described below.

Peer-reviewed literature search strategy

One reviewer conducted a systematic literature search of 2 biomedical databases (Medline and Embase) to identify relevant literature. Searches were conducted on 30 August 2021 and were not limited by date. No other methodological filters were applied to the searches. Search terms and outputs are provided in Table D1 and Table D2.

Table D1: Search terms used in Medline database

#	Term	Hits
1	exp Curriculum/	90,536
2	exp Education, Medical, Graduate/	74,920
3	curricular.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word,	6,333

#	Term	Hits
	organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	
4	curriculum.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	101,917
5	curricula.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	17,049
6	education.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	962,850
7	program.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	539,549
8	programs.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	401,634
9	programme.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	105,432

#	Term	Hits
10	programmes.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	68,077
11	training.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	493,791
12	skill.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	45,996
13	skills.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	192,308
14	course.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	588,437
15	courses.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	78,586
16	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15	2,561,502
17	exp Fellowships and Scholarships/	8,125

#	Term	Hits
18	Fellowship.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	11,123
19	Fellowships.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	9,668
20	Post fellowship.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	93
21	17 or 18 or 19 or 20	16,636
22	exp Rural Health/	23,689
23	exp Rural Health Services/	13,431
24	rural.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	179,741
25	22 or 23 or 24	179,741
26	exp General Surgery/	39,832
27	surgery.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	2,799,838
28	surgical.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism	1,439,571

#	Term	Hits
	supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	
29	surgeon.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	100,287
30	surgeons.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	146,425
31	26 or 27 or 28 or 29 or 30	3,273,606
32	16 and 21 and 25 and 31	59

Database
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations, Daily and Versions (R) 1946 to 27 August 2021
Search date
30 August 2021

Table D2: Search terms used in Embase database

#	Term	Hits
1	exp Curriculum/	93,362
2	exp Education, Medical, Graduate/	333,478
3	curricular.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	8,241
4	curriculum.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	115,568

#	Term	Hits
5	curricula.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	20,997
6	education.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1,243,238
7	program.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	991,188
8	programs.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	394,758
9	programme.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	146,239
10	programmes.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	84,744
1	training.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism	697,802

#	Term	Hits
	supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	
12	skill.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	150,275
13	skills.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	225,601
14	course.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1,193,616
15	courses.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	109,656
16	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 15 or 16	3,896,872
17	exp Fellowships and Scholarships/	333,478
18	Fellowship.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	17,352
19	Fellowships.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word,	3,648

#	Term	Hits
	organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	
20	Post fellowship.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	197
21	15 or 16 or 17 or 18	344,799
22	exp Rural Health/	1,475
23	exp Rural Health Services/	14,113
24	rural.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	209,364
25	20 or 21 or 22	209,364
26	exp General Surgery/	17,265
27	surgery.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	3,784,011
28	surgical.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1,782,659
29	surgeon.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	244,789

#	Term	Hits
30	surgeons.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating subheading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	232,182
31	24 or 25 or 26 or 27 or 28	4,307,313
32	14 and 19 and 23 and 29	791
33	Limit 30 to exclude medline journals	53

Database
Embase 1974 to 27 August 2021
Search date
30 August 2021

Grey literature search strategy

Grey literature was obtained via 2 methods to provide details on rural-focused post-fellowship training programs, positions, grants and/or scholarships in Australia, Aotearoa New Zealand, Canada, the UK, Ireland and the US.

Method 1: Targeted website searches

The following list of colleges/associations/societies (Table D3) were searched via their website's search function (where possible) using the terms 'rural', 'provincial', 'regional', 'surgery', 'post fellowship' and 'fellowship'. If no search function was available, manual searching of the website was carried out.

Table D3: Targeted website searches conducted on 25 and 31 August and 1 and 6 September, 2021

Australia & Aotearoa New Zealand	Website
The Royal Australasian College of Surgeons	https://www.surgeons.org/
General Surgeons Australia	https://www.generalsurgeons.com.au/
New Zealand Association of General Surgeons	https://www.nzags.co.nz/
Australian Orthopaedic Association	https://www.aoa.org.au/
New Zealand Orthopaedic Association	https://nzoa.org.nz/
Australian & New Zealand Society of Craniomaxillofacial Surgery	https://www.anzscmfs.co.nz/
Neurosurgical Society of Australasia	https://nsa.org.au/
Australian & New Zealand Association of Paediatric Surgeons	https://www.anzaps.org/
Urological Society of Australian & New Zealand	https://www.usanz.org.au/
Australian & New Zealand Society for Vascular Surgery	https://anzvs.org.au/
Australian Society of Otolaryngology, Head and Neck Surgery	https://asohns.org.au/
New Zealand Society of Otolaryngology, Head and Neck Surgery	https://www.orl.org.nz/
Australian & New Zealand Hepatic, Pancreatic & Biliary Association	https://www.anzhpba.com/
Breast Surg Australian & New Zealand	https://www.breastsurganz.org/
Colorectal Surgical Society of Australia & New Zealand	https://www.cssanz.org/
Australian & New Zealand Gastric and Oesophageal Surgery Association	https://www.aanzgosa.org/
Australian Hand Surgery Society	https://www.ahssociety.org.au/
Australia & New Zealand Association for the Surgery of Trauma	https://anzast.org/
Provincial and territorial medical colleges of Canada	**Website**
Royal College of Physicians and Surgeons of Canada	https://www.royalcollege.ca/rcsite/home-e
The College of Physicians and Surgeons of British Columbia	https://www.cpsbc.ca/
The College of Physicians and Surgeons of Alberta	https://cpsa.ca/
The College of Physicians and Surgeons of New Brunswick	https://cpsnb.org/en/
The College of Physicians and Surgeons of Saskatchewan	https://www.cps.sk.ca/imis
The College of Physicians and Surgeons of Newfoundland and Labrador	https://www.cpsnl.ca/web/cpsnl
The College of Physicians and Surgeons of Ontario	https://www.cpso.on.ca/
The College of Physicians and Surgeons of Manitoba	http://www.cpsm.mb.ca/
The College of Physicians and Surgeons of Nova Scotia	https://cpsns.ns.ca/
Surgical colleges of the United Kingdom	**Website**

Royal College of Surgeons of Edinburgh	https://www.rcsed.ac.uk/
Royal College of Surgeons of England	https://www.rcseng.ac.uk/
Royal College of Surgeons of Ireland	https://www.rcsi.com/dublin
The Association of Surgeons of Great Britain and Ireland	https://www.asgbi.org.uk/
The Joint Committee on Intercollegiate Examinations	https://www.jcie.org.uk/Content/content.aspx
Intercollegiate Surgical Curriculum Programme	https://www.iscp.ac.uk/
Joint Committee on Surgical Training	https://www.jcst.org/
Viking Surgeons Association	https://www.vikingsurgeons.net/
Surgical college and university databases of the United States	Website
American College of Surgeons	https://facs.org/
Fellowship and Residency Electronic Interactive Database	https://www.ama-assn.org/residents-students/match/freida
The Fellowship Council	https://www.fellowshipcouncil.org/

Method 2: Targeted Google phrase searches

Targeted Google searches were conducted using the phrases listed in Table D4.

Table D4: Phrases searched in Google (www.google.com.au, search dates reported per search term)

Keyword	Phrase	Date searched
Rural	Post Fellowship rural surgery/surgical curriculum	30/8/21
	Post Fellowship rural surgery/surgical training	30/8/21
	Post Fellowship rural surgery/surgical programs	30/8/21
	Post Fellowship rural surgery/surgical programmes	30/8/21
	Post Fellowship rural surgery/surgical education	30/8/21
Provincial	Post Fellowship provincial surgery/surgical curriculum	30/8/21
	Post Fellowship provincial surgery/surgical training	30/8/21
	Post Fellowship provincial surgery/surgical programs	30/8/21
	Post Fellowship provincial surgery/surgical programmes	30/8/21
	Post Fellowship provincial surgery/surgical education	30/8/21
Remote	Post Fellowship remote surgery/surgical curriculum	30/8/21
	Post Fellowship remote surgery/surgical training	30/8/21
	Post Fellowship remote surgery/surgical programs	31/8/21
	Post Fellowship remote surgery/surgical programmes	31/8/21
	Post Fellowship remote surgery/surgical education	31/8/21
Regional	Post Fellowship regional surgery/surgical curriculum	31/8/21
	Post Fellowship regional surgery/surgical training	31/8/21
	Post Fellowship regional surgery/surgical programs	31/8/21
	Post Fellowship regional surgery/surgical programmes	31/8/21
	Post Fellowship regional surgery/surgical education	31/8/21

Study selection

Inclusion criteria were defined a priori to guide study selection for both the database and grey literature searches. Inclusion of English-language-only articles were based on their relevance to the PICO criteria (setting, intervention, comparator and outcomes) (Table D5).

For the peer-reviewed literature search, one reviewer screened all search results by title and abstract. A shortlist of potentially relevant articles was selected for full-text review by the same reviewer. A second reviewer checked a subset of the articles undergoing full-text review and discrepancies were resolved by discussion.

For the Google phrase search, only the first 3 pages of search results were screened for relevant documents from the countries of interest (Australia, Aotearoa New Zealand, Canada, the UK, Ireland and the US) by one reviewer.

Table D5: Study inclusion criteria

Setting	Australia, Aotearoa New Zealand, Canada, United Kingdom, Ireland, United States
Intervention	Rural-focused post-fellowship training programs, positions, grants and/or scholarships for surgeons
Comparator	Not applicable
Outcomes	Description of a rural-focused post-fellowship training program, position, grant and/or scholarship Technical skills taught in rural-focused post-fellowship training program Non-technical (professional skills) taught in rural-focused post-fellowship training program
Study design	Any study design which describes the elements of rural-focused post-fellowship training programs/positions/grants, including (but not limited to) commentaries and narrative reviews

Data selection and extraction

Data were extracted by one reviewer using a standardised data extraction template. Data were extracted for study author, year, location, details of the rural-focused post-fellowship training program/position/grant/scholarship and any other relevant key findings. A second reviewer double-checked a subset of extracted forms for accuracy.

Where details of rural-focused post-fellowship training programs were reported in an included peer-reviewed study, efforts were made to crosscheck this data with the website of the program/institution to ensure all details were up to date. Not all details were available online, in which case it was assumed that the data provided in the peer-reviewed study was accurate.

Quality appraisal of included studies

Not applicable.

Data synthesis

Due to the lack of quantitative data examining the elements of rural-focused post-fellowship training programs, quantitative synthesis was not possible. Program/position/grant/scholarship characteristics have been summarised narratively.

Summary of peer-reviewed findings

A combined total of 112 hits was obtained from the database searches. Of these, 25 underwent full text review. Only 2 studies were selected for inclusion as they reported details of post-fellowship training programs with a rural focus.[36,38] Both programs are offered in the US.

The Mithoefer Fellowship in Rural Surgery

The Mithoefer Fellowship in Rural Surgery (Bassett Healthcare, Cooperstown, New York) is for board-certified or board-eligible surgeons who desire more experience in surgical subspecialties that they believe would assist them to better serve their local communities.[36] It is a flexible fellowship that allows fellows to tailor the experience directly to their needs (e.g. more endoscopy experience or more Urology experience). No specific fellowship duration was reported in the study; however, it was noted that of the 7 fellows who had completed the fellowship, each spent an average of 7 weeks in training.[36] No other details with regards to the technical and non-technical skills taught were reported.

University of Utah Rural Surgery Fellowship

Moesinger and Hill[38] described the establishment of a one-year rural surgery fellowship offered by the University of Utah's department of surgery. The fellowship is available to senior-level residents or general surgeons who desire rural training. The program includes specific rotations in General Surgery, Thoracic Surgery, Gastroenterology, Urology, Gynaecology, Otolaryngology, Orthopaedic Surgery, Anaesthesia, Plastic and Reconstructive Surgery and Emergency Medicine.[38] No other details with regards to the technical and non-technical skills taught were reported.

Summary of grey literature findings

A total of 13 post-fellowship training programs/positions/grants/scholarships, with a rural focus, were identified in the grey literature. Of these, 8 were offered in Australia and/or Aotearoa New Zealand, 3 were offered in the UK and 2 in the US.

Australasia

Post-Fellowship Education and Training (PFET) Program in Rural Surgery

The PFET in rural surgery is offered by the General Surgeons Australia (GSA) Rural Training Committee (RTC) in Australia and Aotearoa New Zealand. The RTC selects fellows for the program and is responsible for accreditation of their hospital posts, as well as the supervision and assessment of the post-fellowship trainees.[125] The fellowship, is available to Fellows of RACS (FRACS) in General Surgery (or those who have recently sat/plan to sit their Fellowship exam in General Surgery).[126] Preference is given to candidates with a genuine interest in rural surgery (plus a history of commitment and initiative), as well as documented plans for future employment in a rural area.[125]

The program comprises 2 (12-month) rotations in 2 different specialties selected at the time of application for the fellowship. These rotations (known as Rural Training Pathways) may be in Breast Surgery, Colorectal Surgery, Endocrine Surgery, Hepatopancreatobiliary Surgery, rural (General) Surgery, General Surgery/Acute Care, Trauma/Emergency Surgery, Transplant Surgery, Upper Gastrointestinal (GI) surgery or other specialties such as Paediatric Surgery or Orthopaedic Surgery.[125] Each rotation has an allocated surgical supervisor to coordinate both formative and summative training assessments. The RTC determines the frequency of formal assessment reporting.[127] According to the GSA PFET Assessment of Rural Training Policy, regular formative assessments and feedback by consultant members of the rural unit are necessary to reinforce good performance and review underperformance. Fellowship trainees should also seek continual feedback and reflect on their own learning.[127]

Requirements for successful completion of the 2-year program, with a specific rural-focus, include attendance at the Provincial Surgeons of Australia annual scientific conference (which can be completed

in year 1 or 2 of training) and completion of a research assignment in the field of rural surgery.[125] The research must be accepted for publication in a peer-reviewed journal or book chapter with the trainee as the primary or major author and presented (orally or as a poster) at a recognised peer-reviewed national or international scientific meeting.[125]

The number of fellowships offered depends on the availability of accredited posts. The RTC will liaise with the appropriate specialty training boards for Fellows who have identified a rural training pathway in Colorectal, Hepatopancreatobiliary, Upper GI or Breast Surgery to secure accredited training positions, where possible. If accredited posts are not available in a chosen rural training pathway, candidates may defer commencement of the program. Successful completion of the program is not recognised as prior learning when applying for other PFET programs offered by the Colorectal Surgical Society of Australia and New Zealand, the Australian and New Zealand Hepatopancreatobiliary Association, the Australian and New Zealand Gastro Oesophageal Surgery Association, or Breast Surgery Australia and New Zealand, nor does it provide a pathway to membership in these societies.[125]

Specific program details with regards to technical or non-technical skills were not available.

Burns Fellowship

This fellowship at the Victorian Adult Burns Service at The Alfred Hospital is offered to FRACS of Plastic Surgery or General Surgery who have recently completed their training (or are expected to complete it in the coming year). The Burns Fellowship, although listed on the Board's website, is not directly or indirectly endorsed by the Australian Board of Plastic and Reconstructive Surgery. The Fellowship provides education and training to rural and regional clinicians in all aspects of burn care. Throughout the program, fellows will conduct rostered theatre lists, undertake care of elective and non-elective inpatients, and assess referrals from emergency departments and other hospitals, both in and out of hours. The fellowship also incorporates a research project, which may be clinical, basic science or translational.[128]

Specific program details with regards to technical or non-technical skills were not available.

Rotational fellowships pilot

This pilot program was funded by Queensland Health to provide 2 rotational fellowships in regional, rural and remote settings in Queensland, each for a 2-year period. Surgeons are appointed to a hospital and required to provide outreach services within that region, rotating between metropolitan, regional and rural settings. Fellows are given access to formal peer networks and ongoing training and education. The program supports a partnership model that links centres within a region.[129] Specific program details with regards to technical or non-technical skills were unavailable. According to the 2017 Council of Presidents of Medical Colleges Forum Report, this pilot program was due to commence in 2018.[129] It is unknown if the program still exists as no other details could be found.

Rural Surgery Fellowship for Provincial Surgeons

This Fellowship is offered by RACS through the Rural Surgery Section (RSS) committee to 3 FRACS who are already practicing in a non-metropolitan area of Australia or Aotearoa New Zealand. The Fellowship, valued at $10,000, can be used to fund expenses associated with developing existing skills and/or acquiring new skills to benefit the rural surgeon, the community in which the surgeon practises and the College. These expenses may include travel, accommodation and living costs, as well as conference and course fees.[130]

Recipients of the Fellowship are selected by a panel comprised of members of the RSS committee. Preference is given to current members of the RSS, those who have secured structured visits to established units and those who have not already secured alternative financial support. The recipient is then obliged to complete their 1–8-week training at the agreed institution, guarantee they will continue to practice in their local area upon completion of the training and is encouraged to submit an abstract for presentation at the annual conference of Provincial Surgeons of Australia or an appropriate forum in Aotearoa New Zealand.[130]

New Fellow Rural Placement pilot

The New Fellow Rural Placement pilot is funded by the Australian Government Department of Health Specialist Training Program and coordinated by the RACS STP. The pilot commenced in 2020 (with approval for continuation in 2021). The aim of the pilot is to provide new Fellows with a comprehensive,

high-quality experience in a rural setting to encourage continued, long-term rural practice. Three General Surgery positions and one Orthopaedic Surgery position exist at 4 rural hospitals (one position at each of Royal Darwin Hospital, Cairns Hospital, Rockhampton Base Hospital and Griffith Base Hospital).[131]

The total Fellowship package equates to $270,000, of which $70,000 is contributed by the participating hospital. The remainder is funded by the Australian Department of Health and includes salary support ($150,000), 12-month relocation assistance ($30,000) and coverage for costs associated with professional development ($20,000) within Australia (e.g. travel, accommodation, meals, study materials).[131]

Acute Neurotrauma (eLearning course)

Offered by RACS, the Acute Neurotrauma eLearning course for Fellows comprises a series of modules, case studies and assessment tasks which incorporates information from the RACS Acute Neurotrauma Workshop. Based on the *Management of Acute Neurotrauma in Rural and Remote Locations* guidelines first published in 1992 (revised in 2000 and 2009), the aim of the program is to improve knowledge and understanding of the symptoms of acute neurotrauma, the technology required for diagnosis, and the most appropriate primary and secondary care. Trauma is of particular concern in a rural setting due to distance from medical facilities (potentially leading to delayed treatment); poor driving conditions and high speeds may lead to multiple serious injuries.[132]

The estimated completion time for the course is 4 hours and it may be completed over one or more sessions.[132]

Early Management of Severe Trauma (EMST)

The EMST course is an internationally recognised equivalent to the Advanced Trauma Life Support (ATLS®) course provided by the American College of Surgeons (ACS). The course teaches a systematic, concise approach to the care of a trauma patient in the first 1–2 hours of injury. The course is offered to all fellows involved in the early treatment of trauma in urban or rural areas, regardless of the level of emergency facilities available.[133]

Taught by 10 trauma experts, the interactive course includes skills stations, scenarios, and an eLearning module. First-time participants may undergo the provider course (2.5 days); those who have completed the course in the last 4–6 years may undergo the refresher course (1.5 days). Faculty members provide mentoring to course participants before and during the course.[133]

There are 68 EMST courses offered across Australia and Aotearoa New Zealand at a cost of AU$3,090 or NZ$3,455 for the provider course and AU$2,300 or NZ$2,575 for the refresher course. EMST certification, valid for 4 years, is awarded upon successful completion of the course.[133]

The surgical competencies achieved through the course are listed as follows: medical expertise, technical expertise, professionalism, judgement and decision-making, collaboration and teamwork, and communication.[133]

Definitive Surgical Trauma Care (DSTC™)

The DSTC course is an international course run under the patronage and supervision of the International Association for Trauma Surgery and Intensive Care.[134] RACS recommends the DSTC course for all consultant surgeons and final-year Trainees who participate in the care of injured patients.[135] It is considered essential for surgeons involved in the management of major trauma and those working in remote, regional and rural areas. The course costs $3,950 (in both Australia and Aotearoa New Zealand); no other details were available.[135]

United Kingdom

Rural Surgical Fellowship, North of Scotland

The fellowship in rural surgery is funded by the National Health Service (NHS) Education Scotland and administrated by the North of Scotland Specialty Training Programme in General Surgery. The educationally approved fellowship is for surgeons who have completed or nearly completed their specialty registration in General Surgery. The fellowship aims to allow surgeons to gain the appropriate knowledge and skills required to practice in a Rural General Hospital (RGH) or to provide humanitarian relief work

with international organisations such as the International Red Cross or Medecins Sans Frontieres.[119,136] Specifically, the fellowship is available to:

- National Training Number (NTN)§ holders in General Surgery in the UK within 2 years of receiving their Certificate of Completion of Training (CCT) who will hold a Fellowship of the Royal College of Surgeons in General Surgery by the time they take up the post
- CCT holders in General Surgery who have been in regular General Surgery practice for 18 months and are on the Specialist Register for General Surgery
- trained specialists in General Surgery whose applications have been processed and who are completing final requirements for entry to the General Medical Council (GMC) Specialist Register by virtue of European certification or Article 14
- trained specialists in General Surgery from outside the UK who have evidence of eligibility to the sit the Fellowship of the Royal College of Surgeons exam and enter the GMC's Specialist Register within 18 months of appointment.[136]

Fellowship training for 4–24 months allows aspiring rural surgeons the opportunity to acquire skills in specialties other than General Surgery, including Accident and Emergency, Trauma and Orthopaedic Surgery, Urology, Ear Nose and Throat (ENT) Surgery, Ophthalmology, Neurosurgery, and Gynaecology and Obstetrics. Fellowships are based out of Aberdeen or Inverness and normally include 6–12 weeks in one or more RGH and the remaining time in modular training in other surgical specialties. Participating hospitals are in Orkney, Shetland, Caithness, Elgin, Western Isles, Fort William or Oban. Post-fellowship trainees are assigned an educational supervisor and multiple clinical supervisors who will carry out

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§ NTNs are given to trainees who are in the process of completing their training program, that is, subject to successful progress they will complete the program and gain entry to the GMC's Specialist Register and work as a consultant.137. NHS Health Education England. Training numbers: NTNs and DRNs explained 2021 [Available from: https://www.nwpgmd.nhs.uk/sites/default/files/Training%20Numbers%20-%20NTNs%20and%20DRNs.pdf.

workplace-based assessments. Fellows may wish to undertake the fellowship as a proleptic appointment at one of the participating RGH, where their surgical experience may be tailored to suit the needs of the centre, with central funding available for a 1-year appointment.[119,138]

Some detail regarding the technical competencies required in the above specialties is provided in the *Standard informing delivery of care in rural surgery* report published by RCSEd in March 2016.[138] Briefly this includes:

- Urology: since Urology makes up one-third of General Surgery practice, rural surgeons should be able to diagnose and manage a range of urological emergencies including kidney obstruction and acute testicular torsion. Elective urology procedures vary for each RGH and may differ in frequency. During a 6-month rotation, knowledge could be gained from problem-based assessments or short essays on basic urological topics set by a trainer.
- Trauma and Orthopaedics: rural surgeons are responsible for all trauma cases presenting to a rural emergency department. They should be able to treat simple injuries and be involved in referral and follow-up of more complicated injuries. Rural surgeons are usually only responsible for minor elective orthopaedic procedures. An ATLS certificate (described previously) is required for CCT in General Surgery. It is desirable for rural surgeons to be qualified as ATLS instructors as it will assist in maintaining their skills and offers opportunities to have regular contact with other physicians involved in trauma care. During a 6-month Orthopaedics rotation, the fellow would be expected to attend daily radiology meetings, take part in regular fracture clinics, undertake plastering and simple manipulations, and assist in the trauma operating theatre. Credentialing of certain procedures could be undertaken.
- ENT: a one-month rotation in Otolaryngology should be sufficient to expose rural surgeons to the common ENT emergencies they may encounter in a rural setting (little elective ENT is needed). Training and gaining of credentials in a small number of procedures (e.g. tracheostomy, tonsillectomy, control of post-tonsillar bleeding, recognition of major neck sepsis and removal of foreign bodies) is recommended.
- Ophthalmology: a one-month rotation in Ophthalmology with set learning objectives is recommended for a rural surgeon. Training in slit-lamp examination; the causes, presentation,

and removal of foreign bodies from the eye; dendritic ulcers; flash burns and other causes of 'red eye' (including glaucoma) are needed.

- Neurosurgery: rural surgeons should be trained in the initial management of head injuries, including anatomy, pathophysiology, clinical assessment, appropriate investigation, and treatment (in some cases including active resuscitation or emergency craniotomy).
- Obstetrics and Gynaecology: rural surgeons may be involved in the surgical management of Obstetric and Gynaecological emergencies depending on what other staff are available at the RGH in question (e.g. GP, midwife). As such, the rural surgeon's training in Obstetrics and Gynaecology should be tailored to the needs of the unit. Maintenance of skills and a relationship with the referral hospital are important, along with study leave and regular visits to the referral unit (by the rural surgeon) and visits from supervising obstetricians and gynaecologists to the RGH.[138]

No other details were available for the non-technical skills taught in the Rural Surgical Fellowship program.

The Faculty of Remote, Rural & Humanitarian Healthcare (FRRHH) Fellowship

The FRRHH fellowship offered by RCSEd is open to FRRHH members who wish to work, or currently work, in remote, rural and humanitarian healthcare, including those with CCT. The fellowship, valued at (maximum) £5,000 per application, can be used for any project or activity (including research, training, education or travel) that will support the recipient's access to different healthcare systems to develop the knowledge, skills and experience required to work in a rural setting.[139]

Viking Surgeons Association Online Rural Surgery Series

The Viking Surgeons Association and the FRRHH host various webinars for fellows.[140] Those listed on the RCSEd website with a rural focus include:

- Surgical specialty emergencies in the rural unit: two webinars of this type were listed—Neurosurgery and ENT. In the Neurosurgery webinar the recognition of injuries, resuscitation, appropriate and timely investigation, stabilisation for transfer (if appropriate and available) and

options for operative management were discussed. In the ENT webinar the main life-threatening ENT emergencies were discussed, including epistaxis, postoperative bleeding and airway problems.

- General Surgery subspecialties in the rural unit: two webinars of this type were listed—Plastic and Reconstructive Surgery and Gastroenterology. The Plastic and Reconstructive Surgery webinar described the common presentations of Plastic Surgery cases in rural settings (e.g. hand injuries, burn injuries and skin lesions), and their acute management and referral to specialist centres. The Gastroenterology webinar provided an update on the management of conditions that have changed significantly in the last decade.
- Ophthalmology for the rural surgeon: this webinar focused on common conditions including ocular infections and the safe management of trauma, and simple tumours and techniques on how to remove an eye.
- Rural Orthopaedics: this webinar discussed proximal humeral fractures, wrist fractures, and bone and joint infection.
- Thriving and surviving in remote and rural surgery: this webinar discussed keeping up with current practice in different specialties, operating on friends and relatives, and dealing with complications.[140]

United States

Mastery in General Surgery Fellowship

Offered by the Wake Forest® University Department of Surgery, the Mastery in General Surgery Fellowship is a one-year program that provides additional training in General Surgery, including emergency General Surgery (4-month rotation), Minimally Invasive Surgery (1-month rotation), Oncologic Surgery (1-month rotation) and Endocrine Surgery (1-month rotation). Experiences in surgical critical care (1–2-month rotation), Obstetrics and Gynaecology (1-month rotation) and surgical practice in rural settings are also offered.

The aim of the fellowship is to produce surgeons with excellent broad-based skills who are well-rounded, skilful, compassionate and highly sought after for employment in community practices, academic medical centres and international surgical organisations. Exposure to the various surgical specialties can be tailored to the fellows' preferences regarding areas in which they wish to expand their knowledge and the location in which they intend to practice.[141]

Leadership (non-technical skill) is one of the program's goals, so fellows can develop their skill and experience in effectively leading teams, managing conflict, coordinating multiple services and mentoring others. Regular feedback is provided throughout the program, including peer review and performance improvement initiatives. Fellows are also exposed to aspects of billing, collections and medical liability.[141]

Nizar N. Oweida, MD, Fellow of the American College of Surgeons (FACS), Scholarship

The Nizar N. Oweida, MD, FACS Scholarship is designed for surgeons serving small communities. Three scholarships, each valued at $5,000, can be used to subsidise the costs associated with either attending clinical congress or undertaking additional training or research appropriate to a rural surgeon. Costs may include travel expenses, lodging and per diem, registration and course fees. ACS fellows or associate fellows from any surgical specialty who are under the age of 55 (on the date of application) and practice in a small town or rural community in the US or Canada are eligible to apply for the scholarship.[142]

Appendix E. Delphi results

It should be noted that these results have been documented verbatim from the Delphi respondents. Italics demonstrates where further clarification was needed.

Table E1: Examples of positive behaviour markers demonstrating Collaboration and Teamwork in the context of the rural setting.

Theme	Statement from Participants
Communication	
Communication	
Good communication is key	
Communication (written and spoken) skills	
Smaller institutions have the opportunity to foster closer ties amongst colleagues which can be crucial in adjusting communication style to effectively communicate in difficult situations	
Communication in regards to patients being transferred to referral hospital is usually performed on a consultant level. This enables reduction in unnecessary transfers, fast tracks the management of the pt (pt can be brought directly to angio suit, theatre, ED or ward)	
Good communication that values local skills and enables these to be developed and supported	
Conversations and communication with other team members such as ward nurses, theatre staff and clinic staff about organisation of patient care and patient feedback	
Listening	
Early communication (*in regards to good operative care)*	
Answering you phone	
Returning missed calls	
Willingness to communicate with a specialist far away for advice	
Communication focused	
Involvement of Medical Admin in early stages at a ground level	
Documentation of progression	
Conversations may be required with RFDS regarding prioritisation	
Engagement	
Engagement	
Good working relationship with colleagues in tertiary hospital	

However, you do need to build relationships with tertiary hospitals especially when you need to refer patients or transfer patients, or need a second opinion
Rural practice requires a Surgeon to be more involved in Coordination of patient care an collaborations between sites
Collaboration and teamwork basics
Consideration
Patience
Accepting and adjusting for people's limitations
Being prepared to take the extra steps
Not making situations other people's problems
Following up
Willingness to follow basic advice given
Communication with GPs
Good and timely communication with GPs
GP interaction is important to ensure care continues well in community
There is greater relationship between the rural GP and Surgeon
Follow up can be difficult as patient live in quite remote areas and there is often a greater reliance on the GP
A patient may be referred from nurse in a remote clinic and conversations may need to occur with you GP anaesthetist regarding this suitability for care at the Regional Hospital vs recommendation for transfer to metropolitan centre
It may be necessary to have conversations with your GP anaesthetists regarding the suitability of the patient for management in the regional hospital
Logistics
Cooperate with waitlist in planning lists, mindful of local logistics and plan operations accordingly
Frequent conversations with anaesthetists about improving workflow in theatre and preoperative anaesthetic clinic
Collaboration
Ask for advice promptly
Interdisciplinary collaboration and service planning
Multidisciplinary surgery
A patient had a thyroidectomy for what turned out to be a rapidly progressive breast cancer met rather than papillary cancer found earlier in the year. I was able to coordinate several family meetings with intensive care over the Christmas period to help with their adjustment to her imminent demise. An ENT colleague came in after hours for laryngeal assessment. Likewise, it was possible to call in the palliative care physician to assist in person after hours. All of this was smoothly organised due to longstanding collaborative relationships.

Collaboration between specialties
Cross-specialty cover of uncomplicated patients
Independent advice on patients
Help by other colleagues
In Darwin I have the support of the general surgeons who provide after-hours support. They look after all scrotal emergencies and manage patients with urosepsis, retention and haematuria. They are able to perform stenting and cystoscopies. I provide the urology services along with a SIMG. Without this support the urology service would not be viable. In contrast in Albury is an example of negative behaviour. There was an active decision by the general surgeons not to assist with any afterhours urology. They would not even allow their registrar to be involved
Shared decision-making
Seeking advice outside specialty
The concepts of working collaboratively in a rural setting are not dissimilar to metro settings
In my experience (Kimberley region WA) good patient care requires extensive collaboration which is multidisciplinary and may involve many more conversations and coordination by a specialist than in metropolitan practice
Simple classic from Mt Isa a nurse has a finger injury at netball but lives in Brisbane. Should she come back to Brisbane? Viewing X-ray, discussion with patient, discussion with hand therapist, suggestion of specific brace by hand surgeon acquired by and fitted by hand therapist and continuing support through telehealth fracture clinic
Meetings and management
Functional department meetings with service planning and improvement at the heart of it is essential
Social department meetings
Surgical team meetings
Monitoring and day to day management of the resident duties
Organisation of the weekly registrar/PHO roster to ensure adequate training for SET trainees while still giving service PHO's a good experience
Managing the registrar/PHO leave roster
Assessment of available physical, equipment and staff resources with team including administration
Workshop scope of practice in the particular location
Patient Advocacy
Advocacy skills
Elective patient that need metropolitan referral—for example, for cancer treatment need extra steps above just a referral. I find it is always helpful to involve the cancer Nurse Specialists and highlight the remoteness of the patient and the best local pathway to coordinate care which may be a clinic in a community or an Aboriginal health Service

Technology
Use of merging technologies in IT
Telehealth fracture clinic
Good use of telecommunications
Workforce
Partly due to the limited number of surgeons in the rural setting
As we had 2 urologists this was, from my perspective, not viable. I was expected to management scrotal emergencies, insert catheters etc after hours often without registrar support
Clinical Judgement
Good ability to assess the local skills available that determine appropriate disposition of patients i.e. safe to treat locally, with tertiary support, or transfer
Education
Teaching on the job
Organisation presentations at M&M meetings
Journal clubs
Student teachings
Multidisciplinary
Inviting ward in charges for surgical handover
Conversing with allied health staff (physio/OT) about particular patients and how their care could be improved
Needs to be able to work with nurses/allied health and medical staff from diverse cultural background—needs to be respectful of this diverse background—needs to be able to cooperate with consultants who are IMGs and did not go through same selection and training process as the trainee
Good feedback from nursing and theatre staff
Working with multidisciplinary team and other health care professionals is key in any setting
A referral may be from a nurse in a remote clinic advice and governance begins
Good operative care requires teamwork
Occasionally you might be called to help in critical situations when no on call
Clinical judgement and collaboration
Patients may be appropriate to be kept in the remote community with updates provided but more commonly would need RFDS transfer either to the regional hospitals or metropolitan centre
Patient Care
Keeping the patient details and following up on their progress through the system is important

Depending on the size of the community it is vital to work with the patient and their family
Often patients are key members of the community
Depending on the size of the community it is vital to work with the patient and their family
Often patients are key members of the community

Abbreviations

ED = emergency department, ENT = Otolaryngology ear nose and throat, RFDS = Royal Flying Doctors Service, GP = general practitioner, IT = information technology, M&M = morbidity and mortality, OT = occupational therapist, PHO = Principle House Officer, SET = surgical education and training, SIMG = Specialist International Medical Graduates, WA = Western Australia

Table E2: How do you guide trainees to acquire skills in Collaboration and Teamwork in the context of the rural setting?

Theme	Statement from Participants
Example	
Example	
Setting an example	
Set an example first and foremost	
I often try to guide trainee by example	
If young trainees are guided poorly, they will carry this attitude for the rest of their career	
Role modelling by consultants	
Setting an example of this respectful behaviour towards other cultural and educational backgrounds	
Critical to this is the personal attitudes, behaviour and examples set by their mentor	
Example, by consultant surgeon first in student life and also through intern and beyond	
Role modelling	
Encourage	
Encourage	
Explanation of processes and the reasons behind this approach and encourage attendance at inter specialty lists	
I still teach EMST and actively encourage participants to think forward and backward in the chain of care to consider the challenges each team may face in providing the best care they can	
From the tertiary hospital side, there is ample opportunity to provide supervision for interactions with rural centres, and feedback about performance encouraging good support and communication	
The registrars need to be encouraged to see the benefits of working outside their strict confines of their specialty	
Encouraging trainees to listen to surgical/ed/clinic staff about their difficulties, if any, in fulfilling the mandate of the organisation	
Encourage positive behaviours and providing feedback if this behaviour is lacking	
They are given some guidance into expectations and the situation is monitored with a gentle hand unless obvious problems arise	
Encourage personal communication to discuss cases	

Communication
Involving them in the process of communication
Communication guidance and reasoning especially with the GPs
Exposure to MDTs
Communication skills courses
Communication with the patient and their GP is essential
Often there is less opportunity for consultation with patients in the rural setting. I tend to spend more time with the patient with any consultation. Clear documentation in the digital medical record with letter to GP is performed
After surgery or admission, a clear plan of management in the future is discussed with the patient with or without family
Clear detailed discharge summary is performed in a timely fashion
Direct phone call to the GP is often also performed to ensure everyone is aware of the admission and ongoing plan
But in terms of working with tertiary centres you need to ensue those you are dealing with know who you are
You need to communicate clearly and be available
Setting up framework of communication
Review communication process periodically
Social Aspects
Start of term social events to allow people to familiarise away from the training venue
Mentorship
Mentorship
Explain importance of collaboration
Explain importance of collaboration and shared care of complex problems
Teach good basic understanding and description of skills
One on one training for a stipulated period (for us it is 2 months with each of 3 registrars for a 6-month period)
Mentoring, by a competent surgical mentor in such a way that every question will be answered and discussed
Good mentoring from an experienced rural surgeon
Multidisciplinary Team
Multidisciplinary training is an excellent way for people to discover what they didn't know they didn't know about other groups within the hospital
Shared care of complex problems
Scope of Practice
Thinking outside traditional scope of practice often required in a rural setting
Important to accept sometimes thinking outside of traditional scope of practice

In Darwin we have SET training in Gen surgery and they are told that they will work in the urology service and cover after hours as well as elective work. They universally enjoy the experience and can see the benefit of acquiring the knowledge and skills in managing urological conditions. In contrast in Albury they are told that they are not to deal with urological conditions. This is very counterproductive, not only to the trainee but also to the health service. It directly impacts on the urologist in terms of recruitment and retention. It is the main reason I left Albury.
Differences between rural and metropolitan surgery
In a rural setting, resources are not as plentiful as in the metropolitan centres. The surgical practice is markedly different as there is often less opportunity in seeing a surgeon, longer waitlist times for theatre/angio and well as logistic difficulties with follow-up
Our trainees always remark how much harder rural surgeons work compared to their metropolitan counterparts
The skills are not different from working in a metro
The skills are all transferrable
Feedback
Close and constant monitoring
Review of progress
In my experience dissatisfied PHOs will soon speak up and, on the rare occasions when it has been necessary, the trainees have been given more direct instruction in what to do. This really fits into the 'entrustable professional activity' basket and does provide a good insight into trainee abilities in teamworking and collaboration. To be fair, most of the time in question of no news is good news but views of relevant staff can be sought or canvassed
Rural Placement
This requires suitable rural terms in training
Nothing beats a rural term with good mentoring from an experienced rural surgeon
Critical to this is the personal attitudes, behaviour and examples set by their mentor—and bearing in mind he/she will be metropolitan, his/her view of 'country cousins'. Careful selection of rural training posts and mentors and planned assessment of these
Selection for human factors understanding R&R activity by the med student and trainee (understanding distance and delay and the deteriorating patient). Training for above through rural placement and serious support from many trainers both on site and telehealth perhaps. Selection of med students from R&R origins may assist in their willingness to return to R&R practice. Change the med entry requirements significantly.

Abbreviations
EMST = early management of severe trauma, GP = general practitioner, MDT = multidisciplinary team, PHO = Principal House Officer, SET = surgical education and training, R&R = rescue and recovery

Table E3: What challenges might be encountered in delivering this competency (Collaboration and Teamwork) in a rural setting?

Theme	Statement from Participants
Resources	
Resources	
Heavy workload and time constraints with busy on call roster	
Resourcing: course availability, back fill of position	
Availability of resources	
Currently there is a large discrepancy in wages in Tasmania compared to the remainder of Australia. For the public service in Tasmania, this is approx. ~20% less than the remainder of the country. This has resulted in a drain of staff (nurses and doctors). This should be standardised in the NW and Mersey Hospitals, the majority of staff in the ED are often over paid locums. This results in poorer delivery of health care to the local patients. There is less collaboration and teamwork when the staff is transient	
Availability of resources	
Limitation of time and heavy caseload	
Bed blockage has been a major issue in our region	
One of the biggest issues when people make an enquiry about working in a rural setting is the after hour work. If this is unrealistic and not supported by the administration, you simply will not be able to recruit and retain subspecialists in rural settings. You might get IMGs to do it for a while, but you will not Australian trained surgeons.	
There has to be a strategy to manage the on call issues.	
Hospitals have to be appropriately resources to allow a rural surgeon to perform your surgery at a contemporary level	
There needs to be a commitment from the health authorities to adequately resource these positions	
Staff Turnover	
High turnover of staff in regional hospital	
Having to work with short term locums (one or two weeks) in regional hospitals	
It will depend upon how many staff there are and how much scope there is for mismanaging rosters	
The loss of SET1 year from the training program has led to a number of rural registrar posts in WA being list from the training program as they cannot deliver the 100 major cases per term required. They are however filled by Service Registrars but therefore with a reduced change that the experience gained will be in a Doctor who will become a surgeon	
Increasing use of junior metropolitan FIFO surgeons in rural WA	
Workload of rural mentors	
Adequacy of R&R hospitality, hospital awareness of needs for a trainee, hospital awareness of study need for trainees in time and commitment, state and territory government clarity on why they must fund this and looking not for political points but for safety and quality in surgical care delivery	

Difficult to teach in short training terms (<6 months)
Isolation
Isolation
Geographic distance can be difficult to allow face to face interaction. Telecommunication has been very effective in allowing for better interactions with colleagues.
The smaller pool of trainers is also a setback, however, this can be beneficial as smaller departments tend to be more collaborative
You need to have the general surgeons supportive of their sub-specialist colleagues in urology, vascular and plastic surgery. These subspecialties by their nature will have small numbers in regional centres. It is unrealistic to expect these doctors to work frequent on call rosters. Without the support of the general surgeons these subspecialties will not be viable in the long run.
Smaller units, fewer theatres operating so less change for cross fertilisation of ideas
Trainees often don't have opportunity to make those contacts at the tertiary centres—sometimes they are no the ones transferring the patient and dealing with the tertiary centre.
Distance from ivory towers
Workplace culture and environment
I have worked/trained in some regional centres where the workplace is toxic. Frankly, we all know these hospitals and the key players driving conflict. It's time to address this issue as these regions sometimes experience long term issues in recruitment and retention due to their reputation for bullying and hostile interactions between staff. They also create a devastating impression for regional practice for Trainees that only experience time in one rural setting.
Pressure of work and pushback from city colleagues
If you can't take a stone out with modern technology or you have to transfer patients because of lack of technology, then there is no job satisfaction. There is no point in training in a rural surgeon if they do not have a satisfying job to go to
Those trainees from the big city hospitals may bring with them the habit of "I" and "my work" as the most important thing in the hospital settings. Tend to look down on the knowledge and skills amongst the staff in the regional hospitals.
Lack of trainee understanding how "things work" in a rural setting, lack of understanding or rural and remote attitudes
Willingness by trainers to support R&R trainees
Partner willingness to participate thus supporting them in a position or family support or travel and transport costs
Lack of established supervisors
Short term rotations may not give enough time to establish relationship of trust and confidence
Communication
On the interpersonal level, is strive to demonstrate early and collaborative communication over patient care, and where conflict arises show that focusing on the desired outcome rather than the personality of people in conflict can be helpful
Workload of rural mentors, and difficulties in assembling team for timely clinical discussion
Need time to test the efficacy of communication

Professionalism
It is also important to own and acknowledge my own lapses in professionalism (hard to imagine I know!) and show the repair that can occur in relationships when this is done
It also requires that the consultants have ready access to the trainee and that the consultants have their 'finger on the pulse' of the unit
Number of cases
Occasionally a lack of "major cases"
Limitation of procedures allowable
General surgical training need to encompass these areas with the support of the gen sur training board. The gen surg training posts in regional hospitals need to have subspecialty exposure and if not these training posts should be removed
The loss of SET1 training year which did not require 100 major cases led to a loss of Trainee in the Kimberly and replacement by service registrar
Lack of exposure to general surgery
Fees from University
Universities Fees from Universities

Abbreviations
ED = emergency department, FIFO = fly in fly out, IMG = International Medicine Graduate, R&R = Rescue and Recovery, SET = surgical education and training, WA = Western Australia

Table E4: examples of positive behaviour markers demonstrating communication in the context of the rural setting

Theme	Statement from Participants
Time	
Time to explain	
Good quality time spent talking with patients, families, and carers at times of consultation	
Giving patient time and space and encouragement to ask questions	
Good communication requires enough time to get the full story	
With indigenous patient extra time is required for communication	
The basics would reflect the marker of good communication anywhere, including taking enough time to get the full story	
Communication with indigenous patients may require some extra time and understanding of circumstances	
Tailoring operating lists to suit available resources and times	
Arranging ward rounds and rooms sessions when the maximum team members are available	
Making time to individually discuss trainees progress and concerns	
Cultural Context	
Acceptance of social standing	
Allowing cultural decision-making in care planning	

Respecting cultural wishes in the handling of patient tissues. Returning tissue or organs to the patient if requested
Using accredited translators, similarly, using sign language experts. With the face protection required having a face shield to allow patient to lip read.
Good cultural competency in the rural context—important to have local knowledge of industries, seasonal factors etc that influence patient care, and in those areas with significant indigenous population, an understanding of local customs
Willingness to learn and say a few works (to greet the patient/family) in the most commonly used aboriginal language in the region
Being aware of significant cultural differences between the trainee and her/his patient—this does not apply to my personal situation but in general the rural trainee will have more interaction with indigenous patient than in the city—this requires preparation and awareness
Rural practice requires additional nuances: with a patient understanding their social and geographical circumstances
Remote patients have English as a second language and for some languages there are no interpreters and you need to use family when able
Additional rural issues may be understanding a patients social and geographical circumstances
It needs to be tailored to the patient—for example, the Kimberley has a range of people some of whom are remote and speak in language but many who are fully able to understand their health.
Use of interpreters although ideal is often not possible with disappearing languages. Family members can be of assistance
Being situationally aware at all times
Manners and professionalism
Manner
Conducts efficient handover
Verbal and non-verbal communication allowing a relaxed interaction
Professional approach to teamwork and communication style
Honesty and integrity
Inclusive and approachable: friendly
Adapts comms to context
Establishing accessibility and approachability so that members of the team do not think twice before contacting you
Keeps conversations at work specific and objective particularly with people of opposite gender at the same time not sounding condescending or stiff (speaking truth in love is a good way to remember)
Being able to communicate in plain language with patient and relatives
Trainees introducing themselves to patients
Use of appropriate language
Ensuring interaction are undertaken in a 'safe space'
Use of appropriate forms of language when questioning or supervising junior staff

Again, communication is a generic skill—it is not any different whether you are in rural or metro. The skills of communication are exactly the same. In rural though you are often in the spotlight more because you are not having to compete with other trainees
Good communication requires introduction, respect, enough time to get the full story, listening etc
The basics would reflect the marker of good communication anywhere—respect, identifying yourself, taking enough time to get the full story, listening, enquiring etc
Human factors in R&R are always critical
Inclusion of patient and family
Keep patient and family well informed
Inclusion of family and care support in patient interactions
Good quality time spent talking with patients, families and carers at times of consultation
Ability to personally communicate with patients and families at appropriate level, e.g. a phone call to check on progress after discharge
Patient first policy, the primary reason for the consultation is the patient and their needs
Team and multidisciplinary communication
Conducts efficient handover
Communicates effectively within the team
The communication between the hospital and the GP community if often very good in rural settings.
The administration blocks that sometimes counterproductively stymie communication are frequently worked around in rural settings as People often know one another's phone number and makes the call when needed
Liaison with all parties involved in patient care, GP liaison in the rural setting is particularly important
"Phone a friend" when making decisions.
Consultation with other disciplines
The only real difference in a rural setting is more direct communication with GPs and nurses especially small remote towns serviced by the regional hospital.
Rural practice requires additional nuances…with a healthcare worker at another site understanding their resource constraints and patient transport systems.
When communication with another health practitioner you might need to enquire about another sites resource limitation and usual modes of transfer
Relationship with colleagues with whom you can discuss and plan on occasions refer to further management
General Communication
All of the communication marker as described in the guide are relevant/important
Again, communication is a generic skill—its not any different whether you are in rural or metro. The skills of communication are exactly the same. In rural through you are often in the spotlight more because you are not having to compete with other trainees
Honesty, not driven by $$

Understanding of clinical care capability framework of the place where the training is carried out
Understanding how to gather all the relevant patient information in a particular circumstance, then to understand it all then to project future prospects for that individual before making a clinical decision

Abbreviations
GP = General Practitioner, R&R = rescue and recovery

Table E5: How do you guide trainees to acquire skills in communication in the rural setting?

Theme	Statement from Participants
Encouragement	
Encouraging	
Encourage trainee to hold regular*	
Encourage connection outside the hospital e.g. attend breast screening, GP education meetings, social events	
Encourage trainees to learn some words used by aboriginal people in the locality	
Encourage trainees to listen	
We encourage SET trainees to lead ward rounds with the consultants observing, this gives valuable insight into the above behaviours and permits real time feedback	
Demonstrate/role modelling/leading by example	
Demonstrate good hand over and good communication on ward rounds	
Trainees are instructed on the access to translators through our unit	
Demonstrate with regular opportunities for them to observe and be observed	
Modelling, demonstrate the joy that come from harmonious working relationships	
Role modelling	
Being a good role model in terms of communication with patients/relatives—remaining respectful during the communication with difficult patients/relatives	
Role modelling	
By setting an example	
First and foremost, the mentors attitudes and behaviours	
Show them how you do it	
Cultural competency	
Cultural induction program relevant to the local population	
Advice regarding religious issues	
Use learning opportunities well, guide research/knowledge gathering to improve cultural competence	
Indigenous cultural courses.	

Reading such as Paul Trudgeon's book "why warriors lie down and die"
There are various courses in indigenous culture and communication with one mandatory in WA Dept of health
Awareness of the community mix, their attitudes, behaviours and beliefs
Feedback
Feedback multisource feedback tools
Feedback to trainees
Observation of courtesy—good documentation on request forms
It can be done via mini-cex assessment with formal feedback
Informal feedback 'on the job'
(We encourage SET trainees to lead ward rounds with the consultants observing). This gives valuable insight into the above behaviours and permits real time feedback (either directly or by taking over the consultation) if it is felt that communication is not ideal
Watch them initially
Difference between rural and metropolitan surgery
Same way they should acquire communication skills anywhere, but with an understanding of the tyranny of distance. In the rural settings at times could be considered more important
Same way they should communicate anywhere
Trainees need to understand the complexities of general practice, the remoteness and the lack of resources in rural settings
Practical Suggestions for learning
Spend time independently in outpatient and emergency departments and wards
Practice with case presentations and meetings
They also need to learn to give 'practical' not 'theoretical' advice
Plan to have some standard protocols
Use all the possible comms links that are available
Rural terms
Orientation pre terms
Make certain they know that they will be heard by one who is called and then and suggest avoiding involvement with those who don't listen when discussions are important

Abbreviations
GP = General Practitioner, SET = surgical education and training
Notes
*rest of the content not written

Table E6: What challenges might be encountered in delivering this competency (communication) in a rural setting?

Theme	Statement from Participants
Consistency of staff	
Constant change of personnel	
Consistency of consultants and senior staff (not fly in fly out healthcare workers)	
Team dynamics	
Trainee not used to small team dynamics	
A challenge may be the smaller number of consultants resulting in a smaller number of potential role-models; negative behaviour will not be 'averaged out' as easy as in larger units	
There has to be the ability to observe trainees in the workplace. If staffing numbers are low this might be difficult. If there is not the ability to directly observe Trainees' communication with patients all that you have to guide you is feedback from patient or other staff which only tens to happen if interactions have been spectacularly good or bad	
Cultural and community difficulties/beliefs	
Female Trainees or male Trainees may have problems with different cultures due to the patient cultural beliefs. There are often preconceived ideas and expectations from different cultures which can make open and honest discussion difficult	
Large number of Trainees are born overseas or may be IMGs which can increase the cultural divide	
Many surgical Trainees now are born overseas and may be IMGs. Both the communication sometimes of both parties in a second language and a lack of understanding of rural Australia can further exacerbate communication gaps	
An understanding of the community's attitudes to seeking medical attention	
Language difficulties and availably of interpreters	
Organising consultation times in keeping with rural activities	
Contacting community leaders to get health messages across	
No difference between rural and metropolitan surgery	
No great barriers otherwise	
Can't think of anything specific to the rural setting	
I am not sure whether there are more difficulties to deliver this competency in the rural setting because the hierarchy is flat and direct observation of the trainee occurs frequently	
Multidisciplinary communication and communication in general	
Sometimes the communication between rural practitioners and tertiary institutions can be very difficult. There can be difficulty accessing communication with the right person in the major hospital, or the communication can be dismissive or obstructive due to internal pressures that are not apparent to outsiders. From the standpoint of the major hospital sometimes the person asked to make the call does not have the expertise or authority to do so, which may reflect the fatigue management more senior doctors need to adopt when rosters are inadequately staffed.	

Many of our surgical Trainees now are born overseas and may be IMGs. Both the communication sometimes of both parties in a second language and a lack of understanding or rural Australia can further exacerbate communication gaps
Distance, location, isolation
Tyranny of distance
Without exposing Trainees to regional centres, they will not be able to appreciate these issues. Training positions in Geelong, Ballarat and Bendigo, for example, do not reflect true rural and remote settings and indeed give a distorted view. We need to define true remote and isolated centres which all trainees need exposure to.
Being the trainer here could be difficult (not in the R&R place)
Workplace culture
Poor standards—consultants not coming or caring
Occasionally trainees not wanting to listen to advice
Stress—e.g. some of our Trainees felt harassed in the ED by some consultant(s)
Getting everyone to read from the same page can become difficult
Executive may have different set of priorities where staff may be made to feel as mere cogs in the wheels not as person with emotions and feelings
Being the Trainee may give an isolated and alone dimension which may be hard to remove
Consultant training
Have consultant staff in rural settings had training in the appropriate assessment tools? If they have come from overseas (which many have in rural settings) have they any knowledge of Mini-Cex or case-based discussions etc?
Trainee attitude
Adjusting to different ways of think in non-urban patients
Training Methods
Lack of rural terms
An online learning tool would be very appropriate

Abbreviations
ED = emergency department, IMG = International Medical Graduate, R&R = rescue and recovery

Table E7: examples of positive behaviour markers demonstrating Cultural Competence and Cultural Safety in the context of the rural setting

Theme	Statement from Participants
Understanding indigenous culture	
Understanding Indigenous people in rural setting	
Identification of First Nations people and sensitive to ensuring above and beyond treatment planning to help close the gap	

The use of indigenous liaison officers has made of big difference in helping us understand the complexities of remote indigenous issues. The issues of languages and relationship to land is very complex
Awareness and use of indigenous liaison officers
Similar to urban centre, but more likely to encounter indigenous patients
A rural clinician must strike a balance between best practice and appropriate cultural care. For rural and Indigenous patient many do not want to leave home/country for their treatment. Indigenous patients can have a great fear of going to the city. Thus, there are statistical discrepancies for example in surgery with mastectomy rates which could be represented as “institutional racism” instead of appropriate cultural care
There are well know discrepancies in health access and outcomes for rural patients and in particularly Indigenous patients. There can be tension between best practice care and culturally appropriate care. Remote Indigenous patients in particular have a fear of going to a metropolitan centre. A good example would be the cardiac catheter and stenting rates for Indigenous patients. In surgery rural patients are more likely to opt for a mastectomy over WLE and radiotherapy which requires weeks away from their country/family. This could be framed as “institutional racism” but in fact culturally tailored care.
Learning Cultural Norms
Learning the cultural norms in the community
Enquiring mind
Understanding or attempts to learn local context and history
Rational and seeks to understand unfamiliar cultures inquisitive
Good local knowledge to complement skills in cultural competence
As well as respectful curiosity to learn more about different cultures and personal background of her/his colleagues and patient are positive behaviour markers demonstrating cultural competence
Understanding the demographics of the community you are serving
Respect for cultural backgrounds/religion/sexual orientation
Respect for people of all backgrounds
Respecting sexual orientation and religion
Respectful
Appropriate use of language
Functional brain-mouth filter
Appropriate use of language
NESB, arranging interpreter services
Introduce yourself
Gently ask permission to examine the patient if a child, permission from the auntie or other relative
Compliance of treatment

Think about how culture may affect compliance
Awareness of cultural and socio-economic factors and their impact on patient management, particularly post discharge
Willingness to learn to concerns of the culturally different person and ability to tweak patient management plans to address the patient concerns (e.g. allowing a person to leave hospital for sorry business, change the antibiotics to oral, share the contact phone number to call if any deterioration, make alternate dressing change plans etc) sharing with treating team and asking for advice to manage a complex cultural issue which has the potential to adversely affect patient outcome.
Firstly, with the ESB community, understanding their patterns of seeking medical attention, and adapting to these. Secondly, with NESB, arranging interpreter services, and consulting with community leaders with respect to traditions and beliefs—also disseminating health messages
Acknowledging own limitations/self-reflection
Acknowledgement of own privilege of education regardless of culture
Aware of local cultural differences, always aware of and embraces multiculturalism in the team
Self-reflection
Acknowledge/recognises own biases
Demonstrating that there might actually be a cultural issue is a start
Understanding the meaning of cultural competence and cultural safety is the first step
Teamwork/collaboration
Teamwork
Collaboration
Family inclusion
Inclusion of MDT members
Involvement with GP in management
Involvement of family members in management
Patients and their family need to be fully informed, assistance for booking flights and accommodation and family escort for vulnerable patient are necessary
As a clinician it is important to take time to explain treatment options and what is best, involve family, offer support for a family member to be an escort for a vulnerable patient
Social aspects of community
Engagement with the local community socially provides deeper understanding of how people see their world and its possibilities and limitations. It also provides doctors “sent” to a regional/rural post with a sense of belonging outside of the hospital. In some jobs I was able to play music, or join a sporting group and this changes my sense of the town and my place in it
Leadership
Good leadership skills

Racism when encountered, particularly amongst staff should be called out
Another important behaviour is to call out racism
Understanding and communication
Understanding
Gentle greeting first, carefully listens for response from patients and relative, introduce yourself, and any colleague or team member with you
Listen carefully for response
Giving time for discussion
The hospital has regular newsletters that highlight events e.g. NAIDOC week
How to handle an abusive or "difficult patient"
Discussion of goals of care and aims and objectives with elderly patients
Honesty
Honest
Advocacy
Advocacy
Culturally different staff
There are many heads of surgical departments from different cultural backgrounds in our hospital
Other culturally diverse groups are invariably immigrant groups and I suspect the trainees get considerable exposure of these groups in metropolitan hospitals
In the rural setting we have multicultural teams working in the medical field as well as among outpatients—very often there is not only one ethnic group present in the rural places; this forces the trainee to adopt and to be open and ware of the cultural differences; friendliness and kindness
Patient presentation
There is minimal clinical variation across the patient population

Abbreviations
ESB = English speaking background, GP = general practitioner, MDT = multidisciplinary team, NAIDOC = National Aborigines and Islanders Day Observance Committee, NESB = non-English speaking background

Table E8: How do you guide Trainees to acquire skills in Cultural Competence and Cultural safety in the rural setting?

Theme	Statement from Participants
Formal training programs	
Cultural awareness training	
I personally found the Indigenous cultural sensitivity training received on induction at Darwin to be applicable across a wide array of cultural situations	

Videos, workshops, role play
Education: cultural safety training
Take advantage of educational opportunities available
Education re: above points. Trainees sometimes need to be educated on the specific of above issues
Education regarding cultural aspects of patient care and management
Using learning opportunities to fill in knowledge gaps
Mandated courses are useful to a degree but in reality, skills can only be acquired with exposure in a setting which has large Indigenous population
Encourage to do cultural competency courses
I would just like to throw in here my views on the cultural competency items that have been inserted into the FSSE course. To me, these seem trite, superficial, and patronising. If we are to training registrars in Cultural competency, the consultants will need to have much better training than this
There are various courses in Indigenous culture and communication with on mandatory in WA dept of Health
A great book to read is “why warriors Lie down and die” by Richard Trudgen
Cultural awareness training
Thinking and research
Encourage thinking
Research the community demographics so that you are aware of the potential cultures and their practices. Educate yourself on any specific cultural practices when it comes to patient care and communicating with family
Lived Experience
Tough one without many years of lived experience I’m afraid
Talk to patients and people from different cultures, learn from colleagues of different culture and never be afraid to ask for help
Connect! Do stuff outside your comfort zone and take advantage of educational opportunities
Our next vascular SET Trainee is the first person from an Aboriginal or Torres Strait Islander background to train as a Vascular Surgeon in Australia
Mandated courses are useful to a degree but in reality, skill can only be acquired with exposure in a setting which has large Indigenous population
I think the best thing is rural experience
Leading by example/role modelling
Leading by example, role modelling
Providing a positive role model
Allowing them to gain experience but being willing to lead when “going gets tough”
Role model

I try to set an example of respectful curiosity—I do not think that we all have to be the same but absolutely respect the cultural differences of every member of the team as well as of our patients
Setting an example
The personal example of the mentor
By example firstly…all patients are given compassionate quality care that is safe and timely
Mentoring
Brief them during orientation on local idiosyncrasies, stress and communicate to them a zero tolerance for cultural intolerance
Mentoring
Being available for advice
Setting an example, pointing out relevant differences
Supervised Exposure
Supervised exposure to patients and environments with specific cultural needs or differences
Awareness of isolation
Awareness of isolation at times
Feedback
Feedback
Feedback

Abbreviations
FSSE = Foundation Skills for Surgical Educators, SET = surgical education and training, WA = Western Australia

Table E9: What challenges might be encountered in delivering this competency (Cultural Competence and Cultural Safety) in a rural setting?

Theme	Statement from Participants
Intolerance/racism	
Bias, prejudice, and racism	
Rural areas with small intolerant communities	
There is less multiculturism in rural settings. Sometimes this may lead to less understanding or tolerance of people	
Narrow-mindedness is not limited to the rural environment but certainly is poor performance more likely to become obvious and might be a bad role-model; occasionally, however, a bad example can also be a good teaching “how not to do it”	
In general, I think there is more overt racism in rural health	
To be honest I think overt racism is more common in rural than metropolitan settings	
Cultural Diversity	
Lack of cultural diversity in most rural settings	
Lack of access to cultural groups within the workplace	

As in Q4, but often rural locations have more exposure to patients and colleagues with different cultural backgrounds and needs. Rural training exposure may be better achieved in these settings
Again, there is a vast difference between rural settings. The experience in Ballarat will be very different to Dubbo which will be different to Alice Springs. Only a limited number of trainees will get a meaningful exposure to Indigenous health issues. Again, there should be a ranking of centres on exposure to Indigenous population. Basically, the further you are from a capital city of major centre the more exposure you get to indigenous issues
On a positive note, there is probably more contact with indigenous patients the more rural one goes so there is opportunity to learn
Difference between metro and rural surgery
None. This should be no different to city medicine
Personal factors/personality traits
Assumptions that all issues of culture are transferable across groups and gender
Personalities
Ego
Toxic leadership
Criticism
Undermining
Range of local knowledge, adjusting to different regions
Knowing how and from whom to seek advice
Difference of opinions
Resources
Availability of resources
Training
Training the trainers, as I have indicated will be critical and needs to be done properly
Assessment
Assessment is going to be difficult as it is far from clear what the standards are
Patients
Not as many culturally different patient groups
Language
Language skills. Availability of translators
Many: language issues, explanation and re explanation if needed overcoming patients concerns about the hospital service allowing them to trust your management of their condition

Table E10: Examples of positive behaver markers demonstrating Scholarship and Teaching in the context of the rural setting.

Theme	Statement from Participants
Actively involved in research	
Actively involved in research	
Aware of recent publications, makes time for teaching, studying and research	
I also saw that the ability to design, gain approval for, and execute simple high quality research projects was a more straightforward process regionally than in major centres I worked in	
Keen to be involved in research; likely to need to be multicentre/collaborative	
Research studies	
There are numerous opportunities for audit and outcome research as well as multicentre studies—active involvement and contribution/initiation to these would be considered positive behaviour markers	
Consider some research that may enlighten other in the scholarship arena even if it is relatively simple on nature	
Journal clubs, reading literature, keeping up to date with literature	
Actively involved in research and journal clubs	
Need to remain aware of development in all areas if not area of expertise	
Aware of recent publications, make time for teaching, studying and research	
Journal reading and being prepared for surgical lists	
Keeps up with literature and incorporates into practice	
Engagement in learning clubs such as Journal Clubs	
Setting up clinical review and journal club meetings	
Broad reading of the literature before beginning practice in a particular rural setting is critical	
Learning opportunities and Maintaining CPD	
Maintaining CPD	
Attending Conferences	
Attendance at all teaching and training opportunities from CPD to M&Ms across specialties and workforce—acknowledges there is much to be learnt from multidisciplinary education especially drawing experience of others	
Aware of recent publications, makes time for teaching, studying and research	
Reading and knowledge of new procedures	
Even with the consultants in the unit, there is often limited chance to attend conference due to on-call commitments. There are only 3 vascular surgeons in Tasmania. When one has an opportunity to attend, we try to share any information obtained by a presentation in the unit meeting. There are dedicated college tutorials fortnightly for our vascular trainee as well	
Presenting literature review to colleagues. Case and topic presentations	
In rural centres there are a smaller number of peers which means you need to be motivated for self-learning	

There is a need to be updated on a wide spectrum of conditions in the rural context
Appropriate use of CPD time demonstrated by trainee
It is so important that the Trainee understands the unique pathologies found in a particular region. This would be learning that must be encouraged by the mentor/trainer prior to the Trainee practicing in a particular R&R setting. This will differ by setting according to geography and some other factors
Present at conferences, perhaps a case of great interest perhaps a series of one pathological type
Practicing evidence based medicine
Practicing evidence-based clinical are*
Focus on evidence-based medicine in their practice
Teaching opportunities/willingness to teach
Teaching junior doctors
Regular teaching with defined curriculum
Willingness to teach
Makes time for teaching
Willingness to teach others on ward rounds, in services, formalised tutorials and lectures
Willingness to teach juniors/nursing/allied health
The positive of being in rural hospital is that you establish a closer bond with the consultant staff—both surgical and non-surgical—which I believe encourages a good learning environment. The consultant relies on the Trainees as much as the Trainee relies on the consultant for learning and application
Credentialing to deal with a wide spectrum of conditions safely will demand willingness to travel to other centres, watch procedures, reflect on what is applicable in the local context, teach the team members and the executive about how safe surgery in a wide spectrum of conditions can be offered to local population, in the local hospital
Willingness to teach and train (at all levels)
Not dissimilar to any other setting—you need to be involved in teaching your juniors—that happens in rural or metro
There may be non-traditional teaching opportunities in rural practice. I have given talks to community groups and GP registrars. If I am doing a FIFO visit to another town, I am sometimes asked to do a presentation at the Hospital education meeting. Positive behaviours are active teaching with a set time and program whether to Rural Medical School Students or JMOs
Teaching opportunities can be more varied in rural practice. I have certainly provided teaching to community groups and Rural GPs. When doing FIFO visits to other towns in the Kimberley I am sometimes asked to present at multidisciplinary hospital education session
Personality Traits
Emphasis on lifelong learning
Broad education and natural curiosity across specialists to avoid over reliance on “consult” mentality

Enquiring mind
Journal reading, being prepared for surgical lists
Good communication and advocacy skills
Integrity: ability to remember when we had less skills and knowledge
Good time management skills as often these activities are prepared and performed out of work time.
Questioning/inquisitive
You need to be a positive role model to the juniors
You also need to ensure your own skills and knowledge are equipped to manage the variety of cases. In rural you may not have a senior trainee to depend on and often time you will be the most senior trainee even If you are only a SET2
Understanding the need to be a generalist and think broadly as a trainer and as a Trainee
In rural centres there are a smaller number of peers which means you need to be motivated for self-learning
Networking and interacting
Networking with city specialists and contribution of teaching in national setting as a mean of contribution and retaining satisfaction at work
Credentialing deal with a wide spectrum of conditions safely will demand a willingness to travel to other centres, watch procedures, reflect on what is applicable in the local context
Interaction with consultants and trainees
Trainer teaching skills and methods
Encouragement
Appreciation
Positive and constructive feedback
Far and away the best teaching I experience occurred in a regional setting. The closeness of smaller clinical teams and the heightened responsibility with adequate supervision was a fabulous mix
On our rural setting, there is only one set vascular trainee. As consultants, we have spent many hours with direct one to one teaching whether it is in ward, clinic, ED or theatre setting. It has been clearly reflected on our Trainees in the metropolitan setting. Each year, coming to Tasmania to train has been very popular
Holistic approach to patient and community essential
The rural environment is an ideal place for one on one teaching for the trainee: there are junior doctors and students—often with an international background—who can and will benefit from personalised teaching sessions; often the registrar is the most senior on the ward apart from the consultants which make her/his teaching efforts very valuable
Arranging surgical lists so that the trainee has adequate time as assistant and surgeon. Conduct joint consulting sessions. Not leaving trainee to “finish off the list” unsupervised.
Difference between metro and rural surgeon

Not dissimilar to any other setting—you need to be involved in teaching your juniors—that happens in rural or metro
See RACS surgical competence and performance framework. Little difference in principles in rural setting.

Abbreviations
CPD = continued professional development, ED = emergency department, FIFO = fly in fly out, GP = general practitioner, M&M = morbidity and mortality, R&R = rescue and recovery, RACS = Royal Australasian College of Surgeons
Notes
*sentence not complete by participant

Table E11: How do you guide trainees to acquire skills in scholarship and teaching in the rural setting?

Theme	Statement from Participants
Encourage learning activities	
Encourage participation in journal clubs	
Encourage attendance and presentation at all sessions from grand rounds to 10 min teaching topics	
Encourage interest	
I encourage contribution to teaching sessions by the registrar and I actively contribute to junior doctors/students/registrar teaching sessions	
Support Research	
Support research	
I actively look for and offer opportunities to perform audits and outcome research; I support initiation of multi-centre prospective studies which have resulted in publications as well as conference presentations. I see the rural environment as an ideal field to answer research questions because most patients are keen to help and are not 'study tired' due to too many studies trying to recruit them for participation	
There are research and audit opportunities. These often take the form of a "how we do it in the country" audit with a metropolitan benchmark as a comparator. The Provincial Surgeons Conference is a forum in which this type of paper can be presented	
Audit projects	
Practical methods for guiding trainees	
Give projects to improve standard operating procedures and patient-centred protocols	
Ensuring adequate time for clinical meeting. Looking up cases before lists to save time on teaching	
Surgical library	
Encourage them to think about the rural skill set required, training toward rural skill set but not forgetting that rural patients deserve the same first-class service and results as their city counterparts	
Videos	
Workshops	
Roleplay	
Initially advise and set reading tasks	

Conduct journal clubs
Work through curriculum
Our Trainee is actively involved in training our intern and medical student and allied health. Despite only being SET1, our Trainee is given a lot of responsibility, and this often translates to teaching and training and supporting staff on ward/theatres and in angio
Enable opportunity for teaching, research, and discussion of literature
Observation of teaching—again with appropriate feedback. Formal peer review of teaching. Feedback from learner on teachings (either formal or informal)
Explicitly talks to Trainees about their role in teaching in their future
Giving responsibility to trainee to organise and present at educational meetings, and take time out to discuss with the Trainee individually
Commitment to them as listener, answerer, discusser, global supporter always willing to communicate. Communication anytime is a great resource for the learner
Role modelling/mentor/lead by example
Leading by example
Example
Mentor example
Role modelling
Mentorship: demonstrate use of workplace tools available for teaching these skills and delivering the knowledge required in the workplace
Role modelling the attitude of ongoing learning, teaching about self-reflection as a way of improvement in surgical practice
Use of appropriate feedback and mentoring is probably the best way to teach the scholarship aspect
Role modelling
What can the trainee do
Engage teaching staff, junior doctors, and students
I think the processes are the same as in the city—be there, go to the library/read up, ask questions. One benefit is the dilution of attention from consultants experienced in massive teams in the city doesn't play such a role and its more likely a good teaching relationship. And be fostered between consultants and Trainees
Talk to consultants about the areas you wish to concentrate on—again though this is no different to being in any other rotation. The principles are the same. Make time with supervisor to go through your goals and what you wish to learn, what are you not comfortable with, attend as many education sessions via online as you can (these are all accessible to Trainees particularly in general surgery).
Make sure your hospital gives you the time to attend. Make is a priority.
Formal Courses
Formalized: many teaching and research methods courses

Human Resource Management
Balanced delegation of teaching roles in the surgical department

Abbreviations
SET = surgical education and training

Table E12: What challenges might be encountered in delivering this competency (Scholarship and Teaching) in a rural setting?

Theme	Statement from Participants
Time/availability to leave work	
Time off to attend conferences if limited number of Trainees in the rotation and need to cover clinical work	
Time access to CPD usually limited by time because of travel and rostering limitations. A little better not with development of better web platforms for learning	
Lack of time	
Participation in CPD activities can be difficult. Time constraints	
Time commitments	
Study leave is lost in travel and the costs of attending meeting is not reflected in our EBAs	
We need more study leave and a greater allowance	
Providing the trainee can be released for CPD activities then the scholarship side should be catered for (and if they cannot be released should the post be approved for training)	
Being the only registrar may not give Trainees the time to attend to these types of activities so protected educational time need to be ensured (though again this would also be expected of metropolitan hospitals)	
Lack of leave cover	
Adequate staffing and workload	
Adequate staffing numbers and support from the administration to recognise teaching as an important activity	
Isolation and lack of colleagues	
Workload of surgeons and on-call commitments making research supervision difficult	
Smaller number of trainers available	
Same as in Q4: challenges are resourcing, as regional centres currently are understaffed. Otherwise, no major barriers	
Sometimes the excessive workload experienced by senior staff can mean they have little time or energy for teaching	
There is also difficulty attending sometimes given the workload	
Likewise, numbers can influence the ability of trainers to supervise or adviser on teaching activities	
Workload and availability of mentor	
Scope of procedures	
Broader range of ability might result in broader training sometimes after the FRACS	

Potentially smaller scope of procedures available to teach from
Getting the credentialing committee, executive to agree on the spectrum of conditions which can be treated locally, getting the referral hospitals and subspecialists with their own turf to agree with the regional hospitals
Although there is no shortage of clinical material rurally, it might be that it is more difficult to teach certain topics especially the more specialists' areas. Rurally as the
Often no outpatients, so less opportunities to teach nonoperative skills
Personality traits
Personalities
Ego
Toxic leadership
Lack of motivation
Trainee loneliness
Trainee isolation
Trainee depression
Trainee introversion
A mistake made by the trainee and consequences
Location and facilities and travel
Isolation
Lack of research facilities/library facilities
It is challenging with the Covid pandemic as interstate travel to attend courses is difficult. There is greater improvement with zoom education meetings and conferences etc.
Smaller setting, remoteness limits face to face opportunities, and potentially internet access
The cost and difficulty in attending meetings in the cities, study leave is lost in travel and the costs of attending meetings is not reflected in our EBAs
We miss out on exposure to visiting experts
We need to have easier access to city hospital MDTs
RACS does not conduct may courses outside major centres. I don't think RACS has an appreciation of the difficulty and cost of attending courses from the more remote centres
Getting the regional hospital executive to fund for equipment and instruments to improve safety of practice in the regional hospitals, getting support in terms of numbers and attitude of other specialists (anaesthetists, ED), nurses, allied health etc
Distance and lack of locum leave relief can be impediments to attending meetings for trainees. Covid and the increasing use of online forums have shifted this space
Distance to attend meetings/education

Covid and telemedicine platforms have changed this space
Availability of team to get together for education
Suitable venue
Lack of resources, expertise, placement time
Lack of expertise
The lack of peers and technology—difficult to overcome and will be a deterrent to any trainees and surgeons
Funding sources, ignorance, and lack of interest from peers, difficulty to publish rural study results in a 'university-metropolitan centred' environment
Lack of forums in which to present research. The Provincial Surgeons of Australia meeting is a good forum
Assessment
Again, the numbers game determines much of what can and cannot be done in terms of teaching. If a unit has a group of medical students for example, then teaching can be accessed easily. If there is just one the whole teaching role is changes and it would be difficult to get honest, unbiased feedback on teaching activities

Abbreviations

CPD = continued professional development, EBA = enterprise bargaining agreement, ED = emergency department, FRACS = Fellow of The Royal Australasian College of Surgeons, MDT = multidisciplinary team, RACS = Royal Australasian College of Surgeons

Table E13: Examples of positive behaviour markers demonstrating health advocacy in the context of the rural setting?

Theme	Statement from Participants
Awareness of needs in the community/how to improve rural health	
Awareness of needs in the community	
Recognises GP services are so limited in some areas that specialists take on that role for following up results, treatment coordination, appreciated health outcomes are impacted by access so delayed diagnosis and treatment is not a failing of individual bit the systems	
Identify deficiencies	
Provide outreach service to improve health services engagement	
Acknowledges and understands the barriers to health care delivery in rural settings and understands how they impact on health outcomes	
Attempts to understand the dynamic of the patient's illness in the wider context of family and community	
Improvement of delivery and health care to rural patients. Develop an understanding that rural patient often DO NOT receive the same standard of care as those patients closer to major centres	
Understanding the need of local patients	
Disadvantaged in most of the Australian hospitals are (though not exclusively) Australian Aboriginals and Torres Strait Islanders, many of who feel uncomfortable to travel to big cities for surgical procedures	

Getting to know the community is really important. This is a community that trainees will be serving, so understanding the community and getting involved goes a long way
Involvement in planning of services and wider systems such as cancer networks
Positive behaviours can include involvement in health planning such as alcohol and drug services and design of regional cancer networks
Close contact with community leaders, service clubs and media (printed and electronics) to disseminate factual health information
Open to innovation/happy to change their ways for rural surgery
Open to innovation
Reasonable expectations
Adaption
Is not dogmatic in their approach as rural settings sometimes require a lot of compromise of flexibility
Advocating for regional hospitals to build up capacity to cater to the health needs of local population by adding infrastructure and resources (interpreters/Aboriginal Liaison Officer/telehealth links with clinics and referral hospitals/allied health services like podiatry and footwear)
Use of telemedicine
Commitment to patient reported outcome measures/trusting the patient/patient-centred care
Commitment to patient reported outcome measures
Put the patient at the centre of decision-making
Appropriate referral to patient to support services
Appropriate informed consent with options including 2nd opinion
Providing all clinical records, X-rays and laboratory results for 2nd opinion/transfer of care
Empathy, willingness to have contact with patients and family, communication with all members of Pts care team be it primary or secondary care
I was visiting a large rural hospital to teach ED. ED asked me to come and see a patient, and aboriginal girl who had fractured her lower femur. The leg was very angulated and severe pain as a consequence! Assessment of all the facts confirmed foetal alcohol spectrum disorder and I concluded we need to transfer to a large centre for definitive care. With the ED physician as anaesthetist, a nurse and I were able to straighten the leg and the fracture was then aligned and far less pain expected. We splinted the leg and arranged RFDS transfer to the larger centre having informed the receiving consultant. Transfer was smooth, almost pain free in the splint and arrival and transfer there later that evening with carer accompanying. Surgery was undertaken the following morning and all want well with transfer back to home several weeks later...to a safe house with full time carer
Personal health advocacy/Surgical Wellbeing
Healthy lifestyle choices
Own wellbeing—regular exercise and breaks to model health living

Work life balance, strategies to relieve pressure, exercise, healthy activities
Have my own GP
Take time out for illness
Able to recognise needs for self and colleagues with respect to fatigue management
Positive behaviour markers include good personal, physical, and mental health—I would consider this a basic need for any surgical Trainee
Generic Patient Advocacy
Encourage patients to stop smoking
Recommendations to lose weight, to stop smoking, limitation of alcohol consumption
Another positive behaviour marker in this field is to identify and address health issues in patients (smoking, obesity, diabetes)
Giving appropriate health advice to patients re lifestyle factors affecting health
Counselling patients re lifestyle, smoking, setting up adequate services to meet demand
Accessible Care
Arrange accessible care including follow up appointments to minimise travel
Appropriate and cost-effective use of investigations and test use of evidence based advice
Outline the specific relating to transfer of care, travel, and accommodation
Evidence Based Practice
Focuses on EBM as a pillar of their practice approach
Public Health Advocacy
In Darwin we have direct contact with the health minister to advocate alcohol and speed policies with good outcomes
Fulfilling mandatory reporting requirements such as STIs to community health. Involvement in other reporting such as feedback forms for the national bowel cancer screening program
Fulfilling mandatory reporting requirements—for example, to community health for STI tracing
Indigenous Health
In the Kimberley setting I have been involved in discussions about cultural circumcision which is done on boys aged 13 to 15 and sometimes against their will with a high complication rate. We have tried to have discussions with Aboriginal elders about a collaboration where boys are brought to hospital at “law time” for a medical circumcision. This remains problematic and so far without resolution.
Collaboration
Links with multidisciplinary teams in metropolitan areas to present and discuss complex cases
Involvement in telemedicine and metropolitan MDTs

Abbreviations
EBM = evidence based medicine, ED = emergency department, GP = general practitioner, MDT = multidisciplinary team, RFDS = Royal Flying Doctors Service, STI = sexually transmitted infection

Table E14: How do you guide Trainees to acquire skills in Health Advocacy in the rural setting?

Theme	Statement from Participants
Understand health outcomes	
Understand health outcomes	
Incorporate patient reported outcome measures into regular practice	
Awareness of patients at risk in early discharge if no local services, adherence to robust but not onerous follow up plans	
Community health/health promotion activities	
Advocate for community health initiatives	
Health promotional activities	
Initiate needed health campaigns	
Lead by example/role modelling/ mentorship	
Once again lead by example	
Demonstrate counselling with Trainee on ward round and encourage them to try same	
Set an example by showing willingness to speak with relatives and patients	
Mentorship is central	
Role modelling	
Pointing out relevant cases when they arise	
Setting a personal example—with regard to lifestyle choices, actively encouraging better lifestyle choices in patients with regard to obesity, smoking and poorly controlled diabetes	
Role modelling the above	
Mentor example	
Use one principle by word and example. Do to others as you would have them do to you. Luke 3.61	
Outreach services	
Encourage Trainees to attend outreach services with consultants	
Guide Trainees to visit communities through outreach clinical services and encourage them to get an idea about how and where people live. House visit with the home visit nursing service.	
Engagement with administration	
Engagement with hospital administration to improve service and inclusiveness of populations and areas of identified need	
Multidisciplinary care	
Taking part in multidisciplinary care	
Presentation of cases at MDT	

Promoting the trainees to present cases at MDTs
Exposure and education in a rural setting
Exposure to these settings
Local education in Rural context
Encouraging discussion of learning opportunities in the clinical context
Outline community health expectations
Formal training in EBP/education
Formal training in EBM
Encourage them to do one project about advocacy during their rotation (e.g. alcohol reforms/domestic violence/smoking and drug issues)
Usually by critical questioning of their decision-making and encouraging them to look up evidence rather than rely on custom and practice
Talk to Trainees about their role as a consultant
Awareness of the state of health of the community
Indigenous Health
Encourage the use of liaison officers, interpreters, and community health workers to get better engagement with the indigenous community
Cultural awareness training
Personal Health Advocacy
Encourage everyone to have a GP
Patient Advocacy
Our Trainee is always encouraged to advocate for the patients even with the limited resources
Adaption of a holistic approach to patient care
Offering help/access to support services for patients interested to make changes
Telemedicine
Familiarity with telemedicine platforms
Promoting the trainee to have experience with telemedicine platforms and present cases at MDTs

Abbreviations

EBM = evidence-based medicine, GP = general practitioner, MDT = multidisciplinary training

Table E15: challenges might be encountered in delivering this competency (Health Advocacy) in a rural setting?

Theme	Statement from Participants
Time pressures	
Time pressures with busy clinical caseload	
Fatigue management, excessive clinical load and difficulty accessing care within limited timeframes available for appointments	
Limitation of time	
This is not a part of "rostering" and there is no slack in the system to slot for activities like community visits as Trainee rosters are very much around and about clinical services in the hospital	
If Trainees are only in rural for six months, this can be challenging	
Difference between metro and rural surgeons/training	
Not clear. Should be able to be delivered everywhere	
None. This should be no difference to city medicine	
None specific to the rural setting	
Actually likely to be more visible/tangible	
There may be less services but probably more opportunity to teach this skillset in a rural setting	
I do think a rural setting is a good place to learn these skills	
Fundamental difficulties/lack of colleague support	
Frustration of inequity and fundamental difficulties in delivering of health care in rural areas. E.g. aim to discharge patients via local health service but no GP cover to take patient or beds full at destination hospital	
Lack of engagement from other team members	
We have noticed that Trainees will blindly adopt practices that they have seen in metropolitan centres without any critical thought (often, I suspect, because they are not allowed to challenge the perceived wisdom) and seem to have a belief that, somehow, the surgeons there know more than the regional surgeons. Working in a department where 80% of the consultant workforce have either been trained, or have worked, overseas we are aware of the inefficiency and waste caused by following such dogma but it is very difficult to get Trainees to accept our views.	
A mentor not engaged with health advocacy	
Personality traits	
Personalities	
Ego	
Toxic leadership	
Resources	
We have noticed that trainees will blindly adopt practices that they have seen in metropolitan centres without any critical thought (often, I suspect, because they are not allowed to challenge the perceived wisdom) and seem to have a belief that, somehow, the	

surgeons there know more than the regional surgeons. Working in a department where 80% of the consultant workforce have either been trained, or have worked, overseas we are aware of the inefficiency and waste caused by following such dogma but it is very difficult to get Trainees to accept our views.
Variation in acceptance of the “norm”
Reluctance from patients
Small and connected rural clients may not accept the trainee as a legitimate health advocate
Reluctance of family or care supporters
Variation in acceptance of the “norm”
Perception of infringement upon individual rights
Lack of engagement of the indigenous communities
Personal health advocacy
Access to Trainees regular GP dentist etc
Distance and location/distance from mentor
Distance
As the trainer I may not be there all the time although that would be ideal. Always a challenge ……. But we have facetime and zoom!! use them
Lack of resources
Lack of resources
In the rural setting there us limited resources—medical and non-medical staff, infrastructure, services etc. Achieving the competency is difficult with these limited resources
Lack of the above resources
The number of patients with poor mental and or physical health in the rural setting can be overwhelming for the trainee support services to point patients to are often limited in their availability in the rural setting
Lack of outpatient clinics
Lack of services

Abbreviations
GP = general practitioner

Table E16: Examples of positive behaviour makers demonstrating Judgement and Clinical Decision Making in the context of the rural setting

Theme	Statement from Participants
Access to resources/access to diagnostic modalities/awareness of equipment availability	
Limited access to diagnostic modalities in the rural setting (magnetic resonance imaging, nuclear medicine, etc)	
Equipment and perioperative and post op care availability	
Situational awareness	
Situational awareness	
Aware of local resources and makes use of them	
Regular unit meetings	
Situational awareness must drive decision	
Self-awareness	
Self-awareness	
Say no to surgery sometimes	
Learn from mistakes	
Honest (own abilities, local resources/expertise etc)	
Able to use the local resources fully but understand when more specialist's investigation/management necessary	
Correct management, choice of operation and decision to operate	
Knowing when to transfer, knowing when you have reached your limitations, knowing when to ask for assistance	
Display sound judgement when limits of skill are reached	
Obtaining advice from metropolitan specialists colleagues where appropriate	
A risk is giving an opinion on something that you are not expert in	
Being prepared to take advice	
Being prepared to give up on an operation that you are not performing frequently enough	
Patient transfers	
Situational awareness, self-awareness, realities of transferring patients	
Early liaison with consultant to work out timing and location for transfers to ensure one transfer once and minimal delays. Similarly with inpatient presentations—often the slowest road to definitive care is admission	
Clear processes for assessment and transfer are often well established in rural regional centres	
Early identification of patients requiring higher level of care and early consultation with or without transfer	
Knowing when to transfer	
Peri operative and postoperative care	
Perioperative and post op care availability	

Demonstrate sound postoperative decision-making
Outline preoperative, operative, and post-operative care, including timeline and recovery milestones
Constructive feedback/audit
Constructive feedback
Tasmanian audit of surgical mortality
Firstly, I believe you need to maintain a total practice audit to have your own data on numbers and outcomes
I would advocate for a total practice audit to inform the practitioner and other of how often they are performing procedures and their results
Positive behaviours include audit
Appropriate support and supervision
Appropriate support and supervision
Seeks consultant help in a timely manner
Ask questions of seniors
There are centres with good workplace culture also generally have strong ties with subspecialty units centrally, and shred decision and support can be modelled to trainees
Daily one to one training with our Trainee and staff
Appropriate timeliness of discussions with consultants
Uses medical expertise to make informed and timely decision in all parts of the patient journey
Select for those who will learn non-technical skills and are teachable in this arena, the teach it again and again
MDT care/ Shared decision-making
Early involvement of subspecialty
Involvement in MDT meetings
There are centres with good workplace culture also generally have strong ties with subspecialty units centrally, and shred decision and support can be modelled to trainees
Regular multidisciplinary meetings
Discussion/presentation of cases with colleagues
In the rural setting the hierarchy is very flat and frequently the Trainee and her/his consultant are the only two surgeons involved in the clinical decision process; the rural setting is an ideal field for the trainee to be closely involved with the clinical decision process
Teamwork and leadership mast be understood and mastered in practice always in R&R situations
Clinical Expertise
Wide considerations of differentials
Knowledge
Prioritises cases effectively

Good knowledge of patients and results. Up to date surgical practice
Understand of the patients situations as well as medical issues surrounding clinical decision-making
Management of waiting lists—both for clinics and theatre
Mini clinical examinations
Communicating with patient to find out their wishes regarding their care, establishing goals of care at admission, implementing protocols like enhanced recovery after surgery, smoking cessation before surgeries
Appropriate use of tests and investigations
Sensible diagnoses and suggested management plans
Uses knowledge to make informed and timely decisions
Displays sound rationale for decision-making and judgement
Uses available information to effectively prioritise acute and elective patient assessment
Demonstrate rational and safe intraoperative clinical decision-making
Uses experience to inform decision-making (again though these are all behaviours we would expect from all trainees no matter where they are)
Offer and outline appropriate non-surgical options in management
Develop strict protocols for following up all tests and investigations
Non-technical skills are far more important in training and practice than we at present want to admit. Judgement and decision-making are both critical if we add distance and delay for a deteriorating patient
Social Awareness
Social awareness
Understanding of social differences
Culturally safe
Follow up contacts with postoperative patients
Staff education in handling the difficult/distressed patient
Communication is also critical in all facets of patient care but perhaps more important in R&R setting
Professionalism and behaviour
Diligent behaviour
Good time keeping
Professional
Works to minimise the impact of bias on decision-making
Manages uncertainty in clinical decision-making
Maintain the mantra of 'no harm'
Communication Skills

Communication skills
Give explanations in common language avoiding medical terms
Communication is also critical in all facets of patient care but perhaps more important in R&R setting
Education/CME/CPD
Seeks to fill knowledge gaps and continually improve
Rural requires a wider breadth of practice and this make you vulnerable to falling behind current practice. Good CME is required including upskilling in extended practice areas
Reading up on procedures you do occasionally prior to doing them is sensible. Having an open anatomy nook in theatre when exploring a wound is also
Rural surgical practice involves a breadth of practice that exceeds metropolitan. Surgeons need to seek experience with a wider skill set and also maintain their knowledge
Maintenance of CPD; being prepared to take advice or read up on something
Assessment
Examine for it in assessment along the was an in final exams

Abbreviations
CME = continuing medical education, CPD = continued professional development, MDT = multidisciplinary team

Table E17: How do you guide trainees to acquire skills and confidence in Judgement and Clinical Decision Making in the context of a rural setting

Theme	Statement from Participants
Using a risk matrix to guide behaviours	
Using a risk matrix to guide behaviours	
Simulation	
Practice scenarios, discussion during live situations	
Simulation scenarios	
Role play	
Clinical and surgical courses as appropriate to training pathway including simulation style courses	
Supervise clinic/MDT/guidance from mentor	
Supervised clinics/MDT where decision to operate or not is discussed	
VMO led service so decisions across all specialities made in conjunction with higher level experience and training. Trainees never given sink or swim guidance	
Mentorship	
Opportunity to assess and discuss with graded responsibility depending on training level	

I encourage the trainee to see patients and to report back to me so that we can then decide on the next steps together; the personal development of Surgical Trainees in developing their strengths in clinical judgement and decision-making can be observed beautifully over a 6-months rotation in the rural setting; due to the one on one situation between Trainee and consultant a very good professional relationship can develop
We always have a consultant available. During workshop hour they will be within the hospital and are readily contactable at night. Set expectation early. Trainees are encouraged to make management decisions and receive feedback—properly delivered—if it is felt that their decision-making is incorrect
Explicit discussion of cases on list/in ward
Regular brief and de briefing sessions
Self-reflection/critical questioning
Reflection on important pieces of information to convey when relaying clinical info
Critical questioning of decision-making on ward rounds
Particularly with knowing your limits, Trainees need to speak to their supervisor about what they are comfortable with, what they need guidance on, and most important where they need to improve (again not dissimilar to all of training)
Role modelling/leading by example
Role modelling
Demonstration of behaviour
Personal example
Educational material
Videos
Workshops
Other courses as relevant: cultural safety, EBM, communication skills, medicolegal aspects of decision-making
Attendance at M&M, journal club meetings
Tasks with arranging educational material, organizing health promotional activities
Use a training process for R&R and online e-learning tool can be very useful
What the trainer can do (practical suggestions)
Offer the opportunity to plan and mage operative lists and guide them when appropriate
Encourage knowledge of pts and the procedures. Encourage discussion to the alternatives and decision-making processes to making final decisions
Work and teach from first principles. In regional settings there is always going to be a need for clear thinking and action as the predictability of what's needed from a surgeon is reduced
Important to teach understanding of the limited resources in a rural setting and how patients are best managed safely
Regular review, feedback, gradual granting on independence

By establishing routines and protocols where patients' overall wellbeing and wishes are given priority
Exposure
Exposure
No different than city hospitals—they have to work with resources available. As the resources are often limited, they have to rely more on clinical judgement and sometimes make uncomfortable decision. A critical part of their maturation as a surgeon. Again, this is a reason for mandatory rotations through more remote hospitals.
Trainees interested in rural practice should have access to sub-specialty terms. Post fellowship time in an appropriate centre is valuable. I did a post fellowship year in Darwin. Taking opportunities during your training to join another specialty for theatre is also valuable
Extra terms in sub-specialty areas. A 'rural fellowship' tailored to the area where you are planning to practice. For me this was in Darwin.
Resources
No different than city hospitals—they have to work with resources available. As the resources are often limited, they have to rely more on clinical judgement and sometimes make uncomfortable decision. A critical part of their maturation as a surgeon.

Abbreviations
EBM = evidence based medicine, M&M = mortality and morbidity, MDT = multidisciplinary team, R&R = rescue and recovery, VMO = visiting medical officer

Table E18: How do you make the decision to perform surgical procedures in the context of a rural setting in the following situations: Infrequent and high risk procedures

Theme	Statement from Participants
Experience and training	
Even if infrequent, must be a procedure that you have experience and training in	
Ensure appropriate skill mix	
Ensuring currency of practice	
With 30yrs experience I am comfortable with these, however we have seen young consultant general surgeons with sub-specialist training who embark on these procedures without adequate experience and local resources with poor outcome for the patient and surgeon	
This needs to be discussed with the supervisor or consultant the Trainee is training with. The Trainee needs to be open about their limits and the supervisor/consultant needs to be aware of the Trainees previous experience	
Appropriate critical care backup	
If high risk, only with appropriate critical care back up	
Adequate facilities for post op care	
MDT approach	
Discussion with peers	

Seek advice from appropriate colleagues
Consult with others
Discuss cases with colleagues in tertiary centres in subspecialty units
If rare procedure discuss with other colleagues
Peer (local of interstate or more universal context) opinion
Consult with colleagues
Sometimes perform with colleagues assisting
Discussion with patient (with or without) family and colleagues both locally and in referral centre
Discuss with colleagues
Discussion with a colleague at a separate (often "higher") institution
Consultant with anaesthetists, nurses, executives, and patients/families
Discussion with trusting colleagues in tertiary hospitals
If the patient needs the operation, I am uncomfortable with the operation and I have anaesthetic support to proceed: I will ask one of my colleagues for her/his support
This will usually be a multidisciplinary decision and we gave both a high-risk anaesthetic clinic and a joint ICU/anaesthetic/surgical meeting to discuss selected cases. These will inform as to whether the procedure can be done 'in house' or should be referred elsewhere. Often in these cases, if the procedure is within scope, it is the co-morbidities that determine suitability for a rural setting
Communication/collaboration
Appropriate planning
Plan, plan, plan
Careful pre-op planning
Clinical decision-making
Study for the surgery
Read up, study relevant imaging
Read up
Documentation of the case
I do them/practical example
I do them
1) does the patient need the surgery and are there alternative treatment options 2) if the patient needs the operation, I am comfortable with the procedure and I have anaesthetic support to proceed: I operate 3) if the patient needs the operation, I am uncomfortable with the operation and I have anaesthetic support to proceed: I will ask one of my colleagues for her/his support during the case 4) if the patient needs the operation but is not safe to be operated in the rural setting and there is time to organise a transfer: I will organise transfer to a metropolitan centre

I would still be keen to do these with appropriate patient selection and disclosure to the patient. In general, would refer on patient or pathologies likely to be difficult. For example, keen to do a hemithyroidectomy for follicular neoplasm but not a total for large multinodular goitre. I would have to have an open disclosure discussion with the patient about my experience/comfort with the procedure
When an urgent condition carries less risk than transfer
Depends on the operation and certain patient factors
Risk benefit analysis
Risk benefit balance—discussion with patient and family about risks of delay or transfer against early local intervention or nonoperative strategies
Balance of risk, alternatives
Patient-centred discussion with openness to options
Discussion with patient (with or without family). Clear explanation of risks and benefits of having procedures performed in rural setting
Resources
Appropriateness of the procedure in the given setting
Resources availability
Backup and support services
Clinical context
Careful pre-op planning and ensuring availability of any specific equipment/colleagues
Competency of organisation to support the procedure
Clinical context
Theatre/angio availability in a timely fashion for pts condition
Theatre/angio staff availability and skill set availability of appropriate specialists e.g. Suitable anaesthetist or cardiothoracic surgeon etc.
Support from anaesthetic and other colleagues to allow safe delivery of care
Require adequate instrumentation, suitable anaesthetists
EBM
Evidence based medicine
Audit of own performance
Audit of own performance
Medico legal context
Medicolegal context
Senior support required

Young surgeons starting in rural settings without senior support must be given support somehow and RACS needs to work with the health service and surgeon to ensure good outcomes without simply saying 'you shouldn't be doing these procedures'. This attitude is all too frequent and destructive
Situational Awareness
Situational awareness

Abbreviations
RACS = Royal Australasian College of Surgeons

Table E19: How do you make the decision to perform surgical procedures in the context of a rural setting in the following situations: Procedures outside your regular scope of practice but in which you have had training

Theme	Statement from Participants
Requires support/potential support from colleagues	
Avoid this without support. Attendance by a colleague with more experience or within their regular scope	
Perform lifesaving/damage control surgery under advice from subspecialty surgeon in tertiary unit, engage other local surgeons	
Individual risk assessment, safer to proceed or transfer? Is there an opportunity to discuss with a colleague?	
Personally, I would only do these in an emergency after discussion with the tertiary centre. For example, recently I had to perform a laparotomy on a three year old for primary peritonitis. The patient had come to us as there were transport problems with RFDS so, after discussion with the paediatric surgeons at our regional children's hospital I performed the laparotomy locally before transferring the patient the next day. Wherever possible we would try and get two consultants involved in such cases	
Communication/collaboration	
Avoid unless life or limb/risk benefit	
Generally, avoid unless life or limb threatening with no hope for transfer	
As above, honest risk benefit discussion with patient and family about surgical options locally or potential for transfer	
Alternative treatments and impact on patient and family	
Consider the risk to the patient and whether on referral is appropriate	
Individual risk assessment, safer to proceed or transfer?	
When retrieval not available to manage an urgent condition	
Reasons for doing them	
I do them	
Also dependent on time taken to transfer and how long patient has taken to arrive at rural centre	
If outside my scope, I would generally transfer	
Since we are considering the rural setting—most procedures that I have been trained in are within my scope of regular practice; for non-emergency procedures outside my regular scope of practice I have a low threshold of referral to another surgeon	
Refer to a major centre if not comfortable	

It depends on the magnitude of the operation, the recency of your training and whether you are doing operations of a similar nature
It doesn't depend on the complexity of the procedure and whether I am doing similar procedures. The further I would move from recency of training the less likely I would take it on. If there was a need there could be opportunity for upskilling
Never undermine local services
Never undermine local services
Acquisition of appropriate procedural skills
Ensure acquisition of appropriate procedural skills
Acuity of procedure
Refresh knowledge. Consider the extent to which regularly utilised skills transferred to the procedure under consideration.
Credentialing
Credentialing
Discuss with EDMS If needed
In consultation with credentialing committee/DMS
Resources
Consider if equipment availability is adequate
Availability of more appropriate surgeon
Scope of practice
Scope of practice
Currency of practice
Currency of practice

Abbreviations
DMS = Director Medical Services, EDMS = Executive Director Medical Services, RFDS = Royal Flying Doctors Service

Table E20: How do you make the decision to perform surgical procedures in the context of a rural setting in the following situations: Procedures that you have had little or no previous experience in

Theme	Statement from Participants
Do not perform	
Do not perform. Refer on to colleagues with appropriate level of experience	
Avoid unless life threatening	
Generally, avoid unless life threatening with no hope for transfer	
I try not to do them unless in an emergency situation and generally in discussion with a colleague more experience in these fields	
Only perform lifesaving procedure. Engage another local surgeon and subspecialty surgeon in tertiary unit giving guidance	
Generally, avoid unless in dire emergency	

Consider the need for this procedure to be done by me rather than someone with experience—this would usually come down to whether the patient life or quality of life might be affected by delay in care
Only if life threatening and too unstable to transfer
In an emergency situation, canst safely transfer, chance to talk through or maybe get telehealth guidance
I would only do if I had to treat a patient who would otherwise die or suffer significant morbidity without my intervention; I would point out to the patient or her/his carer that this is a procedure I have little or no previous experience in and that I only do it to prevent death/serious morbidity. If there was a shift in the need for a certain elective procedure in my rural practice and I have little or no previous experience in this procedure then I would make every effort to learn the required skill/procedure and introduce it in a safe, monitored and audited way in my elective practice
Having had a broad based training there is not much that I have not at least seen so, if it was a life or death situation and I had support from a centre, then I would be prepared to tackle the case
Would only do if an emergency and under the instructions of a metropolitan specialist
I would only take these on If there was an emergency need and under guidance from a metropolitan specialists
When no other option is available
Discussion with colleague
I try not to do them unless in an emergency situation and generally in discussion with a colleague more experience in these fields
Discussion with local and tertiary colleagues before commencement
Only perform lifesaving procedure. Engage another local surgeon and subspecialty surgeon in tertiary unit giving guidance
In an emergency situation, can't safely transfer, chance to talk through or maybe get telehealth guidance
Phone a friend, what is best for the patient
Again, this would need to be a life threatening emergency and my approach would be to discuss the case with the tertiary centre in the first instance.
As above, we would always try to get more than one consultant involved in such a case
Unlikely to undertake without collegial support
Would only do if an emergency and under the instructions of a metropolitan specialist
Communication/collaboration
Perhaps online live mentoring through a procedure with a distant specialist mentor
Working as a patient advocate
Joint decision-making as patient advocate to ensure they remain cared for, and that solution remains my problem until solved
Ensure acquisition of appropriate procedural skills
Ensure acquisition of appropriate procedural skills
Consider the complexity and risk of the procedure and how my current skill set maps onto what would be required
Credentialing

Credentialing
Complete or refer on
Consider the need for this procedure to be done by me rather than someone with experience
Generally, if elective and there were options, would refer on
Getting a visiting specialist to come to regional hospital periodically
Scope of practice
Scope of practice
Efficient transfer
Efficient transfer
Situational awareness
Situation awareness
Clinical decision-making
Clinical decision-making

Table E21: How do you make the decision to NOT perform a surgical procedure (and therefore transfer a patient for care elsewhere)

Theme	Statement from Participants
If not time critical/urgency	
If time permits (not time critical) and outcome dependent on surgeon with experience in the procedure	
High risk, low acuity	
If the patient can be transferred safely, and there is no urgency	
If the patient presents in an emergency situation and she/he cannot be transferred for care in another centre transfer is not an option in the elective	
Is there time to transfer the patient safely	
Resources not available in rural setting—hospital/staff/equipment	
The need for intensive care or specialised treatment not available in rural setting	
Resource availability	
Back up and support service	
Pretty much where the level of support, skills and equipment is not adequate to allow elective surgery at my centre	
Lack of safe perioperative support	
Working within the hospital capability framework preoperative assessment and scoring, availability of ICU and nutritional support	

Non-emergency setting the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) as well as the necessary support structures (ICU, HDU, specialist nursing care); if one or several of these are deficient for a certain condition then I will refer the patient on to receive care elsewhere
Usually a combination of lack of instrumentation and inadequate postop support
This would be dependent on skill, area of expertise and what facilities are available at the hospital
When necessary preoperative management can't be done, or appropriate level of postoperative care unavailable. When optimal equipment not available. Infection risk in the facility. Experienced personnel not available
Appropriateness of the procedure in the given setting
Some rural setting more conducive to transfer than others
Appropriateness of the procedure in the given setting/service
Patient requiring elective surgery for a procedure not performed regularly in rural setting
Elective situation where results from care at a high volume centre measurably better
Follows protocols and recommendations
Non-emergency setting the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues)
Secondly does the procedure fit in the CSCF of the hospital
This depends on the assessment of how advantageous it is for the patient to have a metropolitan specialist do the operation compared to me and my hospital. The larger the divergence the more likely I would not offer the surgery. Thus, there are many procedures which I eliminated from my practice. For example elective rectal resections.
Situational awareness
Communication to family
Often a case of "what would I want for my family member"
good explanation to family and patient of the lack of action
Scope of practice/experience
Scope of practice
I had limited experience or no experience in the procedure, I would consider transfer
Firstly, do I feel I have the skills to manage the patient safely and locally
This would be dependent on skill, area of expertise and what facilities are available at the hospital
Multidisciplinary care and collaboration
Discuss with subspecialty via phone
Communication/collaboration
Patient stable for transfer
If patient is stable enough to survive transfer and requires surgery which is highly specialised and not performed in the rural setting

If the patient can be transferred safely
Risk factor for litigation
Risk factors for litigation in patient interactions
Patient accepted by another institution
When patient is gladly accepted by another institution
Clinical decision-making
I'm comfortable making these decisions with my experience by for younger surgeons who are at a vulnerable stage of their career need to have a structure in place for support from major centres
Thirdly, does the combination of procedure and co-morbidity raise concerns that the patient should not be treated locally
Do I feel that outcomes might be better by the patient being treated in a larger centre (e.g. upper GI/pancreatic cancers)
Additionally for large operations/complex patients who had high risk of complications—even if manageable in a rural setting
Ultimately, I make a decision to transfer a patient elsewhere where I know the outcome for a super-specialist treatment is significantly better than mine
Personal stressors
I would consider onward referral to reduce stresses on myself and the hospital
Additionally, I consider personal stresses from potential complications of surgery and have a lower threshold to transfer a patent who is high risk even if the complication could be effectively managed in a rural setting

Abbreviations
CSCF = clinical service capability framework, GI = gastrointestinal, HDU = high dependency unit, ICU = intensive care unit

Table E22: How does your answer to the question (Table E21) above differ depending on emergency or elective context?

Theme	Statement from Participants
Perform if an emergency	
Perform if an emergency and outcome likely to be worse (or death) without intervention	
In general, if I assess that there could be a risk to life or quality of life I will take on procedures with as much support as I can gather	
If the patient had a time critical life threatening condition that transfer was not possible, the local surgeons would perform surgery to attempt to save pts life	
Usually with the emergency situation, time is a critical factor. Life/limb threat may well be a factor	
Time critical emergencies will be managed locally irrespective of facilities but focus on damage control procedures and then shifting referral to hospital	
In rural setting the question of emergency vs elective is of significance; often transfer of patient takes too long or is even impossible due to weather conditions; in these emergency situations procedures may need to be done in the rural setting which usually would have been transferred; if transfer is no option due to the condition of the patient, then surgery will have to be done in the rural hospital and the patient can be transferred for further care afterwards	

Unlikely to differ unless procedure too urgent to allow delay for transport e.g. tracheostomy for airway obstruction
Emergency surgery liberates you to do more major procedures with the risks of deterioration in patient transfer. You do your best.
For emergency surgery where the patient's life would be at risk if the time taken for transfer (which is a considerable time in the Kimberley) the threshold changes and there is a freedom borne of necessity to take on bigger cases
In emergency circumstances, timing becomes critical, and delay in management has to be matched against the health risks of transfer being greater than intervention in less than optimal conditions
If doing surgery would get MDT advice
Would engage and get advice from remote colleague with experience to guide me
Discussion with referral centre subspecialists even while performing emergency procedures
Communication/ collaboration
Scope of practice
Almost never do elective procedures out of my scope
For elective surgery there is no excuse for performing procedures outside once personal scope of practice and experience whether this occurs in the rural or metropolitan setting
Transfer for elective
Significantly. Much greater reliance on transfer in elective setting and safe to do so
Transfer to tertiary centres is more common for elective procedures
Yes. For example, here have been occasions where I have had to perform a thoracotomy for trauma, but I would never consider performing an elective thoracotomy
Follow the protocols/local policies
Follow the protocol/local policies
Ensure practice of safe surgery
Ensure practice of safe surgery
Hinges around acuity as a major factor in the risk benefit analysis
You have to deal with the emergency on its merits
Elective procedures give time for planning, discussing, consulting, and reflecting
With elective surgery, delay doesn't incur a health consequence, allowing time to arrange circumstances to be optimal
Clinical decision-making
Is transfer a good option
Acuity and likelihood of deterioration if transferred. Mode of transfer available. Distance to transfer
Depends on the patient's stability and availability of transfer
In the rural setting the question of emergency vs elective is of significance; often transfer of patients takes too long or is even impossible due to weather conditions

Situational awareness
Situational awareness

Table E23: What challenges might be encountered in delivering this competency (Judgement and Clinical Decision-making) in a rural setting?

Theme	Statement from Participants
professional networks	
Lack of professional networks with specialists to provide timely advice	
Support services	
Good relationship with colleagues and peers is paramount	
Trainees need to know who they can transfer to If outside their facility. There needs to be strong links with the tertiary hospitals or bigger hospital in the catchment	
Communication	
Limited communication	
City colleagues need to improve their communication around complications they inherit—too often there is not direct communication between the specialists involved as to what has been done, or public comment made in meeting setting deriding rural practitioners' skills or judgement. These behaviours magnify the fear many trainees feel about taking a change on moving out from the cities	
Getting all team member on the same page	
Getting through to the right "empowering" and "enabling" specialists in the referral centre (calls often go to the registrars/fellows in referral hospital: one needs to insist on talking to the consultant—but the referral hospital consultant need to have some idea of the person calling them---- challenging indeed)	
More opportunity for this professional skill in a rural setting	
Not many really. These situations mostly arise in rural settings	
These challenges are more frequently encountered: smaller hospitals, smaller volumes, fewer specialists with super specialisation. Less easy to transfer elsewhere due to remoteness and in a time appropriate manner. So, in this context these skills are more reliably learnt and experienced in these settings	
Would be a day to day learning opportunity, likely to have exposure to good bad and frustrating examples	
The rural setting is the ideal environment to participate in difficult decision-making with regard to what to do and what not to do in elective surgery; for emergency procedures the trainee will learn how to cope with decision-making when you are "caught between a rock and a hard stone"; I do not think there are challenges to deliver this competency in a rural setting—I think this is the ideal environment to develop this competency	
Better setting to teach this than major urban hospital	
Too quick to transfer	

Registrars tend to be too timid and the range of operations they can do out of training too narrow perhaps for rural setting. This results in increasing transfer of care in the last 20-30 years
High risk trainees develop a sense that rural centres can't do things and rely on transfer to the mothership when failing and appreciate how much does get done locally that doesn't get shipped out. Example of this week of 14 year old which trainee reflexively tried to transfer rather than assessing if this "paediatrics" could be safely done locally (didn't appreciate this is more about comfort of anaesthetics than surgeon skill).
Resource availability
Resource availability
Limit of support levels and staff levels to allow for full range of procedures
These challenges are more frequently encountered: smaller hospitals, smaller volumes, fewer specialists with super specialisation
Resource limitation
Backup and support
Backup
Tertiary surgeons not understanding the situation on the ground in rural areas and form barriers to transfer
In my experience there can be a lack of support from tertiary centres when things do not go well and this is seen as a risk for trainees considering moving away from the cities
Support (or not) by other departments e.g. anaesthesia, medical administration
Resource limitation and peer and health service support
Getting all the team member to read from the same page
Surgical skills
Skill mix
Tertiary surgeons not aware of the local skill available and requesting unnecessary transfers
Perceived expertise and competency
Transfer difficulties
Less easy to transfer elsewhere due to remoteness and in a time appropriate manner
There will be some patients (often very complex, rare conditions) that will need to transfer to tertiary hospital. Logistics with transfer etc Logistics with family and patient etc costs able to do in a timely fashion
Training methods
Situation awareness training
This is very difficult to teach. Often pattern recognition and knowing when early transfer is best
This is straightforward with the elective cases—just have the trainees sit in on the MDT meetings and learn by osmosis. The other cases are firstly, rare, and secondly unique, so it is difficult to teach the decision-making in this setting. It will also depend upon prior experience of the surgeon exactly where on the continuum they are. I think a key element is trying to teach the Trainees confidence

This is learned experience and relevant to Trainees more as they come to the end of their training
It is higher level experience that probably need individualisation
Some Trainees may not be as open to non-technical skills and thus selection for NTS abilities is critical
Risk benefit
Giving an effective and understandable risk analysis to patients and supporters
Reason with patients
Overcoming a natural desire to be treated locally. Where indigenous patients are involved, there is widespread belief that transfers out don't survive

Abbreviations
MDT = multidisciplinary teams, NTS = non-technical skills

Table E24: Examples of positive behaviour markers demonstrating Leadership and Management in the context of the rural setting?

Theme	Statement from Participants
Involvement in hospital and health network management	
Involvement in hospital and health network management	
Work with hospital boards and quality improvement initiatives	
There are probably more opportunities in leadership and management in rural settings. Involvement as Head of Department, planning of surgical services are basic areas	
A constructive relationship with management which is driven by outcomes not policy	
Post graduate education	
Postgraduate education	
Leadership roles on surgical unit, managing junior staff and rosters etc	
Assuming leadership role on surgical unit, managing junior staff and rosters etc	
Generally, as a surgeon you are held in high esteem in a rural community and also can have roles in the community. If you desire an evolution into management roles there are likely to be opportunities where you might act in these positions. In terms of behaviour a willingness to help sort out problems and assist in allocation of staffing and resources are attributes	
Rural surgical units are usually small and the effects of good as well as bad leadership/management become obvious easily rural surgeons often have leadership roles within the hospital as well as their communities	
Management of juniors and nursing staff	
Planning operating lists to match time and staff available, and to enable Trainee appropriate surgical experience	
Conducting ward rounds at appropriate times	
Good registrars tend to lead good teams	
Good registrars tend to lead good teams	

Recognises that excellence in management are not limited to large urban research centres
Recognises that excellence in management and leadership are not limited to large urban research centres
Adjusts leadership style to suit the rural situation
Ability to adjust leadership style to the setting e.g. Small hospital
Leadership and management skills are again transferrable across settings so the following would be applicable anywhere: adopts leadership role at appropriate times. Delegates to optimise team performance. Uses resources to enhance leadership. Models' positive leadership behaviours. Creates a positive time for the team. Maintain performance and behaviour standard as a leader when under pressure. Speaks up against damaging behaviour and unprofessional conduct. Encourages others to speak up. Co-ordinated efficient care of patients. Provides direction regarding patient care. Promotes joint decision-making
Traits of good leadership
Good leadership
Fairness
Social justice
Integrity
Initiative
Ability to bring others along
Role model to others
Able to resolve conflicts
Demonstrate inclusion
Respectful and informed decision-making
Accept responsibility for outcomes good and bad
Professional
Inspiring
Trustworthy
Communication skills
Dependable and approachable
Flexible
Decisive
Assertive
Confident
Flexibility in management
Having a 'can do' approach as your default position
Willing to listen to other points of view/opinions

Well formatted strategy
Demonstration of consultative and collaborating leadership
Developing business cases for supporting safe surgery close to home
Working with multiple stake holders to agree on the agenda of safe surgery closer to home
Checking results, signing of letters, ensuring tasks are completed etc.
Behaviour in theatre
There are probably ten types of leadership, and all have merits perhaps except one when it comes to healthcare. Compassionate patients care a priority #1 in first step. Compassion in management of the issues with team is critical. Compassionate palliative care vs futile surgery is a simple example in some countries. Private practice is driven by the $$ value of the operation to be done…futile or otherwise! Back to the patient first in every dimension
Specific Example
Delegates to optimise team performance. Uses resources to enhance leadership. Models' positive leadership behaviours. Creates a positive time for the team. Maintain performance and behaviour standard as a leader when under pressure. Speaks up against damaging behaviour and unprofessional conduct. Encourages others to speak up. Co-ordinated efficient care of patients. Provides direction regarding patient care. Promotes joint decision-making
Leaders that welcome new specialists and Trainee and find ways to accommodate their needs and consider available options to assist the surgeon's family integrate into the community tend to retain staff. When I moved to my region I wrote to and then had lunch with all the general surgeons working in the area as a way of getting to know each other and sound out any concerns. Almost universally the response was positive, and it was a great way to establish collegiality for our community
Collaboration and teamwork
Much of the behaviours have been described in collaboration and teamwork but should also include items such as checking results, signing off letters, ensures tasks are completed etc
Communication
Effective communication with administration and team members in knowing and acknowledging limitations of the facility
Debriefing all team members after surgery

Table E25: How do you guide a trainee to acquire skills in Leadership and Management in the rural setting

Theme	Statement from Participants
Get them involved in extracurricular	
Get them involved in committees, meetings, and projects	
Encourage involvement in administrative roles as well as clinical	

By allocating them specific tasks which will need a multidisciplinary and collaborative approach (such as auditing a certain condition/auditing theatre flow)
Courses and extra study
Encourage additional study. Leadership courses
Videos, workshop, role play
Formal education: leadership and management courses
I encourage Trainees to do the CRM training and if they have a serious interest in management to do the AICD course
Encouragement and support in role
Encouraging adoption of such roles if not done spontaneously. Support in such roles
Encouraging innovation in leadership and developing new protocols
Give trainee additional responsibilities
Guide them to look after interns, medical students
Give them the opportunity to lead ward rounds, manage the roster and mentor juniors
Exposure with increasing responsibilities
Providing opportunity to lead
Granting of some, progressive independence. Registrar lead war rounds
As a Trainee progresses give them more leadership and management roles
Giving Trainees responsibility to lead in discussion and planning
Leading by example/role modelling
Leading by example, role modelling
Role modelling
I think sharing experiences in management problems (within the bounds of confidentiality and the interest of the health service) can help Trainees come to understand the path ahead of them and the difficulty in achieving some of outcome one might expect to be easy. There are often competing interests at play and learning what these are and hearing about how others navigate these is an important part of professional development
By example
Role modelling
Role modelling
Sharing information with colleagues trying to set the example of a 'good leader'
Mainly by example
By example
Example, example, example, always a winner
Mentorship

Teaching Trainees to look for solutions
Mentorship
Make aware of limitations
Make aware of limitations of resource
Leading operative and word teams
Developing leadership skills outside a named position by leading especially operative and ward “teams”
Set clear expectations
Firstly, have clear goals at the start of a placement regarding expectations
Feedback and evaluation
Review and feedback
Firstly, have clear goals at the start of a placement regarding expectations in these areas I always keep an eye on these aspects and will remind/give feedback If they are not being done correctly
Correcting observed inappropriate behaviour
Making time available to evaluate performance
Future planning
Plan future activities

Abbreviations
AICD = Australasian Institute of Company Directors, CRM = crisis resource management

Table E26: What challenges might be encountered in delivering this competency (Leadership and Management) in a rural setting?

Theme	Statement from Participants
Availability of opportunities	
Availability of opportunities	
Limited opportunity to take part in administrative roles	
Confidentiality can be tricky to maintain in small settings which can limit management teaching opportunities as described above	
Senior leadership factors	
Dependent on senior leadership in hospital or health networks	
Systemic challenges	
There is also sometimes an attitude of “we need more people to fill the public jobs and on call roster but we don’t want to lose any private work”. This can leave Trainees or new consultants feeling unwelcome or unsupported by senior colleagues. Ensuring a clear balance is struck between the pressures to recruit and retain appropriate staff and concerns that can arise around nepotism and public/private conflicts of interest in rural settings is also not easy.	
A non-responsive, overly bureaucratic, management	

As junior staff is often temporary, they need to earn the trust of older more permanent staff in the rural setting—that takes time. As a Head of Department I will communicate to the permanent staff about dependability and trustworthiness of juniors and how we could mould them along for right thinking so that safe surgery can be provided closer to home
We have electronic systems that allow me to keep tabs on matters such as unsigned letters, unchecked results etc but if such systems are not in place this would be difficult. Having time to run these checks
Consultant availability
Being there with the Trainee for some of the time FIFO surgeons can be an impediment to best example and does worry me a lot
Smaller administration structure—trainees are often not involved
Smaller administrative structures—Trainees often do not participate in administrative meetings
Same challenges as city medicine
Same challenges as city medicine
None specifically to the rural context
None specific
Universal to any setting
Workload
Support for additional workload e.g. if leadership positions are taken on
Often surgeons and their teams are very time poor as they have large workloads with ongoing demands
Available theatre time, staff, and equipment
Personality traits
Personalities
Ego
Toxic leadership
Undermining
Backbiting
Rural environment factors
Strong relationship between juniors from the local community may undermined the authority of the Trainee
Lower number of juniors to be involved in teaching and managing
Often team member have multiple roles
Lack of ability to escalate the issue locally
Transport and distance
Services across different sites
Language and cultural diversity
Trainees not supported by seniors

There is also sometimes an attitude of "we need more people to fill the public jobs and on call roster, but we don't want to lose any private work". This can leave Trainees or new consultants feeling unwelcome or unsupported by senior colleagues. Ensuring a clear balance is struck between the pressures to recruit and retain appropriate staff and concerns that can arise around nepotism and public/private conflicts of interest in rural settings is also not easy.
Limitation of cases
Should not be many challenges but limitation of cases can be a factor
Easier in salaried health department
I think easier to deliver in positions salaried by health department. If the model is fee for service/VMO I would think surgeons are likely to, understandably, put their management resources into their own practices
Poor senior management
As surgical units are often small poor management decisions and poor leadership becomes obvious very quickly and can destroy a team; as mentioned earlier for a trainee observation of a bad example can also be a teaching experience
Electronic leadership
We have electronic systems that allow me to keep tabs on matters such as unsigned letters, unchecked results etc but if such systems are not in place this would be difficult

Abbreviations
FIFO = fly-in fly-out, VMO = visiting Medical Officer

Table E27: Examples of positive behaviour markers demonstrating Professionalism and Ethics in the context of the rural setting

Theme	Statement from Participants
Honesty/integrity	
Doing the correct thing for the right reasons. Integrity and honesty	
Never say a bad word about anyone	
Honesty, integrity	
Patient-centred approach/evidence based medicine approach	
Patient-centred approach	
Respect patient autonomy	
Evidence based practice first and foremost	
Professional and ethical treatment of all patients	
Restrict fees to schedule	
Make consultation times suit community availability	
The practitioner talks to and listens to the patient and or family and or parent with little interruption. Touch…Examination is appropriately consented and appropriate in every clinical way	
Punctual/time management skills	

On time starts of meetings, surgeries etc
Time management skills
Public vs private commitment and priorities
Public vs private commitment and priorities
Equal management of private and public patients
Confidentiality and privacy
Trustworthy, respect for confidentiality above all. Everyone knows everyone. Never discuss treatment or patients
In rural practice confidentiality is even more crucial as you encounter more and more people in your town as patients
Protect patient rights and information
Cultural factors
Accepting that cultural/religious factors will affect decision-making
Ensure effective communication with diverse ethnic and language groups
Respect for others
Acknowledges and respects others “moral” codes, needs and wishes
Respect of colleagues
Fosters an environment of collegiality
No difference in rural setting than any other setting
This is no different in a rural setting to any other setting
As per the guide, nothing specific to rural setting
The basics of professionalism and ethics are the same as in any medical practice
No different than city
Again, this competency in terms of training would be the same in any setting i.e. Reflects on own practice and acts to institute change as required. Receptive feedback and willing to engage in changes. Maintains currency of knowledge and skills. Demonstrates ownership and accountability of clinical and non-clinical situations. Engages in clinical responsibilities and attends commitments. Recognises and acts within own limitations. Fosters an environment of collegiality. Upholds the rights to equitable care for patients. Protects patients’ rights and information. Fulfils legal and regulatory requirements. Demonstrates fiscal responsibility indecision-making and clinical practice. Adhere to institutional and professional policies and procedures
Open disclosure of competency
Open disclosure is morally important including as mentioned earlier disclosure of your experience and recency when consenting for less common procedures
General examples
Professional
Courtesy

Supportive culture
Transparency
Reflective and acknowledges errors
Maintains appropriate boundaries
Acceptance that best treatment may not be surgical
In our regional hospital private hospital we have a shared weekend roster and a weekend acute roster
Regular morbidity and mortality meetings and reviews
All the items detailed in “collaboration and teamwork”. “scholarship and teaching” and “leadership and management” plus things such as being on time, attending the preoperative huddle, adhering to local protocols such as hand hygiene, use of WHO checklist etc
Role modelling
Role modelling where ethics and professionalism underpins decision-making
Medical professionals are public figures in their rural communities, and they have to be aware of their responsibilities outside the hospital: their behaviour is setting the benchmark for others in the community (you cannot hide like in big cities) good ethical and professional behaviour in my opinion are key to a long term and happy career in the rural environment
Standards for care
Ensuring the standard of care is in alignment with the standards elsewhere in the country
Government and institutional standards
Fulfils legal and regulatory requirements. Demonstrates fiscal responsibility in decision-making and clinical practice. Adheres to institutional and professional policies and procedures.

Table E28: How do you guide trainees to acquire skills in Professionalism and Ethics in the rural setting?

Theme	Statement from Participants
Additional learning/courses	
Additional reading on ethical practice	
Workshop	
Encourage Trainee to attend courses	
Formal courses	
Encourage diversity awareness training	
Involvement in local community	
Involvement in local community	
Introduce trainee to community leaders	
No difference between rural and metro setting	

Same as everywhere else
Role modelling
Modelling respectful communication
Leading by example
Role modelling
Practice what you preach
Lead by example
Mainly via example of consultant behaviour
Role modelling etc
Role modelling etc
Role modelling
I try to set an example of highly ethical and professional behaviour towards my patients, peers, students, other hospital staff and of course the trainee. I think it is important to reflect on one's actions and comments continuously and it is important to go back and apologies (and make changes) if one's behaviour has not met the standard mentioned above
Role modelling
Set a good example
Personal example
Have a Trainee sit in with consultations
Example example example
Separating clinical from social relationships
Separating clinical from social relationships
Supervised patient visits
Supervised patient visits
Professional behaviour in orientation
Include professional behaviour as part of orientation
Mentorship
Ensure trainee aware of other factors influencing decision-making
Mentorship
Active discussion around competing needs and perceptions around decisions taken is helpful
Encouragement of good professional standards
Ongoing discussion and interactions (mentoring)
Talk to Trainees about ethics
Respecting culture

Respecting culture
Feedback and assessment
Regular feedback, Trainee assessments, 360 reviews
Feedback promptly if standards fall short of those expected
Consideration of ethics
Consideration of ethics in decision-making process
Clear setting of examples
Clear setting of examples
Have trainee to do a district health analysis
Have trainee to do a district health analysis

Table E29: What challenges might be encountered in delivering this competency (Professionalism and Ethics) in a rural setting?

Theme	Statement from Participants
Detrimental past experiences/witnessing bad behaviour	
Local past experience with colleagues who have had lower standard of ethical practice	
I believe that the rural setting is an ideal environment for the Trainee to learn about the consequences of good as well as bad ethical and professional behaviour; consultants cannot hide behind the walls of a large institution: our ethical and professional behaviour is under constant observation and a Trainee is the eye-witness to consequences of good and bad behaviour; the only limitation/challenge I can see for the rural setting is once again the limited number of consultants: there is not such a large variety of behaviours to be observed	
Loss of trust in community	
Loss of trust of community	
No difference rural to metro	
No difference than in city medicine	
Few as behaviours and attitudes can be demonstrated anywhere	
Cannot see any barriers apart from that raised in Q4 about resourcing	
None specific	
Universal to all practice but lack of outpatient clinics can restrict opportunities	
Misc examples	
Don't often run by knife to skin times, equipment issues	
Adequate rest	
Acceptance of bad behaviour	

Stress
Well doctors give patient just 11 seconds before interrupting a new study in the Journal of General Internal Medicine found that, on average, patients get about 11 seconds to explain the reasons for their visit before they are interrupted by their doctors. 10 Sept 2018.
Issues with boundaries
Ability to separate clinical from social networks. Often near impossible given limited population so how this is managed is delicate
Trainee may 'let their guard down' during rural postings and thus cross boundaries that should not be crossed
Treating family and friends needs to be managed carefully in a rural setting
There are a smaller pool of staff and eligible partners so staff can form relationships which may create conflict of interest
Public vs private
Co-located vs separate public and private hospitals
It can be difficult to manage the crossover between private and public roles, and a less rigid approach to this divide can be necessary in rural settings with limited resources
It is possible easier to deliver ethical and professional care in regional areas with no private hospitals or private practice nearby. In regional areas with opportunity for private consultation or procedures, one need to draw compartments where conflict of interest will not come into play
Toxic culture
Unprofessional behaviour, toxic culture, blame game
Lack of cases
Failure to consult enough with patients and families
Supervision
Having the ability to observe the Trainee in the workplace at the appropriate times
Fiscal knowledge
With fiscal responsibility Trainees are not always the ones making decisions but they need to understand what is responsible financial decisions for the hospital and most importantly the patient i.e. don't order scans that are not needed
Lack of knowledge of billing practices
Lack of cultural diversity
Lack of knowledge and experience with non-metropolitan communities and practice. Lack of awareness of cultural diversity
Lack of leadership
Lack of leadership experience
Collegiate support
Having a colleague to discuss it with…second opinion is always a great opportunity for patient satisfaction and personal learning as well

Table E30: Are there any additional professional skills or competencies that could be needed in a rural surgical setting

Theme	Statement from Participants
Broader Scope of Practice	
General skills outside regular speciality	
A more general skillset needed to compensate for less specialised practices	
From a urology perspective a urologist would benefit from paediatric exposure. For a urology service to be viable in a rural setting the general surgeons must be trained in basic urological skills particularly accepting scrotal surgery is equally urological and general surgical. Managing ureteric stents, difficult catheterisations and suprapubic catheters should be mandated for rural based general surgeons	
The ten core competencies are generic and cover all settings. I am not sure if they count as competencies exactly, but the rural surgeon has to probably be more flexible and has to have the confidence to undertake procedures that are either at the limits of their comfort zone or, possible outside it. These can be encouraged but i'm not sure they can be taught	
No additional professional skills or competencies	
No	
No	
N*	
None in addition, but certain competencies have more relevance. Advocacy, Cultural Safety, comprehensive generalist training and exposure, Q9 is particularly relevant	
No	
No	
Willingness to learn	
Willingness to learn	
Professional networks	
Good, supportive professional networks in urban settings with subspecialists competency	
Establishing referral pathways. Knowing how to get good advice	
What is really important in rural training is making contacts with larger hospitals. This is not something though that can really be done in SET training. Also, you need to be aware that training only in a rural setting may not set a trainee up to be a good rural surgeon. They need a wide variety of experience and to be able to make those contact they need to have worked in those settings. Ensuring they can "call a friend" to get a second opinion, spending one day a month in a tertiary hospital when you are a consultant	
RACS sponsored visits to referral centres, discussions with peers, OR attendance, participation with MDTs would be invaluable	
An Open mind	
Just an open mind	
Flexibility/adaptability	

When does flexibility and adaptability fit in? sometimes we just have to work with what we have and embrace it—outside of work to
Knowing and adjusting your practice to the local level of care available
Social and situational awareness
Social and situational awareness
Working with a small group and still maintain boundaries
Accept the rural practice is different to metropolitan. Awareness of geographic limitation on practice and care
Wisdom, knowledge of local expertise and deficiencies
Important competencies for rural surgeons are social skills and situational awareness
Ability to cope alone
Ability to cope alone
Isolation is the biggest issue
Match the training to the needs of the community
I think we need to revisit the concept of matching our training to the needs of the community rather than the interests of the powerful subspecialty groups. I did some survey work for GSA in 2015 where anonymously new Fellows indicated their hands on experience in training for common elective and emergency procedures. Many had achieved fellowship and never done a colectomy or a trauma laparotomy. From my time in tertiary hospitals, it seemed trainees were in duplicated and effectively non operative roles, vying with Fellows for experience
Prior specialist employment
Prior specialist employment. Not always amendable to post-fellowship job
Good assessment skills
Good assessment skills, use of ISOBAR algorithm
Resilience
Insight, sense of vocation and desire to serve despite apparent temporary personal inconveniences, a willingness to put up with executive which may not always cooperate
Additional rotations
I think a trainee with interest in rural surgery should spend one year during her/his training in rural training sites. I think a trainee with interest in rural surgery should spend one rotation of her/his training in an 'acute surgical unit'
Accountability
Must be prepared to be accountable, no large groups to fall back on
Non-technical skills are critical
Non-technical skills are critical to all facets of care delivery

Abbreviations
GSA = General Surgery Australia, ISOBAR = identify, situation, observations, background, agreed plan, read back
Notes
*word not completed by respondent

Table E31: From your experience what could be added as part of a rural-facing curriculum to complement the existing SET, covering the 9 surgical specialties, to better prepare SET Trainees for independent rural practice?

Theme	Statement from Participants
Structured training opportunities/generalist skills	
Structures training opportunities for technical and non-technical skills to expand a generalised skillset	
Making sure that the core generalist skills are well taught	
Rural experience	
Lots, of experience in places like Darwin, Alice Springs, Broome	
Nothing needs to be added. Exposure in these settings is critical	
Breadth of training, including in rural areas	
Insight on global surgical burden and a compulsory time in an underdeveloped country to do surgical work with a trustworthy surgeon in that situation	
Mandatory rotation through an 'acute surgical unit' and mandatory rural rotation (six months to every Surgical Trainee and one year for those with an interest in rural surgery); the second 6 months for the Trainee with interest in rural surgery could also be a part of a fellowship after graduation from the SET program	
Extra time in rural practice transitional period after training with gradual increase in independent practice	
Same as metro surgeons	
Surgeons in rural areas need then same non-technical skills as their city counterpart	
Everything that is in the general surgery curriculum is applicable to rural training	
NTS is a comprehensive manner for all trainees	
Access to networks (professional)	
One of the challenges is access to networks for bouncing ideas and CPD	
Training in above improved communication tools with colleagues	
Encourage networking	
As mentioned above the important aspect is when you are setting up practice is being able to get those contacts	
Access to CPD	
One of the challenges is access to networks for bouncing ideas and CPD. Many excellent college led CPD offerings are still Sydney centric in timing and face to face nature. Needs to start somewhere so EVERY time a teaching session is scheduled think "how hard would it be for someone working in the Badlands on a one in three roster to be able to attend this?' not curriculum linked but access to education opportunities is a big deal	
How to deal with feelings of isolation	
Similarly, how do we deal with a feeling of isolation—or fear that isolation might be an issue. Easy to be one in a department of 10 but very hard to step in to the second or third specialist in a town. Or the first!	

Understanding rural practice
How do we shake the belief that excellence is only available in cities and that a life of uncertainty and fewer resources can also have meaning?
Also important for those trainees NOT planning a rural career to have an understanding of the difficulties faced by rural practitioners
Know limitations and use resources
Trauma management might be the best example. Work with what we have, know our limitations, use resources—human or otherwise. Enable those human resources to be better.
Cross-speciality training
And also postings to other specialties that would be key for rural inclined trainee surgeon e.g. Vascular rotation, Neurosurgery rotation and Plastic rotation
Cross specialty training for longer
Making sure that the core generalist skills are well taught and potentially some cross specialty skills
I am presuming another round of the survey will be looking at what might be a reasonable extended scope of practice for rural surgeons. There is certainly additional clinical experience and skill sets that should be included
Some time spent in disciplines outside current general surgery—Vascular, Plastics, Cardiothoracic, ENT, Urology, Neurosurgery occasionally
Obviously, exposure to the subspecialties at a more senior registrar level is critical. Be able to do a tracheostomy, managing chest trauma, unblocking a kidney is important
Acquisition of basic skills in Plastic, Urologic, Orthopaedic and Vascular surgery would be invaluable
Time duration
Time duration
Trauma surgery experience
There must be trauma surgery experience with a hands on and responsible role. There needs to be recognition that the majority of procedures can be broken into components that could allow for more than one trainee to advance their skills within a complex case. Consultants need to have a clear understanding of where the learning edge is for their trainees in order to achieve this. The idea that "you'll get to operate when you're a fellow" need to be rooted out of training in bigger units.
Indigenous culture
Indigenous cultural training
Rural surgeon mentorship
Rural surgeon mentorship would be valuable
Compassionate care for all patients
Compassionate care for all patients first priority

Abbreviations

CPD = continued professional development, ENT = Otolaryngology ear nose and throat, NTS = non-technical Skills, SET = surgical education and training

Table E32: How could a rural-facing curriculum help develop confidence and competence in SET Trainees providing surgical care to rural patients?

Theme	Statement from Participants
Professional networks	
Know how to “phone a friend” and ask for help	
Actively building hub and spoke networks between tertiary and regional centres through planned training programmes and short (e.g. 3-6 months) skill specific fellowships placements for upskilling and building networks	
By challenging referral hospital surgeons to foster close relationship with regional surgeons/Trainees	
Show the benefits to rural surgery	
Show that this is an acceptable practice	
Reinforcing to the Trainee the immense difference they are making working in the rural setting	
By causing the Trainees to spend time in regional and rural areas	
In a rural-facing curriculum Trainees will observe the daily practice of rural surgeons and will learn that most surgical procedures do not need a highly specialised training program but experience and a good working environment; I believe that the SET training has the potential to deliver a good baseline education for a future rural surgeon and that additional training could be done in rural centres using fellowship programs	
Improve telemedicine support from subspecialty	
Improve telemedicine support from subspecialist	
Appropriate use of telehealth	
Help them use the tools of modern IT and communication in medicine and day to day life!!	
Rural rotations	
By predominantly rotating in rural hospitals	
Confidence is absolutely key—more exposure in a protected space to allay fear	
Have a strong focus on rural training not a token rural rotation	
Better exposure to rural practice, both education od rural practice and experience	
However, the best thing for confidence is rural experience	
Rotations is rural centres with training in management of all the issues discussed	
More technical training	
More technical training and help during training for a broader capability without sacrificing depths	
Rural-facing curriculum would aim to train SET Trainees to become rural surgeons (wider scope of practice rather than focusing on sub-specialty care)	

Education of hospital management on surgeon competencies as these transcend traditional subspecialty boundaries
Better preparing skillset and behaviour patterns for smaller departments
Provides a local context, with surgeons being specifically trained to meet the needs and demands of rural populations
Expounding extended core competencies would be valuable in establishing a mindset, however the best thing for confidence is rural experience and an expanded clinical skill set
Some time spent in the above disciplines with frequent updates, interdisciplinary dialogue
I think that there should be targeted training in certain procedures that could be life-saving. I would include tracheostomy, thoracotomy, burr holes and some vascular exposure. This needs to be more that the 'one go' approach seen in the Definitive Management of Surgical Trauma course. I think the trainees need to be doing 20-30 of these procedures in order to gain some degree of expertise so allocations to specialist units would be necessary
Specific training (including above)
Have a community engagement component
Have a community engagement component
Ensure rostering practices are in place that facilitate Trainees engaging with the community through sport/music/hobbies so they build deeper connections and a positive impression of what the place is like. Too often I lived in a place I barely got to know as my hours prevented any social activity and as a result I don't think of those places fondly
Education of hospital management
Education of hospital management
Benefits to government and community
Would increase confidence of local governments that their expenditure on these pathways would more likely lead to retention of surgeons and sustainability of services with a regular conveyor belt of locally grown surgeons
Organisation behaviour
Better preparing skillset and behaviour patterns for smaller departments
At a system level—address toxic management eddies when we all know they exist—recruit pairs/triads of specialists to ensure the clinical burden is sustainable. Money spent employing beyond the bare minimum is well spent when it prevents burnout and rapid turnover. Trainees are watching what life is like for their consultant's, inspiring connected communities have do difficulty recruiting and retaining staff
As above not relevant to the question but very important is working with the hospitals to accept a broad scope of elective practice. It's not good enough for rural general surgeon being restricted in the scope of practice for elective procedures but then expecting them to do the same procedure in an emergency without the benefit of acquiring and maintaining skills by doing the procedures electively this also requires a change in the culture of the subspecialty societies who often look down on their rural colleagues and want to place restrictions on the rural practitioners for their own personal gain
Upgrading general surgery as a specialty

Strong relationships
On an individual level—ensuring these positions are built on strong relationships between Trainees and consultants
Exposure to experienced rural surgeons' period of support/mentoring after training completed
Excellent supervising surgeons
Ensuring the supervising surgeons are excellent
Ongoing development on model of care
In the context of my speciality which is necessarily tertiary base, ongoing development of models of care with a balance of rural visits by clinicians, appropriate use of telehealth and city visits by patients and education to rurally based surgeons, will develop hand in hand with the SET curriculum
Another curriculum won't add value
I don't think another "curriculum" can add value. What can add value are resources on specific issues facing rural surgeons and how to navigate them because you may not need to navigate them until you are working as a fellow or consultant. That is where the energy should be focused—not on reinventing another "curriculum" that will just be a repeat of what the specialties already have included. Think about what you need to know to set up a practice in rural setting—or pathways to gain further experience in an area a Trainee has not had much exposure to (which is how the General Surgery Rural Post Fellowship Training program works)
Build them into corridors
Build them into corridors of opportunity for elective and emergency actions/activity and help them use the tools of modern IT and communication in medicine and day to day life!!

Abbreviation
IT = information technology, SET = surgical education and training

Table E33: Reflecting on your own training, what helped you develop confidence in a rural surgical practice?

Theme	Statement from Participants
Exposure to multiple surgical specialties	
Exposure to multiple surgical specialities during training and ongoing exposure as consultant	
Longer generalised training encompassing General surgery, Orthopaedics, burns/Plastic, Urology, Neurosurgery and Cardiothoracic	
I decided I would be going rural from early in my training and sought an expanded training experience. I was enrolled in the Rural Surgical training program and did a term of Plastic Surgery and Vascular Surgery during my training. I sought opportunities while doing General Surgical terms to equip myself—did endoscopic interventions and caesareans. I did a post fellowship year in Darwin which consolidated many of my extended scope of procedures and added some experience in chest and neurotrauma and Orthopaedics.	
Ambition to want to be competent in a variety of fields	
I was trained in a large university hospital outside of Australia; my training was in no way intended to make me a good rural surgeon but it was a very broad and intensive surgical training (all in one place, no rotations to other metropolitan or rural hospitals); my only	

experience with the surgical training in Australia is through my interaction with Trainees as well as through my college activities; I was lucky to have received a similar broad surgical education as SET Trainees in Australia receive it (if I had not had that broad surgical training I would not have been fit for purpose in the rural setting); confidence to work in rural surgery for me resulted from knowing that I had seen and done a lot before I came to rural practice; confidence also came from a supportive working environment where I had colleagues to rely on
I trained in the UK a long, long time ago. I spent 15 years from finishing medical school to becoming a consultant and, in the process, spent time in Neurosurgery, Cardiothoracic surgery, Vascular surgery and multiple General surgical units. By the time I became a consultant I was confident that I could handle most things that came through the door.
My own training was a LONG time ago, with basic skills in Orthopaedic, Plastic, Urologic, Vascular, Chest and Neuro, and I felt confident I could handle the gamut of General Surgery and emergency sub-specialties.
Environment requiring a generalist mindset
Austere environment has required generalise mindset
Time spent in rural environment
Does not apply in the Australian context—most of my training was in rural hospitals in India
Training outside of capital city and experienced broader range of capabilities
Regular secondments to country areas for significant periods of time (i.e. long terms)
Good balance between metro and rural rotations
Grew up in rural area
3 rural postings
Darwin and Townsville were amazing places to train with just enough rope to keep me constantly expanding my skill responsibilities but with enough oversight to work safely
Rural terms prior to SET training informed my attitudes
Most of all, I spent a considerable time growing up in a rural centre
Regional and rural fellowships
Time spent as a fellow at Darwin was invaluable in the Australia
Role models and good mentors
Role modelling after rural surgeons
And ongoing connections with the surgeons in those towns as encouraging mentors
Good mentors
Mentorship Being thrown in at the deep end (but not wise way, going forward). Passion to redress inequity in health care: RACS needs to find a way to identify these people. There are many. Darwin has quite a few. They need to be recognized: not for accolades, but so they can be role models/mentors to inspire young aspiring Surgeons to train and practice in rural settings

I was inspired by the skill of my regional consultants and fell in love with many of the places I worked in through music, camping, and kayaking. Ultimately, I found having one traffic light between my forest home and hospital base, along with awesome colleagues far outweighed the attractions of climbing the career ladder in a tertiary hospital.
Mentors guiding how best to manage rural patients
Broad range of interest during training
A broader range of interests during training and opportunities to expand those interest during training years, for me it was Paediatric surgery, Plastic and Vascular Surgery
Frustration with city colleagues
But also the opposite, frustration with the diluted expertise of city colleagues who had lost the ability to be doctors first and were instead “experts” in one area and consult specialists in others.
Good/supportive colleagues
Having friends in other specialties like Urology, Neurosurgery and Plastics
Good relationships with surgeons in my specialty throughout Australia and overseas
Phone a friend
I was fortunate I had a 2 year stint as a consultant in London and then moved to Albury where I have 2 experienced colleagues who nurtured me. I have seen on a number of occasions when a junior consultant moved to a regional centre without the experience and support and they did not have the maturity and experience to manage difficult situations. This results in a loss of confidence by the practitioner and also a loss of confidence from their peers and community. Word spreads quickly in smaller environments! RACS needs to put into place support mechanisms for junior consultants particularly in the more remote and smaller communities. Going to join a group practice in Gosford is very different to being the only Urologist/ENT/Plastics in Dubbo.
Interacting with surgeons working in rural areas at a personal level, being challenges by the vision and vocation
Confidence also came from a supportive working environment where I had colleagues to rely on
1 year of semi-independent practice then mentoring by senior colleague as required
A senior nurse suggested an opportunity was there. He was a quality coordinator headed for the R&R hospital. We continued communication and patient care became much simpler, more cost effective and patient orientated for R&R care quality. He had a vison I had the desire to help him make it work. It did
Military surgical training
Military surgical training in the UK.
War surgery mindset and damage control training has given confidence
Busy jobs/gaining experience
I did VERY BUSY training jobs and then had a VERY BUSY consultant post for 3 years prior to moving to a regional centre. It is important to have a good grasp of your specialty and confidence in your surgical ability and limitations prior to embarking on a rural/regional career.

Very rigorous and busy training jobs independent operating list during senior years of training
Improvement in IT
Improvement in IT—remote access to hospital and private radiology etc
Educational activities
Keeping abreast current literature, attendance at meetings and workshops
Networking with hospitals
I believe a formal linkage with a major centre is critical. Being able to discuss cases, join an MDT, take your more complex cases so you can operate on them in yourself in a bigger hospital, provide locum relief etc is very important and needs to be fostered by RACS and the regional health authorities
Visit to regional hospitals for procedure specific training in the regional areas, intermittent rotations in referrals hospitals to develop further skills and knowledge
Gaining lost skills
Over time I lost some of the skill I had acquire mainly—due to specialisation in the UK—but, since arriving in Australia, I have had to revive some of them. Having had a solid foundation—albeit many years ago—it was not that much of a stretch to pick up the skills

Abbreviations
MDT = multidisciplinary team, R&R = rescue and recovery, RACS = Royal Australasian College of Surgeons, SET = surgical education and training, UK = United Kingdom

Appendix F. Round 2 Delphi results

Table F1: Collaboration and Teamwork Results

Statements with Consensus (75%)	Agree %	Statements with Consensus for Exclusion	Disagree %	Statements with no Consensus	Agree %	Disagree %
Positive behaviour markers demonstrating Collaboration and Teamwork in the context of the rural setting						
Good communication skills (spoken and written) and willingness to communicate with multidisciplinary staff—for example, doctors from other disciplines including general practice, nurses, allied health professionals, Aboriginal and Torres Strait Islander Health Workers, technical and administration staff	100.00%					
Building administrative and clinical peer relationships between rural and referral hospitals including tertiary hospitals	100.00%					
Communicating, collaborating, and sharing care with General Practitioners	100.00%					
Communication with General Practitioner anaesthetists—for example, regarding the suitability for patient care at a regional centre versus transfer	100.00%					
Interdisciplinary collaboration and service planning and collaboration between specialists	100.00%					

Asking for advice and multidisciplinary teamwork and decision-making	95.84%					
Use of telecommunication to facilitate communication within a healthcare team	91.67%					
Collaboration and team care arrangements with allied health staff (physiotherapist/occupational therapist) and other health care professionals	91.67%					
Use of emerging technologies and telecommunication tools to deliver healthcare	91.66%					
Methods of guiding trainees to acquire these skills in Collaboration and Teamwork in the context of the rural setting include:						
Supervising surgeon being a positive role modelling and setting a positive example	100.00%			The same methods of guiding metropolitan Trainee's because the skills are transferrable and are not different from working in metropolitan areas	50.01%	33.34%
Encouragement, skilled feedback and self-reflection regarding positive support, communication, and behaviour with reviews of progress	100.00%					
Skilled mentoring from experienced rural surgeons who explain the importance of collaboration	100.00%					
Rural work experience for the Trainee	100.00%					
Ensuring management plan on discharge negotiated with primary care team and communicated in a timely way in writing, and for critical problems, verbally	95.84%					

Multidisciplinary training as it benefits the surgeon as they learn more about other groups in the hospital and acquire skills in other specialties	95.83%					
Giving Trainee responsibility for communicating with General Practitioners	91.66%					
The challenges that might be encountered in delivering this competency in a rural setting include						
Lack of human resources to replace Trainee during travel away from rural setting to attend face to face courses	83.33%			The lack of availability of courses which rural Trainees can attend	54.17%	29.17%
Attitudes from Trainees from non-rural settings—for example, urban Trainee's not understanding the rural setting and the attitudes within rural hospitals	83.33%			The short-term rural rotations and high turnover of staff in a rural hospital setting	62.50%	20.84%
Heavy workload and time constraints of the supervisor/mentors	79.16%			Heavy workload and time constraints of the Trainee	70.83%	20.84%
				Isolation and geographic distance from larger cities	66.67%	20.83%

Table F2: Communication Results

Statements with Consensus (75%)	Agree %	Statements with Consensus for Exclusion	Disagree %	Statements with no Consensus	Agree %	Disagree %
Positive behaviour markers demonstrating Communication in the context of the rural setting						
Using enough time to talk with patients, families, and carers at times of consultation; having enough time to get the full story and encouraging the patients to ask questions	100.00%					

Timely and effective General Practitioner liaison to facilitate continuity of care	100.00%					
Contributing to a culturally safe and inclusive environment for patient and the health care team	100.00%					
Keeping patients and family informed during all patient interactions—for example, times of consultation, and after discharge	100.00%					
Communicating effectively within a team	100.00%					
Consultation and collaboration with other disciplines	100.00%					
Allowing extra time to communicate with Aboriginal and Torres Strait Islander patients	95.66%					
For patients with English as a second language, using interpreters or where culturally appropriate, family or community members	95.66%					
Allowing for cultural decision-making in care planning	95.65%					
Self-reflection and awareness of cultural differences between the Trainee and their patient	95.65%					
Patient-centred verbal and non-verbal communication, tailored to the patient and their family, their culture, and their context	95.65%					
All the communication markers are described in the RACS Surgical Competence and Performance Guide.	78.26%					

Communication is a generic skill—it is not different whether you are in a rural or metropolitan setting						
Methods of guiding trainees to acquire these skills in Communication in the context of the rural setting include:						
Providing demonstrations, role modelling, and setting an example of positive communication skills and behaviour	100.00%			Learning some of the local Aboriginal and/or Torres Strait Islander language(s) to show respect in interactions with Aboriginal and Torres Strait Islander patients and staff	56.52%	21.74%
Providing formal feedback (for example using feedback tools) and informal ad hoc feedback (for example 'on the job' feedback) to the Trainee	100.00%					
Spend time independently in outpatient, emergency departments and wards, and practice with case presentations and meetings—that is, practise is more important than theoretical advice	100.00%					
Perform Entrustable Professional Activities, like the Trainee leading ward rounds with consultant observing	95.66%					
Listening/learning/forming connections with the community, about the people/place/context you are working in	95.65%					
The same way they should acquire communication skills anywhere whether it be a rural or metropolitan area	91.31%					
Participating in Aboriginal and Torres Strait Islander cultural courses and cultural induction programs which are relevant to the local population	82.60%					

The challenges that might be encountered in delivering this competency in a rural setting include						
Constant change of personnel, including consultant and senior staff and fly-in, fly-out healthcare workers	82.61%			Mismatch between Trainees own culture and first language, and that of the patients and staff in the rural location	52.17%	21.74%
Lack of Trainee knowledge of local culture can impact communication	82.60%			There are no great barriers or difficulties specific to the rural setting	47.83%	47.83%
A lack of training and understanding of patient and community cultural context relevant to seeking and participating in healthcare	78.26%					
Poor workplace culture—for example, disengaged supervisors or Trainees, bullying/discrimination/harassment, overwork, or unsafe hours	78.26%					

Abbreviations
RACS = Royal Australasian College of Surgeons

Table F3: Cultural Competence and Cultural Safety Results

Statements with Consensus (75%)	Agree %	Statements with Consensus for Exclusion	Disagree %	Statements with no Consensus	Agree %	Disagree %
Positive behaviour markers demonstrating Cultural Competence and Cultural Safety in the context of the rural setting						
Having an inquisitive mind and a respectful curiosity to learn more about different cultures and personal backgrounds of their colleagues and patients, especially local context and cultural norms	100.00%					

Awareness of how culture may affect compliance and having the ability to tweak patient management plans to address the patient's concerns—for example, allowing patient to leave hospital for sorry business, changing antibiotics to oral, making alternative dress-change plans, etc.	100.00%					
Involvement of family and community members where desired by patient, or where culturally appropriate or requested by patient	100.00%					
Listening carefully to patient responses	100.00%					
Trainee being aware of cultural difference of multicultural staff	100.00%					
Being respectful of all elements of human diversity	99.99%					
Understanding Aboriginal and Torres Strait Islander people in rural settings and negotiating a balance between protocol drive ideal care and appropriate cultural care	95.25%					
Cultural self-reflection: recognising own culture, experience, and biases	95.25%					
Awareness and use of Aboriginal and Torres Strait Islander liaison officers	95.24%					
Teamwork and collaboration	95.24%					

Contributing to a diverse and inclusive culture—for example, by calling out racism when it is encountered	90.48%					
Methods of guiding trainees to acquire these skills in Cultural Competence and Cultural Safety in the context of the rural setting include:						
Exposure and rural lived experience	100.00%			Formal cultural awareness training	66.67%	19.04%
Supervisors leading by positive example, and being a positive role model	100.00%					
Supervisors mentoring and being available for advice	100.00%					
Supervisor providing feedback to Trainees	100.00%					
The challenges that might be encountered in delivering this competency in a rural setting include						
Language skills	85.72%			There are no challenges as rural training may lead to more exposure to patients and colleagues with different cultural backgrounds and needs and may lead to more opportunity to learn than in the metropolitan setting	33.33%	42.85%
Racism and intolerance	76.20%					

Table F4: Scholarship and Teaching Results

Statements with Consensus (75%)	Agree %	Statements with Consensus for Exclusion	Disagree %	Statements with no Consensus	Agree %	Disagree %
Positive behaviour markers demonstrating Scholarship and Teaching in the context of the rural setting						
Attending a variety of teaching and training opportunities—for example, attending and presenting at conferences, continued professional development,	100.00%			Not dissimilar to any other settings (metropolitan or rural)—there is little difference in principles in rural setting	55.00%	30.00%

morbidity and mortality meetings across all specialties and workforce meetings						
Being motivated for self-learning including reading, teaching, studying and research	100.00%					
Willingness and making time to teach. This can include ward rounds, in services, formalised tutorials and lectures as well as non-traditional teaching opportunities such as giving talks to community groups and General Practitioner registrars	100.00%					
Having a questioning/inquisitive personality/enquiring mind with an emphasis on lifelong learning and a natural curiosity across specialties to avoid over reliance on "consult" mentality	100.00%					
Networking with metropolitan specialists and interactions with consultants and Trainees	100.00%					
Being involved in teaching juniors	100.00%					
Being up to date with literature and engaging in journal clubs	95.00%					
Being actively involved in research including multicentre and collaborative research	90.00%					
Methods of guiding trainees to acquire these skills in Scholarship and Teaching in the context of the rural setting include:						

Actively looking for and offering opportunities and support for research and audit projects	90.00%			Role modelling the attitude of ongoing learning, teaching about self-reflection as a way of improvement in surgical practice	70.00%	15.00%
Encouraging attendance, presentation, and contribution at all teaching sessions i.e. grand rounds, 10-minute teaching topics, and encouraging participation in journal clubs	85.00%					
Enabling opportunities for teaching, research and discussion of literature and giving responsibility to Trainees to organise and present at educational meetings	85.00%					
Use of skilled mentoring and feedback	75.00%					
The challenges that might be encountered in delivering this competency in a rural setting include						
Time off to attend conferences if limited number of Trainees in the rotation and need to cover clinical work, this includes rostering limitations	90.00%			Potentially fewer teaching opportunities in the rural setting—for example, no outpatient clinics, smaller scope of procedures, certain areas conducive to more specialist areas	40.00%	40.00%
Workload of surgeons and on-call commitments make learning opportunities and research difficult	90.00%			RACS does not conduct many courses outside major centres	63.15%	15.79%
Geographic isolation and distance to attend face to face opportunities	85.00%			COVID-19 and the increasing use of telemedicine and online forums	65.00%	15.00%
Trainees needing more study leave	75.00%					

Rural Trainees needing a greater study allowance due to incurring higher costs of travel to attend courses	75.00%					
Isolation from peers and social networks during rural rotations	75.00%					

Abbreviations
RACS = Royal Australasian College of Surgeons

Table F5: Health Advocacy Results

Statements with Consensus (75%)	Agree %	Statements with Consensus for Exclusion	Disagree %	Statements with no Consensus	Agree %	Disagree %
Positive behaviour markers demonstrating Health Advocacy in the context of the rural setting						
Awareness of the needs of the community and barriers to healthcare delivery in rural settings and understanding how they impact on health outcomes—for example, recognising that GP services are so limited in some areas that specialists take on the role for following up results, and treatment coordination	100.00%					
Attempting to understand the rural community and their disadvantages and having close contact with community leaders, service clubs and media (printed and electronic) to disseminate factual health information	100.00%					
Gaining appropriate informed consent with options including second opinion and providing all clinical records, X-rays and laboratory results for second opinion/transfer of care	95.00%					

Looking after own wellbeing including healthy lifestyle choices, regular exercise, work/life balance, strategies to relieve pressure, having a GP, good personal hygiene and being able to recognise signs of fatigue and fatigue management	100.00%					
Identifying and addressing health issues in patients—for example, encouraging patients to stop smoking, setting up adequate services to meet demand, diabetes management, obesity management	100.00%					
Links with multidisciplinary teams in metropolitan areas to present and discuss complex cases	95.00%					
Methods of guiding trainees to acquire these skills in Health Advocacy in the context of the rural setting include:						
Having Trainees understand health outcomes and awareness of patients at risk in early discharge if no local services are available	100.00%					
Having Trainees advocate and initiate health promotion activities	90.00%					
Supervisors leading by example—for example, demonstrating counselling with Trainee on ward round, showing a willingness to speak with relatives and patients	100.00%					
Supervisor mentorship and pointing out relevant cases when they arise	100.00%					

Encouraging Trainees to be involved with outreach services with consultants	100.00%					
Presentation of cases at multidisciplinary team meetings	100.00%					
Encouragement of Trainee to advocate for the patients and offer help/access support services for patients interested in making changes	100.00%					
The challenges that might be encountered in delivering this competency in a rural setting include						
Lack of resources in the rural setting	85.00%			Lack of engagement and reluctance from patients, families, and care supporters	70.00%	10.00%
Limitations of time with busy clinical caseload and difficulty accessing care within limited timeframe available for appointments	80.00%			Lack of engagement from other team members and mentors around health advocacy	70.00%	15.00%

Abbreviations
GP = general practitioner

Table F6: Judgement and Clinical Decision Making Results

Statements with Consensus (75%)	Agree %	Statements with Consensus for Exclusion	Disagree %	Statements with no Consensus	Agree %	Disagree %
Positive behaviour markers demonstrating Judgement and Clinical Decision Making in the context of the rural setting						
Having situational awareness and being aware of local resources	100.00%					
Being honest and self-aware and acknowledging when your limits have been reached and knowing when to transfer	100.00%					
Early consultation and clear processes for transferring patients	100.00%					
Outline preoperative, operative, and postoperative care, including timeline and recovery milestones	100.00%					
Practice audits to have data on procedures and their outcomes	100.00%					
Appropriate timeliness of discussion with consultants	100.00%					
Early involvement of sub-speciality and involvement in multidisciplinary team meetings	100.00%					
Sensible diagnoses and suggested management plans	100.00%					
Good knowledge of patients and results	100.00%					
Using available information to effectively prioritise acute and elective patient assessment	100.00%					

Appropriate use of tests and investigations and developing strict protocols for following up all tests and investigations	100.00%					
Maintenance of continued professional development; being prepared to take advice and read up on something	100.00%					
Methods of guiding trainees to acquire these skills in Judgement and Clinical Decision Making in the context of the rural setting include:						
Mentorship, discussion and providing opportunity to assess and discuss management plans	100.00%					
Supervisor role modelling and setting a personal example	100.00%					
Access to subspecialty terms for Trainees interested in rural practice	100.00%					
Trainee engaging in educational opportunities for example videos, workshops, journal clubs, attendance at morbidity and mortality meetings, and attendance at relevant courses such as cultural safety, communication skills, medicolegal aspects of decision-making	94.74%					
Simulation scenarios	85.00%					
The challenges that might be encountered in delivering this competency in a rural setting include						
These situations mostly arise in rural setting with challenges more frequently encountered—for example, smaller hospitals, smaller volumes, fewer specialists with super specialisation. Less easy to transfer elsewhere due	95.00%			The Trainee may have difficulty developing good relationships with colleagues and peers.	50.00%	15.00%

to remoteness and in a time appropriate manner. In this context these skills are more reliably learnt and experiences in these rural settings						
Logistics of transfer in a time appropriate manner—for example, remoteness, costs, logistics with family and patients	90.00%			The Trainee may have a lack of professional networks with specialists to provide timely advice.	65.00%	25.00%
Trainees need to know who they can transfer to if outside their facility. The Trainee may lack a strong link with the tertiary hospitals or bigger hospitals in the catchment.	85.00%			Registrars tend to be too timid and the range of operations they can do out of training too narrow perhaps for rural setting	55.00%	20.00%
Risk-adverse Trainees may develop a sense that rural centres cannot do certain procedures and rely on transfers to tertiary centres and fail to appreciate how much gets done locally without transfer	85.00%					
Resource limitations in a rural setting	80.00%					
Back up and support limitations by other departments, peers and health service support—for example, anaesthesia and medical administration	80.00%					
Lack of support from tertiary centres	75.00%					
Perceived expertise and competency with tertiary surgeons not aware of the local skill available and requesting unnecessary transfer	75.00%					
How do you make the decision to perform surgical procedures in the context of the rural setting in the following situations?						
Infrequent or high-risk procedures						

Consult and discuss with appropriate colleagues for their opinion	100.00%	This decision is for the surgeon to make, rather than considering patient	95.00%			
Discuss with colleagues in tertiary centres	100.00%					
Careful preoperative planning and clinical decision-making	100.00%					
Read documentation regarding the case	100.00%					
Discuss with patients the risks and benefits of having procedures in a rural setting	100.00%					
Consider appropriateness of the procedure in the given setting and resources available including staff, instrumentation, suitable anaesthetists	100.00%					
Consultation with anaesthetist, nurses, executives, and patient/family	95.00%					
Even if infrequent, there must be an appropriate skill mix, and it must be a procedure you have experience and training in and ensure currency of practice	90.00%					
Perform with colleague assisting	90.00%					
Only with appropriate postoperative care and critical care back up	85.00%					
Procedures outside your regular scope of practice but in which you have had training						
I would perform lifesaving/damage control surgery under guidance from subspecialty surgeon in tertiary unit	95.00%	This decision is for the surgeon to make, rather than considering patient	90.00%	Generally, avoid unless retrieval not available to manage an urgent condition	65.00%	25.00%

				Discuss with Executive Director of Medical Services before commencing	60.00%	15.00%
				I would have a consultation with hospital credentialing	45.00%	30.00%
Procedures that you have had little or no previous experience in						
Only perform if life threatening, under the guidance of a metropolitan specialist or subspecialty surgeon	95.00%			This decision is for the surgeon to make, rather than considering patient	10.00%	70.00%
Discussion with local and tertiary colleagues before commencement	95.00%					
Only perform if life threatening and too unstable to transfer	90.00%					
How do you make the decision to NOT perform a surgical procedure (and therefore transfer a patient for care elsewhere)						
If the patient can be transferred safely and there is no urgency	95.00%	This decision is for the surgeon to make, rather than considering patient	80.00%	I would consider onward referral to reduce stresses on myself and the hospital	55.00%	25.00%
In a non-emergency setting the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) as well as the necessary support structures (ICU, HDU, specialist nursing care); if one or several of these are deficient for a certain condition then I will refer the patent on to receive care elsewhere	95.00%					
I consider the combination of procedure and co-morbidity and whether this raises concerns, and whether the	95.00%					

outcomes of the patient would be better if treated in a larger hospital						
This would be dependent on the experience (or no experience), skills, area of expertise and what facilities are available at the hospital	85.00%					
Non-emergency setting the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) and whether the procedure fits into the Clinical Services Capability Framework of the hospital	80.00%					
I would discuss with subspecialty via phone	80.00%					
How does your answer to the question above differ depending on emergency or elective context?						
In emergency circumstances, training becomes critical, and delay in management must be matched against health risks of transfer being greater than intervention in less than optimal conditions. In general, if I assess that there could be a risk to life or quality of life, I will take on procedures with as much support as I can gather	95.00%	This decision if for the surgeon to make, rather than considering the patient	80.00%			
I would engage and get advice from remote colleagues to guide me—for example, a discussion with a referral centre subspecialist even while performing emergency procedures	95.00%					

Transfer to tertiary centres is more common for elective procedures—for example, there have been occasions where I have had to perform a thoracotomy for trauma, but I would never consider performing an elective thoracotomy	90.00%					
Depends on the patient's stability and availability of transfer—for example, acuity and likelihood of deterioration if transferred. Mode of transfer available. Distance to transfer	90.00%					
For elective procedures there is no excuse for performing procedures outside one's personal scope of practice and experience whether this occurs in the rural or metropolitan setting	75.00%					

Table F7: Leadership and Management Results

Statements with Consensus (75%)	Agree %	Statements with Consensus for Exclusion	Disagree %	Statements with no Consensus	Agree %	Disagree %
Positive behaviour markers demonstrating Leadership and Management in the context of the rural setting						
Involvement in hospital and health network management	100.00%					
Ability to adjust leadership style to the setting—for example, small hospitals and rural situations	100.00%					
Effective communication with administration and team members	95.00%					

Methods of guiding trainees to acquire these skills in Leadership and Management in the context of the rural setting include:						
Giving the Trainee opportunity to take on leadership responsibilities—for example, lead ward rounds, manage the roster, and mentor juniors, lead in discussion and planning	100.00%					
Providing exposure to the Trainee with the granting of increasing responsibility and progressive independence	100.00%					
Supervisor leading by example and positive role modelling	100.00%					
As a supervisor, sharing information and experiences (within the bounds of confidentiality and the interest of health service)	100.00%					
Mentorship and teaching Trainees to look for solutions	100.00%					
Encourage and get the Trainee involved in administration roles, projects and specific tasks that need a collaborative approach (such as auditing a certain condition/auditing theatre flow)	95.00%					
Review and feedback, making time to evaluate performance and correcting observed inappropriate behaviour	95.00%					
Encourage additional study—for example, leadership and management courses, Clinical Risk Management training, and if they have a serious interest in	80.00%					

management or governance, an appropriate management course or Australian Institute of Company Directors Course						
The challenges that might be encountered in delivering this competency in a rural setting include						
Dependence on senior leadership in hospital or health networks—for example, it would be difficult with a non-responsive, overly bureaucratic management structure/team	75.00%			Limited opportunities	65.00%	25.00%
				Limited support/capacity for additional workload—for example, often surgeons and their team are very time poor and would be more so if leadership positions are taken on	55.00%	30.00%
				The same challenges as the metropolitan setting, there are none specific to the rural context	40.00%	50.00%

Table F8: Professionalism and Ethics Results

Statements with Consensus (75%)	Agree %	Statements with Consensus for Exclusion	Disagree %	Statements with no Consensus	Agree %	Disagree %
Positive behaviour markers demonstrating Professionalism and Ethics in the context of the rural setting						
Honesty and integrity	100.00%					
Patient-centred approach and respecting patient autonomy	100.00%					

Good time management skills—for example, starting meetings, surgeries on time	100.00%					
Equal management of private and public patients	100.00%					
Being trustworthy and respectful of confidentiality. Must protect patient rights and information i.e. everyone knows everyone in the rural setting, and confidentiality is even more crucial as you encounter more and more people in your town as patients	100.00%					
Accepting and ensuring effective communication with diverse ethnic, cultural, religious and language groups	100.00%					
Respect for colleagues and fostering an environment of collegiality	100.00%					
Role modelling good, ethical behaviour in the community	100.00%					
There are no differences when compared to a metropolitan setting	75.00%					
Methods of guiding trainees to acquire these skills in Professionalism and Ethics in the context of the rural setting include:						
Supervisor role modelling and setting an example of highly ethical and professional behaviour	100.00%					
Providing mentorship to the Trainee	100.00%					

Providing regular feedback, Trainee assessment and being proactive i.e. regular feedback if Trainees standards fall short of those expected	100.00%					
Encouraging and fostering involvement in the local community and introducing Trainee to community leaders	90.00%					
Encouraging the Trainee to attend appropriate courses	75.00%					
The challenges that might be encountered in delivering this competency in a rural setting include						
Ability to separate clinical from social and family networks, the Trainee needs to manage this carefully as they may cross boundaries or create conflicts of interest	75.00%			Previous experience with colleague who have had lower standards of ethical practice. The rural setting is limited in the number of consultants: there is not such a large variety of behaviours to be observed	65.00%	20.00%
Understanding what responsible financial decisions for the hospital are and most importantly the patient—for example, don't order scans that are not needed since Trainees are not always the ones making fiscal decisions	80.00%			Difficulty in managing the crossover between private and public roles	40.00%	45.00%
				It is possibly easier to deliver ethical and professional care in regional areas with no private hospitals or private practice nearby	35.00%	45.00%
				There is no difference to metropolitan medicine; behaviours and attitudes can be demonstrated anywhere	65.00%	10.00%

Table F9: General Question Results

Statements with Consensus (75%)	Agree %	Statements with Consensus for Exclusion	Disagree %	Statements with no Consensus	Agree %	Disagree %
The following statements have been provided regarding if there are any additional professional skills or competencies that could be needed in a rural surgical setting						
Rural Trainees need a more general skillset, with skills outside their regular specialty to compensate for less specialised practices	100.00%	Rural Trainees need no additional professional skills or competencies	90%			
Rural Trainees need to learn to establish good, supportive, professional networks and referral pathways with larger hospitals, urban hospitals, and subspecialists	100.00%					
Rural Trainees need flexibility and adaptability, adjusting their practice to the local level of care available	100.00%					
Rural Trainees need social skills and situational awareness	100.00%					
Rural Trainees need the ability to cope with isolation and being alone	85.00%					
The following statements have been provided regarding what could be added as part of a rural-facing curriculum to complement the existing SET curricula, covering the nine surgical specialties, to better prepare SET Trainees for independent rural practice.						
Trainees need exposure to rural areas	100.00%					
Trainees need to understand the difficulties faced by rural practitioners and shake the belief that excellence is only available in cities	100.00%					
Posting to other specialties (cross-specialty training) would be key for rural inclined Trainee surgeons—for	100.00%					

example, a rotation in Vascular Surgery, Neurosurgery, Plastic Surgery, ENT, Cardiothoracic and Urology						
Trainees need a structured training opportunity for technical and non-technical skills to expand a generalise (generalist) skillset	95.00%					
Trainees need training in communication technology and networking with colleagues	85.00%					
Surgeons in rural areas need the same non-technical skills as their city counterparts and everything that is in the General Surgery curriculum is applicable to rural training	75.00%					
The following statements have been provided regarding how a rural-facing curriculum could help develop confidence and competence in SET Trainees providing surgical care to rural patients.						
Referral hospital surgeons should be challenged to foster close relationships with regional surgeons/Trainees and teach the Trainees how to ask for help	100.00%			Rostering practices should be put in place that facilitates Trainees engaging with the community through sport/music/hobbies, so they build deeper connections and a positive impression of what the place is like	60.00%	10.00%
Trainees should have better exposure to rural practice, both education and rural practice and experience	100.00%					
Trainees should be made aware of the immense difference they are making by working in the rural setting	95.00%					
Trainees should receive more technical training and help during their training for a broader capability without sacrificing depths, better preparing skillset and behaviour	95.00%					

patterns for smaller departments, and would provide a local context, with surgeons being specifically trained to meet the needs and demands of rural population						
It could help Trainees appropriately apply information and communication technology to delivering healthcare safety and with appropriate privacy and improve telemedicine support from subspecialists	90.00%					
The following statements **have been provided regarding reflecting on your own training, what helped you develop confidence in a rural surgical practice**						
Exposure to multiple surgical specialties during training for a broad and intensive surgical training experience. Training in General Surgery, Orthopaedic Surgery, burns/Plastics, Urology, Neurosurgery, and Cardiothoracic surgery	90.00%					
Having supportive working environments and having strong relationships/networks with surgeons within the same speciality, and with other specialties	90.00%					
Training outside of a capital city and gaining rural exposure	85.00%					
Role modelling after rural surgeons and having good mentors to guide how to best manage rural practice	85.00%					
Formal linkage and working visits to major centres and regional hospitals. This allows for procedure specific training, being able to discuss cases, joining a	85.00%					

multidisciplinary team, taking more complex cases, and provide locum relief						
Very busy and rigorous training jobs prior to moving to a regional area	75.00%					
Finding a mentor organically is more beneficial than having an assigned a mentor	75.00%					

Abbreviations

ENT = Otolaryngology ear nose and throat, SET = Surgical Education and Training

Appendix G. Co-design dossier

Investigation and Development of a rural-facing surgical curriculum: Co-design Dossier

Disclaimer

Introduction

Provided is a dossier of all the primary and secondary evidence that has been collected for the Royal Australasian College of Surgeons project 'Investigation and development of a rural-facing surgical curriculum'. The purpose of this document is to inform you as an expert panellist of the current literature regarding this topic to aid a relevant and informed discussion during the workshop. If there is any seminal literature that you feel is missing from this document, please don't hesitate to email it to the research coordinator Dr Daniella Dougherty on Daniella.dougherty@surgeons.org and she will disseminate to the other panellists if appropriate.

Background

Australia is a highly urbanised society but there are still 29% of Australians who reside in rural, remote or very remote areas (MMM2-7).[2] On average, these Australians living in rural and remote areas have a higher incidence of disease and injury, poorer health outcomes and live shorter lives compared with Australians living in metropolitan areas.[4] One of the factors leading to these health inequalities may include the reduced access to healthcare for these individuals. In rural and remote areas, healthcare facilities tend to be smaller, with less infrastructure, but generally offer a broader range of services. In addition, general practitioners tend to be responsible for delivering more health services in rural and remote settings than metropolitan areas due to the limited availability of specialists.[5]

Modified Monash Model

- Modified Monash Model (MMM) is the model used to determine if a location is considered rural, remote, or very remote
- MMM uses geographical remoteness and town population size to categorize locations on a scale of one to seven
- Areas classified as MM1 are major cities, and areas classified as MM2-7 are rural, remote, and very remote
- This model has been used in the Department of Health since 2020[1]

The Australian National Medical Workforce Strategy 2019-2021 reported that in Australia, the number of healthcare professionals per capita is adequate but maldistributed. It was reported that only 12% of surgeons are living and working rurally, in addition five out of nine specialties have less than 5% of surgeons based outside of urban areas.[6] Access to healthcare, in particular surgical care, in rural and remote communities has been recognised as an issue in Australia for decades, and one of the main contributors in the difficulty of recruiting and maintaining a workforce in these areas. Furthermore, the present Surgical Education and Training (SET) curriculum provided by the Royal Australasian College of Surgeons Specialty Training Boards (STBs) tends to be urban focused that is not well contextualised to the rural and regional setting. The problem with urban-focused training programs is that it can unintentionally convert students with intentions to work rurally into urban specialists. Conversely, positive rural exposure for urban origin students and Trainees is strongly associated with urban to rural conversion, with increased rural recruitment and long term retention.[7]

It is important to ensure that the rural context is reflected in training and educational content. A rural-facing surgical curricula will serve to equip Trainees in STP rural posts to develop skills and competencies necessary to

practice in rural, regional, and remote areas. Thereby, maximising the potential for rural training positions to impact rural surgeon recruitment and retention, as well as magnifying the impact of positive rural work exposure.

A rural-facing surgical curriculum requires a curriculum framework to organise a plan and set of learning outcomes that defines the content to be learnt in clear, definable standards, of what the Trainees should know and be able to do. The curriculum framework underpins the learning outcomes, and the curriculum is then aligned to the learning outcomes, and the students are assessed against these learning outcomes. An example of a learning outcomes are provided below in Table G1 from the General Surgery Curriculum[8] regarding adult groin hernias:

Table G1: General Surgery curriculum exert regarding adult groin hernias

Medical Expertise	Judgement / Clinical Decision Making			Technical Expertise
Anatomy/Physiology/Pathology	Clinical Assessment	Investigations	Principles of Management	Operative Management
Describe the anatomy of inguinal region, spermatic cord and testis Describe the embryology of testicular descent and processes vaginalis Provide an anatomical and pathological classification of groin hernias	Identify signs and symptoms of reducible, irreducible, and strangulated hernias Distinguish inguinal from femoral hernias	Select and interpret appropriate medical imaging modalities where indicated	List management options (non-surgical and surgical) Indications Contraindications Basic procedural details Indications/contraindications for laparoscopic repair Describe details of common management options, as well as possible risks/complications and how to deal with them, postoperative care Management of recurrent hernias Post hernia repair pain	Open (mesh) repair of inguinal hernia Open repair of femoral hernias Open repair of strangulated and non-strangulated femoral and inguinal hernias Laparoscopic inguinal hernia repair

The overarching aims of this current research project has been to:

1. investigate the literature and other surgical institutions on the importance of rural-facing surgical curriculum and identify the necessary elements for a generic and specialty specific rural-facing surgical curricula
2. develop and implement recommendations for a framework for Specialty Training Boards and the Royal Australasian College of Surgeons to provide rural-facing surgical curricula for Trainees in rural STP posts.

It should be noted that the focus of the rural-facing curriculum framework will be the professional skills rather than the technical skills of the surgical Trainees. A technical skill refers to any psychomotor action or related mental faculty acquired through practice or learning pertaining to a particular craft or profession.[9] Much has been written

about the importance of developing good hand eye coordination, manual dexterity and focused psychomotor skills in a craft such as surgery.[10] The Royal Australasian College of Surgeons defines the non-technical skills as behaviours encompassed in the following competencies (these descriptions have been taken verbatim from the RACS Surgical Competence and Performance Guide):[11]

Judgement and Clinical Decision Making

'Makes informed and timely decisions regarding assessment, diagnosis, preoperative preparation, surgical management and postoperative follow up. Encourages preventative health measures to optimize patient outcomes. Promotes culturally competent and culturally safe behaviours. Understands that surgery is not always the best option for patients'

Some of the key behaviour include:

- Recognises conditions and circumstances where surgery may be needed—demonstrates an understanding of indications and contraindications based on contemporary best practice, and the individual patient's circumstances, expectations, risks, and comorbidities
- Plans ahead and anticipates consequences—uses surgical knowledge and experience to understand the likely outcomes of interventions or conservative treatment in the individual patient context. Anticipates possible complications and takes appropriate precautions to minimise harm
- Considers and discusses options—considers options or treatment pathways, including conservative options. Assesses and discusses the risks and benefits of all options with the patient, family or carer and respects the patient's decision. Works to minimise the impact of bias on decision-making to ensure equitable outcomes.
- Implements and reviews decisions—undertakes the chosen course of action and continually reviews its suitability in light of changes in the patient's condition.

Professionalism

'Demonstrates commitment to patients, the community and the profession through the ethical practice of surgery and demonstration of cultural competence and cultural safety'

Some of the key behaviours include:

- Demonstrates awareness and insight—Reflects on one's surgical practice and has insight into changes that may occur, and its implications for patients, colleagues, Trainees, and the community. Makes appropriate changes to practice as areas of improvement are identified
- Observes ethics and probity—Maintains standards of ethics, probity, and confidentiality. Accepts the rights of the individual and acts in a respectful manner towards patients, families, and carers. Works within the standards of the regulatory bodies regarding advertising and self-promotion.
- Behaves in a respectful and culturally competent manner towards colleagues and team—Models a respectful and collegial attitude towards the entire health care team to contribute to an inclusive workplace. Acts as a role model for the team and actively demonstrates a zero-tolerance attitude towards unprofessional conduct including discrimination, bullying and sexual harassment.
- Maintains personal health and wellbeing—Maintains personal, mental, and physical health for the wellbeing of the surgeon, and to optimise performance during surgical practice for the benefit of colleagues and patients
- Demonstrates ethical billing practices—Maintains billing practices that are justifiable, proportionate, and reasonable, and does not exploit or financially disadvantage a patient or family. Takes responsibility to ensure that an honest and open agreement of informed financial consent occurs between the treating team and the patient or family. Ensures only appropriate surgical treatment is offered without influence of inducement of profit or personal gain.

Health Advocacy

'Identifies and responds to the health needs and expectations of patients, families, carers, and members of the healthcare team. Responds to the health needs of communities and the health system by supporting rational, evidence-based measures to improve health outcomes in the wider community. Promotes cultural competence and cultural safety to improve health outcomes in the broader community.'

Some of the key behaviours include:

- Cares with compassion and respect for patient's rights—Provides optimal care while respecting patients' rights, choices, dignity, privacy, and confidentiality. Engages patients and, where appropriate, families or carers in planning and decision-making in order to best meet their needs and expectations
- Responds to the social determinants of health—Is aware of how social determinants of health can impact on patients and their health outcomes. Advocates for better health care to assist in more equitable health outcomes for patients, especially those living in rural and remote areas, those affected by disadvantage related to disability, education, geography, nutrition and living standards, and with particular reference to Aboriginal and Torres Strait Islander peoples and Māori.
- Demonstrates a commitment to the sustainability of the health care systems—Gives due consideration to the financial and environmental effects relating to health care sustainability. Does not undertake investigations or procedures that are shown to have minimal or marginal improvement possibilities for patients.
- Cares for the wellbeing of colleagues—Recognises potential impairment in colleagues and its impact on patient and personal outcomes. Responds to circumstances that need to be escalated.

Communication

'Communicates effectively and in a culturally competent manner with patients, families, carers, colleagues, and others involved in health services in order to facilitate the provision of high-quality health care. Operates with respect, denouncing unprofessional conduct including discrimination, bullying and harassment.'

Some of the key behaviours include:

- Gathers and understands information—Seeks timely and accurate information during the consultation, in the ward or clinic and in the operating room
- Discusses and communicate options—Works to build rapport and trust with patients, their families, and carers, and engages them in the decision-making process. Communicates decisions clearly and effectively to all involved parties and ensures patients understand the information provided, employing interpreters, or alternative methods of communication suitable for patients as required.
- Communicates in a respectful manner with patients, families, and carers—Takes care during the communication process not to diminish or invalidate a patient's personal circumstances, or cultural beliefs

and practices. Arranges an appropriate environment to discuss confidential information and is mindful of how their own personal beliefs may impact on patient care, including unconscious bias.

- Communicates effectively with team members, staff, and colleagues—Communicates with all members of the health care team in an effective and respectful manner. Adapts communication techniques dependent on individual circumstances and acknowledges that good communication is the key to better team and patient outcomes. Demonstrates the ability to provide timely and effective feedback to team members.

Collaboration and Teamwork

'Works cooperatively with peers, Trainees and other health professionals to develop a shared picture of the clinical situation and facilitates appropriate task delegation to ensure the delivery of safe, effective and efficient surgical care. Works collaboratively to optimise teamwork and a patient-centred care plan.'

Some of the key behaviours include:

- Plays an inclusive and active role in clinical teams—Works together with all team members to gain an understanding of the clinical situation and to ensure all management issues are addressed, both for the patient and for the service provided. Actively promotes shared decision-making, values the contribution and expertise of other team members, and multidisciplinary team (MDT) engagement where appropriate.
- Establishes a shared understanding through appropriate documentation and exchange of information—Ensures all necessary and relevant clinical information has been communicated in a timely manner to the patient's General Practitioner and other relevant health care professionals.
- Demonstrates a willingness to seek or offer a second opinion—Consults widely among the health care team in both an informal and formal manner. Seeks and provides a second opinion in the best interests of the patient, when appropriate.
- Fosters an environment where patient safety measures are the team's responsibility—Complies with and respects policies and procedures that contribute to patient safety. Understands the positive impact of team competence on the continuity of care for the patient
- Supports conflict resolution and manages differences within the team—Acts to help resolve conflict within the team and encourages respect for diversity among team members. Facilitates discussion when required and considers all perspectives when resolving differences.

Leadership and Management

'Leading, providing direction, promoting high standards, matching resources to demand for services, and showing respect for all members of staff. Encourages leadership across all levels of the team.'

Some of the key behaviours include:

- Identifies when to lead, manage or take direction as required—Recognises own ability to lead or take direction when there are others who are better equipped to lead or manage a situation. Appropriately delegates responsibilities according to the skills of the person
- Leads to inspire others—Exhibits leadership behaviours to inspire others and actively promotes a safe working environment. Speaks up against damaging behaviours and unprofessional conduct including discrimination, bullying and harassment. Remains calm and in control in high pressure situations.
- Sets and maintains standards—Ensures quality and safety by actively complying with accepted principles of surgery, codes of professional conduct, and by following clinical and operating room protocols. Engages in local health service delivery strategies and professional bodies to contribute to the betterment of the surgical profession.
- Supports others—Provides collegial and emotional support to team members as required. Assesses their abilities and tailors one's style of leadership accordingly.

Scholarship and Teaching

'As scholars and teachers, surgeons demonstrate a lifelong commitment to surgical practice through reflective learning and the creation, dissemination, application and translation of medical knowledge for optimal patient outcomes.'

Some of the key behaviours include:

- Shows commitment to lifelong learning—Commits to lifelong reflective learning and practice, including technical and non-technical skills, and disseminates knowledge to others. Identifies own limitations and seeks opportunities to continuously improve.

- Teaches, supervises, and participates in assessment—Facilitates the education of students, trainees, colleagues, and other health professionals. Fosters the learning of others by promoting a positive culture, and a safe teaching and learning environment for all. Adopts effective methods of communicating feedback to facilitate the learning of others.
- Engages with research to improve surgical practice—Translates evidence-based research, experience, and data into practice. Evaluates or researches surgical practice, identifies opportunities for improvement and implements change at individual, organisational and health system levels.

Cultural Competence and Cultural Safety

'Demonstrates a willingness to embrace diversity among all patients, families, carers and the healthcare team and respects the values, beliefs and traditions of individual cultural backgrounds which are different to their own. Promotes self-reflection, acknowledges their own biases, prejudices and stereotypes and works to mitigate their effects. Promotes a safe and inclusive health care environment and works to eliminate health inequities.'

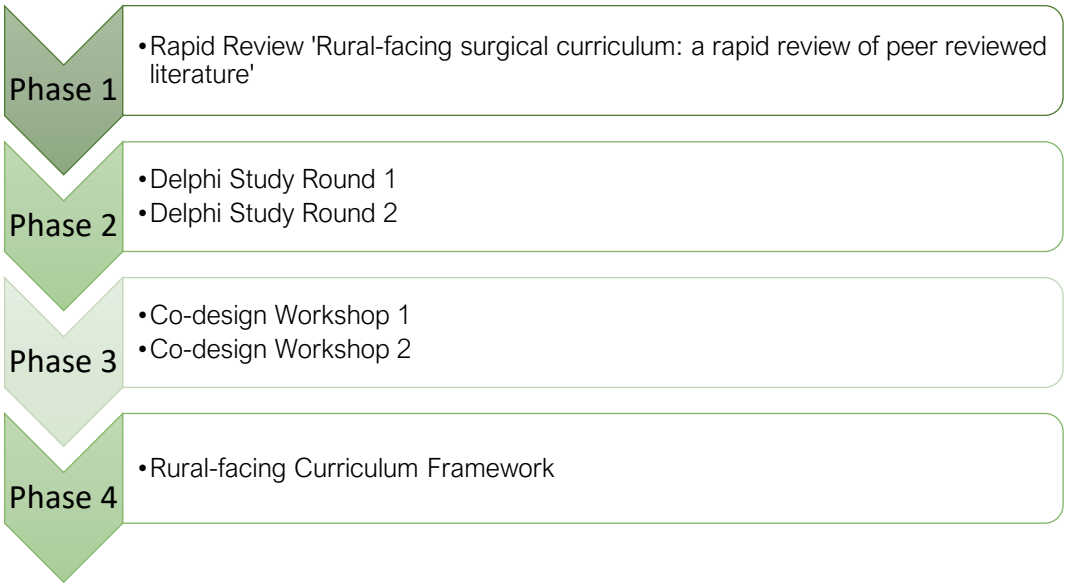
Some of the key behaviours include:

- Indigenous Health. Promotes cultural competence and cultural safety across the whole health system in order to achieve equitable healthcare for Aboriginal and Torres Strait Islander peoples and Māori—Understands the special status of Aboriginal and Torres Strait Islander peoples in Australia, and Māori in New Zealand as Indigenous people, and actively works to develop personal cultural competence and cultural safety skills to achieve optimal health outcomes
- Fosters a safe and respectful health care environment for all patients, families, and carers—Creates a safe and inclusive environment that considers cultural and social determinants of health for patients, families, and carers to address equitable access to health care. Provides safe, respectful, and effective communication and care.
- Promotes an inclusive and safe workplace for all colleagues and team members—Fosters a workplace that is inclusive of diversity of colleagues, team members and other staff. Helps to negotiate differences and build a common understanding in the workplace environment. Demonstrates self-awareness of biases and works to mitigate differences in understandings. Provides an environment where all learners

feel safe to speak up. Communicates in a respectful manner and acts as a role model in the teaching environment.

Stages of Research

This research project is proposed to be completed across four phases; these are listed below.



Summaries of Phase 1 and 2 can be found in the sections below. A brief description of Phase 3, the co-design workshop, is also provided.

Phase 1: Rural-facing surgical curriculum: a rapid review of peer reviewed literature

A rapid review is a form of knowledge synthesis in which components of a systematic review process are simplified or omitted to produce information in a timely manner.[12] This section will provide a summary of the findings from the rapid review; the full review can be found in Appendix 1. Based on peer-reviewed literature, this rapid review aimed to determine:

1. What are the elements of a rural surgical training program?
2. What are the essential elements of rural surgical training programs according to surgeons and Trainees?
3. Are there any elements of a rural surgical training program that are missing according to surgeons and Trainees?

A total of 45 publications provided the evidence base for the rapid review, of these 25 studies provided descriptions of rural surgical training programs, 16 provided survey or questionnaire results and 3 studies provided both descriptions and survey/questionnaire results. One study was a scoping review regarding perceived training gaps for isolated surgeons.

Australian Programs

Two studies described the Australian RSTP funded by the Commonwealth Government.[3,13] The RSTP was established in 1997 by RACS to support the recruitment and retention of rural surgeons for rural practice in a range of specialties. The program exists within the General Surgery Program and uses existing General Surgery rotations. There were no selection criteria for entry into the program. The registrars rotate through specialty posts such as Paediatric surgery, Orthopaedic surgery, Colorectal Surgery, Breast Surgery or Vascular surgery to prepare them for a non-metropolitan career. Each Trainee is allocated a rural mentor. No further details about the RSTP were provided in the 2 included studies.

Australian Survey Results

From the 4 studies that conducted surveys on a population of Australian rural surgeons,[14-17] there was no consistent theme or consistent research question.

Chong and Kiroff [17] conducted an online survey to review the RACS RSTP fellowship between 2000 and 2006 vs non-RSTP surgeons who completed fellowships in the same period randomly selected from RACS database.

Sixty-nine participants completed the survey: 35 from the RSTP group and 34 control participants. At time of the survey, 15 RSTP surgeons were working full time in non-metropolitan areas throughout Australia, this was compared to 6 in the control group.

RACS Rural Surgical Training Programme

- RACS set up the RSTP in 1997
- The RSTP was commonwealth funded
- It aimed to produce 10 rural General Surgeons per year
- The objective was to 'support recruitment and retention of rural surgeons by preparing surgical Trainees for rural practice in a range of surgical specialities'
- A key feature is that it existed inside the General Surgery Programme. There is no selection bias. It uses existing General Surgery rotations. It leads to the same fellowship with the same fellowship exams as General Surgery
- There was initial hope that the programme would be extended to other specialities, but this did not come to fruition
- In General Surgery entry into RSTP occurred one year earlier. Many rural hospitals have suitable SET1 positions.
- A 6-month term in Plastic Surgery is highly desirable and usually achievable
- A 6-month term is Vascular Surgery is also desirable
- The RSTP offers a mentoring programme. Each Trainee is allocated a rural mentor. The aim is to provide regular contact and advice[3]

Twelve participants from the RSTP group and 4 control reported performing procedures beyond the scope of General Surgery; 5 RSTP surgeons and 1 control surgeons performed surgeries beyond the scope of General Surgery daily. These surgical procedures included video assisted thoracic surgery pleurodesis, thoracic sympathectomy, head and neck dissection, adenotonsillectomies and septoplasties. Six of 15 RSTP surgeons responded positively when asked whether the RSTP had adequately prepared its Trainees for rural work. Six of 15 RSTP surgeons also responded positively when asked about the adequacy of the RSTP in preparing them for work in their current or previous rural work locations. Of the remaining surgeons, 1 each answered, 'to an extent' or 'unsure' and 7 responded negatively. Nine respondents were assigned a mentor during their residency, and from these, only 2 found the experience useful. When asked how the RSTP could be improved, some of the respondent's comments included enabling a greater proximity between mentors and Trainees, more autonomy regarding choosing training locations to ensure a more rounded surgical experience, and the creation of senior registrar or Fellow positions in rural hospitals.

The authors discussed within the article that little is known about what constitutes rural surgical practice. This, along with the broad scope of rural General Surgery, makes preparing surgeons for rural practice complicated.

Furthermore, there is concern about professional isolation in rural surgery, which results in fewer opportunities for skill maintenance and peer-review. This may lead to increased fears of medicolegal vulnerability, especially with surgeons undertaking procedures outside of their traditional scope, sometimes without adequate medical, nursing, and technical backup. The authors also commented that there are difficulties with rural surgeons obtaining advice and transferring critically ill patients to metropolitan centres.

Bruening, Anthony and Maddern[15] surveyed 8 General Surgery Trainees who completed 1 month pilot rotations for advanced General Surgery Trainees in Whyalla, South Australia. After the rotation, 5 respondents felt the ideal length of time for the rotation would be 3 months, 3 respondents felt 6 months, 2 were unsure, and 1 felt that 1 month was the ideal duration for the rotation. When looking at the overall educational experience on a 10-point visual analogue scale; mentor supervision was given a median rating of 9 (range 6–10), surgical skills teaching was 7 (range 3–9), clinical teaching was 8 (range 5–10), the volume of clinical work was 6 (range 5–8) and the range of pathology was 7 (range 5–10).

Faris[14] authored a descriptive article regarding the educational needs of rural surgeons in Australia. The article included responses to a questionnaire that was mailed to surgeons in rural Victoria; with the results demonstrating what rural surgeons feel their training should be comprised of. The data from the survey indicated that a residency rotation with rural surgical mentors may further enhance the qualifications and interest of rural surgeons. When looking at the duration for advanced surgical training, the survey responses recognised that not all training for rural surgery (broad General Surgery and some specialty training) could be achieved in 4 years. The results indicated a strong recommendation for an additional 2-year training after attaining RACS Fellowship (FRACS). The responses showed that broad General Surgery skills with training in specialties (especially Orthopaedic Surgery, Plastic and Reconstructive Surgery, Urology, Vascular Surgery, Paediatric Surgery and Cardiothoracic Surgery) are favourable when asked about content. In addition, flexible curricula that can be prescribed depending on the interest and training of the surgeon, the needs of the community they intend to practise in, and the availability of specialist services in that community would be warranted. When asked about venues, respondents felt General Surgery training for rural surgeons should be the same as accredited training for advanced Trainees in General Surgery and should occur in a teaching and regional hospital.

Bishop and Drummond[16] completed a study which included an examination of the level of Neurosurgery training received by rural surgeons and the subjective confidence in surgical management of neurotrauma of rural surgeons. The survey was aimed only at rural surgeons who actively dealt with neurotrauma. 343 respondents (341 General Surgeons, 1 Orthopaedic Surgeon, 1 Paediatric Surgeon) completed the survey. The survey results showed that 36% of respondents had not trained in Neurosurgery beyond a basic medical degree, 36% had trained in a neurosurgical resident position, and 28% had trained in a neurosurgical registrar position. Sixty-one per cent of surgeons had completed the 'Early Management of Severe Trauma' course, and 15% of surgeons had completed the RACS 'Definitive Surgical Trauma Care' course. The authors noted that basic competencies expected for neurotrauma training in the General Surgery Program would require at least some time spent training in a neurosurgical registrar position; however, only 28% of the respondents had Neurosurgery training more advanced than resident level. They concluded that a significant volume of neurotrauma is managed surgically in rural Australia; however, neurotrauma training of rural surgeons has occurred on an ad hoc basis.

In addition, the results of the survey revealed that confidence in managing neurosurgical procedures significantly increased with distance from a neurosurgical centre, including assessment of computed topography images, performing burr hole and craniotomy procedures and intracranial pressure monitoring. Furthermore, of the 600 procedures documented in the survey, only 50 (8-9%) were performed while a neurosurgeon was in telephone consultation.

Canadian Programs

Two studies were identified describing a Canadian rural-focused curriculum.[18,19] The Multi-Specialty Community Training Network (MSCTN) was established in 1997 by the University of Ontario Faculty of Medicine and Dentistry in partnership with a variety of communities and physicians in the region. It was developed to provide specialty residents with the opportunity to perform part of their training in rural and regional settings. The learning objectives and evaluation tools for the MSCTN are based on The Royal College of Physicians and Surgeons of Canada (RCPSC) CanMEDS Framework. The 7 key elements of CanMEDS are: medical expert/clinical decision-maker, communicator, collaborator, manager, health advocate, scholar/learner and professional/personal. These elements were modified for rural and regional practice and are used as the basis for a MSCTN resident evaluation.[18] Most residents who participate do so for 1-3 months and are in the 3rd year of their 5-year training

program.[18] The scope of practice for all specialists participating in the MSCTN Rural Training Program is broader than they would encounter in university specialty practice.[19]

Canadian Survey Results

Gillman and Vergis[20] completed a survey of final-year Canadian trained residents scheduled to sit the RCPSC certifying examination in General Surgery. The objective of the survey was to explore the perceived competencies of graduating General Surgery residents in Canada. The author stated that the varying caseload seen by rural practitioners far exceeds the practice of most urban surgeons, with a greater percentage performing procedures falling into the realms of Orthopaedics, Obstetrics, and Gynaecology or Plastic Surgery. These indicate that most graduating surgical residents are not comfortable performing procedures outside the traditional scope of General Surgery, regardless of whether they plan to pursue fellowship training or community practice. The authors have suggested establishing a rural/community Fellowship Training Program or rural/community General Surgery Residency Program.

US Programs

Twenty-three articles were identified that described rural surgery training programs in the US. Of these, 8 provided a general summary or review of the elements of these rural programs.[21-28] Timmerman, Thambi-Pillai, Johnson, et al.[27] outlines the American College of Surgeons' (ACS) three proposed strategies to address the growing crisis of a lack of rural general surgeons in the US. The first strategy involves providing rural surgery opportunities to any resident interested in rural surgery during the 5 to 7 years of surgical training. In some institutions, this includes a rural rotation, generally 1 to 3 months in duration, in a community setting. These rotations may be elective or required as part of the General Surgery Residency Training and tend to occur during the 2nd to 4th years of residency.[24,27] During these rotations, residents connect with a rural surgeon mentor and get to perform a broad range of General Surgery and subspecialty procedures.[22,24] Other institutions have implemented a dedicated rural surgery track, where up to 9 months of training, including rural surgery rotations and surgical subspecialty training, are provided to interested residents during their second through fourth years.[27] Another method, termed 'the immersion approach', involves residents spending an entire year in a rural community in place of a research year during the middle years of their residency. It is reported residents spend

the year in the rural community working alongside surgical subspecialists free of competing specialty residents and have a high volume of operative experience including endoscopy.[22,27] The second strategy reported by Timmerman, Thambi-Pillai and Johnson, et al.[27] to address the decline in rural surgeons is the creation of new surgical residencies with a primary focus in rural surgery. These programs are commonly located in more rural areas, have higher volumes of endoscopy and ambulatory surgical exposures, and lack subspecialty residents allowing General Surgery residents to gain experience in different specialties.[27] The third strategy, which is not of relevance to this review, is the creation of General Surgery fellowship opportunities.[27]

Reviews of the different rural surgery programs or tracks within the US have been conducted by Rossi, Rossi, McLaughlin, et al.,[26] Mercier, Skube and Leonard, et al.[25] and Avery Jr and Wallace. [21]

In the review by Rossi, Rossi and McLaughlin, et al.,[26] members of the Advisory Council on Rural Surgery defined 4 primary components for successful rural surgical training based on expert opinion and a literature review for articles that discussed needs assessments for rural surgical training.[26] These 4 components were: 1) clinical experience in rural settings, 2) a robust diagnostic and therapeutic gastrointestinal experience, 3) exposure to diseases and procedures in surgical subspecialties and 4) an absence of competing surgical specialty learners in the rural rotation and/or the parent surgical residency.[26] The review then identified existing rural programs from the American Medical Association (AMA) Fellowship and Residency Electronic Interactive Database (FREIDA) and a previous study[29] and grouped them according to their ability to provide these four components.

Similarly, Mercier, Skube and Leonard, et al.[25] identified rural surgical programs offered by the Accreditation Council for Graduate Medical Education (ACGME) and classified them as to whether they had an intrinsically rural surgery residency, elective rural surgery rotation, required rural surgery rotation or designated rural residency. Only programs located in rural areas (defined as a population of ≤ 50,000) or if a rural rotation was part of the curriculum (confirmed to be in a rural location) were included.[25]

Details of the rural training programs reported by Rossi, Rossi and McLaughlin, et al.[26] and Mercier, Skube and Leonard, et al.[25] with respect to length and year(s) of rotations, residents per year, population of rural location, whether surgical specialties and endoscopy are taught and whether they are considered broad or basic have

been summarised, this can be found in Appendix 1. Finally, Avery Jr and Wallace[21] reviewed 11 rural surgery training programs in the US, describing the components of the training programs, including rotation length and subspecialty exposure. Again, this can be found in Appendix 1.

The remaining studies have reported on one or more individual rural surgical programs, the key details have been provided below.

Basset Healthcare, Cooperstown, New York

Basset Healthcare, Cooperstown was described in the following articles.[21,23,30-36] Bassett Healthcare, Mithoefer Centre for Rural Surgery was established in 2004 to facilitate training General Surgery residents who are interested in practising in a rural area. A recent survey found that 70% of its graduates who practise General Surgery remain in a rurally designated area.[30] Residents in the rural track spend 2 to 3 months during post graduate year (PGY) four training alongside a Bassett graduate in rural practice.[33] The surgery residents are offered broad based General Surgery experience (extensive experience in Gynaecology and Obstetrics, Endoscopy, Neurosurgery, Urology, Cardiothoracic, Otolaryngology, Plastic Surgery, and hand surgery) with no other competing fellows or subspecialty residents. The senior residents are also given the opportunity to complete a 6-week rotation in Saranac Lake, New York in a broad-based surgical practice. The student is directly supervised by a member of the attending staff throughout the rotation, with weekly feedback sessions and an exit interview with the course director.

University of North Dakota, Grand Forks

University of North Dakota General Surgery residency has a rural training track.[21-23,32,35-38] The program offers a broad exposure to General Surgery and the surgical subspecialties. The program includes 9 months of training with surgical specialties and rural surgery rotations in PGY 2, 3 and 4. Six of the 9 months of subspecialty rotations are with those in which rural surgeons often perform cases. During the rural surgery track rotations, the residents are generally expected to be on call when the attending subspecialty surgeon is on call. When the rural surgery rotation is at the same campus as one of the core faculties, the resident may be required to take a general surgery call.

Due to no other surgical residencies to compete with, the residents were able to incorporate subspecialty procedures into their daily surgical routine. The program includes dedicated rotations in Anaesthesiology, Pathology, Plastic and Reconstructive Surgery, Orthopaedics, Otolaryngology, and Urology.[23] These rotations are 2 or 3 months in length and take place in Grand Forks or Fargo Hospital. During PGY 4 the residents complete a 2-month rotation in paediatric surgery at the Arnold Palmer Hospital for Women and Children in Orlando, Florida.[37] A specific rural surgery experience is offered for 1 month during the PGY 1 and PGY 2 years in Park Rapid, Minnesota, where the residents can perform more than 100 surgical cases, which include advanced laparoscopic procedures.[37] The rural surgery track incorporates specific rural surgery, endoscopy, and specialty rotations (including Plastic Surgery, hand surgery, wound management, Anaesthesia, critical care, and advanced endoscopy.)[38]

In addition, residents can request specific experiences in the specialties that may be required in their future practice location, and this is organised to be covered in PGY 4 and PGY 5.[37]

Gundersen Lutheran Medical Centre, La Crosse, Wisconsin

The Gundersen Lutheran General Surgery residency program has been described in 10 articles.[21-23,31,32,35,36,38-40] The General Surgery program is 5 years in length and has rural surgery electives for interested residents. In the absence of other residents or fellows in surgical subspecialties, the residents' complete rotations in General Surgery, Orthopaedics, Neurosurgery, Otolaryngology, Burn Surgery, Plastic Surgery, Cardiothoracic surgery, Urology, Gynaecologic oncology, Obstetrics and Gynaecology, and Endoscopy.[21] Rural surgery electives are available in PGY 3 and 4 and are 1 month in duration.[41] Residents work with Gundersen Lutheran regional surgeons who practise in broad spectrum General Surgery.[39,31] The residents who undertake the rural elective live in the community and are on call with the attending rural surgeon. These residents are responsible for all surgical patients, including their critical care and nutritional needs.

Gundersen Lutheran also incorporates a curriculum of professional skill topics. With lectures and practical exercises in coding and reimbursement, malpractice protection, and defence preparation, contracts, and practice

administration throughout the year. There are also clinical ethics conferences every 2 months and financial planning seminars are offered for residents and their spouses on an annual basis.[39]

University of Tennessee College of Medicine, Chattanooga, and Knoxville

Six studies described the 6 year (5 clinical and 1 research year) General Surgery residency at the University of Tennessee at Chattanooga.[21,23,31,32,35,36] The program offers a broad General Surgery and subspecialty program with all PGY 3 residents spending 3 months on a rural surgery rotation in Athens and Etowah, Tennessee.[21,23] General Surgeons are responsible for mentoring the residents and providing them with rotation in General Surgery, Thoracic Surgery, and Vascular Surgery, as well as providing exposure to Endocrine Surgery, Colorectal Surgery, Breast Surgery, Urology, Gynaecology, Caesarean sections, and Otolaryngology Surgery.[21,23,31] The surgical residents also gain experience during this rotation in diagnostic and therapeutic endoscopy and are provided with dedicated office time to evaluate gastroenterological conditions.[23,31]

The University also offers a 5-year General Surgery residency in Knoxville. Because there are limited fellowship programs, General Surgery resident gain a broad exposure to General Surgery, Cardiothoracic, and Vascular Surgery, Paediatric Surgery and the subspecialties.[42] This program has a 1-month elective in a rural or international location in PGY 3 and a 3-month rotation in PGY 4.

Oregon Health and Science University, Grants Pass, Oregon

Eleven studies have described the Oregon Health and Science University General Surgery residency in Portland, Oregon.[21-23,32-36,38,43,44] The General Surgery residency includes optional 6 to 12 months rural surgery rotations in either Grants Pass or Coos Bay, Oregon.[45] Two residents in PGY 4 can spend 12 months in Asante Three Rivers Medical Centre, Grants Pass. Working with General Surgeons where they gain exposure to surgical disease, General Surgery, Vascular Surgery, Endoscopy, Urology, Obstetrics/Gynaecology and Orthopaedic Surgery.[45] Two PGY 3 or 4 residents can do a 6-month rural rotation at the Bay Area Hospital, Coos Bay. Residents gain exposure to General Surgery, endoscopy, minimally invasive surgery and other surgical subspecialties.[45] The hospital in which the residents rotate has rural general surgery staff and multiple specialists[46] with no competing residents.[23] The time spent rurally models what it would be like working in rural practice, in particular working with

partners, interacting with referring physicians, attending to billing and office management and ensure continuity of care.[38]

University of Utah, Salt Lake City

Four articles described the University of Utah's General Surgery Residency Program in Salt Lake City.[21-23,32] In lieu of the PGY 3 research year, General Surgery residents can elect to spend 1 year completing a rural surgery fellowship in Ogden Regional Medical Centre.[21] During this year, the resident has specific rotations on Anaesthesia, Gynaecology, Obstetrics, Orthopaedics, Urology, Gastroenterology, Thoracic Surgery, Plastic Surgery, Otolaryngology, Pulmonary, Emergency Medicine, Trauma, and General Surgery[23].

East Tennessee State University, Quillen College of Medicine

Two articles[21,47] describe the broad-based General Surgery residency program offered by East Tennessee State University at the Quillen College of Medicine. The program utilises 4 hospitals and offers experience in General Surgery and Vascular Surgery. An optional year after PGY 3 or PGY 4 for residents interested in rural surgery is offered in Orthopaedics, Urology, Otolaryngology/Ear Nose Throat (ENT) and Gynaecology.

University of Minnesota

Two articles[21,25] describe the General Surgery rural training track offered at the University of Minnesota. The first 3 years of this program are that of traditional General Surgery at the Twin Cities with the last 2 years focusing on rural surgery at Essentia Health St. Marys Medical Centre in Duluth. Didactic educational experiences are delivered via video conferencing. The clinical curriculum includes exposure of residents to a wide variety of surgical skills required in rural environments including Obstetrics, Gynaecology, Endoscopy, Emergency and Trauma Surgery triage, stabilisation, and transport, Thoracic, Vascular, Urologic and Otolaryngology Surgery in addition to General Surgery competencies. Residents are part of the caesarean section call rotation at each site. They also interact with and support primary care colleagues such as family medicine physicians. Residents spend over 9 months at rural locations outside of Duluth over the course of 2 years. All PGY 2 residents spend 5 to 6 weeks at Essentia Health. During this rotation, residents are involved in an average of 60 to 100 General Surgery outpatient cases, as well as being on call overnight for caesarean section once per week.

East Carolina University, Greenville

The East Carolina University surgical residency program incorporates a 1 month community rural surgery rotation at Edenton, North Carolina and elective for PGY four residents.[21] The residents participate in clinical hospital and office care, operative management, and consultation.[48]

University of Nebraska Medical Centre, Omaha, Nebraska

The University of Nebraska General Surgery residency offers a 1-month rural rotation at the Great Plains Regional Medical Centre in North Platte, Nebraska in PGY 3. The program incorporates extensive skills in in minimally invasive General Surgery and endoscopy.[21] The residents are exposed to a large spectrum of simple/complex open and minimally invasive General Surgery cases with extensive endoscopy cases (both upper and lower, diagnostic, and therapeutic). The program also reports to provide exposure to billing and coding practices in a private setting.[49]

In addition to the General Surgery rotation, since 2017 the Department of Otolaryngology also offers a rural rotation. The website reports that rural Otolaryngologists often have very broad practises and are often asked to tackle problematic patients without the support and resources of a large academic institution.[50]

University of Cincinnati

The University of Cincinnati offers a rural surgery rotation as part of its 5 year residency. Santry, James[33] stated that in year 3, residents work with a group of 5 General Surgeons and subspecialists in Obstetrics, Gynaecology, Urology, and Plastic Surgery. Currently, it is reported that PGY 5 residents spend 2 months in the rural location where they undertake ventral and inguinal hernia surgery, cholecystectomies, appendectomies, surgical management of ulcer disease, small bowel and colon resections, and endoscopies.[51]

University in Arizona, Tucson

In 2002, the General Surgery Program at the University of Arizona university commenced at 6-week rural surgery elective during PGY 3 or PGY 4 clinical year at Tuba City Indian Health Hospital. However, according to the

University's website, the rural surgery rotation is currently offered in PGY two.[52] Their exposure during this time is described to include 'bread and butter General Surgery', Trauma, Endoscopy, Otolaryngology, Urology and Orthopaedics for adults and children. Residents are also exposed to the beliefs among members of the native Navajo Nation with regards to culturally safe medical and surgical care.[33]

US Survey Results

Twelve US studies were identified regarding the perceived training needs of US General Surgeons (published from 1978—2021). One was a scoping review and the other 11 were cross-sectional (surveys). Where the specific surgical specialty was listed in the population, most of the respondents were rural general surgeons.

Scope of practice and training satisfaction

Breon, Scott-Conner and Tracy[53] found that among rural surgeons in Iowa, 26% of all the cases performed in the study period were procedures not required by the ACGME for graduation from an accredited General Surgery Residency Program.[53] These 'out of scope' procedures included Urology (3.5%), simple Orthopaedics (3.5%) and Gynaecology (18.5%). Overall, 71% of rural surgeons in Iowa who responded to the survey stated that they routinely perform surgeries outside the realm of their General Surgical residency training. Furthermore, less rural surgeons (compared with their urban counterparts) felt their residency program adequately prepared them for their current surgical practice.[53] Similarly, Heneghan, Bordley and Dietz, et al.[54] found that rural General Surgeons had a substantially higher volume of endoscopy, Gynaecology, Obstetrics, and Urology compared with urban General Surgeons. Heneghan, Bordley, Dietz, et al.[54] also suggested that current residency training program in the US do not provide graduates with the skills needed for the breadth of practice required to provide surgical care in rural communities.

Perceived training needs

Nealeigh, Kucera and Artino, et al.[55] completed a scoping review which analysed the perceived training gaps among an isolated civilian and military population. A total of 30 articles were included in this review and the most frequently reported technical skill gaps where in Orthopaedics (external fixator placement and hand trauma), Urology (nephrectomy/renal hilum and circumcision—both primary and revision), Obstetrics and Gynaecology

(caesarean section, uterine haemorrhage, hysterectomy, and ovarian pathology) and Otolaryngology (ENT training)[55].

Surgical Training Recommendations

Broad Based General Surgery

Five of the 11 surveys found that surgeons need to be trained in a broad-based residency program, as rural General Surgeons have a broader scope of practice compared with their urban counterparts.[54] Broad-based General Surgical residency programs were cited in Cook, Hughes and Deal, et al.,[56] Deal, Cook and Hughes, et al.,[57] Heneghan, Bordley and Dietz, et al.,[54] Zuckerman, Doty and Bark, et al.[58] and Hughes et al.[59] Cook, Hughes and Deal, et al.[56] found that 81% of the survey respondents agreed that the ideal training for a young surgeon interested in a rural surgery career would be a General Surgery training with a dedicated rural track or significant rural experience, while only 4% reported that General Surgery with a formal subspecialty training would be the ideal training. The authors described that from the results, it is suggested that surgeons in rural areas maintain broad-based General Surgery training with a strong focus on endoscopy.[56] Deal, Cook and Hughes, et al.[57] reported that the greatest number of respondents (34 individuals) would advise young surgeons wanting to practise rurally to undertake broad-based training. Heneghan et al.[54] stated that surgeons interested in rural practice need broad-based training to effectively practise in rural communities. Zuckerman et al.[58] reported that many of those involved in general surgical education recommend broad-based training as a foundation for successful practice.

Lastly, Hughes, Cook and Deal, et al.[59] reported consensus among its respondents with regards to the need for broad surgery training with responses such as ‘community based’, ‘broadly trained’, ‘bread and butter surgery’, ‘the fundamentals’, and ‘true General Surgery’ used to describe the nature and scope of their practices. One respondent stated, ‘I think General Surgeons in rural areas need to be much more broadly trained than in a traditional General Surgery residency program allows’.[59]

Subspecialty training

Several studies surveyed surgeons and one study program directors regarding subspecialty training that would benefit rural surgeons in the US. Burkholder and Cofer[60] found that currently practicing rural surgeons felt that additional training in the surgical subspecialties would have been beneficial. Cook, Hughes and Deal, et al.[56] additionally found that the top 3 reasons surgeons recommended subspecialty training for residents interested in a rural or non-metropolitan career were acquiring technical skills, improving confidence and improving one's ability to obtain hospital privileges. Cook, Hughes and Deal, et al.[56] The results for these are as follows.

Obstetrics and Gynaecology

Six surveys found that respondents felt that rural surgeons would benefit from additional training in Obstetrics and Gynaecology during their residency programs to equip them with the skills required for rural surgery.[54,57,60-63] Some of these articles listed specific surgical procedures (Table G2). The most frequent response was caesarean section.[54,57,62,63]

Table G2: Obstetrics and Gynaecology procedures listed per study

Author	Procedure
Deal, Cook and Hughes, et al.[57]	Caesarean section Emergent hysterectomy Tubal ligation Dilation and curettage
Heneghan, Bordley and Dietz, et al [54]	Caesarean section
Halverson, Hughes and Borgstrom, et al.[63]	Caesarean section Endometrial ablation Ectopic pregnancy Management of ovarian torsion Management of ectopic pregnancy Management of postpartum Anal fistula plug
Landercasper, Bintz and Cogbill, et al.[62]	Caesarean section

Orthopaedics

Six surveys found that respondents felt that rural surgeons would benefit from additional training in Orthopaedics during their residency programs to equip them with the skills required for rural surgery.[54,57,60-63] The specific surgical procedures listed can be found in Table G3.

Table G3 Orthopaedic procedures listed per study

Author	Procedure
Deal, Cook and Hughes, et al.[57]	Carpal tunnel release Ganglion Cyst Management Traumatic amputation Dislocation management Common fracture management
Halverson, Hughes and Borgstrom, et al.[63]	Hip fracture management Carpal tunnel release Hand tendon repair
Landercasper, Bintz and Cogbill, et al.[62]	Hand Surgery

Urology

Five studies found that respondents felt that rural surgeons would benefit from additional training in Urology during their residency programs to equip them with the skills required for rural surgery.[54,57,60,61,63] The specific surgical procedures listed can be found in Table G4.

Table G4 Urology procedures listed per study

Author	Procedure
Deal, Cook and Hughes, et al.[57]	Ureteral stent placement Suprapubic catheter placement Vasectomy Bladder suspension Cystoscopy
Halverson, Hughes and Borgstrom, et al.[63]	Cystoscopy Urethral dilation Management of testicular torsion Suprapubic tube insertion Urethral stent insertion

Endoscopy

Five studies found that survey respondents would have liked or felt that a greater level of endoscopy training and/or experience is vital for a future rural surgeon.[54,56-58,62]

Otolaryngology (ENT)

Three studies recommended further subspecialty Otolaryngology training for rural surgery residents.[57,60,63] Deal et al.[57] and Halverson et al.[63] both recommended training in tonsillectomy was important. Halverson et al.[63] also recommended training in oesophagectomy.

Laparoscopy

Three studies recommended further training or experience in laparoscopy.[54,57,63]

Plastic Surgery

Four studies recommended further training in Plastic Surgery[54,57,61,63] with specific mention of simple rotational flap and complex laceration repair[57] and facial laceration repair and excision of facial lesions.[63]

Other sub-specialties

The following surveys recommended further training or experience during a General Surgery residency program for rural surgeons in: Trauma and Critical Care,[56,57] Thoracic Surgery,[54,61] Vascular Surgery,[61] Neurosurgery,[61] Colorectal Surgery,[61] and Gastroenterology.[57]

Professional Skills

Two surveys had respondents who recommended a greater amount of professional skills training during their residency programs.[57,63] Deal, Cook and Hughes, et al.[57] had respondents who recommended the topics of

understanding business and finance, and mentorship. Halverson et al.[63] had survey respondents who recommended a greater level of training in leadership and communication.

Survey of program directors

Burkholder and Cofer [60] conducted a survey on 58 directors of American Surgery Residency Programs (response rate 24%). When asked whether or not a rural surgery curriculum was necessary to train a rural surgeon, on a 5-point Likert scale, the mean score for a program that had a curriculum in place was 3.95 compared with a mean score of 3.25 for programs that did not have a rural curriculum. Regarding rural curricula, out of the responding programs, 36.2% indicated that they had a rural curriculum in place, 62.1% did not have a rural curriculum in place, and 1.7% gave no response.

Additionally, Rossi, Wiegmann and Schou, et al.[29] conducted a survey to identify programs which demonstrate commitment to training rural surgeons and their ability to provide three to 12 months of subspecialty training. The authors sent an electronic survey to all the ACGME General Surgery Residency Programs in the US and Canada listed on the fellowship and residency electronic information database (FREIDA) for the year of 2016 to 2017.

Of the 261 programs surveyed, 52 (19.9%) provided a response. Eleven of the programs had an established rural track and 15 were willing to customise a training program for residents interested in rural surgery. Seven of the established rural training programs were not included on the ACS website and 3 programs were not included on FREIDA. The survey also identified an additional 14 rural training program not identified by either the ACS website or FREIDA. In total 44 programs identified by ACS, FREIDA, and the survey state that they are able to accommodate the rural surgical resident by providing the appropriate exposure and training.[29]

Phase 2: Delphi Study

Background

A Delphi study has been conducted on a group of individuals involved in rural and regional surgery and surgery education, this focused on the professional skills and competencies as described by RACS and reported in the introduction of this dossier. The aim of the Delphi was to determine what are the important skills of a rural surgeon and gain more details regarding the judgement and decision-making processes in rural surgery. Round 1 of the Delphi consisted entirely of open-ended questions, which were coded and themed, if a particular theme was stated by more than two respondents it was documented as a main theme and was used in Round 2 of the Delphi.

Round 2 utilized a 7-point Likert scale of agreement, where the surgeons chose to either strongly disagree, mostly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, mostly agree, strongly agree. The aim of Round 2 was to find whether where was a consensus of agreement for each of the statements provided. The methodology for generating consensus was based on Diamond and Grant[3] paper "defining consensus: a systematic review recommends methodologic criteria for reporting Delphi Studies". This study found two common definitions for consensus, these being:

- Percentage agreement (conducted in 25 studies)
- Proportion of rating within a range (conducted in 16 studies)

We used the proportion of rating within a range as this was common definition when a 7- or 9-point Likert scale was being used. Diamond and Grant[3] reported that the median threshold for consensus was 75% agreement (range 50% to 75%), therefore we used a threshold of 75% agreement. The range that was chosen was top 3 (somewhat agree, mostly agree, strongly agree) being the range for consensus for inclusion, bottom 3 (somewhat disagree, mostly disagree, strongly agree) being the consensus to exclude. All others were a result of no consensus and can be taken into a third round of the Delphi if required.

Round 1 Delphi Results

The results have been presented as the question and the main statements associated with that question, with the number of times it was stated in the raw data. The full data can be found in Appendix 2.

Collaboration and Teamwork

Table G5: Collaboration and Teamwork Round 1 Delphi questions and associated results

Please describe examples of positive behaviour makers demonstrating Collaborating and Teamwork in the context of the rural setting	
Main Themes	Number of statements
Good communication skills (spoken and written) and willingness to communicate with a number of multidisciplinary staff e.g. specialists, nurses, theatre staff	16
Interdisciplinary collaboration and service planning and collaboration between specialists	8
Working with allied health staff (physio/OT) and other health care professionals is key in any setting	4
Asking for advice and sharing decision-making	3
Building relationships with tertiary hospitals and colleagues in tertiary hospitals	2
Communication with GPs	2
Communication with GP anaesthetists	2
Use of technologies and telecommunications	2
How do you guide Trainees to acquire skill in Collaboration and Teamwork in the context of the rural setting	
Role modelling and setting an example	9
Good mentoring from experienced rural surgeons and in particular explaining importance of collaboration	7
Encourage and provide feedback regarding good support, communication, and positive behaviour	4
Communication with GP's is essential	4
Rural placement and support form experienced mentors	4
Close and constant monitoring with reviews of progress	3
Clear management plan and discharge summary which has been discussed with the patient with or without their family	2
Multidisciplinary training is important to the trainee but also to the health service	2
The skills are transferrable and are not different from working in metro	2
What Challenges might be encountered in delivering this competency in a rural setting?	
The availability of resources e.g. course availability, backfill of position, needing help from hospital and health authorities	6
Short term rotations and high turnover of staff	5
Heavy workload and time constraints, there needs to be a strategy to manage the on-call issues	4
Isolation and geographic distance from larger cities	3
Attitudes from Trainees from non-regional or remote areas	3
Occasionally lack of exposure to "major cases" and general surgery	2

Communication

Table G6: Communication Round 1 Delphi questions and associated results

Please describe examples of positive behaviour markers demonstrating communication in the context of the rural setting	
Main Themes	Number of Statements

Using enough time to talk with patients, families, and carers at times of consultation, having enough time to get the full story and encouraging the patients to ask questions	5
Include patients and family and keep them all informed during all patient interactions e.g. times of consultation and after discharge	5
Using sound verbal and non-verbal communication, adopting communication to context and using appropriate language with patients and relatives	4
Allowing cultural decision-making in care planning	3
Being aware of significant cultural differences between the trainee and her/his patient	3
Using interpreters, sign language or family members when required	3
Being inclusive and approachable and ensuring interactions are undertaken in a safe space	3
All of the communication markers as described in the guide are relevant/important. Communication is a generic skill—it is not different whether you are in rural or metro	3
Communicate effectively within the team	3
GP liaison in the rural setting is particularly important	3
Communication with indigenous patients may require extra time	2
Consultation with other disciplines	2
How do you guide Trainees to acquire skills in communication in the rural setting?	
Demonstration, role modelling, and setting an example	9
Encourage the trainee to listen, form connections outside the hospital, learn some words used by aboriginal people in locality and lead ward rounds with the consultant observing	5
Formal and informal feedback	5
Spend time independently in outpatient, emergency departments and wards, and practice with case presentations and meetings—that is, practise is more important than theoretical advice	4
Indigenous cultural courses and cultural induction program relevant to the local population	3
Same way they should acquire communication skills anywhere	2
What challenges might be encountered in delivering this competency in a rural setting?	
No great barriers or difficulties specific to the rural setting	3
Poor workplace culture e.g. consultant not coming in or caring, Trainee not wanting to listen to advice, Trainees stressed and being harassed by some consultants	3
Constant change of personnel e.g. fly-in, fly-out healthcare workers	2
Large number of Trainees are born overseas or may be IMGs, which can increase the cultural divide. Both the communication sometimes of both parties in a second language and lack of understanding of rural Australia can further exacerbate communications gaps	2
A lack of understanding of the communities' attitude to seeking medical attention and cultural beliefs	2

Cultural Competence and Cultural Safety

Table G7: Cultural Competence and Cultural Safety Round 1 Delphi questions and associated results

Please describe examples of positive behaviour markers demonstrating Cultural Competence and Cultural Safety in the context of the rural setting	
Main Themes	**Number of Statements**
Inquisitive mind and a respectful curiosity to learn more about different cultures and personal backgrounds of her/his colleagues and patients, especially local context and cultural norms	7
Acknowledges/recognises own biases	5
Involvement of family members in management	4

Understanding indigenous people in rural settings and striking a balance between best practice and appropriate cultural care	3
Being respectful of all background, sexual orientation, and religions	3
Awareness of how culture may affect compliance and having the ability to tweak patient management plans to address the patient's concerns—for example, allowing patient to leave hospital for sorry business, changing antibiotics to oral, making alternative dress-change plans, etc.	3
Teamwork and Collaboration	3
Awareness and use of indigenous liaison officers	2
Racism when encountered should be called out	2
Listen carefully to patient responses	2
Trainee aware of cultural differences of multicultural staff	2
How do you guide Trainees to acquire skills in Cultural Competence and Cultural Safety in the rural setting?	
Formal cultural awareness training	9
Leading by example, being a positive role model	8
Mentoring and being available for advice	4
Exposure and rural lived experience	3
Providing feedback	2
What challenges might be encountered in delivering this competency in a rural setting?	
Racism and intolerance	4
Rural training may lead to more exposure to patients and colleagues with different cultural backgrounds and needs and may lead to more opportunity to learn	2
Language skills and issues	2

Scholarship and Teaching

Table G8: Scholarship and Teaching Round 1 Delphi questions and associated results

Please describe examples of positive behaviour markers demonstrating Scholarship and Teaching in the context of the rural setting	
Main Themes	**Number of Statements**
Being up to date with literature and engaging in a journal club	8
Willingness and making time to teach this can include on ward rounds, in services, formalised tutorials and lectures as well as non-traditional teaching opportunities such as giving talks to community groups and GP registrars	8
Being actively involved in research as well as multicentre, collaborative research	6
Attendance at a variety of teaching and training opportunities including attending and presenting at conferences, CPD, M&Ms across all specialties and workforce	6
Need to be motivated for self-learning which includes reading, teaching, studying and research regarding pathologies and procedures	4
Questioning/inquisitive personality/enquiring mind with an emphasis on lifelong learning and a natural curiosity across specialists to avoid over reliance on "consult" mentality	4
Focus and practicing evidence-based medicine	2
Networking with city specialists and interactions with consultants and Trainees	2
Not dissimilar to any other settings (metro or rural)—you need to be involved in teaching your Juniors. See RACS surgical competence and performance framework. Little difference in principles in rural setting	2
How do you guide Trainees to acquire skills in Scholarship and Teaching in the context of the rural setting?	
Role modelling the attitude of ongoing learning, teaching about self-reflection as a way of improvement in surgical practice	6

Actively look for and offer opportunities, and support research and audit projects	4
Enable opportunity for teaching, research and discussion of literature and give responsibility to trainee to organise and present at educational meetings	4
Encourage attendance, presentation, and contribution at all teaching sessions from grand rounds to 10-minute teaching topics and encourage participation in journal clubs	3
Use of appropriate mentoring and feedback	2
What challenges might be encountered in delivering this competency in a rural setting?	
Time off to attend conferences if limited number of trainees in the rotation and need to cover clinical work—rostering limitation	7
Isolation and distance to attend face to face opportunity and RACS does not conduct many courses outside major centres. I don't think RACS has an appreciation of the difficulty and costs of attending courses from the more remote areas	7
Workload of surgeons and on-call commitments making learning opportunities and research difficult	4
Trainee loneliness, isolation, depression, and lack of motivation	4
Potentially less teaching opportunities e.g. with no outpatient clinics, smaller scope of procedures, certain areas conducive to more specialists areas	3
Need more study leave and a greater allowance	2
Covid and the increasing use of telemedicine and online forums have shifted this space	2

Health Advocacy

Table G9: Health Advocacy Round 1 Delphi questions and associated results

Please describe examples of positive behaviour markers demonstrating health advocacy in the context of the rural setting?	
Main Themes	Number of Statements
Looking after own wellbeing including health lifestyle choices, regular exercise, work/life balance, strategies to relieve pressure, having a GP, good personal hygiene and being able to recognise signs of fatigue and fatigue management	7
Awareness of the needs of the community and barriers to healthcare delivering in rural settings and understand how they impact on health outcomes e.g. recognise GP services are so limited in some areas that specialists take on the role for following up results and treatment coordination	5
Attempting to understand the rural community and their disadvantages and having close contact with community leaders, service clubs and media (printed and electronic) to disseminate factual health information	5
Identify and address health issues in patients e.g. encouraging patients to stop smoking, setting up adequate services to meet demand, diabetes management, obesity management	5
Appropriate informed consent with options including second opinion and providing all clinical records, X-rays and laboratory results for second opinion/transfer of care	2
Links with multidisciplinary teams in metropolitan areas to present and discuss complex cases	2
How do you guide Trainees to acquire skills in health advocacy in the rural setting?	
Lead by example e.g. demonstrate counselling with Trainee on ward round, showing a willingness to speak with relatives and patients	8
Advocate and initiate health promotion activities	3
Mentorship and pointing out relevant cases when they arise	3
Presentation of cases at MDT	3
Understanding health outcomes and awareness of patient at risk in early discharge if no local services, adherence to robust but not onerous follow up	2
Encourage Trainee to be involved with outreach services with consultants	2
Trainee is always encouraged to advocate for the patients and offer help/access support services for patients interested to make changes	2

What Challenges might be encountered in delivering this competency in a rural setting?	
Lack of resources in the rural setting	5
Limitations of time with busy clinical caseload and difficulty accessing care within limited timeframe available for appointments	3
Lack of engagement and reluctance from patients, families and care supporters	3
Lack of engagement from other team members and mentor around health advocacy	2

Judgement and Clinical Decision Making

Table G10: Judgement and Clinical Decision Making Round 1 Delphi questions and associated results

Please describe examples of positive behaviour markers demonstrating Judgement and Clinical Decision-making in the context of the rural setting	
Main Themes	Number of Statements
Being honest and self-aware and acknowledging when your limits have been reached and knowing when to transfer	8
Early consultation and clear processes for transferring patients	5
Maintenance of CPD; being prepared to take advice and read up on something	5
Practice audits to have data on procedures and their outcomes	4
Appropriate timeliness of discussion with consultants	4
Early involvement of sub-speciality and involvement in MDT meetings	4
Good knowledge of patients and results	4
Situational awareness and being aware of local resources	3
Outline preoperative, operative, and postoperative care, including timeline and recovery milestones	3
Sensible diagnoses and suggested management plan	3
Uses available information to effectively prioritise acute and elective patient assessment	3
Appropriate use of tests and investigations and developing strict protocols for following up all tests and investigations	2
How do you guide Trainees to acquire skills and confidence and in Judgement and Clinical Decision Making in the context of a rural setting?	
Mentorship, discussion and providing opportunity to assess and discuss management plans	7
Educational opportunities including videos, workshops, journal clubs, attendance at M&Ms and attendance at relevant courses such as cultural safety, communication skills, medicolegal aspects of decision-making	6
Simulation scenarios	4
Role modelling and personal example	3
Trainee interested in rural practice should have access to subspecialty terms	2
How do you make the decision to perform surgical procedures in the context of a rural setting in the following situations?	
Infrequent or high-risk procedures within your scope	
Appropriateness of the procedure in the given setting and resources available including staff, instrumentation, suitable anaesthetists	11
Consult and discussion with appropriate colleagues for their opinion	9
Discussion with colleagues in tertiary centres	4
Discussion with patients with or without risks and benefits of having procedures in a rural setting	4
Even if infrequent, there must be an appropriate skill mix, and it must be a procedure you have experience and training in and ensure currency of practice	3

Consult with anaesthetist, nurses, executives, and patient/family	3
Care preoperative planning and clinical decision-making	3
Read documentation regarding the case	3
Only with appropriate post op and critical care back up	2
Perform with colleague assisting	2
Procedures outside your regular scope of practice but in which you have had training	
Generally, avoid unless retrieval not available to manage an urgent condition	5
Perform life-saving/damage control surgery under advice from subspecialty surgeon in tertiary unit	3
Discuss with EDMS	2
In consultation with credentialing	2
Procedures that you have had little or no previous experience in	
Only perform if life threatening and too unstable to transfer	12
Discussion with local and tertiary colleagues before commencement	11
Only perform is life threatening, under the guidance of a metropolitan specialist or subspecialty surgeon	6
How do you make the decision to NOT perform a surgical procedure (and therefore transfer a patient for care elsewhere)	
Non-emergency setting the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) as well as the necessary support structures (ICU, HDU, specialist nursing care); if one or several of these are deficient for a certain condition then I will refer the patent on to receive care elsewhere	10
Non-emergency setting the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) and whether the procedure fits into the CSCF of the hospital	5
If the patient can be transferred safely and there is no urgency	4
This would be dependent on the experience (or no experience), skills, area of expertise and what facilities are available at the hospital	4
Does the combination of procedure and co-morbidity raise concerns and would the outcomes of the patient be better if treated in a larger hospital	4
Discuss with subspecialty via phone	2
If the patient can be transferred safely	2
I would consider onward referral to reduce stresses on myself at the hospital	2
How does your answer to the question above differ depending on emergency or elective context?	
In emergency circumstances, timing becomes critical, and delay in management has to be matched against health risks of transfer being greater than intervention is less than optimal conditions. In general, if I assess that there could be a risk to life or quality of life, I will take on procedures with as much support as I can gather	10
Would engage and get advice from remote colleagues to guide me e.g. a discussion with a referral centre subspecialists even while performing emergency procedures	3
Transfer to tertiary centres are more common for elective procedures e.g. there have been occasions where I have had to perform a thoracotomy for trauma but I would never consider performing an elective thoracotomy	3
For elective procedures there is no excuse for performing procedures outside one's personal scope of practice and experience whether this occurs in the rural or metropolitan setting	2
Depends on the patient's stability and availability of transfer e.g. acuity and likelihood of deterioration if transferred. Mode of transfer available. Distance to transfer	2
What challenges might be encountered in delivering this competency in a rural setting	
These situations mostly arise in rural setting with challenges more frequently encountered e.g. smaller hospitals, smaller volumes, fewer specialists with super specialisation. Less easy to transfer elsewhere due to remoteness and in a time appropriate manner. So, in this context these skills are more reliably learnt and experiences in these settings	5
Good relationships with colleagues and peers are paramount. The Trainee may have a lack of professional networks with specialists to provide timely advice. Trainees need to know who they can transfer to if outside their facility. There needs to be a strong link with the tertiary hospitals or bigger hospitals in the catchment	4

Resource limitations	4
It is a higher level experience that probably needs individualisation. It is fairly straightforward with the elective cases—just have the Trainees sit on the MDT meetings and learn by osmosis. The other cases are firstly rare and secondly unique, so it is difficult to teach the decision-making in this setting	4
Back up and support limitations by other departments, peers and health service support e.g. anaesthesia and medical administration	3
Registrars tend to be too timid and the range of operations they can do out of training too narrow perhaps for rural setting. This results in increasing transfer of care in the last 20-30 years. High risk Trainees may develop a sense that rural centres can't do things and rely on transfers to tertiary centres and fail to appreciate how much gets done locally without transfer	2
Look of support from tertiary centres	2
Perceived expertise and competency with tertiary surgeons not aware of the local skill available and requesting unnecessary transfer	2
Logistics of transfer in a time appropriate manner e.g. remoteness, costs, logistics with family and patients	2

Leadership and Management

Table G11: Leadership and Management Round 1 Delphi questions and associated results

Please describe examples of positive behaviour markers demonstrating leadership and management in the context of the rural setting	
Main Themes	Number of Statements
Involvement in hospital and health network management	3
Ability to adjust leadership style to the setting e.g. small hospitals and rural situation	2
Effective communication with administration and team members	2
How do you guide Trainees to acquire skills in leadership and Management in the rural setting	
Leading by example and role modelling	9
Give the trainee opportunity to lead ward rounds, manage the roster and mentor juniors, lead in discussion and planning	5
Review and feedback, making time to evaluate performance and correcting observed inappropriate behaviour	4
Encourage and get them involved in administration roles, projects and specific tasks that need a collaborative approach (such as auditing a certain condition/auditing theatre flow)	3
Encourage additional study e.g. leadership and management courses, CRM training, and if they have a serious interest in management AICD course	3
Exposure with the granting of increasing responsibility and progressive independence	3
Sharing information and experiences (within the bounds of confidentiality and the interest of health service)	2
Mentorship and teaching Trainees to look for solutions	2
What challenges might be encountered in delivering this competency in a rural setting?	
Same challenges as city medicine and none specific to rural context	4
Dependent on senior leadership in hospital or health networks e.g. difficulty would be a non-responsive, overly bureaucratic management	3
Limited opportunities	2
Support for additional workload e.g. if leadership positions are taken on. Often surgeons and their team are very time poor	2

Professionalism and Ethics

Table G12: Professionalism and Ethics Round 1 Delphi questions and associated results

Please describe examples of positive behaviour markers demonstrating Professionalism and Ethics in the context of the rural setting	
Main Themes	Number of Statements
This competency would be the same in any setting and is no different in a rural setting	5
Patient-centred approach and respecting patient autonomy	4
Honesty and integrity	3
Trustworthy, respect for confidentiality. Must protect patient rights and information. Everyone knows everyone, and confidentiality is even more crucial as you encounter more and more people in your town as patients	3
Good time management skills e.g. on time meeting starts, surgeries etc	2
Equal management of private and public patients	2
Accepting and ensuring effective communication with diverse ethnic, cultural, religious and language groups	2
Respect for colleagues and fosters an environment of collegiality	2
Role modelling good, ethical behaviour in the community	2
How do you guide Trainees to acquire skill in Professionalism and Ethics in the rural setting?	
Role modelling and setting an example of highly ethical and professional behaviour	15
Mentorship	6
Encourage trainee to attend courses e.g. diversity awareness training	4
Involvement in local community and introduce Trainee to community leaders	2
Regular feedback, Trainee assessment; regular feedback if Trainees standards fall short of those expected	2
What challenges might be encountered in delivering this competency in a rural setting	
No difference to city medicine, behaviours and attitudes can be demonstrated anywhere	5
Ability to separate clinical from social and family networks, the Trainee needs to manage carefully as may cross boundaries or create conflicts of interest	4
It can be difficult to manage the crossover between private and public roles. It is possibly easier to deliver ethical and professional care in regional areas with no private hospitals or private practice nearby	3
Local past experience with colleague who have had lower standards of ethical practice. The rural setting is limited in the number of consultants: there is not such a large variety of behaviours to be observed	2
With fiscal responsibilities Trainees are not always the ones making decisions, but they need to understand what are responsible financial decisions for the hospital and most importantly the patient i.e. don't order scans that are not needed	2

General Questions

Table G13: Round 1 Delphi General Questions and associated results

Are there any additional professional skills or competencies that could be needed in a rural surgical setting	
Main Themes	Number of Statements
No additional professional skills or competencies	6
A more general skillset, with skills outside regular specialty to compensate for less specialised practices	3
Social skills and situational awareness	3

Establishing good, supportive, professional networks and referral pathways with larger hospitals, urban hospitals and subspecialists. Visits to referral centres would be invaluable	2
Flexibility and adaptability; adjusting your practice to the local level of care available	2
Ability to cope with isolation and being alone	2
From your experience what could be added as part of a rural-facing curriculum to complement the existing Surgical Education and Training (SET) curricula, covering the nine surgical specialties, to better prepare SET trainees for independent rural practice?	
Posting to other specialties (cross-specialty training) would be key for rural inclined Trainee surgeons e.g. Vascular rotation, Neurosurgery, Plastic Surgery, ENT, Cardiothoracic and Urology	7
Exposure to rural areas	4
Training in communication tools and networking with colleagues	4
Surgeons in rural areas need the same non-technical skills as their city counterparts and everything that is in the general surgery curriculum is applicable to rural training	3
Structured training opportunities for technical and non-technical skills to expand a generalise skillset	2
Understanding the difficulties faced by rural practitioners and shaking the belief that excellence is only available in cities	2
How could a rural-facing curriculum help develop confidence and competence in SET Trainees providing surgical care to rural patients?	
More technical training and help during training for a broader capability without sacrificing depths, better preparing skillset and behaviour patterns for smaller departments and would provide a local context, with surgeons being specifically trained to meet the needs and demands of rural population	7
Better exposure to rural practice, both education and rural practice and experience	6
Challenging referral hospital surgeons to foster close relationships with regional surgeons/trainees and teach the Trainees how to ask for help	3
Reinforcing to the Trainee the immense difference they are making working in the rural setting	3
Help Trainees appropriately use the tools of modern IT and communication tools and improve telemedicine support from subspecialists	3
Ensuring rostering practices are in place that facilitates Trainees engaging with the community through sport/music/hobbies so they build deeper connections and a positive impression of what the place is like	2
Reflecting on your own training, what helped you develop confidence in a rural surgical practice	
Supportive working environment and having strong relationships/networks with surgeons within the same speciality and with other specialties	8
Exposure to multiple surgical specialties during training for a broad and intensive surgical training experience. Training in General Surgery, Orthopaedic Surgery, urns/Plastics, Urology, Neurosurgery and Cardiothoracic Surgery	7
Training outside of capital city and gaining rural exposure	7
Role modelling after rural surgeons and having good mentors to guide how to best manage rural practice	6
Very busy and rigorous training jobs prior to moving to a regional area	2
Formal linkage and working visits to major centres and regional hospitals. This allows for procedure specific training, being able to discuss cases, join an MDT, take more complex cases, and provide locum relief	2

Round 2 Delphi Results

Below are the statements for each question that reached a consensus, they have been rated from highest level of agreement to lowest (all above the 75% consensus threshold). The percentage of agreement has also been documented. The full results from Round 2 of the Delphi can be found in Appendix 3.

Collaboration and Teamwork

Table G14: Collaboration and Teamworking Round 2 Delphi statements that reached consensus

Positive behaviour markers demonstrating Collaboration and Teamwork in the context of the rural setting	
Statements with Consensus	Agree %
Good communication skills (spoken and written) and willingness to communicate with multidisciplinary staff—for example, doctors from other disciplines including general practice, nurses, allied health professionals, Aboriginal and Torres Strait Islander Health Workers, technical and administration staff	100.00%
Building administrative and clinical peer relationships between rural and referral hospitals including tertiary hospitals	100.00%
Communicating, collaborating and sharing care with General Practitioners	100.00%
Communication with General Practitioner anaesthetists—for example, regarding the suitability for patient care at a regional centre versus transfer	100.00%
Interdisciplinary collaboration and service planning and collaboration between specialists	100.00%
Asking for advice and multidisciplinary teamwork and decision-making	95.84%
Use of telecommunication to facilitate communication within a healthcare team	91.67%
Collaboration and team care arrangements with allied health staff (physiotherapist/occupational therapist) and other health care professionals	91.67%
Use of emerging technologies and telecommunication tools to deliver healthcare	91.66%
Methods of guiding trainees to acquire these skills in Collaboration and Teamwork in the context of the rural setting include:	
Supervising surgeon being a positive role modelling and setting a positive example	100.00%
Encouragement, skilled feedback and self-reflection regarding positive support, communication and behaviour with reviews of progress	100.00%
Skilled mentoring from experienced rural surgeons who explain the importance of collaboration	100.00%
Rural work experience for the Trainee	100.00%
Ensuring management plan on discharge negotiated with primary care team and communicated in a timely way in writing, and for critical problems, verbally	95.84%
Multidisciplinary training as it benefits the surgeon as they learn more about other groups in the hospital and acquire skills in other specialties	95.83%
Giving Trainee responsibility for communicating with General Practitioners	91.66%
The challenges that might be encountered in delivering this competency in a rural setting include	
Lack of human resources to replace Trainee during travel away from rural setting to attend face to face courses	83.33%
Attitudes from Trainees from non-rural settings—for example, urban Trainee's not understanding the rural setting and the attitudes within rural hospitals	83.33%
Heavy workload and time constraints of the supervisor/mentors	79.16%

Communication

Table G15: Communication Round 2 Delphi statements that reached consensus

Positive behaviour markers demonstrating Communication in the context of the rural setting	
Using enough time to talk with patients, families, and carers at times of consultation; having enough time to get the full story and encouraging the patients to ask questions	100.01%
Contributing to a culturally safe and inclusive environment for patient and the health care team	100.00%
Keeping patients and family informed during all patient interactions—for example, times of consultation, and after discharge	100.00%
Communicating effectively within a team	100.00%

Timely and effective General Practitioner liaison to facilitate continuity of care	100.01%
Consultation and collaboration with other disciplines	100.00%
Allowing extra time to communicate with Aboriginal and Torres Strait Islander patients	95.66%
For patients with English as a second language, using interpreters or where culturally appropriate, family or community members	95.66%
Allowing for cultural decision-making in care planning	95.65%
Self-reflection and awareness of cultural differences between the Trainee and their patient	95.65%
Patient-centred verbal and non-verbal communication, tailored to the patient and their family, their culture and their context	95.65%
All the communication markers are described in the RACS Surgical Competence and Performance Guide. Communication is a generic skill—it is not different whether you are in a rural or metropolitan setting	78.26%
Methods of guiding trainees to acquire these skills in Communication in the context of the rural setting include:	
Providing demonstrations, role modelling, and setting an example of positive communication skills and behaviour	100.00%
Providing formal feedback (for example using feedback tools) and in formal ad hoc feedback (for example 'on the job' feedback) to the Trainee	100.00%
Spending time independently in outpatient clinics, emergency departments and wards, and practice with care presentations and meetings i.e. practical experience over theoretical advice	100.00%
Perform Entrustable Professional Activities, like the Trainee leading word rounds with consultant observing	95.66%
Listening/learning/forming connections with the community, about the people/place/context you are working in	95.65%
The same way they should acquire communication skills anywhere whether it be a rural or metropolitan area	91.31%
Participating in Aboriginal and Torres Strait Islander cultural courses and cultural induction programs which are relevant to the local population	82.60%
The challenges that might be encountered in delivering this competency in a rural setting include	
Constant change of personnel, including consultant and senior staff and fly-in, fly-out healthcare workers	82.61%
Lack of Trainee knowledge of local culture can impact communication	82.60%
A lack of training and understanding of patient and community cultural context relevant to seeking and participating in healthcare	78.26%
Poor workplace culture—for example, disengaged supervisors or Trainees, bullying/discrimination/harassment, overwork, or unsafe hours	78.26%

Cultural Competence and Cultural Safety

Table G16: Cultural Competence and Cultural Safety Round 2 Delphi statements that reached consensus

Positive behaviour markers demonstrating Cultural Competence and Cultural Safety in the context of the rural setting	
Awareness of how culture may affect compliance and having the ability to tweak patient management plans to address the patient's concerns—for example, allowing patient to leave hospital for sorry business, changing antibiotics to oral, making alternative dress-change plans, etc.	100.00%
Having an inquisitive mind and a respectful curiosity to learn more about different cultures and personal backgrounds of their colleagues and patients, especially local context, and cultural norms	100.00%
Involvement of family and community members where desired by patient, or where culturally appropriate or requested by patient	100.00%
Listening carefully to patient responses	100.00%
Trainee being aware of cultural difference of multicultural staff	100.01%
Being respectful of all elements of human diversity	99.99%
Understanding Aboriginal and Torres Strait Islander people in rural settings and negotiating a balance between protocol drive ideal care and appropriate cultural care	95.25%
Cultural self-reflection: recognising own culture, experiences, and biases	95.25%
Awareness and use of Aboriginal and Torres Strait Islander liaison officers	95.24%

Teamwork and collaboration	95.24%
Contributing to a diverse and inclusive culture—for example, by calling out racism when it is encountered	90.48%
Methods of guiding trainees to acquire these skills in Cultural Competence and Cultural Safety in the context of the rural setting include:	
Exposure and rural lived experience	100.01%
Supervisors leading by positive example, and being a positive role model	100.00%
Supervisors mentoring and being available for advice	100.00%
Supervisor providing feedback to Trainees	100.00%
The challenges that might be encountered in delivering this competency in a rural setting include	
Language skills	85.72%
Racism and intolerance	76.20%

Scholarship and Teaching

Table G17: Scholarship and Teaching Round 2 Delphi statements that reached consensus

Positive behaviour markers demonstrating Scholarship and Teaching in the context of the rural setting	
Attending a variety of teaching and training opportunities—for example, attending and presenting at conferences, continued professional development, morbidity and mortality meetings across all specialties and workforce meetings	100.00%
Being motivated for self-learning including reading, teaching, studying and research	100.00%
Willingness and making time to teach. This can include ward rounds, in services, formalised tutorials and lectures as well as non-traditional teaching opportunities such as giving talks to community groups and General Practitioner registrars	100.00%
Having a questioning/inquisitive personality/enquiring mind with an emphasis on lifelong learning and a natural curiosity across specialties to avoid over reliance on “consult” mentality	100.00%
Networking with metropolitan specialists and interactions with consultants and Trainees	100.00%
Being involved in teaching juniors	100.00%
Being actively involved in research including multicentre and collaborative research	90.00%
Being up to date with literature and engaging in journal clubs	95.00%
Methods of guiding trainees to acquire these skills in Scholarship and Teaching in the context of the rural setting include	
Actively looking for and offering opportunities and support for research and audit projects	90.00%
Encouraging attendance, presentation, and contribution at all teaching sessions i.e. grand rounds, 10-minute teaching topics, and encouraging participation in journal clubs	85.00%
Enabling opportunities for teaching, research and discussion of literature and giving responsibility to Trainees to organise and present at educational meetings	85.00%
Use of skilled mentoring and feedback	75.00%
The challenges that might be encountered in delivering this competency in a rural setting include	
Time off to attend conferences if limited number of Trainees in the rotation and need to cover clinical work, this includes rostering limitations	90.00%
Workload of surgeons and on-call commitments make learning opportunities and research difficult	90.00%
Geographic isolation and distance to attend face to face opportunities	85.00%
Trainees needing more study leave	75.00%
Rural Trainees needing a greater study allowance due to incurring higher costs of travel to attend courses	75.00%

Isolation from peers and social networks during rural rotations	75.00%

Health Advocacy

Table G18: Health Advocacy Round 2 Delphi statements that reached consensus

Positive behaviour markers demonstrating Health Advocacy in the context of the rural setting	
Awareness of the needs of the community and barriers to healthcare delivery in rural settings and understanding how they impact on health outcomes—for example, recognising that GP services are so limited in some areas that specialists take on the role for following up results, and treatment coordination	100.00%
Attempting to understand the rural community and their disadvantages and having close contact with community leaders, service clubs and media (printed and electronic) to disseminate factual health information	100.00%
Looking after own wellbeing including healthy lifestyle choices, regular exercise, work/life balance, strategies to relieve pressure, having a GP, good personal hygiene and being able to recognise signs of fatigue and fatigue management	100.00%
Identifying and addressing health issues in patients—for example, encouraging patients to stop smoking, setting up adequate services to meet demand, diabetes management, obesity management	100.00%
Gaining appropriate informed consent with options including second opinion and providing all clinical records, X-rays and laboratory results for second opinion/transfer of care	95.00%
Links with multidisciplinary teams in metropolitan areas to present and discuss complex cases	95.00%
Methods of guiding trainees to acquire these skills in Health Advocacy in the context of the rural setting include	
Having Trainees understand health outcomes and awareness of patients at risk in early discharge if no local services are available	100.00%
Supervisors leading by example—for example, demonstrating counselling with Trainee on ward round, showing a willingness to speak with relatives and patients	100.00%
Supervisor mentorship and pointing out relevant cases when they arise	100.00%
Encouraging Trainees to be involved with outreach services with consultants	100.00%
Presentation of cases at multidisciplinary team meetings	100.00%
Encouragement of Trainee to advocate for the patients and offer help/access support services for patients interested in making changes	100.00%
Having Trainees advocate and initiate health promotion activities	90.00%
The challenges that might be encountered in delivering this competency in a rural setting include	
Lack of resources in the rural setting	85.00%
Limitations of time with busy clinical caseload and difficulty accessing care within limited timeframe available for appointments	80.00%

Judgement and Clinical Decision Making

Table G19: Judgement and Clinical Decision Making Round 2 Delphi statements that reached consensus

Positive behaviour markers demonstrating Judgement and Clinical Decision Making in the context of the rural setting	
Having situational awareness and being aware of local resources	100.00%
Being honest and self-aware and acknowledging when your limits have been reached and knowing when to transfer	100.00%
Early consultation and clear processes for transferring patients	100.00%
Outline preoperative, operative, and postoperative care, including timeline and recovery milestones	100.00%
Practice audits to have data on procedures and their outcomes	100.00%
Appropriate timeliness of discussion with consultants	100.00%

Early involvement of sub-speciality and involvement in multidisciplinary team meetings	100.00%
Sensible diagnoses and suggested management plans	100.00%
Good knowledge of patients and results	100.00%
Using available information to effectively prioritise acute and elective patient assessment	100.00%
Appropriate use of tests and investigations and developing strict protocols for following up all tests and investigations	100.00%
Maintenance of continued professional development; being prepared to take advice and read up on something	100.00%
Methods of guiding trainees to acquire these skills in Judgement and Clinical Decision Making in the context of the rural setting include	
Mentorship, discussion and providing opportunity to assess and discuss management plans	100.00%
Supervisor role modelling and setting a personal example	100.00%
Access to subspecialty terms for Trainees interested in rural practice	100.00%
Trainee engaging in educational opportunities for example videos, workshops, journal clubs, attendance at morbidity and mortality meetings, and attendance at relevant courses such as cultural safety, communication skills, medicolegal aspects of decision-making	94.74%
Simulation scenarios	85.00%
The challenges that might be encountered in delivering this competency in a rural setting include	
These situations mostly arise in rural setting with challenges more frequently encountered—for example, smaller hospitals, smaller volumes, fewer specialists with super specialisation. Less easy to transfer elsewhere due to remoteness and in a time appropriate manner. In this context these skills are more reliably learnt and experienced in these rural settings	95.00%
Logistics of transfer in a time appropriate manner—for example, remoteness, costs, logistics with family and patients	90.00%
Trainees need to know who they can transfer to if outside their facility. The Trainee may lack a strong link with the tertiary hospitals or bigger hospitals in the catchment.	85.00%
Risk-averse Trainees may develop a sense that rural centres cannot do certain procedures and rely on transfers to tertiary centres and fail to appreciate how much gets done locally without transfer	85.00%
Resource limitations in a rural setting	80.00%
Back up and support limitations by other departments, peers and health service support—for example, anaesthesia and medical administration	80.00%
Lack of support from tertiary centres	75.00%
Perceived expertise and competency with tertiary surgeons not aware of the local skill available and requesting unnecessary transfer	75.00%
How do you make the decision to perform surgical procedures in the context of the rural setting in the following situations? ***Infrequent or high-risk procedures***	
Consult and discuss with appropriate colleagues for their opinion	100.00%
Discuss with colleagues in tertiary centres	100.00%
Careful preoperative planning and clinical decision-making	100.00%
Consider appropriateness of the procedure in the given setting and resources available including staff, instrumentation, suitable anaesthetists	100.00%
Read documentation regarding the case	100.00%
Discuss with patients the risks and benefits of having procedures in a rural setting	100.00%
Consultation with anaesthetist, nurses, executives, and patient/family	95.00%
Even if infrequent, there must be an appropriate skill mix, and it must be a procedure you have experience and training in and ensure currency of practice	90.00%
Perform with colleague assisting	90.00%
Only with appropriate postoperative care and critical care back up	85.00%

Procedures outside your regular scope of practice but in which you have had training	
I would perform lifesaving/damage control surgery under guidance from subspecialty surgeon in tertiary unit	95.00%
This decision is for the surgeon to make, rather than considering the patient—*This was a consensus with disagree*	90.00%
Procedures that you have had little or no previous experience in	
Only perform if life threatening, under the guidance of a metropolitan specialist or subspecialty surgeon	95.00%
Discussion with local and tertiary colleagues before commencement	95.00%
Only perform if life threatening and too unstable to transfer	90.00%
How do you make the decision to NOT perform a surgical procedure (and therefore transfer a patient for care elsewhere)	
If the patient can be transferred safely and there is no urgency	95.00%
In a non-emergency setting the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) as well as the necessary support structures (ICU, HDU, specialist nursing care); if one or several of these are deficient for a certain condition then I will refer the patent on to receive care elsewhere	95.00%
I consider the combination of procedure and co-morbidity and whether this raises concerns, and whether the outcomes of the patient would be better if treated in a larger hospital	95.00%
This would be dependent on the experience (or no experience), skills, area of expertise and what facilities are available at the hospital	85.00%
This decision is for the surgeon to make, rather than considering the patient—*This was a consensus with disagree*	80.00%
Non-emergency setting the decision not to operate locally is based on the availability of surgical expertise (either by myself or my colleagues) and whether the procedure fits into the Clinical Services Capability Framework of the hospital	80.00%
I would discuss with subspecialty via phone	80.00%
How does your answer to the question above differ depending on emergency or elective context?	
In emergency circumstances, training becomes critical, and delay in management must be matched against health risks of transfer being greater than intervention unless than optimal conditions. In general, if I assess that there could be a risk to life or quality of life, I will take on procedures with as much support as I can gather	95.00%
I would engage and get advice from remote colleagues to guide me—for example, a discussion with a referral centre subspecialist even while performing emergency procedures	95.00%
Transfer to tertiary centres is more common for elective procedures—for example, there have been occasions where I have had to perform a thoracotomy for trauma, but I would never consider performing an elective thoracotomy	90.00%
Depends on the patient's stability and availability of transfer—for example, acuity and likelihood of deterioration if transferred. Mode of transfer available. Distance to transfer	90.00%
This decision if for the surgeon to make, rather than considering the patient—*This was a consensus with disagree*	80.00%
For elective procedures there is no excuse for performing procedures outside one's personal scope of practice and experience whether this occurs in the rural or metropolitan setting	75.00%

Leadership and Management

Table G20: Leadership and Management Round 2 Delphi statements that reached consensus

Positive behaviour markers demonstrating Leadership and Management in the context of the rural setting	
Involvement in hospital and health network management	100.00%
Ability to adjust leadership style to the setting—for example, small hospitals and rural situations	100.00%
Effective communication with administration and team members	95.00%
Methods of guiding trainees to acquire these skills in Leadership and Management in the context of the rural setting include	

Giving the Trainee opportunity to take on leadership responsibilities—for example, lead ward rounds, manage the roster, and mentor juniors, lead in discussion and planning	100.00%
Providing exposure to the Trainee with the granting of increasing responsibility and progressive independence	100.00%
Supervisor leading by example and positive role modelling	100.00%
As a supervisor, sharing information and experiences (within the bounds of confidentiality and the interest of health service)	100.00%
Mentorship and teaching Trainees to look for solutions	100.00%
Encourage and get the Trainee involved in administration roles, projects and specific tasks that need a collaborative approach (such as auditing a certain condition/auditing theatre flow)	95.00%
Review and feedback, making time to evaluate performance and correcting observed inappropriate behaviour	95.00%
Encourage additional study—for example, leadership and management courses, Clinical Risk Management training, and if they have a serious interest in management or governance, an appropriate management course or Australian Institute of Company Directors Course	80.00%
The challenges that might be encountered in delivering this competency in a rural setting include	
Dependence on senior leadership in hospital or health networks—for example, it would be difficult with a non-responsive, overly bureaucratic management structure/team	75.00%

Professionalism and Ethics

Table G21: Professionalism and Ethics Round 2 Delphi statements that reached consensus

Positive behaviour markers demonstrating Professionalism and Ethics in the context of the rural setting	
Honesty and integrity	100.00%
Patient-centred approach and respecting patient autonomy	100.00%
Good time management skills—for example, starting meetings, surgeries on time	100.00%
Equal management of private and public patients	100.00%
Being trustworthy and respectful of confidentiality. Must protect patient rights and information i.e. everyone knows everyone in the rural setting, and confidentiality is even more crucial as you encounter more and more people in your town as patients	100.00%
Accepting and ensuring effective communication with diverse ethnic, cultural, religious and language groups	100.00%
Respect for colleagues and fostering an environment of collegiality	100.00%
Role modelling good, ethical behaviour in the community	100.00%
There are no differences when compared to a metropolitan setting	75.00%
Methods of guiding trainees to acquire these skills in Professionalism and Ethics in the context of the rural setting include	
Supervisor role modelling and setting an example of highly ethical and professional behaviour	100.00%
Providing mentorship to the Trainee	100.00%
Providing regular feedback, Trainee assessment and being proactive i.e. regular feedback if Trainees standards fall short of those expected	100.00%
Encouraging and fostering involvement in the local community and introducing Trainee to community leaders	90.00%
Encouraging the trainee to attend appropriate courses	75.00%
The challenges that might be encountered in delivering this competency in a rural setting include	
Understanding what responsible financial decisions for the hospital are and most importantly the patient—for example, don't order scans that are not needed since Trainees are not always the ones making fiscal decisions	80.00%
Ability to separate clinical from social and family networks, the Trainee needs to manage this carefully as they may cross boundaries or create conflicts of interest	75.00%

General Questions

Table G22: Round 2 Delphi General Question statements that reached consensus

The following statements have been provided regarding if there are any additional professional skills or competencies that could be needed in a rural surgical setting	
Rural Trainees need a more general skillset, with skills outside their regular specialty to compensate for less specialised practices	100.00%
Rural Trainees need to learn to establish good, supportive, professional networks and referral pathways with larger hospitals, urban hospitals, and subspecialists	100.00%
Rural Trainees need flexibility and adaptability, adjusting their practice to the local level of care available	100.00%
Rural Trainees need social skills and situational awareness	100.00%
Rural Trainees need the ability to cope with isolation and being alone	85.00%
The following statements have been provided regarding what could be added as part of a rural-facing curriculum to completement the existing Surgical Education and Training (SET) curricula, covering the nine surgical specialties, to better prepare SET Trainees for independent rural practice	
Trainees need exposure to rural areas	100.00%
Trainees need to understand the difficulties faced by rural practitioners and shake the belief that excellence is only available in cities	100.00%
Posting to other specialties (cross-specialty training) would be key for rural inclined Trainee surgeons—for example, a rotation in Vascular Surgery, Neurosurgery, Plastic Surgery, ENT, Cardiothoracic and Urology	100.00%
Referral hospital surgeons should be challenged to foster close relationships with regional surgeons/trainees and teach the Trainees how to ask for help	100.00%
Trainees need a structured training opportunity for technical and non-technical skills to expand a generalise (generalist) skillset	95.00%
Trainees need training in communication technology and networking with colleagues	85.00%
Surgeons in rural areas need the same non-technical skills as their city counterparts and everything that is in the General Surgery curriculum is applicable to rural training	75.00%
The following statements have been provided regarding how a rural-facing curriculum could help develop confidence and competence in SET Trainees providing surgical care to rural patients	
Trainees should have better exposure to rural practice, both education and rural practice and experience	100.00%
Trainees should be made aware of the immense difference they are making by working in the rural setting	95.00%
It could help Trainees appropriately apply information and communication technology to delivering healthcare safety and with appropriate privacy and improve telemedicine support from subspecialists	90.00%
Trainees should receive more technical training and help during their training for a broader capability without sacrificing depths, better preparing skillset and behaviour patterns for smaller departments, and would provide a local context, with surgeons being specifically trained to meet the needs and demands of rural population	95.00%
The following statements have been provided regarding reflecting on your own training, what helped you develop confidence in a rural surgical practice	
Exposure to multiple surgical specialties during training for a broad and intensive surgical training experience. Training in General Surgery, Orthopaedic Surgery, burns/Plastics, Urology, Neurosurgery and Cardiothoracic Surgery	90.00%
Having supportive working environments and having strong relationships/networks with surgeons within the same speciality, and with other specialties	90.00%
Formal linkage and working visits to major centres and regional hospitals. This allows for procedure specific training, being able to discuss cases, joining a multidisciplinary team, taking more complex cases, and provide locum relief	85.00%
Training outside of a capital city and gaining rural exposure	85.00%
Role modelling after rural surgeons and having good mentors to guide how to best manage rural practice	85.00%
Very busy and rigorous training jobs prior to moving to a regional area	75.00%

Finding a mentor organically is more beneficial than having an assigned a mentor	75.00%

From the results of Round 2 of the Delphi Survey, the curriculum framework is in early development. The results from the Judgement and Clinical Decision-making will be used in the co-design workshops as there needs to be further expert opinion to form learning outcomes, teaching strategies, and assessment strategies.

Co-design Workshop

Purpose of the Co-design Workshops

As reported, RACS are currently developing a rural-facing curriculum framework to be implemented across the nine surgical specialties with a focus on the professional skills and competencies. The area of focus for this co-design workshop will be the Judgement and Clinical Decision-making competency. From the Delphi results we have determined positive behaviour markers; however, these needs to be further refined and a greater level of detail is required to developing specific learning outcomes.

Scope of the Workshop

To define rural specific outcomes and assessments strategies for the Judgement and Clinical Decision-making competency for the RACS rural-facing surgical curriculum framework.

Objectives of the Co-design workshops

1. Define the factors that arise from rural-specific challenges/situations regarding the Judgement and Clinical Decision-making competency
2. Devise rural-specific learning outcomes for Judgement and Clinical Decision-making
3. Generate ideas regarding teaching strategies for these learning outcomes
4. Generate ideas regarding the observation and assessment for these learning outcomes
5. Provide feedback on the draft curriculum framework as developed from ideas from workshop one
6. Generate potential challenges with the implementation of the framework in a rural setting

Co-design Workshop 1

The aim of this workshop is to collectively address objectives 1-3. Firstly, we aim to explore the factors that are disproportionately more impactful on patient outcomes in rural settings, compared to the urban setting. Secondly, learning goals around these will be devised in order to develop surgical Trainees that are competent and confident to work in the rural setting.

Some example questions that would be beneficial to think about before the workshop are listed below:

- What resources and resource limitations do rural surgical Trainees need to be aware of?
- Consider how situational awareness is addressed during training in rural settings?
- What avenues are there for transferring a patient in the rural setting?
- What is involved in the process of transferring a patient?
- What do you think about logistically before transferring a patient? E.g. weather, distance to tertiary hospital
- What does it specifically mean to acknowledge when your surgical limits have been met?
    - What are the steps that follow in making this decision?
    - What do surgical Trainees need to do to ensure patient safety and best possible care if they feel the surgery is beyond their scope?
- Does preoperative, operative, and postoperative care differ in a rural setting?
- Does discussion with consultants differ in a rural setting?
- How can Trainees evaluate and learn about the effective functioning and participation of multidisciplinary groups?
- How can surgical Trainees learn about medicolegal aspects of rural practice?
- Do initial consults differ if a patient has travelled a far distance for their appointment?
- What is the process for the following procedures when transfer is not an option?
    - High-risk procedures
    - Infrequent procedures
    - Procedures that are out of your usual scope of practice

Between the workshops

After workshop one, the research team will work on collating the information generated into a draft curriculum framework. The draft framework will then be emailed to all the members of the expert panel two weeks before the second workshop, this will enable time to review the document before the workshop so productive discussion can ensue.

Co-design Workshop 2

The aim of the second workshop is to go through objective 4-6. There will also be time to add any additional thoughts or ideas that were missed during the first workshop.

Additional Involvement

Workshop 2 will mark the end of your volunteered commitment for the rural-facing surgical curriculum, however if it is of interest the proposed framework post the second workshop can be emailed to yourself if you would like to provide any further feedback.

Conclusion

If you have any questions or concerns regarding any elements of this dossier or regarding the upcoming Co-design workshops, please don't hesitate to contact Dr Daniella Dougherty on Daniella.dougherty@surgeons.org or 0405 483 861.

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Appendix H. Co-design transcriptions

Challenges—these are the conversations that have been discussed and presented during the co-design workshop 2, most of these are out of scope of the current project and may not be included in the final report

- Engaging with jurisdictions early, as they control employment and ability to do a lot of these things, particularly if it required resourcing, is heavily involved in the jurisdictions
- Making sure everything works as seamlessly as it can
- State legislates where the jobs are, but the registrars determine what type of surgeon they want to be
- How do you retain surgeons in rural area where the money and the prestige is to work in a urban environment?
- If a hospital has the capacity for 4 FTE and 4 active surgeons no matter how good they are or if they enjoyed it, they won't be able to get a job
- Does this lead into some of the discussions around how we train people and so on, shouldn't need to be stealing people from elsewhere in the world, should probably train them here but structurally don't have the people to do it
- If completed a rural fellowship and then they decide they don't want to work rurally will be deemed unsuitable as they have had very specific training. If they are allowed to do tonsils, fractured NOF and bowel cancers in femurs can they do that in an urban setting—it opens a big can of worms—this is applicable to many rural areas
- This is a conversation that the college has not been receptive to at this point in time
- If different sites and different curriculums—what is expected of the rural Trainees if so many rural surgeons in that location
- The more you broaden your curriculum—Different Trainees may have different expectations you make it more difficult for the individuals on the ground to teach them
- It takes about 5 junior doctors to make the paperwork worth the while and then they start to break even for how much work they save you

- Hidden curriculum—need to get better at how we professionally deal with each other and need to stop the hidden curriculum of it you are any good you will be in the city and that is what some rurally orientated surgeons hear when they do to the city, and are told if they want to go back to the country they are wasting their time, if they are any good they would be subspecialising in the city and rural colleagues are treated badly
    - Have to in some way unpick that hidden curriculum that does on and its two fold, if you are any good you go to the city and you treat your rural colleagues badly
- Has to move beyond the you have a good relationship with x, y, z in a major tertiary hospital, it has to move beyond that individual's personal relationship where there is a more respectful way of dealing with each other colleagues—systemic, respectful ways of working with each other is what the aim is.
- In rural QLD there are four rural settings which will begin from 2023 where each setting will get two Trainees in each buddy centres they will exchange those Trainees in year 1 and 2 so their basic skills are really good before they leave these two centres they go and spend 2 more years in a bigger tertiary unit to pass their exams they will be offered a year of transition as the fifth year as a senior Trainee for which they will be given responsibility as a young surgeon, a consultant on their own with supervision by the Seniors so rather than being in their last year in a big city where they get very highly influenced by the subspeciality work that is going around. They get taught general orthopaedics in their 5th year.
- Need to throw different things at them
    - Most people feel comfortable working where they train
- If you don't expose people to training in your location, they have very little appetite to work there
    - Exposure is key
- Engaging in subspecialty societies is also very important (breast, colorectal) as the challenges in major metropolitan practice are very different to the challenges in rural practice
    - In metropolitan private practice if you can't take people out from competing with you by restricting the operations, they can do it is very good from an urban surgeons point of view, it is a disaster from a rural surgeons point of view because it precludes people from

getting exposure for their training and the other things they need from practicing in a broad skillset

- Engaging with the subspecialty societies is important, while they may profess to have desire to support rural practice some of the things that are being proposed will stop rural surgeons being able to complete some types of surgeries which is not a great outcome
- Unintended as it may be, it is the outcome that is going to occur because all the people that sot on the boards are metropolitan
- Need to somehow engage those people as well

Appendix I. Co-design workshop 1, activity 1: findings

The content in this Appendix has been documented verbatim from the co-design workshop participants.

Table I1: Co-design workshop one: Activity one findings

Theme	Comments and Statements from Participant
Urgency/stability of the patient	
Need to consider the urgency of the operation/instability of patient; damage control surgery versus transfer	
Next step depends on a) whether a patient remains stable b) time/ability for adult retrieval to come to transfer patient	
Patient factors—the extent of the injury, the stability, the improvement, the co-morbidities, other interventions done to date	
Communication with family and patient	
Communication with family; can family members go as an escort etc.	
Keep patient and family in the loop	
Family expectations	
Family enquiring about need for transfer and managing their expectations around this	
Ability to keep family informed about all factors involved in managing this patient and managing families' expectations	
Keeping the family in the loop, really must make sure they understand and if they have sought advice from another surgeon, you know what that advice is	
Staffing Resources	
Staffing resources available to do damage control/liver packing/lack of interventional radiology, anaesthetic capabilities (question if GP anaesthetists only—may need themselves be discussing/liaising with bigger centre anaesthetists for support throughout)	
Consider theatre nursing capabilities and equipment (warming room/fluids/ensuring adequate packs etc.)	
Availability of local surgical assistance	
What other resources can assist you with resuscitation liaising with family and tertiary referral centres to free your time	
Resource factors—other skilled people, anaesthetists, intensivists, is there a theatre and appropriate for the procedure, blood products	
Confidence in perioperative team and perioperative management	
Post anaesthesia care	
What resources are available to you currently e.g. anaesthetics, theatre, blood availability	
Anaesthesia availability	
Other surgical resources in town	
Damage Control Surgery	
Damage control surgery versus transfer	

Damage control surgery
Can the surgeon embolism/radiologically intervene or not—either yourself or someone locally
Embolization for liver bleeding (tertiary centre) versus damage control trauma laparotomy first
Challenge of possibly needing damage control in one hospital then post-op transfer
Do you have the skill set for damage control laparotomy—you would likely do so in a rural environment
Anaesthetic Resources
Question if GP anaesthetists only—may need to themselves be discussing/liaising with bigger centre anaesthetists for support throughout
Resource factors—anaesthetist
Confidence in perioperative team and perioperative management
What resources are available to you currently e.g. anaesthetics
Communication with Colleagues
Communication—within hospital and tertiary centre for advice
Look to call trauma centre for support
Seek/liaise external specialist advice
Can you phone a tertiary centre for advice—how well are you networked
Availability of advice/consultation with trauma unit
Network of support from mentor or colleagues
Support network—availability of beds in tertiary/transfer hospital
Transfer Factors
Be considering transfer options, mode, destination, communication, documentation, timing, level of support (e.g. intubated/care flight versus stable going by air with nurse escort versus patient transfer bus)
Next step depends on a) whether patient remain stable b) time/availability for adult retrieval to come to transfer patient
Transportation available and transfer time
External factors—flying conditions, care/driving, time to take, state/jurisdictional policies to retrieval
Where is Royal Flying Doctors Service base
How long is air transfer
Weather conditions
Covid has recently been a factor, if they are transferred to a major tertiary hospital and then there are negative outcomes, the family may not be able to come down. This has created several issues in rural and regional practice. A bad example has been when a patient has been transferred from rurally to Melbourne and then died

During covid, tertiary hospitals are also running at a greater capacity, and this has led to significant decision-making issues due to ICU availability
Non-staff resources
Availability of other resources such as fluids/blood products etc.
Does trauma service travel out to patient and bring resources
Resource factors—is there a theatre and appropriate for the procedure, blood products
What is limited critical care, if we can operate, we can ventilate
Blood bank availability
Local ICU availability
Availability of blood products
Theatre availability
What resources are available to you currently e.g. theatre, blood availability
Theatre equipment
What other blood resources do you have for a massive transfusion protocol
Knowledge of what resources are, regardless of what they are, knowing what you have and knowing what the availability is
Interpersonal relationship between the patient and surgeon, and patient and other staff
Complexities of smaller towns and interpersonal relationships…sometimes to advantage, sometimes not, highly emotive situation
Personal relationship with patient
Any community link to other people involved in the accident
Impact upon other staff, their relationship and patient
Needs to be tested for drugs and alcohol—any awkwardness depending on outcome
How long have you been working/living in that community
Impact upon other staff, their relationship with patient
The smaller the town, you can't dodge the personal relationship with the patient
How big is the impact on your staff afterwards, you will spend far more time dealing with the emotional impact on your staff from the relationship than the surgical management of the patient
When did this occur during the week? If the on-call team for the weekend goes in emotionally damaged, how do you maintain surgical capability and be able to run the hospital for the rest of the weekend. This needs to be kept in mind.
Potential self-harm due to the mechanism of the injury
Potential self-harm
Single vehicle unrestrained, is this self-harm
Confidence of the surgeon

Lack of confidence managing the patient
Surgeon's experience
Potential over confidence in managing patient
The surgeon knowing their own limitations, however there was disagreement in the co-design. Regardless of what skills the surgeons, if the patient become unstable, they need to do a laparotomy and use of advice is based on the surgeons resources and how long you must hold onto the patient
Clinical and technical factors
Patient factors—the extent of the injury, the stability, the improvement, the co-morbidities, other interventions done to date
Other injuries
Low haemoglobin needs treating
Bleeding also means coagulation/clotting issues
Potential for other unrecognised injuries
Will need interventional radiology rather than surgery if remains stable
Recognising that if they do stabilise, and they are safe to be transferred, the weather may not be appropriate, so ongoing monitoring and then surgery may need to be done locally
Other patient within the hospital
Are there other trauma cases around that need managing, or are you expecting any other due to the weather
Question of whether potential other injured patients arriving
Death of the patient
The answer often depends on if the patient is stable and can be transferred or the patient is stable and cannot be transferred. During the transfer and the patient dies, you will have to deal with the consequences of the patient dying. If you operate and they die, it will have major consequences to the team and the community. Consequences will always depend on the outcome. You will either be heroes or zeroes retrospectively
Often if you can get people out so they don't die in the local hospital it is better for the family as no one wants to come into the hospital where a relative has died which then further implicates their health care

Abbreviations
GP = General Practitioner, ICU = intensive care unit

Appendix J. Draft Judgement and Clinical Decision Making Curriculum framework following co-design workshop 1

Table J1: Judgement and Clinical Decision Making rural-facing surgical curriculum draft: Has situational awareness and is aware of local resources

Behavioural Marker	Learning Outcomes
Has situational awareness and is aware of local resources Demonstrates and understanding of what is occurring around themselves in the healthcare and rural context, and understands the availability (or lack thereof) of resources in the rural surgical setting—for instance, staff resources and surgical resources	Understands own surgical ability including scope of practice and the impact of extenuating circumstances on management planning
	Understands that sometimes they will need to practice under the guidance and advice from colleagues
	Understands the potential limitations of surgical practice in rural and regional settings and that these are contextual to each location
	Understands the importance and conducts consultations with receiving centres following a patient transfer
	Establishes tied and relationships with smaller referring centres and colleagues
	Understands own and hospital resources and resource limitations*
	Understands and can organise patient transportation options+
	Understands the external factors that may affect transportation plans
	Understands that hospital resource limitations may lead to changes in surgical management plans
	Understands that the surgeon may be the key coordinator to organise and coordinate the patients' healthcare needs
Learning opportunities/strategies	
	Mentorship
	Organise outreach clinical from tertiary centres to local hospital
	Feedback
	Monthly discussion of complex cases with other surgeons—both senior and junior

	Open discussions when things don't go so well; reflection, analysis
	Case base, scenario, role playing
	Sharing clinical cases and outcomes
	Get Trainee to actually talk through what they feel is needed for case, ongoing case and then work out if it is available
	Apprenticeship

*anaesthetics/physician/theatre colleagues, theatre nursing capability, resuscitation resource, critical care facilities/ICU facilities, interventional radiology, equipment (warming room/fluids/packs), anaesthetic capability, surgical assistance, theatre availability etc.
†knows the different transport options, knows the factors that need to be considered before transportation e.g. weather, distance, RFDS base location etc.

Table J2: Judgement and Clinical Decision Making rural-facing surgical curriculum draft: considers and engages in self reflection

Behavioural Marker	Learning Outcomes
Considers and engages in self reflection Trainee demonstrates honesty and self-awareness and can acknowledge when their professional or personal limits have been reached, this incorporates knowing when to transfer or refer to a colleague	Reflects and learns from adverse events and complications that occur during, or as a result from surgery
	Engages with colleagues regarding clinical scenarios and suggested management plans
	Engages colleagues for feedback and accepts constructive criticism
	Able to reflect and create learning plans for acquiring required skill sets for the specific rural/regional setting
Learning opportunities/strategies	
	Case diary with reflection and discussion with colleagues
	Before going home, go over what went well for the day and leave it at the door

Table J3: Judgement and Clinical Decision Making rural-facing surgical curriculum draft: conducts clear and detailed surgical planning

Behavioural Marker	Learning Outcomes
Conducts clear and detailed surgical planning The Trainee conducts in early consultation and has clear processes for transferring patients when required. Trainee outlines preoperative, operative, and postoperative care, including timeline and recovery milestones	Discusses treatment plans, and any changes as they occur with the whole treating team
	Engages and communicates in a timely manner with General Practitioners and allied health staff
	Discusses resource requirements for individual patients in a manner that enables equipment/preparation for surgery

	Able to adopt and change their surgical plan if new information becomes available
	Aware and able to foresee any difficulties that may arise during the operation and has made contingency plans to deal with these
	Discusses rationale for and evidence for surgical decisions that are made
Learning opportunities/strategies	
	Explicating laying out of expectations and formal review of planning preoperatively
	Modelling through outpatient clinics etc—not all states have surgical outpatients

Table J4: Judgement and Clinical Decision Making rural-facing surgical curriculum draft: participates in multidisciplinary team environments

Behavioural Marker	Learning Outcomes
Participates in multidisciplinary team environments Trainees work closely with colleagues and multidisciplinary team which includes the appropriate timeliness of discussion with consultants and the early involvement of sub-specialists and involvement in multidisciplinary team meetings	Engages and liaises with a variety of medical personnel
	Engages team in discussions and decisions
	Ensures everyone is comfortable in decision-making process and outcome, if not, encourages contacting relevant expertise/support from elsewhere
	Actively engages with nursing staff, administration, and allied health staff
	Ensures patient transfers are necessary and investigates whether other practitioners in the region can complete the required procedure
Learning opportunities/strategies	
	Ensuring Trainees run MDT meetings
	As a consultant tagging along as a Trainee runs a ward round etc.
	Administrative education within training
	Giving Trainees the opportunity to run a theatre/trauma and coordinate themselves
	Didactic

Abbreviations
MDT = multidisciplinary team

Table J5: Judgement and Clinical Decision Making rural-facing surgical curriculum draft: conducts practice audits

Behavioural Marker	Learning Outcomes
Conducts practice audits Trainees conducts practice audits to have data on procedures and their outcome	Actively promotes and participates in whole of hospital audit rather than just surgical outcomes
	Utilises results of clinical audit and modifies practice (if required) accordingly
	Contributes to audits within larger regional or specialty groups
	Engages with other surgical members of surgical and multidisciplinary team to achieve quality improvements
	Discusses the surgical outcomes of surgical unit and comprehend how this compares to other centres
	Plans and continuously works towards closing the audit loop
	Actively participates in audit practices of other units within hospital as well their own unit
Learning opportunities/strategies	
	Attendance at PSA to see importance.
	Become collaborative with other rural surgeons
	Develop networks to facilitate looking at how one practices
	Didactic

Abbreviations
PSA = Provincial Surgeons of Australia

Table J6: Judgement and Clinical Decision Making rural-facing surgical curriculum draft: participates in continued professional development

Behavioural Marker	Learning Outcomes
Participates in continued professional development Trainee maintains their participation in formal continued professional development and is prepared to take advice and read evidence and information on required topics	Engages in practices to improve hospital performance (e.g. root cause analysis of management errors)
	Active engagement in new and improved skill acquisition
	Utilises training and learning opportunities
Learning opportunities/strategies	
	Regular journal clubs—often smaller group in rural/regional areas; involve students and JMOs
	Hosting social events that have an educational component

Appendix K. Co-design workshop 2, activity 1: findings

The content in this Appendix has been documented verbatim from the co-design workshop participants.

Table K1: Activity one findings: Has situational awareness and is aware of local resources

Behavioural Marker			
Has situational awareness and is aware of local resources Demonstrates an understanding of what is occurring around themselves in the healthcare and rural context, and understands the availability (or lack thereof) of resources in the rural surgical setting—for instance, staff resources and surgical resources			
Draft Learning Outcomes	Any Suggested Changes	Relevant for rural context because	Potential assessment tools
• Understands own surgical ability including scope of practice and the impact of extenuating circumstances on management planning	• Ok • No	• Vitally important • Rurally surgeons need to be more generalist and therefore should be aware of their own abilities and limitations • Essential given resource limitations in rural environment* • May be required to undertake procedures/management patients that	• Role playing type assessment (acting out or written exercise by Trainee, as hard to observe in everyday/regular routine caseloads and consultant to observe) • Case studies • Professional/Trainee assessment tool • Self-reflection
• Understands that sometimes they will need to practice under the guidance and advice from colleagues	• Paragraph within your own personal level of scope (still need to be limitations) • Be mentored by a senior surgeon	• As a Trainee or junior consultant in a rural setting the varied presentation (uncommon	• Role playing type assessment • Self-reflection

	• Maybe change under to with—links to relationship below • Include that this may be remote guidance • No	pathology, late presentation) will require to seek advice and guidance • You can't be an expert in everything* • Important to obtain advice regarding patient management for subspecialist colleagues when required • Need to be flexible and adapt as often the only surgeon, so operating outsides of specialties is not uncommon (minor ortho, neurosurgery etc) • In cases where transfer is not possible 'virtual' presence of a colleague can be very helpful in surgical decision-making and even operating	
• Understands the potential limitations of surgical practice in rural and regional settings and that these are contextual to each location	• …and the specific clinical situation	• Critical for safe surgical practice—should not undertake that which cannot be safely managed • See above comments* • Very important • Smaller centres often have limited post op resources and you need to realise that what	• 360 • Trainee self-reflection

		you can do and what the hospital can do may be different	
• Understands the importance and conducts consultations with receiving centres following a patient transfer	• Maybe change following to something that encompasses before and after the transfer	• An extremely important and integral part of maintaining connection with receiving centres and an irreplaceable learning tool • Ensures you know the patient's journey and can look after them when they return. Also allows you to see if you needed to transfer. Can lead to department growth by tracking regular transfers and building this skill into a team	• Handover assessments • DOPS maybe • Role playing assessment • 360
• Establishes ties and relationships with tertiary centres and colleagues	• Makes mention of audit and MDT ongoing learning • Maybe more formal to say networks rather than ties • …in metropolitan and non-metropolitan centres • Usually the problem is on the other side	• By understanding your limitations, you must have professional ties with MDT and audits • Ability to network, maintain and foster close professional relationships with tertiary centres for development of trust and efficient transfer of patients • Learning opportunities • You need friends • Can be difficult if the rural surgeon has never worked with the tertiary surgeon. Regular	• Role playing assessment • 360

		'upskilling' would provide direct face-to-face interaction with the tertiary centres specialists and improve later communication	

Abbreviations
DOPS = direct observation of surgical skills

Table K2: Activity one findings: Considers and engages in self-reflection

Behavioural Marker			
Considers and engages in self-reflection Trainee demonstrates honesty and self-awareness and can acknowledge when their professional or personal limits have been reached, this incorporates knowing when to transfer or refer to a colleague			
Draft Learning Outcomes	Any Suggested Changes	Relevant for rural context because	Potential assessment tools
• Reflects and learns from adverse events and complications that occur during, or as a result from surgery	• Ok	• More important especially if you're a single surgeon, now that you are on par with colleagues (checks and balances) • Experience from near miss or adverse events are the key to understanding and improving • Essential wherever you work • It is important that you are seen as on par or better than peers. It enables confidence in your own practice	• Trainee reports consultants likely to be able to observe • Self-reflection • Audit meetings

		• Being in a rural place can be very isolating. Discussing cases and or complications will be helpful to learn from but also to cope with the pressure	
• Engages with colleagues regarding clinical scenarios and suggested management plans	• Ok • Daily handover meetings attendance • Engages with sub-specialists and other rural surgeons regarding difficult clinical scenarios and patient management	• Making sure you are providing best practice and supported • The variation in the presentation of patients in a rural setting should encourage one to get involved in clinical situations • Again should happen where ever you work but a failure in this space has a greater impact in a rural environment* • Very important in rural surgery given a wide variety of patients you look after • Teamwork and morale are everything in a country environment. Like it or not the surgeon is usually the leader	• 360 • Audit
• Engages colleagues for feedback and accepts constructive criticism	• Colleagues provide regular constructive feedback	• See above* • You have to get along in a smaller environment	• 360 • Audit

		• There is always a need to stay grounded and be aware that you will have problems. This is true for all surgeons, not just rural	
• Able to reflect and create learning plans for acquiring required skill sets for the specific rural/regional setting	• Join senior surgeons for assisting in difficult and complex cases	• Essential in a rural setting as you have to develop new skills to service the community needs and maintain currency. This needs to be much more formally planned as it is more difficult in a rural environment to pick up skills from a colleague who just works next door • This is the most important of all learning outcomes within this section for preparing for rural practice • Not all rural environments are the same and some need different skills sets. The ability to develop new skills to build a service is essential. It also allows surgical teams to build capability by gentle expansion of the work. If there is enough work for 3 surgeons but on call is busy then increasing the skill set will generate more work and allow further	• 360

		surgeons to have an elective load and hence cover the emergencies	

Table K3 Activity one findings: Conducts clear and detailed surgical planning

Behavioural Marker			
Conducts clear and detailed surgical planning The Trainee conducts in early consultation and has clear processes for transferring patients when required Trainee outlines preoperative, operative, and postoperative care, including timeline and recovery milestones			
Draft Learning Outcomes	Any Suggested Changes	Relevant for rural context because	Potential assessment tools
• Discusses treatment plans, and any changes as they occur with the whole treating team	• No	• Fosters exchange of knowledge and experience as well as develop trust and camaraderie • You can sort of get away with poor communication in a metropolitan setting as there are many more layers in the hierarchy who sort of cover off on omissions*	
• Engages and communicates in a timely manner with General Practitioners and allied health staff	• Includes nurse practitioners and nurse surgical assistants • Could change to say 'engages and communicates in a timely manner with other medical officers, nursing staff and allied	• Needs to understand the importance of nursing "bush nurses" who are often the primary caregivers for patients	

	health staff both within the hospital and community'	• Key factor in serving your community is maintaining open channels of communication with the local GP • See above*	
• Discusses resource requirements for individual patients in a manner that enables equipment/preparation for surgery	• Forward planning of operative elective lists	• Forward planning for patients especially for indigenous Aboriginal and farmers and lower socioeconomic status • If you don't have it in a rural environment, then you have a problem as there isn't necessarily another hospital that you can just borrow from it • Theatre equipment may not necessarily be in stock or available for a certain operative case	
• Able to adopt and change their surgical plan if new information becomes available		• Important in an emergency situation with an ever changing clinical scenario • Applied everywhere • Need to be flexible in the rural setting given the super added variables that are encountered	

• Aware and able to foresee any difficulties that may arise during the operation and has made contingency plans to deal with these		• Demonstrates maturity, foresight and experience • Less fat in the system rurally • There is no one to bail you out so if you start you have to be able to finish	
• Discusses rationale for and evidence for surgical decisions that are made	• Critical appraisal of current practice	• Your treatment options may be limited due to place for infrastructure available • Consent process—do you offer alternative hospital or close to home • Part of good communication and relationship building	

Abbreviations
GP = General Practitioner

Table K4: Activity one findings: Participates in multidisciplinary team environments

Behavioural Marker			
Participates in multidisciplinary team environments Trainee works closely with colleagues and multidisciplinary team which includes the appropriate timeliness of discussion with consultants and the early involvement of sub-specialists and involvement in multidisciplinary team meetings			
Draft Learning Outcomes	Any Suggested Changes	Relevant for rural context because	Potential assessment tools
• Engages and liaises with a variety of medical personnel	• Multidisciplinary team	• Important that it include tertiary centres	• 360

	• Limited 'variety' of medical personnel in the rural setting	• Recurring theme less fat on the system in rural so important to communicate well to avoid things falling through cracks* • Rural hospitals run with visiting medical practitioners, hospitalists, GP's and a huge range of different doctors. The team based tertiary hospital doesn't exist. The referral pathways may be over the phone or direct. Communication with all is essential	• A lot of this communication stuff is well assessed by 360 degree evaluation, but they can be onerous to deliver—GSA I know are reluctant to go down this path because of the number of Trainees—over 400 general surgical Trainees means a lot of administrative work*
• Engages team in discussion and decisions	• Respect for other staff members experience • Leadership qualities	• Unit meetings are important, but some units may not have a unit (anaes, nurse) there is benefit to have cross-specialty meetings as its important to foster collegiate links • Teamwork is the key for rural hospitals • See above* • Metro centres will often have rehab centres, physio's silver chain. Rural environments often just have the hospital. The team (peripheral and central) will often have an idea of how to plan the discharge and admission. In an operative setting the team	• 360 • Because of that it tend to fall to Trainee assessment forms*

		approach enables everyone to be part of the decision and plan which may need to alter depending upon their level of confidence (i.e. a GP anaesthetist may have a weight range for children) • The rural team should be a tight-knit team to have the best patient outcome and to improve the surgeons stress	
• Ensures everyone is comfortable in decision-making process and outcome, if not, encourages contacting relevant expertise/support from elsewhere	• ?Comment on team building • No changes	• Exploring that everyone is comfortable early will ensure the team feels they have been listened to. Can actually raise something the surgeon may not have thought of. Is just standard teamwork, not rural	• Self-directed assessment • 360 • Morning handover with the whole team
• Actively engages with nursing staff, administration, and allied health	• Advocacy for ensuring hospital supports the specialist • Grand round • ? comment on team building or ass as another draft learning outcome	• Small community with skills requires engagement of all regular multidisciplinary meetings • They will be your colleagues forever, they will be married to, children of, parent of your patients. They are your community within your community. When times are tough they will have your back.	• 360 • 360

• Ensures patient transfers are necessary and investigates whether other practitioners in the region can complete the required procedure	• Isn't this about team building. I can't think of the words but wonder whether this can be redrafted into a more succinct and better definable outcome that is then measurable • There should be a known net	• If you can't do it locally, finding someone who can • Patient transfer cost a lot of money and remove patients from their social supports • Transfers are a valuable resource and if abused its like crying wolf. Patients lose confidence in a facility if they feel they need to be transferred for what they feel should be able to be done locally	

Abbreviations
GP = General Practitioner, GSA = General Surgery Australia

Table K5: Activity one findings: Conducts practice audits

Behavioural Marker			
Conducts practice audits Trainee conducts practice audits to have data on procedures and their outcomes			
Draft Learning Outcomes	Any Suggested Changes	Relevant for rural context because	Potential assessment tools
• Actively promotes and participates in whole of hospital audit rather than just surgical outcomes	• Agreed	• Hospital MM are there, but more proper audit this would involve audit with a tertiary centre within your own surgical specialty	• 360 • EPA • Trainee assessment form

		• Rural hospitals require more active medical staff input to deliver optimal, timely and current treatment • There are less people in rural and it is essential that the surgeons lead the team in the audit cycle • By default in rural environments surgeons will necessarily be more involved in administrative matters • The smaller the hospital, the greater the likelihood that you will have less peers. So the entire hospital performance is what you will be judged on* • Small team. No 'variety' of doctors which allows for crossover between different specialties (medicine/gyne/ortho) to look at each other audit	
• Utilises results of clinical audit and modifies practice (if required) accordingly	• Ok—logistics should consider the balance being involved in a tertiary centre or similar context of health service (size, geographic classification)	• Insight is key, audit ensure you keep your eye on the ball and that you don't just think you are at the level expected. There will	• 360

	• Compared outcomes with other rural/regional hospitals • Same as previous slide with learning from complications	always be someone who will question your work if you are not at a major centre	
• Contributes to audits within larger regional or speciality groups	• Agreed—as above • Audits of case series or long-term outcomes • Yes, see previous slide	• Good for networking and establishing helpful relationships • Country patients are generally under-represented in audits. Builds them into practice and gives them a voice* • Ensure your metro colleagues are aware they can trust you, particularly as there is a changing of the guard. When you first go out, it is generally your teacher that mentors you but eventually they retire and new surgeons like to think they are better than everyone else*	• 360 • EPA
• Engages with other surgical member of surgical and multidisciplinary team to achieve quality improvements	• Agreed • Agreed	• Cross-pollination is extremely helpful in quality improvements. Limited resources should encourage it. • Equity, rural patients need the same care as everyone else*	• 360

		• Too small numbers to discuss patients in local MDT setting to via tertiary hospital is ideal. It also helps communication with the tertiary surgeons	
• Discuss the surgical outcomes of surgical unit and comprehend how this compared to other centres	• Agreed—as above • Participates in state-wide projects—e.g. the Getting it Right the First Time program	• The context is important—some headings can be combined • Suggestion: aims to improve practice by comparison with like-sized services • Need to know where you fit in performance wise • As above*	
• Plans and continuously works towards closing the audit loop		• Improving medical care by improvement through audits increase trust among the community • As above*	
• Actively participates in audit practices of other unit within hospital as well as their own unit	• Agreed as above • Only in context of shared patient of pathology	• As above*	• EPA

Abbreviations
EPA = entrustable professional activity, MDT = multidisciplinary team

Table K6: Activity one findings: Participates in continued professional development

Behavioural Marker			
Participates in continued professional development Trainee maintains their participation in formal continued professional development and is prepared to take advice and read evidence and information on required topics			
Draft Learning Outcomes	Any Suggested Changes	Relevant for rural context because	Potential assessment tools
• Engages in practices to improve hospital performance (for example root cause analysis of management errors)		• Involvements in rural settings is essential to maintaining good contact and relationship with management to deliver safe services • Surgeons in rural areas have greater responsibility in terms of whole of hospital performance • Smaller teams mean there is no admin support or surgeon for every role. So, everyone has to carry the load. The more Trainees are exposed to this type of manager level requirement the more they realise they need to be the custodian for this type of task	
• Active engagement in new and improved skill acquisition	• Attend courses and conferences	• Fill gaps in service by acquiring new skills	• Professional assessment

		• Easy to fall behind and stray from the path of practice in isolation • Old fashioned care is often what leads to people looking down their noses at rural surgeons	
• Utilises training and learning opportunities	• Maybe add creates and uses	• In rural environment sometimes you have to actively create the opportunity as otherwise they just don't occur • Failure to do so leads to disheartenment of the trainer and less future opportunities	• Goal setting • Trainee assessment

Table K7: Activity one findings: Patient-centred care and shared decision-making

Behavioural Marker			
Patient-centred care and shared decision-making Trainee has a good understanding of their patients, and their patients results Trainee takes patient needs, preferences, family/social background, situation into account Trainee is open and actively involved in shared decision-making with patient			
Draft Learning Outcomes	Any Suggested Changes	Relevant for rural context because	Potential assessment tools
• Evaluates and acknowledges historical context of the relationship with some patients	• I don't understand what this one is—does it mean some patients have a difficult relationship with the hospital but they have	• Acknowledge of close-knit nature • It might • Bias may arise due to personal	

with the hospital and modifies management accordingly	no where else to go for care so allowances and strategies need to be made • Wording needs to change • Relationship the patient has with the hospital	• Patients only choice, previous poor outcome can affect their desire to be treated or omitted	
• Evaluates and selects appropriate treatment pathways whilst respecting patient wishes and autonomy	• Not much differential between urban and rural • ? add facilities as a higher-level function	• Recommended current practice • Distances involved in receiving gold standard treatment often lead to patient choosing alternate pathways. For instance, a mastectomy rather than a small excision and radiotherapy if radiotherapy means 800km travel each way and 4 weeks away from their home/family/job	
• Demonstrates knowledge regarding limitations of rural health practice and utilises communication technologies to accommodate virtual consultation where possible	• Do we want to add something about appropriate virtual consultations—recent research out of UK indicates that there have been some problems as a result of overuse of virtual consultations	• Telehealth • Geographical • Often the patients will do a consultation from GP room—like a roundtable. The GP can do the physical exam and report back to specialists • We have 10 patients a week still travel to public outpatient clinical to be seen by a registrar for routine follow up that could be	

		done by their GP or the local surgeon. Or telehealth, must embrace technology and be able to problem solve it when it doesn't work	
• Recognises cultural considerations and acknowledges cultural and situational reasons for variation in patient compliance/completing care episodes	• I would love to see the RACS package on cultural competency and then we can really flesh this space out	• Indigenous health • Farmer health—they don't tend to complain/hard to pin down/generally don't take care of themselves and very busy with farm/very hard for them to find farm cover to seek treatment (centre for farmers health based in Hamilton, Deakin Uni) • Lower socioeconomic status and health • Professional behaviour demonstrating cultural sensitivity • Is the only way they will be able to care for our first nations people	
• Establishes and respects patient preference for location of care if appropriate	•	• Agreed as above • Important for the surgeon to cover all options. But also need to take into consideration that patient may not want to travel without compromising your professional scope of practice	

		• Needs to be limitations on what can be perform even if the patient is asking for it • There will always be those patients that want to stay and those that want to go. Need to continue to manage them regardless or pick up the complication when they come back. The patient is not blamed for their decision on where to be treated	
• Ensures communication occurs in patients first language; including consenting to procedures and discussions about care to ensure patient has the correct information	• Utilise and have available interpreters	• Can be hard to complete if translators are needed. Would need telephone interpreters. Some surgeons don't have public outpatient services so can't offer interpreter services (often private only). There will be local context especially with refugee communities. In regional areas tend to be more homogenous. • Communication can be further challenging if there is a conference call with translator, consultant, and patient • This is very difficult in a lot of rural environments—so much harder with phone	

		interpreters and getting bookings etc especially in private rooms and very time consuming and resource intense • Health literacy is poorer in rural and remote areas	
• Models' non-discriminatory behaviour and calls out and discusses racism on the individual and systemic level	• Not much differential between urban and rural • Practice equality	• Very difficult in some places where such behaviours are endemic and perpetrated by the patients themselves	
• Understands cultural considerations regarding end of life care and in particular the importance of dying on country	• Not much differential between urban and rural • Is thus specific for indigenous people as there are many parallel considerations for migrants	• Being brave enough to accept that conversations around death is not failure and hospitals are not the best place to die for some people	

Abbreviations
GP = General Practitioner, RACS = Royal Australasian College of Surgeons

Table K8: Activity one findings: Clinical decision-making

Behavioural Marker
Clinical Decision Making Trainee makes sensible diagnoses and suggested management plans Trainee uses available information to effectively prioritise acute and elective patient assessments Trainee appropriately uses test and investigations and develops strict protocols for following up tests and investigations

Draft Learning Outcomes	Any Suggested Changes	Relevant for rural context because	Potential assessment tools
• Demonstrates the ability to present a clear, logical history, findings, provisional diagnosis and create an investigation and treatment plan		• Knowing time factors (bottlenecks) and availability and limitations of your area, especially when test results are not rapidly available • The paucity of expensive imaging and investigations makes it imperative that clinical skills are of a superior level • Medical notes often offsite, with a GP and not available. Often only present when they are sick and often the first presentation	
• Utilises multidisciplinary team members opinions during the process of clinical decision-making		• Agreed—potentially has to be with tertiary centres if solo surgeon • Need to make use of the health care opportunity that arises with a presentation	
• Demonstrates the ability to explain reasons behind clinical decisions and management decisions	• Justify decisions and actions	• Plans are often atypical to manage time frames, harvest, travel. This means that sound documentation needs to be part of the process to ensure that it is obvious to all why decisions are made	

• Considers relevant environmental and social factors in decision-making	• Judicious utilisation of implants/products	• Knowing time factors and availability and limitations of your area. • Knowing the patient's lifestyle and adapt accordingly	

Abbreviations
GP = General Practitioner

Appendix L. Example case scenario

42-year-old person presents with a hand injury sustained while working on a farm, they are in Australia on a work Visa so that they are very anxious because if unable to work it will affect his ability to stay in Australia on his Visa status also their accommodation is tied in with their employment (lives on the farm where they work) English is not their first language, you've had to establish preferred language for communication then source an interpreter. Interpreter was offered from the employment agency who you understand is an agent that is an intermediary between the farming enterprise and migrant workers but you're concerned about the impartiality of that workers agent so you access interpreter via a free government telephone interpreter service. during that call you also involve a social worker and the nurse unit manager on your unit so that you establish for the patient that the injury is treatable, will be out of action for a certain period of time and will be able to return to modified duties.

You need to get advice about how to manage that injury you don't have a plastic and reconstructive or hand surgeon specialist on site but you're aware of one 2 hours away along your referral pathway. along with your general surgery consultant you contact that plastic surgeon who is able to look at photos that you sent with the patients permission and then login to look at their imaging results remotely, they provide advice that allows you and the general surgeon to manage the problem locally

In terms of discharge planning the farm is located two hours from your hospital, you are aware that there is a general practice service within 45 minutes of the persons residence (you either googled this or had referral from that clinic a few weeks ago, establishing a link with doctors there), and additionally you're aware that one of your colleagues there shares the same first language as the patient. With the patients permission you discussed their case with this general practitioner, they are happy to undertake wound check and happy to arrange for their nurse at their local clinic to do dressing changes and to facilitate video telehealth review with you in 7 days, and additionally you organise Their hand therapy remotely as

there is a telehealth hand therapy service that works in with a local nurse practitioner and as a last step both you and the social worker engage in a group call with the employer and establish what duties are possible and you find serendipitously that the employer is quite supportive and more than happy to facilitate anything required to get the worker back to full speed