Royal Australasian
College of Surgeons

FATES 1 – Rural Accreditation Literature Review

Addressing barriers to rural specialist training

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Final Report

Title	Rural accreditation – addressing barriers to rural specialist training Literature review
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Abbreviations

ACGME	Accreditation Council for Graduate Medical Education
ACS	American College of Surgeons
Ahpra	Australian Health Practitioner Regulation Agency
AMC	Australian Medical Council
FATES	Flexible Approach to Training in Expanded Settings
FRACS	Fellow of the Royal Australasian College of Surgeons
FTE	Full-time equivalent
GMC	General Medical Council
HTP	Hospital training post
MBA	Medical Board of Australia
NHS	National Health Service
NMWS	National Medical Workforce Strategy (2021–2031)
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RACS	Royal Australasian College of Surgeons
RCS	Royal College of Surgeons
RHESAP	Rural Health Equity Strategic Action Plan
RRR	Rural, regional, remote
SET	Surgical Education and Training
SIMG	Specialist International Medical Graduate
STB	Specialty training board
STC	Specialty training committee
US	United States
UK	United Kingdom
WHO	World Health Organization

1. Executive summary

Background

People in regional, remote and rural (RRR) communities in Australia have poorer health outcomes compared with those in metropolitan areas. Coupled with this inequity are medical workforce shortages in non-metropolitan areas. Having surgical Trainees in RRR centres has been shown to improve workforce numbers and can be associated with broader improvements to the health service. However, accreditation requirements for postgraduate training posts have been developed in the context of large metropolitan tertiary hospitals and it is difficult for RRR services to meet these requirements.

Aims

This literature review is one part of the Australian Department of Health and Aged Care's Flexible Approach to Training in Expanded Settings (FATES)-funded project: *Rural accreditation – addressing barriers to rural specialist training*. The review of published literature aims to investigate and address the barriers facing RRR hospitals when attempting to gain accreditation for surgical training posts.

Methods

Systematic searches of MEDLINE and Embase were performed using a search strategy including terms related to 'surgery', 'accreditation and components', 'rural', and 'barriers and incentives'. Grey literature was also investigated. Studies were selected based on reference to the research questions. No restrictions were placed on study or publication type. A thematic analysis was undertaken and results were described narratively.

Limitations

Due to the nature of the research questions, individual issues were not investigated in detail, but were broadly described in terms of barriers and solutions. Specialty-specific curriculum needs will impact accreditation requirements, but these were outside the scope of this report. Despite other countries facing similar issues, specific training-post accreditation for RRR surgery is relatively unique to Australia, due to the nature of the accreditation program and the geographical challenges and distances between hospitals and training centres. Overall, little formal research is available on this topic. Evidence was drawn from narrative reviews and retrospective studies.

Results

The search retrieved 91 studies: 23 narrative reviews, 21 observational or retrospective series, 10 surveys, 1 non-randomised comparative study and 3 systematic or scoping literature reviews, with website searches identifying 33 documents or webpages.

Discussion

There are some acknowledged limitations to this literature review. Unpublished material, including the status of any ongoing work, was not investigated. For the international literature, each publication reflects issues as related to its particular jurisdiction and should be considered in that context. This

review identified broad issues. Ongoing and future FATES research will investigate these issues in more detail.

Large geographical distances, the nature of postgraduate medical specialist training program needs, and training-post accreditation requirements each create unique challenges in providing RRR specialty training in Australia compared to other countries. There were relatively few publications explicitly on barriers and solutions to the accreditation of training posts in RRR centres. However, retrospective analyses and narrative reviews did provide information on various aspects of training and accreditation as related to the questions of this review.

Increased subspecialisation and its effects, particularly in rural areas, is an issue in many countries. While a detailed examination of casemix and training curricula was beyond the scope of this review, the casemix and case volume in RRR hospitals is clearly different to that seen in metropolitan centres. Training solely based on case numbers can thus be a problem for some RRR training sites. Training to competency was not specifically investigated as part of this literature review, but it should be considered in line with the requirements of each specialty and applied to training programs and accreditation standards as needed.

The RRR setting provides other valuable opportunities to the training experience, such as increased independence, a broad scope of practice, a mix of experiences, and interactions with First Nations people. While accreditation and training can be a burden in a RRR setting, the literature showed that benefits of training-post accreditation can flow to the broader workforce and health service. These include access to infrastructure, improved (cross-specialty) collaboration and interprofessional learning, increases in services and workforce capacity, and the recruitment and retention of specialists.

Rather than accept the limitations of a small RRR site, accreditation standards should be flexible enough to recognise the value of the broader experience and the more general and varied scope of practice that RRR training posts provide compared to a traditional metropolitan teaching hospital. The current Australian Medical Council accreditation standards allow for a flexible approach.

Conclusions

This literature review investigated 2 research questions: What are the unique opportunities rural training posts can provide? and How can barriers impeding Australian rural surgical training-post accreditation be overcome?

- Unique opportunities for the Trainee
    - RRR training posts are different to training in a metropolitan setting. They are nevertheless valuable, with a positive Trainee experience, varied scope of practice and more first-hand operator experience.
    - Unlike training in metropolitan hospitals, rural training enables trainees to develop rural practice capability and rural self-efficacy, increasing their confidence to work rurally in future.
- Unique opportunities for the health system

    - RRR training posts help attract and maintain senior clinicians. Trainees, particularly senior Trainees, can enhance the local workforce and receive relevant experience. The greater the number of training posts, the easier it is to attract a specialist workforce.
    - Rural training experience is positively correlated with future rural practice, and that increasing rural training is one lever to reduce workforce maldistribution.
- Caseload, casemix and training opportunities
    - Surgical demands at RRR hospitals vary and differ from those at large metropolitan hospitals. This is reflected in the scope of the RRR training experience. There is a need to recognise the strengths of the casemix and other aspects of the scope and opportunities that RRR training can provide. The accreditation standards and training requirements should be flexible to allow for this, rather than be metro-focused and based on case numbers. There must be a recognition of the more generalist scope of practice and interdisciplinary benefits of a RRR placement. While there may be less exposure to some procedures (i.e. more complex cases or more specialised procedures), for other procedures the numbers of cases and the exposure to training opportunities can be greater. Trainees need a broad experience of conditions and procedures. Specialty collaborations and training networks can help in this regard.
- Supervision requirements
    - Supervisors should be provided with support, training and effective advocacy.
    - The number of specialists at RRR centres can be low. A key barrier in achieving hospital training-post accreditation in Australia is the requirement to provide for each Trainee 2-3 supervisors who are Fellows of the Royal Australasian College of Surgeons (FRACS). Flexibility in the number of supervisors could be based on total full-time equivalent (FTE) supervisor hours of direct FRACS supervision. Partnerships with other specialties or subspecialties, and off-site, remote (e.g. telementoring) or network supervision models would be helpful. Younger Fellows, locums or Specialist International Medical Graduates (SIMGs) could also play a role. The role of supervisors as mentors should be acknowledged and developed, as well as the value of peer support.
- Infrastructure and workforce requirements, and administrative burden on the health service
    - RRR hospitals must balance the workforce requirements of healthcare delivery, supervision and training. Senior Trainees can provide additional workforce support to a RRR hospital. However, the demands of the accreditation process (and training delivery) can be a burden, particularly for less experienced RRR centres. Transparent information would be valuable to understand and clarify what is needed to comply with the accreditation standards. A more flexible approach to gathering and presenting the evidence needed for accreditation could be beneficial, including coordinating and sharing information and activities across specialties and colleges. Standardising terminology and definitions would also be helpful. Tools and support (such as centralised hubs or networks for administrative support) could be valuable. As part of

the accreditation process, ensuring rural knowledge within the accreditation assessment team and providing good-quality feedback is essential.

    - RRR sites may need help to develop the necessary training infrastructure, including information technology (IT) support. These facilities can also benefit the broader workforce. Financial support or partnerships with larger centres may also be helpful for RRR units to gain accreditation.

- Evidence generation requirements for accreditation applications
    - No specific information was identified; however, conclusions relevant to infrastructure and administrative requirements are relevant to this question.
- Lack of transparency of accreditation standards
    - It is a significant commitment for a RRR site to apply for an accredited training post. The accreditation standards need to be transparent, so the site is properly informed and understands the requirements.
- Other issues
    - Research in a RRR site is often difficult, due to distance from other units and a lack of infrastructure. Linkages with rural universities and medical schools, as well as funding for conference attendance, would support this aspect of the accreditation requirements. Other aspects of the broader rural experience should be recognised as being valuable to the Trainee as an alternative to the research requirement.
    - The process of preparing for accreditation and providing training can be costly. Support should be provided for RRR sites to meet the costs for seconded Trainees and for Trainee entitlements to be preserved across all sites.

2. Aims of this literature review

This literature review is one part of the Australian Department of Health and Aged Care's Flexible Approach to Training in Expanded Settings (FATES)-funded project: *Rural accreditation – addressing barriers to rural specialist training*. This project has 4 objectives:

1. Identify barriers to rural hospitals in applying for and meeting surgical hospital training-post accreditation standards.
2. Create a 'supporting evidence' resource to assess performance against hospital training-post accreditation standards within a rural context.
3. Design an administrative model that provides support and engagement for rural hospitals during the hospital training-post accreditation process.
4. Establish foundations for design of a system that distributes training posts based on community need through Trainee workforce data.

This review of the published literature forms part of objective 2 to investigate and address barriers that RRR hospitals face when attempting to gain post-accreditation surgical training.

The FATES program funds non-general practitioner specialist medical training approaches. It aims to broaden the skills of the specialist workforce, bring more specialists to regional areas, and ensure all Australians can access high-quality care.[1]

2.1. Definitions

For the purposes of this review, RRR is used to identify rural, regional and remote, identified as Modified Monash (MM) category MM2 to MM 7.[2] MM1 is a major city or metropolitan location.

Trainees (including SET trainees) means specialist trainees (in surgery or other medical specialty). In the US, the equivalent position is residency or resident. In Australia and Aotearoa New Zealand the term resident is used to describe a prevocational doctor year 1-3.

3. Background

Providing equitable access to health services in regional, rural and remote (RRR) locations is a worldwide challenge.[3] This is a particular issue faced by RRR communities in Australia, where approximately 7 million people (28% of the population) live in rural and remote areas and often experience worse health outcomes and higher mortality rates compared to their urban counterparts.[4-6] Despite these higher needs, the health workforce is markedly smaller in rural and remote areas: only 15% of surgeons live and work rurally and 4 of 9 surgical specialties have less than 10% of surgeons based outside urban areas.[6, 7] In 2020, there were 144 specialists (i.e. doctors other than general practitioners [GPs] who require a referral from another doctor) per 100,000 head of population in major cities, compared to approximately 62 per 100,000 in outer regional and remote areas, and 25 per 100,000 in very remote areas.[4] This inequitable distribution of the health workforce, and strategies for developing the RRR workforce, have been identified by governments as a priority in Australia and Aotearoa New Zealand.[5, 6, 8, 9]

In many ways the rural situation is able to provide unique and interesting experiences for Trainees, as well as for qualified surgeons. RRR sites provide access to a larger variety of patient presentations, along with other rewarding opportunities to assist the community and benefit from the rural lifestyle that is attractive to many.[10, 11] Trainees, in particular, benefit from understanding the healthcare system from the perspective of a low-resource setting. Despite this, negative perceptions of isolation remain, for personal, family and professional circumstances.[12-14] Around the world, countries have tried various strategies to increase the number of health professionals in rural areas, including financial incentives, regulatory measures, and personal and professional support.[13] Competitive salaries have long been recognised as an important component to attracting and retaining rurally based specialists, but problems remain in recruiting to rural areas despite higher remuneration.[3, 15, 16] Another effective approach is to provide RRR training and exposure to Trainees, which can help them develop the necessary skills and encourage them to continue working in rural areas.[3, 6, 13, 17-20]

In Australia, several initiatives are planned or underway to address the issue of rural surgical training. Through its Rural Health Equity Strategic Action Plan (RHESAP), published in December 2020, the Royal Australasian College of Surgeons (RACS) has taken steps to address several issues related to rural surgery and rural surgical training.[21-26] The action plan recognises the poorer health outcomes and the inequity in health services in RRR locations, and aims to overcome the uneven distribution of surgeons and increase the number of rural Trainees.[22, 24] It acknowledges that most decision-making is presently done by metropolitan stakeholders, and improved RRR representation at RACS committees and boards (including Surgical Education and Training [SET]) is required.[24] Additionally, the action plan seeks to recognise the accomplishments and value of rural surgeons.[24] RACS acknowledges the need for rural residents to have access to safe surgery close to home.[24, 26]

RACS published a number of white papers which provided the evidence to support the development of the RHESAP .[27] *Train for Rural* addresses the training standards to develop a skilled surgical workforce with a broad scope of practice to provide care in RRR locations.[22] This intends for all Trainees to have rural work exposure. Currently, the most common rural training experiences are centred in metropolitan hospitals, with short-term secondments to a rural hospital. Separately, *Train for Rural* also recognises other practical aspects of the training experience, such as accommodation for the Trainee and their family, internet access, time and other support for relocation, as well as access to research facilities and mentors. RRR training centres may need support for these requirements, or flexibility in terms of the research component of the training.

The Australian Government's National Medical Workforce Strategy (NMWS) 2021–2031, recognises that the activities of the Commonwealth, the states and territories, health services, specialist medical colleges, regional training organisations, and universities and regulators in developing the healthcare workforce don't always meet the necessary distribution across all locations.[6]

NMWS priorities include reforming training pathways (priority 3) and building and promoting the generalist capacity of the medical workforce (priority 4). Objectives of these priority activities include a greater expectation of medical specialty colleges to provide training in RRR areas; adjustment of accreditation standards to recognise rural training and be flexible in considering local context; and

training to include innovative supervision such as network models and relationships with larger urban hospitals. The number, distribution and location of training sites should be based on community need and focus on specialties in undersupply.[6] The NMWS will build on existing programs that provide exposure to rural practice.

3.1. Training-post accreditation

This increase in RRR training expectations will require an increase in the number of RRR hospitals accredited for surgical training. The World Health Organization (WHO) has identified strategies that can be used to increase health workers in RRR areas, such as establishing accreditation standards and having accreditation bodies develop curricula that reflect rural health issues, and having health worker education institutions closer to rural areas.[3]

Internationally, the accreditation of training posts for postgraduate specialty training varies from country to country. For example, in the United States (US) and Canada, accredited surgical training programs are provided through academic sponsoring institutions; in the United Kingdom (UK) all are based within National Health Service (NHS) hospitals. Further information on international training-post accreditation and RRR specialist training is provided in Appendix A.

Australia has many unique challenges related to training-post accreditation for RRR centres. Surgical training must be provided in accredited training facilities. However, accreditation requirements are generally focused on metropolitan centres; RRR hospitals may find it difficult to reach the standards required to achieve accreditation.[5] A RRR site may simply be unable to meet certain requirements compared to a large metropolitan health service.[21]

The national scheme of specialist training is overseen by the Australian Government's Health Ministers' Meeting and is administered by the Australian Health Practitioner Regulation Agency (Ahpra). The administration of accredited training involves a number of bodies:[5]

- The Medical Board of Australia, (MBA) through the Australian Medical Council (AMC), is responsible for accrediting education providers and their programs of study for the medical profession.[28] The AMC publishes standards for accreditation of training posts. Training in areas of need is encouraged including in RRR areas and in First Nations health services. Training post accreditation is encouraged to be flexible; each post does not need to provide all experiences. Additional specialty-specific accreditation criteria are allowed.
- RACS approves training posts that enable Trainees to acquire the needed competencies to become consultant surgeons.[29]
- There are 9 surgical specialties, and 13 specialty training boards or committees (5 binational for Cardiothoracic Surgery, Paediatric Surgery, Vascular Surgery, Neurosurgery and Urology, and 8 separate Australian and Aotearoa New Zealand committees for General Surgery, Orthopaedic Surgery, Plastic and Reconstructive Surgery and Otorhinolaryngology/Head and Neck Surgery). These specialty training committees and boards (STCs/STBs) each have an agreement with RACS to deliver and oversee specialty training in a semi-autonomous manner, under the governance of RACS.[5]

- RACS and STC/STB accreditation requirements (published in 2016) currently cover 8 standards and 44 different criteria.[29]
- Each surgical specialty has different accrediting arrangements under these standards, with the accreditation of each training post being the responsibility of the appropriate STB.[5]

The current AMC standards of assessment and accreditation of specialist medical programs support the provision of training opportunities in RRR locations. The standards recognise that Trainees need a variety of experiences during training and that every rotation cannot provide everything.[30] The standards allow for rural-specific accreditation criteria, including networked and remote supervision to supplement onsite supervision.[31] However, there has been criticism that the RACS specialty specific accreditation criteria prevent accreditation of many RRR training sites.[31] The RACS hospital training-post accreditation standards for surgical education and training, published in 2016, have no standards specifically directed to RRR training sites. This leads to a metropolitan-centric accreditation system, disadvantaging RRR hospitals that meet the AMC standards but not the specialty specific accreditation criteria that are more easily achieved by metropolitan centres.[29] Draft updated RACS hospital training post (HTP) accreditation standards were released for consultation in 2022 (consultation closed December 2022).[29] Compared to the current 2016 standards, the updated draft contains no material changes explicitly relevant to RRR training posts. However, some specialties have begun to apply separate criteria for hospitals designated as rural or remote.[32]

In 2022, the Australian Government published the detailed report *How accreditation practices impact building a non-general practice rural specialist medical workforce*.[5] Separately in 2022, RACS facilitated a workshop in Darwin to identify and document perceived barriers to reaching RACS HTP accreditation standards in RRR facilities.[21] These reports discuss a range of issues and present numerous solutions that are incorporated into this current report.

3.2. Questions of the review

The objectives of this literature review are to identify, from the published Australian and international literature, barriers and solutions to rural training-post accreditation. Furthermore, the review aims to identify the unique educational opportunities that rural training posts can provide to surgical Trainees.

The following research questions were investigated:

1. What are the unique opportunities rural training posts can provide?
2. How can barriers impeding Australian rural surgical training-post accreditation be overcome?

Current barriers include those reported in RACS's Darwin workshop literature and those in the Department of Health report on rural accreditation:[5]

a. Caseload, casemix and training opportunities
b. Supervision requirements
c. Infrastructure and workforce requirements
d. Evidence generation required for compliance with accreditation applications
e. Lack of transparency of accreditation standards

f. Administrative burden for health services

4. Methods

To identify relevant literature, systematic searches of literature databases were performed using a search strategy that included search terms related to ‘surgery’ AND ‘accreditation and components’ AND ‘rural’ AND ‘barriers and incentives’. Searches of MEDLINE and Embase were performed (25 May 2023), in addition to searches of grey literature (government agencies, health department and medical college websites).

Studies were selected based on reference to the research questions. Due to the broad nature of the research questions and the likelihood of a varied range of study types addressing them, study selection was inclusive. There was no restriction based on study type or publication type. Any source that provided a description of system issues associated with hospital training-post accreditation, or a description of barriers to or enablers for surgical training in RRR hospitals was included in this review.

Citations were downloaded to EndNote and underwent title and abstract screening by a single reviewer. The same reviewer completed full-text screening of articles for inclusion. Studies were extracted using a standardised table in Microsoft Excel. Relevant themes were identified, and study methods and results were extracted. Results were described narratively, as formal data synthesis was not possible.

As the evidence base included limited quantitative data and was across a range of study types, including narrative reviews, quality appraisal was not attempted. Full review methods are detailed in Appendix B.

5. Results

The results of the literature searches are shown in Appendix C.

Of 5,481 identified publications, 91 were included in this review, comprising 23 narrative reviews, 21 observational or retrospective series, 10 surveys, 1 non-randomised comparative study and 3 systematic or scoping literature reviews, with website searches finding 33 documents or webpages.

The publications were commonly from the US (36), Australia and/or Aotearoa New Zealand (28), Canada (7) and the UK (13).

Dot-point items below highlight the themes identified for further elaboration.

5.1. What are the unique opportunities rural training posts can provide?

RRR training with an aligned rural curriculum enables development of rural self-efficacy and rural practice capability, so that graduates have the competence and confidence to practice in a rural setting.[22]

Although it is difficult to benchmark the quality of care provided by RRR surgeons, due to patient complexity and more advanced disease at presentation,[33] several national studies in the US demonstrate that rural hospitals successfully deliver high-quality care for a range of common surgical procedures.[34, 35] In Australia, data from state and territory audits of surgical mortality and several papers presented at the RACS Annual Scientific Conference 2022 demonstrate that rural surgical outcomes for most procedures are the same as or better than outcomes from metropolitan areas, despite equal or greater patient complexity and more advanced disease at presentation.[31]

There is an incorrect yet persisting perception that RRR surgical training in Australia is inferior or substandard to training in metropolitan centres.[6, 21] However, there is substantial supportive evidence that RRR placements, while offering different training opportunities to those provided in metropolitan centres, are a valuable component of the training program.

Opportunities and benefits for the Trainee

- Positive overall Trainee satisfaction with the rural training experience

The Ahpra and MBA Medical Training Survey 2021 found RACS SET registrars are more satisfied with their rural training experience and more likely to recommend their current rural training position to their peers, compared to registrars in metropolitan posts.[31] Rural medical Trainees from 2022 were also more likely to recommend their training position to other doctors in Australia.[36] In a recent survey, SET Trainees identified many positive attributes to rural training. Respondents cited more first operator experience, direct consultation supervision, and a broader casemix as incentives to choosing rural training. These benefits are also reflected in a recent RACS strategy paper.[22] Lifestyle and a positive work experience were also identified as positives.[14]

Scottish surgical Trainees found the remote and rural training pathways to be a good experience. Benefits included a good work/life balance, and scope for breadth of experience in assessment and initial management.[12, 37]

In a US survey of a single training site, a rural General Surgery rotation during residency was found to have broad importance and value in General Surgery resident training, which included understanding the rural lifestyle and rural surgeons' connections with their communities.[38]

- Improved operative experience for the Trainee

In an Australian review of Trainee logs, the total operative caseload and the primary operator experience in major operative cases, were both greater in rural rotations. Endoscopy experience was significantly greater in rural rotations. Operative exposure to gynaecological, laparoscopic, orthopaedic, paediatric and plastic surgical procedures was significantly greater in rural rotations for general surgery.[39]

- Varied operative experience for the Trainee
- Greater autonomy and first-hand operator experience, meaning greater responsibility

A recent Australian survey identified that rural training had a limited casemix to support learning outcomes and lacked formally structured learning opportunities.[14] Rural health services may not have the quantity or complexity of cases of larger metropolitan health services; however, from an educational perspective, rural general surgeons are perhaps the only providers to practice the full breadth of the specialty (e.g. a general surgeon could experience colorectal, breast and gastrointestinal surgery).[5, 40] In the US, this broad scope of practice has been identified as a reason for general surgeons to choose to practice in a rural area.[41] It provides a varied operative experience for the Trainee, including increased exposure to a variety of surgical cases and medical conditions, and opportunities to expand clinical skills and build expertise.

According to a US surgical resident's narrative perspective on rural surgery, opportunities in rural areas are abundant and provide a unique way for surgeons to offer less subspecialised and more generalistcare.[42] Moreover, the data support a training program in rural surgery, which includes senior rotations in additional specialties.[42] Scottish surgical Trainees also reported that rural training provides opportunity for a broad range of experience in patient assessment and initial management, as well as exposure to operative and trauma cases.[12] Survey respondents felt that rural training could teach broader skills and discourage early subspecialisation (they reported feeling their skills could be too specialised).

Opportunities and benefits for the health system

- There are cost benefits to the health system
- Training posts help rural hospitals to attract and maintain senior clinicians
- Trainees provide a valuable service to the hospital

Benefits to the health system include the value and prestige of teaching hospital status, which can be attractive for the recruitment and retention of surgeons invested in the training program. This can reduce recruitment costs over time.[43, 44] Indeed, the experience of providing education has been shown to be a positive experience for rural healthcare workers in the general practice setting; a collaborative small

team approach to teaching in the rural setting is recognised as being beneficial for interprofessional learning.[45]

Trainees also provide value and productivity to the healthcare system.[43] Despite the cost burdens of accreditation and those of being a training post, the influx of surgical Trainees may reduce recruitment costs over time.[44] A US study of a range of rural programs identified that the costs of replacing a surgical Trainee would exceed the costs of providing the training opportunities. The financial benefits of surgical Trainees related to their role in the workforce; program directors considered that Trainees provide a unique role in the healthcare system.[43]

Positive rural training experience is associated with higher chance of surgeons working rurally in the long term.[3, 13, 22, 31, 46-50]

5.2. What are the barriers and solutions to rural training-post accreditation?

Casemix, caseload and training opportunities

Barriers

- Current accreditation requirements are heavily skewed towards metropolitan training

There is a mistaken belief that a 'one size fits all' training solution is possible and that the best way forward for a large teaching hospital will be the same as that for an isolated RRR hospital.[51] Consequently, accreditation standards and practices are not contextualised to value RRR training opportunities.[5]

- Increasing subspecialisation; rural practice offers a true general range of surgery

As recognised by RACS, specialisation in surgery facilitates the acquisition of knowledge and experience, but conversely can lead to fragmentation in knowledge and patient care.[52] Generalist surgeons can play an important role in patient care in providing a broad scope of practice, particularly in RRR settings.

Internationally, there is an ongoing trend towards surgical subspecialisation (or narrow scope specialist) and a reduction in true generalists (or broad scope specialists), which decreases the pool of surgeons available to practice RRR surgery.[53] For example, in Australia, General Surgery is one from a total of 20 General Surgery subspecialties for which a training post can be recognised for the purposes of accreditation.[5]

As the medical workforce becomes more specialised, it also becomes less flexible.[6] The broadly trained surgeon (including for General Surgery and Orthopaedics) with wide experience is becoming a rarity.[54-57] A recent report on General Surgery in the UK recognises that this narrowed scope of practice is not beneficial for rural surgeons and rural communities and is challenging the sustainability of emergency General Surgery services, particularly in district and rural hospitals.[58]

- Casemix is different in rural practice
- Rural centres differ from one another and can be very individual

The scope of practice of a healthcare provider in a metropolitan setting differs from that of a healthcare provider in RRR areas, which is more often an expanded and broader skill set.[45, 59] For example, in non-metropolitan settings, general surgeons provide emergency care and need skills in the diagnosis, initial management and treatment (nonoperative and/or operative) of common conditions across the surgical spectrum.[54] This means that a RRR surgeon needs broad experience in conditions and procedures often outside the requirements of the usual training program.[60, 61]

Appropriately training surgeons to deal with these broader expectations is critical, so they are comfortable in coping with the practice requirements.[62] Clinical practice also varies among sites: 'the general surgeon in Penrith is likely to have a very different practice to one in Portland,' noted Kiroff (1999).[59] In a country as large as Australia, remoteness can vary considerably. For instance, Whyalla is located 231 km by air from Adelaide, whereas Wyndham is 2,215 km from Perth.[63] It is important to acknowledge the individuality of each location and training experience.[21, 59]

- Accreditation based on case numbers is too simplistic

Accreditation based on case numbers is simplistic and doesn't necessarily equate to the quality of the training experience. The variability in casemix provided in RRR settings can provide good educational outcomes. Flexibility in accreditation requirements regarding caseload and casemix has been identified as a critical factor in Australia.[5]

Solutions

- Training experience at rural sites is varied and valuable
- Strengths of the varied and broad casemix and other advantages of rural placement should be recognised for their value and broader training opportunities

The value and benefits of rural training opportunities have long been recognised.[59, 64] A recent Australian report emphasised the strength of the varied casemix in the rural setting.[5] A medical workforce with a broader approach to patient care means more doctors will be capable of working in rural and isolated areas.[65] In the UK it has been suggested that the specialty of remote and rural surgery should be formalised.[55]

Recognition of the value of the rural training experience by colleges, specialists and Trainees would support the expansion of accredited programs in RRR locations.[5]

- Accreditation standards and training requirements should be flexible

Some requirements and restrictions in accreditation standards are historical and not necessarily based on current evidence.[5] As training requirements for accreditation are heavily skewed towards metropolitan training, it is difficult for RRR health services to provide appropriate experiences to meet the accreditation requirements.[5]

Feedback to an Australian Department of Health and Aged Care report indicated that:

> there should not be separate accreditation standards for rural health services nor the lowering of accreditation standards to accommodate rural training. Rather, accreditation standards should be considered in terms of training and graduate outcomes. When

> Colleges undertake an accreditation assessment of a rural health service, there should be consideration of the broader local context, service delivery, educational value and overall training experience, ensuring that training is well supported, not compromised, and that trainees have a good quality and broad training experience.[5]

The broader scope of experience and exposure to conditions not seen in metropolitan centres is recognised in the RACS *Train for Rural* strategy.[22] Rural-specific training to develop and maintain the rural workforce is needed.[35]

- Flexibility in the casemix and caseload accreditation requirements is beneficial
- Other aspects of the training experience should be recognised
- Rural centres often provide less complex cases and/or less specialised procedures; more complex/specialised cases usually go to other larger hospitals
- Exposure to some procedures may be inferior, for others it may be superior
- Caseload can be greater in many rural training placements
- Rural placements can provide training without competition by other Trainees

Accreditation of a site should be considered in the broader context of services and overall experience. The strength of most RRR areas is the varied casemix (although often not to the required caseload), the presence of multidisciplinary teams, and a low resource environment in which to practice medicine. Exposure to other aspects of healthcare including Aboriginal and Torres Strait Islander health services is also a strength of many RRR sites.[5]

Recent Australian qualitative reviews have identified inflexibility in logbook numbers, casemix and elective sessions as issues that impact the accreditation of training posts in RRR sites.[5, 21] RRR hospitals often have difficulty in meeting the strict caseload and casemix requirements. Flexibility in the casemix requirements for General Surgery is valuable.[40, 59]

A recent survey of Australian Trainees and Fellows who had completed at least one placement in a rural setting as part of their SET training, noted limited exposure to complex cases because these were sent to larger hospitals for treatment.[14] Poor access to highly specialised procedures has been identified as a challenge to meeting the RACS HTP requirements.[21] One option may be for postgraduate RRR Trainees to spend 2–3 days per month in a major medical centre to increase their experience and allow access to high complexity procedures.[66] The AMC standards require for program outcomes to be met by the end of training program, not met in every training post. For example, General Surgery training hubs have been operating in Victoria and Queensland allow a one-year secondment to a metropolitan centre for SET training.[22] RACS also provides a grant for travel, accommodation and course fees to support junior doctors who are based in a RRR area to undertake a surgical skills course in Australia or Aotearoa New Zealand.[67]

In the US setting, surgical case volume requirement was less frequently cited as a reason not to continue accreditation for surgical training posts in a mix of RRR and metropolitan hospitals.[68] For 2 US rural hospitals, the overall caseload for Vascular and General Surgery was greater than the required numbers or greater than comparable metropolitan sites.[69, 70] In one hospital, a vascular Fellowship was

not possible due to the lack of required numbers for a single procedure.[69] In Australia, the total operative training caseload has also been reported as being greater in rural than metropolitan sites.[39] There were significantly more endoscopic procedures and greater exposure to gynaecological, laparoscopic, orthopaedic, paediatric and plastic surgery.

In a comparison of specific General Surgery programs in the US, rural minimally invasive/bariatric surgery Fellowship programs were found to provide a similar operative experience.[71] Overall case volume was appropriate and there was a greater number of endoscopy cases at the rural site.

In some instances, Trainee rotation to RRR areas is perceived as providing improved access to certain procedures or broad aspects of training in comparison with metropolitan sites. However, this benefit to the Trainee is not always aligned with the needs of the RRR health facility and the broader community.[5]

RRR training placements can provide greater exposure for Trainees as a result of training free from competing specialty or subspecialty Trainees.[22, 72, 73] In addition, RRR training posts may provide more first operator experience and direct consultant supervision.[22]

- What are the broader specialty requirements for caseload and casemix in a rural setting?
- Training a general surgeon should include an interdisciplinary focus

Locally and internationally, studies have identified the mix of procedures most relevant to rural surgery. In General Surgery, there is commonly a need to undertake procedures from a range of other subspecialties in a broad scope of practice (that is a broad scope of general surgery) and extension into other surgical specialty scopes of practice including obstetrics, urology, gynaecology and orthopaedics.[42, 52]

The interdisciplinary requirements of rural general surgeons is reflected in the General Surgery curriculum in the UK, allowing Trainees to develop competencies in the more interdisciplinary rural and remote surgery, where General Surgery contributes only 30% of the scope.[74] This training is particularly focused towards Trainees intending to practice in remote areas such as the Scottish Highlands and Islands.

The Advisory Council on Rural Surgery of the American College of Surgeons (ACS) set out to identify important components of rural training programs that include broad exposure to surgical specialties and endoscopy, and have published their recommended curricula for training a rural surgeon.[35, 72] The operative curriculum of General Surgery in rural programs in the US includes a range of procedures in obstetrics, gynaecology, endoscopy, emergency and trauma surgery triage, stabilisation and transport, thoracic, vascular, urologic, orthopaedic and otolaryngology surgery.[38, 70, 75-78] Commonly performed operations in US rural hospital training sites include hernia repairs, and breast, endoscopy and vascular procedures.[70] Less common procedures include those on the abdomen, small intestine and stomach.[70]

An audit of Australian rural general surgical procedures included those covered in the RACS Curriculum in General Surgery, with a large volume of endoscopic procedures as well as cardiothoracic, vascular, orthopaedics, urology, paediatric surgery and obstetrics/gynaecology procedures.[73, 79-81] This range of

procedures beyond the scope of General Surgery was also identified in a survey of Australian Rural Surgical Training Program Fellows.[63]

An audit of general surgeons at 4 rural hospitals across South Australia revealed a range of procedures performed, 10.9% of which were of a specialty other than General Surgery (i.e. Urology, Plastic and Reconstructive, Vascular, Orthopaedics, Otolaryngology Head and Neck, and Obstetrics and Gynaecology).[82] Endoscopic procedures were common.

A recent RACS workshop showed that an acknowledgement of the non-technical and non-surgical aspects of training to meet caseload requirements would benefit rural sites.[21]

- Need for a rural-facing curriculum

A rural-facing curriculum is recognised in the RACS *Train for Rural* report, emphasising the need for all Trainees to acquire the generalist skills required for RRR practice. This recognises the value of generalist surgical skills and other skills of outreach, inreach and health service management required in RRR areas.[22, 24] The value of generalists with the necessary training and support is recognised by RACS.[83] However, it is also recognised that if surgeons are unable to provide these skills in RRR locations, others, such as GPs with extended scopes of practice, will provide these services to the rural population.[22]

The extended scope of practice and additional needs of rural training curricula were investigated in a recent RACS report that developed a rural-facing curriculum.[25] Further information regarding rural curricula and the development of rural-specific programs is shown in Appendix A.

Supervision requirements and mentorship

Quality supervision is a critical component of good training. In the US, the relevant training institution is required to provide an assurance of good supervision to be accepted into the residency program.[5, 77] A recent survey of Trainees and surgeons in Australia found that the quality of supervision in Australian rural training hospitals met or exceeded Trainee expectations.[14] Nevertheless, many specialists tend to practice in places where the population is large enough to support their requisite work volume and where they have a supportive environment.[22, 57]

Barriers

- Being able to meet the required number of supervisors in a small rural unit is an issue

A key barrier to achieving hospital training-post accreditation in Australia is the requirement for 2-3 FRACS to supervise each Trainee.[21] Reaching and maintaining the critical mass of specialists required to meet strict supervision requirements is an ongoing challenge in RRR locations.[5]

Solutions

- Supervisor requirements to be based on total FTEs

The RACS RHESAP recommends that supervision be based on total FTE hours of direct consultant supervision rather than on the total number of FRACS employed, to preserve quality and remove the barrier to accreditation of the RRR post.[22, 24] An example is: rather than having 3 surgeons providing 4 sessions of supervision per week there could be 2 surgeons providing 8 sessions per week.[31]

- Provide training and support to the supervisor
- College bodies, societies and structures that support rural surgery should advocate for rural surgery, rural surgeons, rural hospitals and Trainees

Across many countries, colleges, societies and associations provide advocacy and support to surgeons in rural areas. Recent Australian reports found that rural representation in college governance (e.g. rural chapters or interest groups) is key to ensuring that the RRR context is properly considered and to help identify mechanisms to support RRR specialty training.[5, 6] Relationships with colleagues within and across specialties and professional networks are critical to support specialty training.[5] In the hospital environment, a RACS workshop found that effectively improving workplace culture, supervision and clinical leadership is a useful way to support training sites in RRR facilities.[21]

In Australia, RACS has a Rural Surgery Section whose role includes advocating for appropriate surgical training, continuing professional development (CPD), and research and practice development, as well as focusing on surgical workforce issues in a RRR context.[84] RACS also has grants available for isolated surgeons to attend conferences or training.[85] The RACS RHESAP recommends rural representation on all committees and boards involved in SET training.[22, 24] The RACS *Train for Rural* strategy proposes the Rural and Remote Central and Northern Australia Surgical Service Strategy (RCANS), a forum across a range of surgical and clinical stakeholders that will help to develop training networks.[22] In Australia, General Surgery Australia hosts the Provincial Surgeons of Australia Conference Annually.[86]

In the UK, the Royal College of Surgeons (RCS) England Remote and Rural Healthcare Educational Alliance (RRHEAL)[65] and the RCS Edinburgh Faculty of Remote, Rural and Humanitarian Healthcare[87] are areas within specialist surgical colleges to advocate for and provide support and assistance to rural surgeons, as well as leadership in the area of remote and rural healthcare. The Viking Surgeons Association, an association of remote and rural surgeons working in rural general hospitals in the Scottish Highlands and Islands, rural areas of Northern Ireland, the Isle of Man and Iceland, provides opportunities for rural surgeons to engage through conferences and other activities.[88]

In the US, the ACS actively promotes its services to rural surgeons and has an Advisory Council for Rural Surgery.[89, 90]

Canada has a Canadian Association of General Surgeons Rural Surgery Mentorship Program, with quarterly meetings to support and mentor current and future rural general surgeons.[91]

It is critical to maintain the skills of RRR surgeons. Surgeons commonly attend courses to support their continued learning within their field of practice. A recent Australian report recommended the support of professional development programs for rural clinicians to become specialty supervisors or to enhance their supervision or leadership skills.[5] Some STBs (e.g. Cardiothoracic Surgery) host supervisors meetings every few years to specifically discuss how they can better meet the training needs of supervisors.[5] The Australian Government NMWS 2021–2031 recognises that rural supervisors should be provided with tailored support to deliver quality training.[6]

In the US, skills courses have been developed to address the needs of rural surgeons in maintaining and increasing their expertise.[60] Telementoring can also play a role to assist less experienced surgeons in a rural location.[60, 92]

- Flexibility regarding who can supervise
- Use of different supervision models including off-site, telementoring or training networks

Innovative models of training have been proposed to help with the limited number of supervisors at smaller RRR sites.[45] A recent RACS workshop identified that a more flexible approach to supervision would be beneficial, such as reconsidering supervision ratios, in conjunction with looking at a supervisory network across other specialties/subspecialities. Partnerships with other sites, including the private sector, to form networks for education, peer support and supervision, as well as to increase casemix, may be beneficial.[5, 21] Remote supervision as an adjunct or in addition to on-site supervision could also be considered, and the use of digital technologies to increase training capacity at sites unlikely to meet the 3.0 FTE supervisor requirements.[5]

Also under consideration is specialists being able to supervise earlier post-Fellowship, rather than waiting a minimum 3 years post-Fellowship.[5] With many Specialist International Medical Graduates (SIMGs) in rural locations there is an opportunity for them to contribute to supervision arrangements.[5, 22] Locums may also potentially play a supervisory role in some settings.[5]

Alternatively, Fellows from another surgical specialty, or non-Fellows and other suitably qualified clinicians may be able to participate in the supervision of Trainees as part of a multidisciplinary supervisor team.[5] That other members of the healthcare team could contribute to supervision is recognised in the AMC standard for accreditation of training positions, as well as the supervision being in a network rather than locally-based (Standard 8).[22]

Telementoring technologies have been suggested as a way to provide a Trainee with mentoring from an experienced instructor as part of a remote supervision model. This can be beneficial for Trainees to gain experience in unfamiliar and uncommon procedures.[93] Remote Trainee supervision using information and communication technology or telehealth has been used primarily for GP training, but this learning format could be broadened to other specialties and could also enhance local health services.[45]

A broad network of hospitals and surgical facilities is used to provide high-quality specialist services to RRR Australia.[94] Similarly, network supervision models have been proposed to assist in training in RRR centres to coordinate Trainee distribution and allow Trainees to be based in RRR areas.[6] Remote supervision can enhance the onsite FRACS supervision by supplementing with a second FRACS surgeon from elsewhere within the training network.[22] For example, RACS has supported an alternative model of supervision with one local supervisor, one core supervisor in the metropolitan centre, and a mentor in the rural clinical school not linked to direct or clinical supervision.[5] RRR training networks with General Surgery training hubs have been operating successfully in Victoria and Queensland. These programs allow a one-year secondment to a metropolitan centre for SET training.[22] The programs

benefit from strong partnerships and local champions, with more work needed on training opportunities for other specialties, as well as funding and rural-specific accreditation standards.

Due to the difficulty of having the appropriate number and specialties of suitable trainers in RRR areas, expertise from other sites, as well as collaboration with a range of stakeholders (e.g. funding bodies, government, universities), is beneficial for success.[44] The AMC standard for accreditation of training positions encourages Trainees to gain experience from more than one site, and allows for flexible approaches to providing training through an education network.[22] Several different training sites involved in RRR rotations provide additional mentorship and encouragement for Trainees considering a career in rural surgery.[75] These networks can also benefit the operational requirements of the different rural health units, as their capacities for services and training can be very different.[5] It should be acknowledged that in rural and remote hospitals, certain specialties (e.g. Neurosurgery or Paediatric Surgery) will always be provided by outreach services.[54]

Training networks can also provide additional peer support to the Trainee. A lack of peer support has been identified as a barrier for Trainees to attend rural placements.[14]

- Should training be provided by the rural generalist or a specialist?
- Absence of Trainee competition from other surgical subspecialty learners
- Mentorship

An Australian narrative review raised the question of whether specific skills (e.g. training an orthopaedic procedure to a general surgery Trainee) should be taught by a rural surgeon supervisor in the same specialty as the trainee, or a surgeon in the specialty with which the procedure would normally be associated.[59]

Trainees benefit from rural placements that can provide the opportunity for general surgery Trainees to learn in the absence of competing surgical specialty (and subspecialty) learners.[72, 73, 95]

Graduates can act as effective mentors for current residents, forming ongoing beneficial relationships between surgical residency graduates and their rural surgical residency programs.[40] Additionally, mentors often shape the career plans and specialisation of Trainees, therefore exposure of the Trainee to appropriate mentors in a certain specialty is beneficial for retention.[56, 57, 95]

- Cost benefit
- Payment of supervisors

In the US, it was shown that having Trainees in the healthcare system is associated with the retention of high-quality surgeons, due to their investment in the rural training program.[43]

In a US review of paid versus unpaid teaching performance, the 3 domains associated with teaching effectiveness were enthusiasm, ability to establish rapport and direction, and feedback. The faculty with paid teachers provided a better educational experience for resident Trainees.[96]

Research and other program requirements

Barriers

- Undertaking research in a rural training program is challenging in Australia

The requirement for high-level research has been identified as a challenge to meeting the RACS HTP requirements.[21]

Accreditation standards in Australia, including research, have been based on the metropolitan experience. However, all the facilities and resources available in a metropolitan setting may not be available in a RRR environment. This lack of infrastructure can hinder research in RRR centres. Linkages with rural universities and medical schools would support this aspect of the accreditation requirements.[5] Virtual collaborative research networks can help to fill a gap in local research capacity, such as through the RACS Clinical Trials Network Australia and New Zealand.[97] When rural research infrastructure is in place (for example at the Menzies School of Health Research in Darwin), it affords unique opportunity for trainees to be involved in research relevant to RRR, in comparison to metro research opportunities which may be focused on metro healthcare.[98]

Alternatively, or in addition, other aspects of the RRR experience should be recognised as being valuable to the Trainee.

In a US study, the research and academic requirements of the Accreditation Council for Graduate Medical Education (ACGME) were cited as challenges faced by sites choosing not to undergo reaccreditation. The authors stated that reviewing the requirements surrounding academic output (research projects and publications) could help to support these programs.[68]

In a UK study comparing rural with metropolitan sites, surgical Trainees at rural sites had fewer society communications (not defined by the authors, but likely to include conference attendances) but similar numbers of scientific publications.[99]

Solutions

- Grants and funding for Trainees to attend conferences

In a US-based program, residents are provided opportunities to participate in conferences and national meetings, including the Rural Surgery Symposium and the rural surgery meetings of the ACS Clinical Congress.[76] In Australia, the RACS Annual Scientific Congress includes a rural surgery session as part of its program.[100] RACS and General Surgeons Australia through the Rural Coach Program provide grants for general surgery SET Trainees to attend the Provincial Surgeons Australia annual conference.[101]

- Rural and remote career coordinators

The RACS *Train for Rural* strategy recommends a rural and remote career coordinator program, which would play a role in connecting Trainees with mentors, as well as with rural Fellowships, rural research opportunities, other peer groups and conferences.[22, 24]

- Find alternative ways of encouraging research in non-metropolitan regions

Examples of novel ways of encouraging research in RRR areas include the establishment of clinical trials to provide research opportunities to the junior paediatrics faculty in Hawaii,[102] and a journal dedicated to rural surgery in Pakistan.[103]

- Rewarding rural experience

Currently, having a PhD before specialty training gains selection points for a candidate. For those genuinely interested in an academic career, a PhD and research during training is highly valuable. RACS has proposed allocating the same selection points for a year of rural training as for holding a PhD qualification, which would positively recognise the rural training experience.[6] Suggested options for additional selection points include rural origin, rural medical school experience or rural pre-SET work exposure, already implemented by a number of RACS training programs.[23]

Workforce issues

Barriers

In smaller RRR hospitals the workforce is often at capacity; surgical services can be fragile and need to be supported in order to complete the accreditation and provide the training.[22]

- Health service delivery and training must be balanced
- Health service delivery is the focus of a rural hospital

In RRR training centres, the hospital must balance health service delivery with training.[5, 45] Health service delivery is the priority of all hospitals.[5] For small RRR sites, tension may exist between service provision and the delivery of training, for both the supervisor and the Trainee. Systems and support are needed to provide the supervisor with protected time to facilitate training requirements, and Trainees need time for exam leave.[5] Trainees have recently identified high workload and safe-hours concerns as barriers to training in a rural setting.[14] In a survey of Australian and Aotearoa New Zealand Trainees, rural placements were associated with longer on-call hours.[104]

Service demands of Trainees versus training requirements can also be a problem for a rural hospital.[21] For instance, the General Surgery accreditation standards contain a limit of 2 weeks of night shifts per month for an accredited Trainee.[5]

- Workforce demands that impact training opportunities will differ at each site

Each RRR health service will have different workforce demands to meet the needs of the service, dependent on various issues including scope, practice, infrastructure and nursing staff.[5] For example, not every health service will require specialist services such as heart or cardiothoracic surgical units; facilities may use visiting specialists to provide these surgical services. These issues will also impact a site's capacity for training. Many sites will regard their training placements as an opportunity to build and sustain their workforce.[5]

The Australian and New Zealand College of Anaesthetists (ANZCA) has reported examples of rural health services that have rostered Trainees and structured their workforce differently, so the Trainee experience and environment are excellent.[5]

- Workforce changes can easily impact a small rural hospital, including training opportunities
- Staff support for a training program is needed

Changes in service delivery in small RRR hospitals can impact training, for example if a service is temporarily transferred to a separate private hospital.[5] Colleges should allow flexibility and support in these instances, and acknowledge any temporary changes in training arrangements and how this may impact the accreditation process.[5] For example, in Aotearoa New Zealand, transition of a hospital from a secondary specialist to a rural generalist model of medical care took 10 years and included challenges related to workforce stability.[105] Understanding how healthcare is delivered in different settings and how accreditations impact service delivery is important in making accreditation decisions, including training networks with private hospitals.[5]

It has been identified in US training programs that staff need to be supportive of the adoption of a training program at their hospital.[44]

- Specialist numbers, and therefore supervisor availability, may be low

The low number of specialists in RRR hospitals presents major staffing challenges across clinical disciplines. These specialists are often overworked with fewer resources available to them.[21] If a centre is reliant on very few specialists, the training post is at risk of losing accreditation if one specialist is sick, retires or moves away.[5] Fewer staff can also lead to difficulties in sustaining a positive working culture.[21]

- Recruiting senior specialists who can be supervisors

RRR health services have always documented challenges in recruiting senior medical members of staff. A recent Australian report identified that the greater the number of accredited training posts within a health service, generally the easier it is to fill the positions and the easier it is to attract a specialist workforce.[5]

- Time availability may be limited, impact of service/training time
- Should Trainees be more junior or senior?

The placement of Trainees at a RRR site can be a burden or a benefit to a hospital. A RACS workshop identified limited time and support for supervisors at rural training sites, made more difficult as very junior Trainees are allocated to rural areas.[21] Conversely, more senior Trainees can provide additional workforce support and relevant training experiences.[5]

A narrative review from the US identified that exposure of Trainees to rural training during postgraduate year 3 and 4 is most valuable, as basic skills have already been mastered and the Trainee can be relied on more by surgeon mentors.[95] However, an Australian qualitative study revealed that more-senior Trainees were unlikely to be placed at rural hospitals due to the lack of complex casemix required to achieve the learning outcomes.[14]

- Withdrawal of accreditation and impact on the workforce

Withdrawal of accreditation and loss of Trainees destabilises the existing workforce and can increase the workload of the remaining staff.[5]

It should be recognised that not all RRR health services have the full suite or range of services to be able to train, and the training requirement demands are simply too much for some health services compared to the value that a Trainee post might provide.[5] Smaller specialties such as Cardiothoracic Surgery, Paediatric Surgery and Neurosurgery are unable to expand further into rural areas.[5]

Solutions

Understanding how health services are delivered is important in making accreditation decisions.

Other solutions to workforce issues are included in the following section.

Accreditation process, assessment team and administration requirements

The RACS RHESAP recognises that the standards of the AMC are flexible, and suggests separate accreditation criteria for rural training posts.[22, 24] The NMWS 2021–2031 encourages the AMC and specialist medical colleges to continue to review and reform accreditation practices to enable flexibility in accreditation, to consider local contexts and to promote more RRR training.[6]

For surgical training, reaccreditation occurs every 5 years. At RACS, the accreditation team includes a minimum of 2 specialty-specific Fellows, a jurisdictional representative and a Trainee representative. All assessors are volunteers, gaining CPD points to recognise their involvement.[5]

Barriers

- Time and administrative burden of the accreditation process, lack of support
- Particular challenges for a rural site

The impact of accreditation on the specialist workforce and service delivery is significant and can be especially challenging for a RRR unit.[5] Examples from Australia show that up to 100 hours of work may be necessary to collect and collate the required data for emergency medicine, noting that most of the preparation work must be done by specialists, because they are required to meet with assessors during an accreditation assessment. For intensive care unit (ICU) reaccreditation, the director of medical services devoted 8 hours to its preparation and the intensivist 40 hours.[5] This work is often completed out of normal working hours, as colleges rely heavily on a volunteer member workforce.[5]

The accreditation process in Australia depends on a volunteer workforce. Arrangements for site visits and Fellow availability can be problematic during the accreditation process. In smaller RRR hospitals there is likely to be less support available to specialists to complete the accreditation process. Administrative constraints were identified as a challenge to RRR accreditation in a recent RACS workshop.[21]

The volume of work related to the accreditation process, including documentation, time requirements and other burdens can be prohibitive for health services trying to establish new training posts.[5] Timeframes of accreditation cycles can be a concern, with some departments undergoing 3 cycles of accreditation for 3 specialties within a 2-year period.[5]

In an Australian RRR health service, it can take from 6 months to 2 years to develop and successfully accredit a new training post.[5] The accreditation process can entail multiple steps, including initial letters, documents and data prior to the accreditation visit. The overall process comprises a variety of methods including desktop or paper-based reviews, teleconferences, videoconferences and site visits.

Accreditation or reaccreditation requires the health service to gather the required information, documentation and data; to schedule meetings; and for staff to be available for the assessment.[5] A central person, usually the head of the department, coordinates all the accreditation activity. Feedback from Australian hospitals indicates it can take from 40 hours to 12 months to prepare. Administrative support is not always available. There is also a significant administrative burden associated with multiple accreditation assessments, many requesting similar information. These activities can severely impact the accreditation process. Excessive paperwork and a lack of administrative support were identified as factors leading to hospitals not seeking accreditation in a US orthopaedic setting.[68]

Much of the accreditation work consists of compiling 3–4 years of data, which can take 3 weeks of full-time work. There are few administrative or medical education staff in RRR health services to support supervisors in education and training. Time and attention are diverted from other tasks such as service delivery; specialists often undertake the additional work in their own time.[5] Most RRR units do not have resources to fund these activities.

- Inexperience of the rural specialist or hospital in preparing for accreditation

RRR specialists may be inexperienced in preparing applications to support a training post.[5]

- Administrative burden for specialist medical colleges

Colleges have 4–5-year accreditation cycles. In a recent Australian report, some colleges reported accrediting up to 120 training posts or sites per annum.[5] Where possible, most colleges group accreditation visits by jurisdiction or region, for example, to maximise the time availability of Fellows and minimise travel requirements.[5] Reviewing and streamlining accreditation processes and requirements not only helps small RRR hospitals but may also reduce the work burden for colleges.

- Lack of transparency of accreditation standards

College transparency and engagement in accreditation was recently identified as a challenge for health services and state and territory departments of health in Australia.[5] More detailed information would be useful to help health services understand and clarify the requirements to comply with accreditation standards. Health services advised that without clarity regarding accreditation criteria and requirements, there is limited ability to conduct planning and self-assessment against standards to develop higher-level training capacity in advance of an accreditation assessment.[5] For example, for some specialties, caseload or casemix accreditation criteria are not publicly available.[5]

The RACS training accreditation standards are published, which recognises that the standards allow some flexibility around the requirements of each criterion.[29]

- Evidence requirements

No identified publication explicitly described issues related to evidence collection for the purposes of hospital training-post accreditation.

- A highly formal accreditation process can negatively impact rural training posts

International evidence suggests that a formal process for accreditation of training hospitals led to a reduction in Trainee surgeons in rural and regional areas in Japan.[106, 107]

Solutions

- Flexibility in the accreditation process and a risk-based approach

At one large regional health service, the director of medical education oversees all accreditation within the organisation. At this site, where possible, early warnings about issues and potential problems related to accreditation are raised and immediately dealt with. This has led to the suggestion of ongoing risk-based accreditation systems based on quality assurance/quality improvement, rather than defined formal accreditation processes and visits that are particularly burdensome for smaller hospital sites.[5] This represents a solution-based system whereby any issues are identified and resolved early and in an ongoing manner, rather than only when formal accreditation is undertaken. An evaluation framework to gather data, provide evaluation and improve RRR initiatives is recognised by the RACS RHESAP.[24]

- Sharing information between specialties
- Coordinating accreditation activities across specialties

The NMWS acknowledges that stronger collaborative planning and information-sharing is needed among shareholders in the medical workforce sector. Common terminology and definitions will allow merging of information and guide policy decisions regarding the number of training places.[6]

Colleges, specialties and subspecialties should work together to reduce duplication and administrative burden. A recent Australian report identified a range of possible ways in which this could be achieved. Different accreditation assessments often request similar information that is generic across health services, for instance, human resources, industrial relations, Trainee wellbeing, and safety policies and measures.[5] Common accreditation information could be shared across colleges and specialties. Adopting common terminology and definitions across specialty accreditation frameworks has been identified as one important way to reduce the administrative burden.[5]

New RACS accreditation standards will have separate accreditation elements: part A will be hospital-wide (not specialty-specific); part B will be speciality-specific and will need to be addressed at the department level. In addition, several standards will be joint standards across RACS and STBs.[29] This process will help to streamline the accreditation process and allow sharing across specialties.

Some colleges share relevant hospital accreditation data across specialties. For instance, the Royal Australasian College of Physicians (RACP) accreditation program allows information related to the entire health service to be gathered once, allowing ‘whole of health service’ accreditation. The RACP is also automating the accreditation process to limit time burdens and collect data that will improve monitoring between visits.[5]

Having a common online portal for accreditation would create efficiencies and reduce the burden on RRR hospitals.[5]

Accreditation activities could be aligned and coordinated across different specialties or colleges to occur at the same time. However, this may be difficult in practice, as it would require the coordination of various specialties, and much of the work may still fall to certain individuals.[5]

- Composition of site accreditation teams

Conflict of interest policies and processes for accreditation teams to follow help to ensure fair assessments in cases of competing interests with other healthcare and training providers. RACS considers any conflicts of interest:

> by each of the STBs in relation to any perceived, real or potential conflict of interest of accreditation teams to ensure the integrity of the accreditation process. As such, the construct of the team ensures that members of the accreditation teams are not employed by the health service, area, region or district. In addition, team members must not be part of the same training network or program.[5]

Managing conflicts of interest is also recognised in the RACS RHESAP.[24]

Consistency of the assessment team is particularly important in the accreditation of RRR health services. If the assessment team has little knowledge of the RRR health service environment this can lead to variations in assessments between facilities.[21] It is beneficial for RRR Fellows or Fellows with RRR experience or specific knowledge of rural issues to be included in accreditation teams for rural surgical training posts.[5] This currently occurs on an ad hoc basis.[5]

Including jurisdictional representatives and/or independent observers in accreditation assessments will benefit the impartiality of the accreditation process.[5]

- Provide good quality feedback

Improved feedback mechanisms to smaller RRR units as part of the accreditation process will help support Trainees and supervisors in raising issues that need attention.[5]

- Provide tools and support to assist small rural centres

In a small RRR centre it can be more difficult for bullying and harassment issues to be reported anonymously as part of the accreditation process. A centralised hub to support the workforce, as found in metropolitan units, is helpful in this regard.[5] Alternatively, 360-degree reviews, whole-of-hospital surveys, and transparent complaints processes and analyses would be beneficial to identify and treat problematic behaviours such as bullying.[21]

- Resourcing administrative support and/or creating hubs or units to assist in the accreditation process

In RRR and smaller health services there is often no infrastructure or administrative support for the accreditation process.[5]

In some healthcare centres or jurisdictions, medical education and medical workforce units—often with oversight from the director of medical education or the executive director of medical services—provide a centralised hub or resources, including short-term administration for the accreditation process.[5]

A recent workshop recommended a dedicated unit within RACS, or across a network of rural hospitals, to provide support to rural facilities seeking accreditation. This unit could provide advocacy, education, oversight of data, and assistance to develop evidence to show that specific rural training sites—while being different in some cases to metropolitan sites—do meet the training needs of STBs.[21]

Infrastructure requirements

Barriers

In Australia, it was noted in a recent review that 'a site or a training post may be worthy of accrediting, but sometimes it can be too much of an imposition on a RRR health service to commit to developing it to accreditation stage.'[5]

Information technology (IT) infrastructure and a lack of dedicated Trainee spaces have been identified as being specific barriers to training-post accreditation in Australia.[21]

In a review of ACS and ACGME rural surgery training opportunities and a description of the creation of a new training program, appropriate teleconferencing facilities was considered to be a barrier to the process of developing a rural surgery training track.[75]

Solutions

- Support to develop the necessary training infrastructure, including IT and dedicated training spaces

RRR sites would benefit from support to develop the necessary training infrastructure.[5, 21] In addition to benefiting Trainees, these educational facilities could be considered in the retention and recruitment of the clinical workforce.[45]

Costs

Barriers

Accreditation and specialty training can be costly for hospitals, making it difficult for them to complete the accreditation process.

- Costs for accreditation

Financial hurdles must be resolved when establishing a new program. In the US, transition costs for new sites are not insignificant and additional funding (beyond Medicare graduate medical education funding) is often needed to establish new teaching hospital programs.[44] In one hospital, the total startup costs (staff and other expenses) for establishing 5 programs was almost US$4 million.

In the US context, excessive costs and a lack of faculty support were identified as reasons for sites not to join a new single accreditation system for otolaryngology and ophthalmology programs.[68] Program size, faculty and scholarly requirements (including research projects and publications) were identified as contributing to increased costs and program closure. Authors identified the need to address the lack

of institutional commitment and the high cost of maintaining subspecialty programs (particularly in high-need areas), as reasons to re-examine the accreditation requirements and seek increased support for these units.[68]

- Costs for training

For a rural hospital or training unit in the US, securing funding for a surgical training position was considered to be a barrier to ACGME surgical training positions.[75]

In Australia, many rural health services face higher costs for specialist training.[5] In addition to the costs to the training unit of having a Trainee, remote areas often have dedicated industrial agreements for accommodation, car and travel requirements, and higher wages.[5]

Some jurisdictions report a secondment fee, being a percentage of on-costs that must be paid for every seconded Trainee. For health services with fiscal constraints, such as those in rural areas, these additional costs can be prohibitive.[5] Managing Trainees who rotate between jurisdictions or between the public and private sector (if paid under different state and territory awards) may also be difficult for a small rural hospital.[5] The portability and preservation of entitlements across jurisdictions is an issue for Trainees, one recognised in the RACS *Train for Rural* strategy.[20, 22, 24]

These issues can lead to an inequitable system, depending on which health service can offer payment for relocation and accommodation costs, leading to differences in support and expectations between Trainees and service registrars.[5] A service registrar is a senior prevocational doctor who has not applied for or been admitted to the SET program, and who is working in a similar role to a SET trainee under supervision within a surgical unit.

Solutions

No specific solutions were identified in the literature.

Solutions for RRR centres may include access to financial support from government or other training or funding bodies, or partnerships with larger centres that may be able to provide financial or in-kind support.

6. Discussion

There is an inequitable distribution of surgeons and other specialists and training posts in RRR areas of Australia. While this issue is reflected in many countries around the world, the large geographical distances in Australia and the nature of postgraduate medical specialist training program needs and training-post accreditation requirements create unique challenges in providing rural specialty training and increasing the number of rural training posts.

RACS and other colleges are actively investigating this issue.[24, 108-113] The Commonwealth Government has also published reports presenting the issues and providing strategic direction with a plan to increase rural training opportunities and boost the rural health workforce.[5, 6] This will increase the number of training sites and thus place further demands on rural health services.

This report focused on the published literature, forms one of several elements of the FATES *Rural accreditation – addressing barriers to rural specialist training* project. As such, there are some acknowledged limitations to the report as a standalone document.

The literature sources were restricted to accessible material, therefore any unpublished material (e.g. accreditation requirements of specialty societies) was not investigated. This literature review did not follow-up the previous and ongoing work of stakeholders, so the progress (or lack thereof) of current activity is not considered. This review was aimed at identifying broad issues. Future work within the FATES program will undertake valuable follow-up of many of the identified issues. For the international literature, each publication reflects issues related to its particular jurisdiction and should be considered in that context.

There were relatively few publications explicitly addressing barriers and solutions to the accreditation of training posts in non-metropolitan centres. So, while many issues relating to RRR training and training-post accreditation are recognised in the medical community, there is limited high-quality research on this subject. Given the varied issues involved, and the variety of circumstances at each RRR site, the lack of formal trial data is not surprising. However, many publications, including retrospective analyses and narrative reviews, did provide information on aspects of training and accreditation, including those related to the questions of this review.

Increased subspecialisation and the reduction in the scope of surgery across many specialties is an issue in many countries. The value of the rural surgeon and of appropriate rural or more generalist training is clear. The US, in particular, has long been conscious of the decline in numbers of generalist surgeons and its effects, particularly in rural areas, and has established a number of well-described rural surgical programs. Much of this information is based on limited evidence for general surgeons, but many of the identified principles can be applied to other specialties.

While a detailed examination of casemix and training curricula was beyond the scope of this literature review, the casemix and case volume in RRR hospitals is clearly different to that in metropolitan centres. Certain aspects associated with accreditation, such as research, are also more difficult in a RRR setting due to a lack of resources; however, the RRR setting provides other valuable opportunities to the

training experience, such as increased independence, a broad scope of practice, a mix of experiences, and interactions with First Nations people. A common issue was that accreditation requirements were too inflexible and did not allow for or recognise these differences. It is important to acknowledge the individuality of each site and each training experience, particularly in a country as large as Australia. Rather than accept the limitations of a small RRR site, accreditation standards should be flexible enough to recognise the value of the broader experience and the more general and varied scope of practice that RRR training posts provide compared to a traditional metropolitan teaching hospital. The current AMC accreditation standards do allow for a flexible approach.

Training solely based on case numbers can be problematic for RRR training sites. Training to competency was not specifically investigated as part of this literature review. This should be considered part of the specialty-specific curriculum development that would subsequently progress to changes in the accreditation requirements.[114-117] Work in this area should proceed in line with the requirements of each specialty and be applied to training programs as needed.

Rather than focusing on the burdens of accreditation and the difficulties in accommodating Trainees in a RRR setting, the literature demonstrated that the benefits of addressing problems related to training-post accreditation can flow to the broader workforce and health service. These include access to infrastructure, improved (cross-specialty) collaboration and interprofessional learning, and increased services and workforce capacity. As well as having a direct impact on the productive healthcare system, Trainees can indirectly lead to an improvement in the recruitment and retention of specialists.

Nationally and internationally, there are many societies and bodies that support, promote and advocate for the work of rural supervisors. This review identified that flexibility in terms of how many specialists are needed to supervise, how the quantity of supervision is measured (e.g. hours of direct supervision rather than absolute number of supervisors), who these supervisors should be, and where the supervisors are located (i.e. remotely or as part of a broader network) are important considerations to allow supervisors to operate effectively in RRR settings where the number and type of specialists may be limited.

The workforce in RRR hospitals is often stretched to capacity and must balance a range of demands, including healthcare delivery, training requirements and the significant obligations of the accreditation process. Several solutions were identified to help address the demands of the accreditation process, including collecting data in an ongoing manner and reducing duplication by sharing and coordinating information and activities across colleges and specialties. RRR centres could also benefit from administrative support or hubs to provide assistance for the accreditation process.

7. Conclusions

This literature review investigated 2 research questions: What are the unique opportunities rural training posts can provide? and How can barriers impeding Australian rural surgical training-post accreditation be overcome?

- Unique opportunities for the Trainee

    - RRR training posts are different to training in a metropolitan setting. They are nevertheless valuable, with a positive Trainee experience, varied scope of practice and more first-hand operator experience.
    - Unlike training in metropolitan hospitals, rural training enables trainees to develop rural practice capability and rural self-efficacy, increasing their confidence to work rurally in future.
- Unique opportunities for the health system
    - RRR training posts help attract and maintain senior clinicians. Trainees, particularly senior Trainees, can enhance the local workforce and receive relevant experience. The greater the number of training posts, the easier it is to attract a specialist workforce.
    - Rural training experience is positively correlated with future rural practice, and that increasing rural training is one lever to reduce workforce maldistribution.
- Caseload, casemix and training opportunities
    - Surgical demands at RRR hospitals vary and differ from those at large metropolitan hospitals. This is reflected in the scope of the RRR training experience. There is a need to recognise the strengths of the casemix and other aspects of the scope and opportunities that RRR training can provide. The accreditation standards and training requirements should be flexible to allow for this, rather than be metro-focused and based on case numbers. There must be a recognition of the more generalist scope of practice and interdisciplinary benefits of a RRR placement. While there may be less exposure to some procedures (i.e. more complex cases or more specialised procedures), for other procedures the numbers of cases and the exposure to training opportunities can be greater. Trainees need a broad experience of conditions and procedures. Specialty collaborations and training networks can help in this regard.
- Supervision requirements
    - Supervisors should be provided with support, training and effective advocacy.
    - The number of specialists at rural centres can be low. A key barrier in achieving hospital training-post accreditation in Australia is the requirement for 2-3 FRACS supervisors for each Trainee. Flexibility in the number of supervisors could be based on total FTE hours of direct FRACS supervision. Partnerships with other specialties or subspecialties, and off-site, remote (e.g. telementoring) or network supervision models would be helpful. Younger Fellows, locums or SIMGs could also play a role. The role of supervisors as mentors should be acknowledged and developed, as well as the value of peer support.
- Infrastructure and workforce requirements, and administrative burden on the health service
    - Rural hospitals must balance the workforce requirements of healthcare delivery, supervision and training. Senior Trainees can provide additional workforce support to a rural hospital. However, the demands of the accreditation process (and training delivery) can be a burden, particularly for less experienced rural centres. Transparent information would be valuable to understand and clarify what is needed to comply with

the accreditation standards. A more flexible approach to gathering and presenting the evidence needed for accreditation could be beneficial, including coordinating and sharing information and activities across specialties and colleges. Standardising terminology and definitions would also be helpful. Tools and support (such as centralised hubs or networks for administrative support) could be valuable. As part of the accreditation process, ensuring rural knowledge within the accreditation assessment team and providing good-quality feedback is essential.

    - Rural sites may need help to develop the necessary training infrastructure, including IT support. These facilities can also benefit the broader workforce. Financial support or partnerships with larger centres may also be helpful for rural units to gain accreditation.
- Evidence generation requirements for accreditation applications
    - No specific information was identified; however, conclusions relevant to infrastructure and administrative requirements are relevant to this question.
- Lack of transparency of accreditation standards
    - It is a significant commitment for a rural site to apply for an accredited training post. The accreditation standards need to be transparent, so the site is properly informed and understands the requirements.
- Other issues
    - Research in a rural site is often difficult, due to distance from other units and a lack of infrastructure. Linkages with rural universities and medical schools, as well as funding for conference attendance, would support this aspect of the accreditation requirements. Other aspects of the broader rural experience should be recognised as being valuable to the Trainee as an alternative to the research requirement.
    - The process of preparing for accreditation and providing training can be costly. Support should be provided for rural sites to meet the costs for seconded Trainees and for Trainee entitlements to be preserved across all sites.

8. Appendix A: Other information

8.1. Training programs in other countries

United States

The standards of education and training for Fellowship programs in the US are governed by the regulatory body ACGME.[118] Residency and Fellowship programs can obtain accreditation status and the majority of training programs involve multiple hospitals and clinical training sites.[119] Unlike many nations around the globe where a single college of surgeons holds responsibility for this comprehensive process, in the US this goal is achieved through collaboration of delegated authority regulatory organisations, professional societies, teaching institutions and dedicated teaching faculty.[120] The following information is taken from ACGME:[119]

- The Sponsoring Institution is the organisation or entity that assumes the ultimate financial and academic responsibility for a program of graduate medical education.
- The Participating Site is an organisation providing educational experiences or educational assignments/rotations for residents and can include amongst other sites a hospital (inpatient and outpatient settings), university, a medical school, and a teaching hospital. All participating sites must have a formal agreement with the sponsoring institutions.
- The program in conjunction with the sponsoring institution and the participating sites must provide adequate resources and ensure an appropriate learning environment for the Trainees.
- Supervision requirements are decided by the program director.

Healthcare providers in the US have long been conscious of the decline in numbers of generalist surgeons and the effects of this, particularly in rural areas, as well as the decline in emergency and trauma care.[35, 41, 66, 121-123] Studies have investigated and described the relevant skills of a rural surgeon.[40, 61, 95] The ACS and others have published lists of rural training programs.[72, 124-126]

There are several examples of descriptions of rural surgical programs,[44, 70, 71, 75-77] and studies have also investigated problems in achieving the ACGME requirements.[68, 69]

United Kingdom

The UK has a centralised training pathway for surgeons (similar to Australia), consisting of 2 years of foundation training, followed by 2 years of core surgical training in a hospital setting with rotations covering a range of surgical specialties, and approximately 6 years of specialty training. All training posts in the UK are in NHS hospitals, and the General Medical Council (GMC) approves each site for the given training program.[127] Each training post is controlled in terms of the number of Trainees, and each training opportunity is a combination of site, specialty and educational supervisors. The GMC has emphasised the need for increased flexible training options, including a more consistent approach to training doctors in rural and remote areas.[128] The RCS England and RCS Edinburgh recognise the importance of rural surgery training and have published standards and commentary on this issue.[64, 65, 129]

Canada

Similar to the US, Canada has residency programs attached to educational institutions rather than through a college directly. These residency programs are then accredited by the Royal College of Physicians and Surgeons of Canada.[130] Residency programs are led by a program director.

Fellowships after residency training are not accredited by the college, but rather by one of the university postgraduate medical education offices in Canada. These Fellowship programs are monitored by the individual program and supervisor, and meet provincial, university and hospital guidelines regarding the supervision of Trainees.[118]

There has been limited publication of programs focused on rural surgery, but a small number of reviews of provincial examples have been undertaken.[131-133] The Canadian Association of General Surgeons has a rural mentorship program to support and mentor current and future rural general surgeons.[91]

8.2. Examples of rural-specific curricula and programs

In Australia and Aotearoa New Zealand, RACS has identified a number of initiatives for rural training in the RHESAP.

the RACS Rural Health Equity Strategy *Train for Rural* has proposed a dual Fellowship to deal with the issues of equity and flexibility in rural surgical training posts. The dual Fellowship in a primary specialty plus a RRR focus.[22] Specifically, the Global, Remote/Rural/Regional and Deployable (GRiD) Fellowship would include 2 or more years of rural experience after completion of primary fellowship alongside a generalist skills curriculum and would prepare Fellows to provide care in a rural/remote area as well as deployment to regional and/or global humanitarian or military work.[22]

Other RHESAP initiatives are to select Trainees with rural origin or experience to the SET program, and for all SET trainees to have rural training.[23]

RACS has also proposed the Central and Northern Australia Surgical selection initiative as part of the Rural and Remote Central and Northern Australia Surgical Service Strategy (RCANS), where access to rural training is used as a pathway to sustainable remote surgical services.[22] This program would sit alongside SET selection.

The RACS RHESAP as well as a recent Australian report recommends the development of rural-facing curricula.[5, 22, 24]

In Australia, feedback from current and past Rural Coach Program participants is that available rural training posts and pathways are not always understood.[22] A rural and remote career coordinator would play a role in helping Trainees and would assist in planning their training, networking and career goals.[22]

There were no explicit examples of published rural training programs in Australia. One study described the rural workforce in Western Australia (WA). Across 7 health regions there were 40 resident surgeons (and an additional 124 fly in/fly out surgeons and 31 GP proceduralists). Although the study did not attempt to quantify surgical Trainee positions, it was identified that Trainees accompanied 70% of the

resident rural surgeons surveyed, which was considered to reflect a proactive attempt at rural training and recruitment in WA.[81]

In the US, rural practice has been found to be associated with the completion of a surgical residency program committed to rural training, and dedicated residency programs have been developed over many years with a focus on training the rural general surgeon.[41, 125] The ACS has proposed 3 opportunities for rural surgical training: adding rural surgery opportunities as electives for interested residents, creating new residencies with a primary focus on rural surgery, and providing Fellowship opportunities to allow Trainees to focus on surgical experiences most relevant to rural practice.[60, 134] The ACS has a published list of general surgery training programs in the US (compiled by the ACS's Rural Surgery Advisory Council) that have a special focus (or track) related to rural surgery.[124] A separate study of ACS programs and those from other sources has identified a total of 44 programs that indicated they could accommodate a rural surgical resident, involving a customised track extending from some months up to 7 years residency.[126]

Canada has a varied inclusion of training in rural settings in its Standards of Accreditation for Residency Programs and Training Experiences. Outreach to or inclusion of rural experiences is included in the requirements of some, but not all, specialties.[135-137]

In Canada, the CanMEDS postgraduate medical education framework for improving patient care by enhancing physician training has been applied to rural training. A program was created to enhance the rural relevance of specialist education and to provide specialty residents the opportunity to perform part of their training in rural and regional settings.[133] Data from the Northeastern Ontario Postgraduate Specialty program and the Northern Ontario School of Medicine show a positive association of these initiatives with Trainees practicing in rural locations or smaller cities.[131, 132]

A consistent approach to training doctors in rural and remote health has been recognised by the GMC in the UK.[128] The RCS Edinburgh has proposed standards and specific examples of training for rural surgery across a range of subspecialties.[129]

9. Appendix B: Methods

Literature searches in peer-reviewed databases

A systematic literature search in Medline and Embase was undertaken on 25 May 2023 using a strategy structured to [surgery] AND [accreditation and components] AND [rural] AND [barriers and incentives].

The complete search strategies are shown in Table 1 and Table 2.

Supplementary searches for grey literature

The formal searches were supplemented by web-based searches using Google. The following sites were searched:

- Australian Government Department of Health and Aged Care https://www.health.gov.au/
- Royal Australasian College of Surgeons https://www.surgeons.org/en
- Royal College of Surgeons of England https://www.rcseng.ac.uk/
- Royal College of Surgeons of Edinburgh https://www.rcsed.ac.uk/
- UK Department of Health and Social Care https://www.gov.uk/government/organisations/department-of-health-and-social-care
- UK National Health Service https://www.nhs.uk/
- UK General Medical Council https://www.gmc-uk.org/
- American College of Surgeons https://www.facs.org/
- Royal College of Physicians and Surgeons of Canada https://www.royalcollege.ca/
- Health Canada https://www.canada.ca/en/health-canada.html
- World Health Organization https://www.who.int/

Sites were searched using the following terms on Google:

- site:https://www.health.gov.au// rural training post accreditation

The first 2 pages were investigated for relevant information. In the case of no hits or a small number of hits the search was repeated using the terms ‘rural training’ or ‘rural’.

Study selection

Studies were selected based on reference to the research questions. Study selection was inclusive due to the broad nature of the research questions and the likelihood of a varied range of study types that may address the questions. Study selection included any description of system issues associated with hospital training-post accreditation or of barriers to or enablers for surgeons training in rural hospitals. There was no restriction based on study type or publication date.

Study extraction

Studies were extracted to a standardised table in MS Excel. Relevant themes were identified, and study methods and results were extracted. Results were described narratively because formal data synthesis was not possible.

Table 1 Ovid MEDLINE search (1946 to 25 May 2023)

No.	Search term	Number of hits
1	surgery.mp.	3,041,932
2	surgeon$.mp.	250,433
3	General Surgery/	40,521
4	surgical.mp.	1,564,976
5	cardiothoracic surg$.mp.	4,859
6	Thoracic Surgery/	13,704
7	cardiac surgery/	13,704
8	neurosurg$.mp.	92,868
9	Neurosurgery/	16,741
10	orthop?dic.mp.	86,777
11	Surgery, Oral/	8,152
12	Surgery, Maxillofacial/	8,152
13	(Otolaryngology Head and Neck Surgery).mp.	2,212
14	Pediatrics/	57,841
15	p?diatric surgery.mp.	5,367
16	surgery, plastic/	28,124
17	(Plastic and reconstructive surgery).mp.	6,492
18	plastic surgery.mp.	72,956
19	Urology/	13,490
20	urology.mp.	31,628
21	Vascular Surgery/	33,641
22	Vascular Surgery.mp.	14,924
23	or/1-22 [surgery]	3,686,428
24	regional medical programs/	3,769
25	accreditation/	1,5052
26	residency/	59,865
27	training.mp.	579,912
28	accreditation.mp.	31,045
29	standard$.mp.	2,222,804
30	program$.mp.	1,209,410
31	residency.mp.	75,831
32	fellowship.mp.	13,238
33	train$.mp.	746,918
34	curriculum/	86,533
35	education, medical/	60,955
36	education, medical, graduate/	33,160
37	education.mp.	1,053,662
38	curricul$.mp.	122,606
39	supervis$.mp.	94,107
40	case load.mp.	1,094
41	case mix.mp.	6,523
42	infrastructure.mp.	51,933
43	facilit$.mp.	959,073
44	administrat$.mp.	2,948,308
45	or/24-41 [accreditation and components]	4,399,866
46	rural hospital$.mp.	4,550
47	rural.mp.	201,776
48	remote hospital$.mp.	232
49	regional hospital$.mp.	6,870
50	50 rural health/	23,911
51	rural health services/	13,963
52	hospitals, rural/	5,218
53	or/46-52 [rural]	208,288
54	barrier$.mp.	412,793
55	issue$.mp.	700,305

56	facilitat$.mp.	688,133
57	benefit$.mp.	966,456
58	limitation$.mp.	435,777
59	alternative$.mp.	758,952
60	insight.mp.	269,423
61	review$.mp.	4,401,445
62	evaluate$.mp.	3,126,225
63	improv$.mp.	3,287,876
64	flexib$.mp.	229,424
65	problem$.mp.	127,1175
66	solution$.mp.	893,631
67	support$.mp.	11,428,062
68	assistance.mp.	80,490
69	compliance.mp.	189,239
70	encourage$.mp.	128,914
71	enable$.mp.	503,374
72	opportunit$.mp.	334,837
73	strateg$.mp.	1,495,189
74	or/54-73 [barriers and incentives]	19,735,065
75	23 and 45 and 53 and 74	3,203

Table 2 Embase <1974 to 2023 May 25>

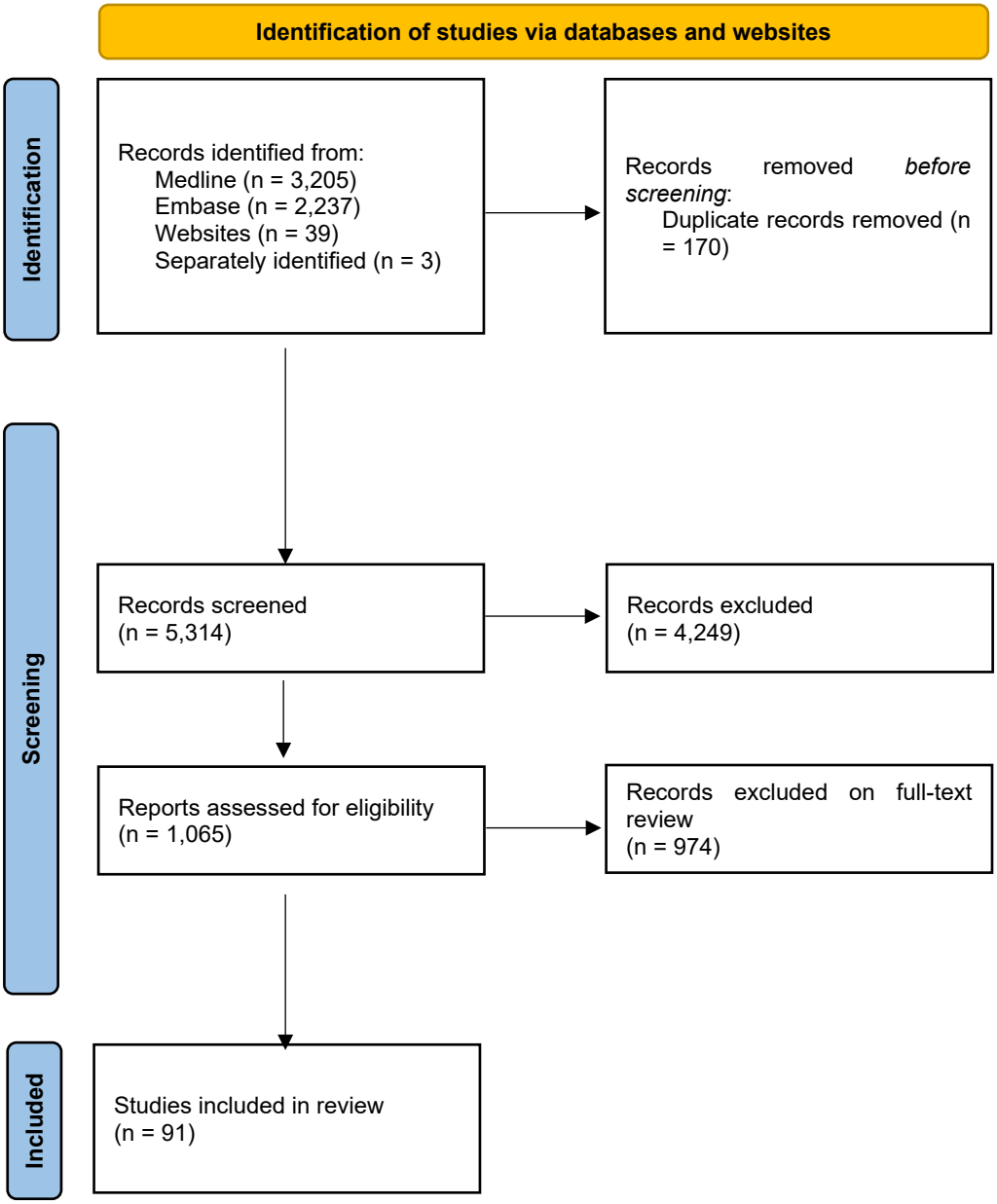
No.	Search term	Number of hits
1	surgery.mp.	4,282,070
2	surgeon$.mp.	437,320
3	General Surgery/	20,688
4	surgical.mp.	2,013,672
5	cardiothoracic surg$.mp.	8,518
6	Thoracic Surgery/	38,432
7	cardiac surgery/	96,326
8	neurosurg$.mp.	129,892
9	Neurosurgery/	72,708
10	orthop?dic.mp.	120,085
11	Surgery, Oral/	20,705
12	Surgery, Maxillofacial/	0
13	(Otolaryngology Head and Neck Surgery).mp.	6,223
14	Pediatrics/	93,621
15	p?diatric surgery.mp.	28,097
16	surgery, plastic/	64,548
17	(Plastic and reconstructive surgery).mp.	11,585
18	plastic surgery.mp.	73,791
19	Urology/	40,216
20	urology.mp.	66,293
21	Vascular Surgery/	38,201
22	Vascular Surgery.mp.	53,413
23	or/1-22 [surgery]	5,048,925
24	regional medical programs/	108,833
25	accreditation/	39,943
26	residency/	13
27	training.mp.	832,730
28	accreditation.mp.	49,453
29	standard$.mp.	2,689,374
30	program$.mp.	1,779,613
31	residency.mp.	67,696
32	fellowship.mp.	21,688
33	train$.mp.	1,056,806

34	curriculum/	104,039
35	education, medical/	221,709
36	education, medical, graduate/	231,087
37	education.mp.	1,388,333
38	curricul$.mp.	142,040
39	supervis$.mp.	121,486
40	case load.mp.	1,720
41	case mix.mp.	10,215
42	infrastructure.mp.	63,852
43	facilit$.mp.	117,6851
44	administrat$.mp.	4,035,269
45	or/24-41 [accreditation and components]	5,875,921
46	rural hospital$.mp.	6,426
47	rural.mp.	241,892
48	remote hospital$.mp.	395
49	regional hospital$.mp.	10,922
50	rural health/	2,062
51	rural health services/	13,520
52	hospitals, rural/	1,298
53	or/46-52 [rural]	252,438
54	barrier$.mp.	543,419
55	issue$.mp.	907,808
56	facilitat$.mp.	855,530
57	benefit$.mp.	1,370,975
58	limitation$.mp.	562,354
59	alternative$.mp.	1,017,172
60	insight.mp.	334,941
61	review$.mp.	5,314,329
62	evaluate$.mp.	4,526,423
63	improv$.mp.	457,2054
64	flexib$.mp.	27,0928
65	problem$.mp.	1,563,955
66	solution$.mp.	1026610
67	support$.mp.	2,614,731
68	assistance.mp.	104,890
69	compliance.mp.	399,175
70	encourage$.mp.	174,136
71	enable$.mp.	619,719
72	opportunit$.mp.	439,439
73	strateg$.mp.	1,922,389
74	or/54-73 [barriers and incentives]	18,375,642
75	23 and 45 and 53 and 74	4,967
76	limit 75 to "remove medline records"	2,237

10. Appendix C: Results

PRISMA flowchart

Figure 1 PRISMA flow chart



Included studies: Peer-reviewed

Table 3 Summary of included studies

Study ID	Country	Study design and methodology	Study aim	Caseload	Casemix	Training	Supervision	Infrastructure	Workforce	Evidence requirements	Lack of transparency	Administration	Costs	Opportunities	Research	Attractiveness
Ahmed 2022	USA	Directory review Survey	To determine the challenges faced by former accredited surgical subspecialty programs during the transition to ACGME accreditation	Y		Y						Y	Y		Y	
Bappayya 2019	Australia	Retrospective audit of a single hospital	To examine the caseload distribution of general surgeons working in regional Australia		Y											
Borgstrom 2013	USA	Narrative review	Description of novel training models			Y										
Brown 2018	UK	Observational review of general surgery rotations	To determine the outcome of core surgical training rotations involving rural compared with urban general hospitals in a single UK deanery	Y	Y	Y						Y			Y	
Campbell 2011	Australia	Retrospective audit of 2 surgeons	To describe the workload of surgeons working in a rural centre with outreach practices		Y											
Campbell 2013	Australia	Retrospective audit of 2 surgeons	To describe the workload of surgeons working in a rural centre with outreach practices		Y											Y

Study ID	Country	Study design and methodology	Study aim	Caseload	Casemix	Training	Supervision	Infrastructure	Workforce	Evidence requirements	Lack of transparency	Administration	Costs	Opportunities	Research	Attractiveness
Carson 2009	Australia	Narrative review	Description of specialist care services in rural and remote Australia			Y										
Chong 2015	Australia	Survey	To determine whether RSTP had achieved its objectives of training surgeons for and retaining them in rural practice in Australia		Y	Y	Y									Y
Clancy 2022	ANZ	Narrative	Description of strategy			Y										Y
Cogbill 2007	USA	Narrative	To describe the training and recruitment of surgeons in rural America		Y	Y	Y									Y
Cogbill 2012	USA	Narrative review	Contemporary issues in rural surgery		Y	Y	Y									Y
Deal 2018	USA	Survey	To determine rural surgeons' opinions about the skill set needed in a rural practice to inform curriculum development for rural general surgery residents			Y										
Deveney 2009	USA	Narrative review	To describe a single residency program at a rural hospital			Y	Y									
Doty 2006	USA	Survey review of surgical logs	To examine the hypothesis that general surgical residents undergoing broadly based training are			Y										Y

Study ID	Country	Study design and methodology	Study aim	Caseload	Casemix	Training	Supervision	Infrastructure	Workforce	Evidence requirements	Lack of transparency	Administration	Costs	Opportunities	Research	Attractiveness
			more likely to practice in a rural location													
Doty 2009	USA	Observational study of existing training programs	To describe the extent to which general surgery residency training is likely to prepare future rural surgeons			Y										
Doty 2009a	USA	Narrative review	To review the past and current rural surgery literature including training			Y										
Fergusson 2022	UK	Survey	To describe Scottish surgical Trainees' attitudes towards training and working in remote and rural surgery, perceived barriers to recruitment and potential solutions			Y										Y
Grandizio 2022	USA	Non-randomised comparative study	To compare the teaching performance of a rural, academic orthopaedic surgery faculty with/without compensation for time spent teaching			Y	Y		Y				Y			
Hao 2020	USA	Retrospective log review and survey	To evaluate the institution's rural rotation in meeting ACGME minimum case requirements and residents' perceptions of educational value	Y	Y											Y
Hogenbirk 2011	Canada	Administrative dataset review	To determine if there is an association between northern			Y										Y

Study ID	Country	Study design and methodology	Study aim	Caseload	Casemix	Training	Supervision	Infrastructure	Workforce	Evidence requirements	Lack of transparency	Administration	Costs	Opportunities	Research	Attractiveness
			training and northern practice location for physicians enrolled in a postgraduate specialty program (including surgery)													
Hogenbirk 2022	Canada	Administrative dataset review	To examine (cross-sectional study) practice location 10 years after the first class graduated from the Northern Ontario School of Medicine, Canada													Y
Hughes 2022	USA	Survey	To understand the scope of cases in which residents participate during rural general surgery rotations and the value residents and program directors find in such rotations													Y
Hyppolyte-Blake 2022	Australia	Survey	To explore the incentives and barriers that influence preference for rural placements during surgical training in Australia		Y	Y										
Jarman 2009	USA	Survey	To identify reasons that general surgery residency graduates choose rural versus urban practice													Y
Kiroff 1999	ANZ	Narrative	A commentary on training, retraining and		Y				Y							

Study ID	Country	Study design and methodology	Study aim	Caseload	Casemix	Training	Supervision	Infrastructure	Workforce	Evidence requirements	Lack of transparency	Administration	Costs	Opportunities	Research	Attractiveness
			retaining rural general surgeons													
Kiuru 2021	ANZ	Literature review	To identify modes of delivery to improve access to rural postgraduate education		Y		Y		Y					Y		
Lauer 2019	USA	Cost analysis Survey of program directors	To define the costs of a graduate medical education program within an integrated (rural) healthcare system			Y	Y						Y	Y		Y
Mercier 2019	USA	Analysis of training programs	To present the process of developing a rural surgery training track within an established residency program and to review the current rural surgery training programs in the nation		Y	Y	Y	Y					Y			
Moesinger 2009	USA	Description of the creation of a new training program	To describe a curriculum for postgraduate (one-year Fellowship) rural surgery training		Y	Y				Y						
Mulcahey 2018	USA	Narrative review	To describe the general orthopaedist in the USA, including issues related to rural and training			Y			Y							
Nuss 2015	USA	Description of the establishment of new programs	To describe current graduate medical education funding and the establishment of new programs			Y							Y	Y		

Study ID	Country	Study design and methodology	Study aim	Caseload	Casemix	Training	Supervision	Infrastructure	Workforce	Evidence requirements	Lack of transparency	Administration	Costs	Opportunities	Research	Attractiveness
O'Grady 2010	ANZ	Survey	To define the current working hours of Australasian Trainees	Y												
Petersdorf 1975	USA	Narrative review	To describe issues in numbers, distribution and equity of health staffing, including in rural areas			Y			Y							
Polk 2012	USA	Focused meeting	To verify and clarify the causes and extent of general surgery workforce shortfalls. To define solutions within the existing framework of medical accreditation and certification			Y										
Puls 2013	USA	Narrative review	To describe rural surgery by American College of Surgeons leaders			Y										
Richardson 2015	USA	Interview	To describe rural surgery in the US including training			Y										
Rossi 2018	USA	Thematic observational study	To describe rural surgery training programs and procedures that are included			Y										
Rossi 2020	USA	Thematic observational study	To delineate essential components of rural training programs		Y	Y										
Rourke 2005	Canada	Narrative review Survey	To describe an innovation in rural medical training for specialist physicians			Y										

Study ID	Country	Study design and methodology	Study aim	Caseload	Casemix	Training	Supervision	Infrastructure	Workforce	Evidence requirements	Lack of transparency	Administration	Costs	Opportunities	Research	Attractiveness
			using the CanMEDS framework													
Russel 2023	ANZ	Mixed method review (literature review, interviews)	To investigate the drivers of declining GP training uptake in the Northern Territory and identify and rank potential solutions				Y						Y			
Ryan 2016	USA	Survey, retrospective review of case logs	To describe the composition and results of rural Fellowship training and procedures	Y	Y	Y										Y
Saito 2020	Japan	Retrospective observational study	To investigate how a new system has affected the geographical distribution of doctors commencing specialty training (Trainees) and choice of specialty			Y										
Sakai 2013	Japan	Observational study	To examine trends in the geographic distribution of paediatricians and all physicians from 1996 to 2010 to identify the impact of the launch of a new training program			Y										
Shanmugakumar 2015	Australia	Skills audit of rural surgeons	To assess rural surgeons and rural training opportunities in rural WA		Y	Y	Y		Y							
Shiramizu 2020	USA	Narrative review	To examine participation in multicentre paediatric clinical trials to provide												Y	

Study ID	Country	Study design and methodology	Study aim	Caseload	Casemix	Training	Supervision	Infrastructure	Workforce	Evidence requirements	Lack of transparency	Administration	Costs	Opportunities	Research	Attractiveness
			opportunities for junior faculty to acquire knowledge about and develop skills in clinical trials.													
Sim 2009	UK	Narrative review	To describe surgery in remote and rural Scotland, including training			Y			Y							
Smith 2014	USA	Summary of panel discussions	To describe solutions relevant to the general surgery workforce shortage			Y										
Sunadaram 2023	USA	Retrospective case review (number and type)	To analyse the vascular caseload at one institution to determine support for the creation of a vascular Fellowship	Y	Y											
Talati 2008	Pakistan	Narrative review	To present the history of surgical training in Pakistan			Y										
Timmerman 2020	USA	Narrative review	To examine initial and ongoing training of the rural surgeon	Y	Y	Y										
Tulloh 2001	Australia	Retrospective audit of 3 surgeons	To provide accurate information on 3 rural surgeons' caseloads	Y	Y											Y
Wachs 2021	USA	Narrative review	To review past and current telementoring systems with a focus on rural settings, and propose a set of requirements for such systems				Y									
Waddle 2000	USA	Narrative review	To present perspectives of a			Y										Y

Study ID	Country	Study design and methodology	Study aim	Caseload	Casemix	Training	Supervision	Infrastructure	Workforce	Evidence requirements	Lack of transparency	Administration	Costs	Opportunities	Research	Attractiveness
			resident on rural surgery including training													
Walker 2020	USA	Narrative review	To examine the status of the rural surgical workforce			Y										
Wantabe 2023	Japan	Systematic review	To determine whether rural surgical rotations during residency can increase the number of general surgeons working in rural areas			Y										
Wong 2003	Australia	Retrospective log review	To examine the influences of Trainee seniority, geographical location of surgical rotation, and surgeon remuneration arrangements on the operative and endoscopy experiences of general surgical Trainees in Victoria	Y	Y									Y		Y

Abbreviations:

ACGME: Accreditation Council for Graduate Medical Education; ANZ: Australia and Aotearoa New Zealand; RSTP: Rural Surgical Training Program of the Royal Australasian College of Surgeons; UK: United Kingdom; US: United States

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