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The information contained in this annual report has been prepared under the auspices of the Royal Australasian College of Surgeons, Australian Capital Territory Audit of Surgical Mortality Management Committee, which is a declared quality assurance committee under the Health Act 1997.

The information contained in this annual report has been prepared by the Royal Australasian College of Surgeons, Australian Capital Territory Audit of Surgical Mortality Management Committee. The Australian and New Zealand Audit of Surgical Mortality, including the Australian Capital Territory Audit of Surgical Mortality, has protection under the Commonwealth Qualified Privilege Scheme under Part VC of the Health Insurance Act 1973 (Gazetted 23 August 2011).
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## SHORTENED FORMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACT</td>
<td>Australian Capital Territory</td>
</tr>
<tr>
<td>ACTASM</td>
<td>Australian Capital Territory Audit of Surgical Mortality</td>
</tr>
<tr>
<td>ANZASM</td>
<td>Australian and New Zealand Audit of Surgical Mortality</td>
</tr>
<tr>
<td>ANZCA</td>
<td>Australian and New Zealand College of Anaesthetists</td>
</tr>
<tr>
<td>ASA</td>
<td>American Society of Anesthesiologists</td>
</tr>
<tr>
<td>DVT</td>
<td>deep vein thrombosis</td>
</tr>
<tr>
<td>FLA</td>
<td>first-line assessment</td>
</tr>
<tr>
<td>HDU</td>
<td>high dependency unit</td>
</tr>
<tr>
<td>ICU</td>
<td>intensive care unit</td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
</tr>
<tr>
<td>RAAS</td>
<td>Research, Audit and Academic Surgery</td>
</tr>
<tr>
<td>RACS</td>
<td>Royal Australasian College of Surgeons</td>
</tr>
<tr>
<td>RANZCOG</td>
<td>Royal Australian and New Zealand College of Obstetricians and Gynaecologists</td>
</tr>
<tr>
<td>SCF</td>
<td>surgical case form</td>
</tr>
<tr>
<td>SET</td>
<td>Surgical Education and Training</td>
</tr>
<tr>
<td>SLA</td>
<td>second-line assessment</td>
</tr>
</tbody>
</table>
We are pleased to provide the fourth Annual Report for the ACT Audit of Surgical Mortality (ACTASM). There continues to be high support for the audit within the ACT, with 100% participation from RACS Fellows, and all public and private hospitals within the Territory. RANZCOG Fellows have now been participating since 2012 and ANZCA commenced participation in February 2014. With 359 closed cases at census date (15 May 2015), this broad participation provides a comprehensive view of the care of the surgical patient within the ACT, with increasingly useful data on areas of potential improvement.

One of the issues identified which was perplexing over the past four years has been the high number of ASA 1 and 2 ratings assigned to patients in the Surgical Case Form (SCF). The numbers have fluctuated slightly, with a first review occurring in 2012, and a second this year. On this occasion, all cases with an ASA rating of 1 or 2 from the past two years, currently 8% of operative cases, were reviewed by the Clinical Director and Project Manager. The majority of cases were found to be trauma occurring in otherwise healthy patients with life threatening injuries being classified as ASA 1, with a small number of cases occurring in patients who presented as healthy individuals, who on investigation were found to have advanced systemic disease. No systemic issues were identified, however in the upgrades to the database, a drop-down box of explanations of ASA grades will potentially prevent any misclassifications.

The primary aim of the audit is the improvement of patient care and safety through self-reflection, peer review, and ongoing educational initiatives. The audit also aims to assist in the quality and safety programs of individual hospitals via feedback, and the provision of deidentified data for accreditation. We are continually working to improve the feedback loop, ensuring the data collected is used to improve patient care. As well as providing individual feedback on every case, this year ACTASM has published the second ACT Case Note Review Booklet; has developed a regional seminar, with topics identified by the audit as of importance within the territory and surrounding region; and contributed to the free National Case Note Reviews online ‘App’.

There are a number of improvements to the Fellows Interface online platform, which will make the audit process more user friendly for Fellows, and aim to eliminate potential transcription errors, decrease data entry time and improve data completeness. These will be trialled in the latter part of 2015, with the aim of moving towards 100% utilisation of Fellows Interface in 2016. Improvements include:

• Self-generation of Notifications of Deaths (NoDs). This will enable a surgeon to log on to complete the Surgical Case Form (SCF) soon after death, while the details are still fresh in their mind, rather than having to remember at a later date once ACTASM has been notified.

• Delegation to third party. This will enable a surgeon to delegate completion of the SCF to a registrar or SET trainee if they were the primary lead for the patient care. The surgeon will still retain full responsibility for completion of the SCF, and will review the form prior to submission to the audit office.

• Individual Surgeons Report. A surgeon will have the ability to print a report of all cases and findings under their name at any time.

• Clinical Governance Report. An individual report provided to every hospital which has had greater than five cases in a year, providing deidentified data with comparison to the national figures.

I would once again like to thank all the participants of ACTASM, the ACTASM Management committee, the College, ACT Health, and the Quality and Information management departments in all participating hospitals, for their support over the past year. I would also like to thank Veronica Walker, the ACTASM project manager for continuing to drive the project forward.

John Tharion
ACTASM Clinical Director
EXECUTIVE SUMMARY

Background
The Australian Capital Territory Audit of Surgical Mortality (ACTASM) is an audit process that provides an independent, external peer review of all surgically-related deaths within the Australian Capital Territory (ACT). It is systematic, objective and confidential, and its purpose is to inform and improve surgical practice, with the ultimate goal of improving the quality of patient care.

ACTASM is modelled on, and contributes data to, the Australian and New Zealand Audit of Surgical Mortality (ANZASM) managed by the Royal Australasian College of Surgeons (RACS). ACT Health provides funding and support to facilitate the audit process within all public and private hospitals in the ACT. Similar mortality audits are established in Western Australia, South Australia, Queensland, Victoria, Tasmania and the Northern Territory. New South Wales (NSW) provides comparable data to ANZASM but is independently managed by the Clinical Excellence Commission of NSW.

Objective
The objective of the audit is a peer review of all deaths associated with surgical care. This includes patients who were under the care of a:
- Surgeon (surgical admission), whether or not an operation was performed
- Physician (medical admission) and subsequently underwent a surgical procedure.

The audit process is designed to highlight system and process errors, and trends in deficiencies of care. It is intended as an educational rather than punitive exercise.

Surgeon participation
- Surgeon participation in ACTASM is 100% (78/78) of eligible Fellows participating in the ACT.
- Fellows from the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) have been eligible to participate since 2012. Participation by RANZCOG Fellows in ACTASM is currently at 67% (18/27).
- Participation by Fellows of the Australian and New Zealand College of Anaesthetists (ANZCA) commenced in February 2014, and participation currently stands at 40% (27/68).
- Of the participating consultants, 75% (92/123) also act as first-line assessors, second-line assessors, or both. This number includes participating RANZCOG and ANZCA Fellows.

Hospital participation
- All private and public hospitals within the ACT participate in ACTASM.
- The majority of completed cases were public patients (93%).

Audit numbers
- There were 118 deaths reported to ACTASM in 2014.
- This report comprises a total of 75% (89/118) of cases that had completed the full audit process.
- 14% (16/118) of cases had not completed the full audit (peer review) process. These cases were still under review by the end of the reporting period and will be captured in subsequent reports.
- 11% (13/118) of cases were excluded from the audit as they were admissions for terminal care or inappropriately attributed to surgery.

Episode of care
- The median length of stay in hospital was five days, ranging from less than one day to 54 days.
- 34% (30/89) of patients were transferred during their episode of care, either between ACT hospitals or from NSW. In 8% (7/89) of cases there was an issue identified in relation to the transfer.
- At least one surgical procedure was performed in 69% (61/89) of patients. Of those patients who had a surgical procedure, 20% (12/61) required more than one operation.
- The most common cause of death was pneumonia/respiratory failure.
Risk profile of audited cases

- Of the audited cases, 62% were male (median age 74 years) and 38% were female (median age 84 years).
- Emergency admissions comprised 90% (80/89) of cases.
- At least one pre-existing significant medical condition (comorbidity) was present in 90% (80/89) of cases.
- 54% of patients had an American Society of Anesthesiologists (ASA) grade of 4 or higher, indicating the presence of a condition that was a constant threat to life.

Risk management

- Deep vein thrombosis (DVT) prophylaxis was assessed as being appropriate in 80% (71/89) of cases.
- Care in a critical care unit was received by 63% (55/88) of patients. Of those cases in which the patient did not receive care in a high dependency unit (HDU) or intensive care unit (ICU), assessors identified one case in which the patient may have benefited from receiving it.
- Fluid balance in the surgical patient is an ongoing challenge and 14% (12/87) of cases were perceived by the surgeon to have had issues related to fluid balance. This is an increase from 2013; however, there was a corresponding decrease in cases where the fluid balance status was “unknown”, indicating a more complete dataset.

Peer review outcomes

- Referral for second-line assessment (SLA) occurred in 7% (8/118) of cases.
- No or minor clinical management issues were identified in 94% (84/89) of cases.
- An area of concern or adverse event was identified in 6% (5/89) of cases.
- A total of 20 areas for improvement were identified in 18 cases. Information on clinical management issues is provided in section 7.3.

Comparison data: ACTASM 2014 and ANZASM 2014

**TABLE 1: COMPARISON DATA: ACTASM 2014 AND ANZASM 2014**

<table>
<thead>
<tr>
<th>Area for comparison</th>
<th>ACTASM 2014</th>
<th>ANZASM 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgeon participation</td>
<td>100%</td>
<td>97.5%</td>
</tr>
<tr>
<td>Hospital participation: public</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>private</td>
<td>100%</td>
<td>92%</td>
</tr>
<tr>
<td>Completed cases</td>
<td>89</td>
<td>23,292</td>
</tr>
<tr>
<td>Issues related to inter-hospital transfers</td>
<td>8%</td>
<td>2%</td>
</tr>
<tr>
<td>Male to female ratio</td>
<td>62%:38%</td>
<td>55%:45%</td>
</tr>
<tr>
<td>Emergency admissions</td>
<td>90%</td>
<td>85%</td>
</tr>
<tr>
<td>Admitted with one or more comorbidities</td>
<td>90%</td>
<td>89%</td>
</tr>
<tr>
<td>ASA* ≥4</td>
<td>54%</td>
<td>54%</td>
</tr>
<tr>
<td>DVT† prophylaxis use assessed as appropriate</td>
<td>80%</td>
<td>81%</td>
</tr>
<tr>
<td>Assessors perception of fluid balance issues</td>
<td>11%</td>
<td>6%</td>
</tr>
<tr>
<td>No issues or minor issues reported</td>
<td>94%</td>
<td>88%</td>
</tr>
<tr>
<td>Areas of concern or adverse events</td>
<td>6%</td>
<td>12%</td>
</tr>
</tbody>
</table>

*ASA: American Society of Anesthesiologists  †DVT: deep vein thrombosis
ANZASM: Australian and New Zealand Audits of Surgical Mortality
Performance review

The following are achievements relating to the recommendations from the 2013 ACTASM Report.

1. Encourage and facilitate participation of ANZCA Fellows in ACTASM data collection and review.
   - Qualified privilege was extended to include ANZCA Fellows in September 2013. Invitations to participate were sent in February 2014, with follow-up correspondence in April and November. Participation now stands at 40% (27/68).

2. Increase utilisation from 58% to 65% of Fellows Interface to eliminate potential transcription errors, decrease data entry time and to improve completeness of data.
   - Fellows Interface utilisation now stands at 62% (57/92).
   - Since 2014 all new participants are only offered Fellows Interface on the participation documentation.
   - Planned upgrades to the Fellows Interface in 2015 include the self-generation of notifications of death, and the ability to delegate a surgical case form (SCF) to a specified third party. Once these upgrades have been implemented a move towards 100% utilisation of the Fellows Interface will occur.

3. Commence trending in reporting, as there will be four years of data in 2015.
   - Four years of ACT trends in data have been incorporated in three graphs in this year’s report. Comparisons with national data are included in the comments.

Aims for 2015

1. Increase utilisation of Fellows Interface to eliminate potential transcription errors, decrease data entry time and improve data completeness. This will be achieved through:
   - Upgrades to the ANZASM database and reporting system, scheduled for mid-2015, enabling self-generation of notifications of death and SCF delegation.
   - Once these upgrades are implemented, work towards 100% utilisation of Fellows Interface.

2. Continue to develop feedback processes for audit findings, including:
   - Provision of a seminar to provide feedback on audit findings to Fellows, other clinicians and health directorate personnel.
   - Development of the second ACT Case Note Review Booklet.
   - Provision of individualised hospital feedback via a clinical governance report to all hospitals with greater than five reported cases in an audit year
   - Contribution to ongoing development of the ANZASM App, to include relevant feedback video presentations and publications.

3. Upgrade anaesthetic audit forms in relation to feedback provided by ANZCA participants. This will be undertaken in conjunction with the project managers of the Tasmanian Audit of Surgical Mortality and the South Australian Audit of Perioperative Mortality.
Recommendations arising from 2014

1. Improved leadership in patient care.
   - In complex cases there must be clear and demonstrable leadership in patient management.
   - The treatment plan for each patient should be understood by all involved in their care.
   - The lead clinician must be accountable, responsive, prepared for challenges and must focus on optimal patient care.
   - During lengthy operations there should be a low threshold for seeking assistance from colleagues to avoid fatigue.

2. Better documentation of care plans and clinical events.
   - The case record is an essential tool for identifying clinical sequence and an appropriate clinical management plan. The case record must contain clear and accurate documentation of events and plans.
   - A recurring issue identified by reviewers is the lack of adequate and legible documentation.

3. Action on evidence of clinical deterioration.
   - Clinical deterioration is an issue that is recognised throughout Australia and internationally.
   - When clinical deterioration occurs and no clear cause is identified consideration, should be given to causes outside the treating surgeon’s specialty or expertise.
   - Clinical findings must be considered alongside the results of investigations.
   - Clinical deterioration must be acted on as well as recorded.

4. Improved awareness of surgical emergencies and sharing of care.
   - Patients admitted as surgical emergencies are at greater risk where care is shared. All health professionals should increase their awareness of this risk and take active steps to address these risks to improve the quality and safety of patient care.

5. Infection control.
   - Surgical patients, particularly those with comorbidities, are at increased risk of developing infection and stringent infection control care should be considered. Improvements can be achieved by focusing on flexibility of patient transfers to adequate control facilities, strengthening of current guidelines of infection control procedures, especially hand washing, revision of stringent training and adherence to patient care protocols.
1 INTRODUCTION

KEY POINTS

- ACTASM is an independent, peer review audit of deaths that occur while patients are under surgical care. The process involves self-reporting by surgeons and peer review by first- and second-line assessors.
- This report covers the census period 1 January 2014 to 31 December 2014. This report is an analysis of the 89 cases that completed the full audit process prior to the census date.
- The report includes trending data from the first four years of ACT data collection.

1.1 Background

ACTASM is an audit process that provides an independent, external peer review of all surgically-related deaths within the ACT. It is systematic, objective and confidential, and its purpose is to inform and improve surgical practice, with the ultimate goal of improving the quality of care for patients.

ACTASM is a RACS initiative and it is modelled on and contributes data to ANZASM. ACT Health via the Canberra Hospital and Health Service provides funding and support to facilitate the audit process in all public and private hospitals in the ACT. The ACTASM Management Committee meets quarterly and oversees the project. This constitutes an invaluable foundation to the running and success of the audit program.

ACTASM commenced collecting data in October 2010. This is the fourth ACTASM Report, and covers the period 1 January 2014 to 31 December 2014. Only cases which have completed the audit process and are closed are included for analysis in the report. The nature of the audit process means that some cases will be incomplete at the census date, and these cases will be included in the 2015 report.

1.2 Project governance and confidentiality

The governance structure of ACTASM and ANZASM is illustrated in Figure 1. The regional ACTASM governance structure is illustrated in Figure 2.

The RACS ACTASM Management Committee has been gazetted as a Quality Assurance Committee under the Commonwealth Qualified Privilege Scheme under Part VC of the Health Insurance Act 1973 (gazetted 23 August 2011). This was updated in 2013 to include ANZCA Fellows.

Participation is now a mandatory component of attaining continuing professional development recertification for Fellows of RACS. Participating surgeons and assessors gain points in category one of the continuing professional development program ‘Clinical governance and evaluation of patient care’.

FIGURE 1: GOVERNANCE STRUCTURE OF RACS, ANZASM AND ACTASM

ACT Minister for Health → RACS Council
| RACS Professional Development and Standards Board |
| Research, Audit and Academic Surgery (RAAS) Board |
| ACT Health |
| ACT Participating Hospitals |
| ANZASM Steering Committee |
| ACT Consultant Surgeons, Anaesthetists and Gynaecologists |
| ACTASM Management Committee |
| ACTASM Project Staff |

ACT: Australian Capital Territory; ACTASM: Australian Capital Territory Audit of Surgical Mortality; ANZASM: Australian and New Zealand Audit of Surgical Mortality; RACS: Royal Australasian College of Surgeons.
FIGURE 2: REGIONAL ACTASM GOVERNANCE STRUCTURE

ACT Minister for Health

ACT Health Directorate

ACTASM Management Committee

ACTASM Project Manager

ACT Consultant Surgeons, Anaesthetists and Gynaecologists

ANZASM (RAAS Division, Adelaide)

ACT Hospitals

ACT: Australian Capital Territory; ACTASM: Australian Capital Territory Audit of Surgical Mortality; ANZASM: Australian and New Zealand Audit of Surgical Mortality; RAAS: Research, Audit and Academic Surgery.

1.3 The audit process

1.3.1 Notification of deaths

ACTASM audits public and private hospital deaths that occurred during an episode of surgical care, whether or not the patient underwent a surgical procedure. This can include cases where a surgeon was involved in the management of a patient admitted by another team, or cases transferred to the surgeon’s care during the admission.

The medical records departments of the participating hospitals, both public and private, notify ACTASM of all surgically-related deaths. Each participating hospital is aware of the inclusion criteria of ACTASM (see 1.3.4) and reports those deaths monthly, or as required.

1.3.2 Methods

ACTASM methodology is described below, with an overview provided in Figure 3. ACTASM receives notification of a surgically-related death (via password-protected email) from participating hospitals. This information is entered into a secure database and an SCF is then sent to the consultant surgeon for completion, either via the online Fellows Interface or a paper version. The SCF is a structured form on which the surgeon is asked to document the details of the case, including whether there were any clinical incidents during the care of the patient. The treating surgeon then returns the SCF to the ACTASM project office.

The completed SCF is deidentified and sent to a different surgeon for peer review, or first-line assessment (FLA). The first-line assessor is a consultant surgeon of the same specialty who may be from a different hospital to the original surgeon. The first-line assessor determines whether the case should undergo further assessment (an SLA) which involves reviewing the deidentified medical records of the case. The first-line assessor may find no clinical incidents or may find clinical incidents which do not need further assessment, and can choose to close the case at this stage.

A primary objective of the peer review process is ascertaining whether death was a direct result of the disease process alone or if aspects of management of the patient might have contributed to that outcome. If there is a perception that the clinical management may have contributed to death, ANZASM specifies that these be reported against the following criteria.

• **Area for consideration**: the assessor believes an area of care could have been improved or different, but recognises that there may be debate about this.

• **Area of concern**: the assessor believes that an area of care should have been better.

• **Adverse event**: an unintended injury or event is caused by medical management rather than by the disease process. The injury or event is sufficiently serious to lead to prolonged hospitalisation; temporary or permanent impairment or disability of the patient at the time of discharge; or contribute to or cause death.

Cases undergo SLA if:

• an area of concern or adverse event has been identified, or is thought to have occurred during the clinical care of the patient, that warrants further investigation;

• there was insufficient information provided on the SCF for the assessor to reach a conclusion; or

• a report could provide valuable insight, or a useful lesson, for either the clinicians involved in the case, or the wider surgical community through inclusion in a case note review booklet.

The second-line assessor is a senior consultant surgeon of the same specialty but from a different hospital to the original surgeon. All ACT second-line cases are sent interstate due to the small size of the ACT surgical community, and the associated difficulty of ensuring that cases are not identifiable. As a result, the SLAs undertaken by ACT surgeons are for interstate rather than local cases.

1.3.3 Providing feedback

ACTASM provides feedback in a variety of different ways, as outlined below.
Surgeons receive written feedback from first- and second-line assessors (deidentified) on their ACTASM cases.

Quarterly reports are provided to hospitals with more than five cases reported for that period. These reports indicate the number of cases received and reviewed, and provide deidentified themes. Hospitals participating in ACTASM may request reports on aggregated deidentified data relating specifically to their hospital, and comparing their hospital with the averages of other hospitals.

Annual reports and case note review booklets are available to the surgical community on the ACTASM website at www.surgeons.org/actasm.

Nationally, seminars and webinars have been implemented to provide feedback on issues identified by the audit to Fellows, other clinical staff, and quality departments within hospitals and area health departments. The first ACT regional seminar will be held in 2015.

A free App is available from the Apple Store and Google Play and includes information on published cases from the case note review booklets around Australia. It will be upgraded in 2015 to include information about future events, such as seminars, as well as a video library of previous events.

The aggregated feedback and related clinical events in annual reports and case note review booklets are not linked to individual patients, surgeons or hospitals. The process is managed by the ACTASM project manager, following ANZASM guidelines, and is coordinated through a secure database.

1.3.4 Audit inclusion and exclusion criteria

ACTASM includes two categories of deaths that occurred in a participating hospital:

1. The patient was under the care of a surgeon (surgical admission), whether or not an operation was performed, or
2. The patient was under the care of a physician (medical admission) and subsequently underwent a surgical procedure.

ACTASM excludes deaths when the:

- Patient was admitted for terminal care
- Case does not fulfil either of the above inclusion criteria.

1.4 Reporting conventions

1.4.2 Terminology

Surgeons and assessors are asked to review the case and to determine whether there were any clinical incidents where care could have been improved. These are then classified as an area of consideration, an area of concern or an adverse event (definitions are provided in section 1.3.2).

Once the clinical incidents have been classified the clinician is asked to give their opinion on the following:

- Whether the incident was preventable, under the categories: 
  - definitely
  - probably
  - probably not
  - definitely not.

In this report the categories ‘definitely’ and ‘probably’ are considered preventable.

- Who the incident was associated with, categorising this information as:
1.4.3 Assessor opinion
The areas for consideration, areas of concern and adverse events contained in this report were events ascribed to the case by the highest level of assessment. The highest level of assessment may be that of the first- or second-line assessor, depending on how far the case has progressed. For ease of reporting both first- and second-line assessors are referred to as ‘assessors’.

The categorisation of the severity of the event, the effect on patient outcome, and the team or location the event was associated with, are the professional judgements of the assessors.

1.4.4 Focus of reporting
ACTASM reports focus primarily on areas of concern and adverse events (see 1.3.2 and 1.4.1). Areas for consideration are excluded from this analysis because they have minimal impact on the outcome and are simply an indication that there were different clinical opinions. However, areas for consideration are included in the data collection process to facilitate reporting of less serious events, as this is important for improving overall patient care. It is also worth noting that in some areas of reporting the criteria are not mutually exclusive and the percentages given will not add up to 100%. Some cases have no clinical incidents reported. Other cases are associated with several clinical incidents, and where analysis of clinical incidents was reported by case, the most serious incident has been ascribed.

1.4.5 Completeness of information
Numbers in parentheses in the text (n) represent the number of cases analysed. Some of the SCFs had incomplete data fields, so the denominator used in each analysis may vary. Clinicians are encouraged to complete all data fields in order to provide a complete report. The use of Fellows Interface, the College's online platform, improves compliance by prompting clinicians when fields are incomplete.

1.5 Data
This report covers deaths notified to ACTASM from 1 January 2014 to 31 December 2014. The census date for this report was 15 May 2015. ACTASM analysed areas of concern or adverse events ascribed to each case by assessors.

The nature of the audit process means that some cases reported to ACTASM during 2014 were still undergoing review at the census date. These cases will be included in future reports.

1.5.1 Data entry
Data is entered in two ways:
1. Directly into the database by the clinician via the Fellows Interface. It is then checked and coded by the project manager.
2. A hardcopy may be completed and sent to the project manager, who transcribes the data into the database.

Use of the Fellows Interface is preferred by ACTASM as it eliminates potential transcription errors and helps ensure data completeness.

1.5.2 Data storage
Data is encrypted in the database with Secure Sockets Layer certificates. This data is sent to and stored in a central Structured Query Language server database that includes a reporting engine. All transactions are time stamped. All changes to audit data are recorded in an archive table enabling a complete audit trail for each case.

1.5.3 Data validity
When required, information is checked against the original SCF and assessment forms. Medical records departments, surgeons, coroner’s office reports and the ACTASM chairman are all resources used by ACTASM to maintain data integrity.

1.5.4 Data analysis
The project manager and clinical director of ACTASM independently group and classify all qualitative information. These groupings are then compared and any differences discussed until consensus is reached.

1.5.5 Denominator
The denominator used in each analysis is the total number of cases for which there is data available and is indicated by (n). This will vary between questions as:

• Some questions can have multiple responses for the same case. For example, some cases will have no clinical incidents reported while others may be associated with several clinical incidents.

• Some questions on the audit forms may not require an answer, and certain sub questions may not require completion.

• A clinician may miss a question or, if they were unsure, may not have answered a question.
2 AUDIT PARTICIPATION

KEY POINTS

- There were 118 surgically-related deaths reported to ACTASM for the period 1 January 2014 to 31 December 2014. Of the 118 cases, 75% (89/118) had completed the full audit process, 11% (13/118) were excluded and 14% (16/118) were still in progress.
- Referral for second-line assessment (SLA) occurred in 7% of cases (8/118).
- All public and private hospitals in the ACT participate in ACTASM.
- Participation in ACTASM by consultant surgeons in the ACT is 100% (78/78).
- Participation in ACTASM by ACT RANZCOG Fellows has increased to 67% (18/27).
- 78% (93/120) of consultants participating in ACTASM have agreed to act as first- or second-line assessors, or both. This number includes participating RANZCOG and ANZCA Fellows.

2.1 Audit numbers

ACTASM received notification of 118 deaths. Figure 4 provides an overview of the audit status of the 118 cases.

FIGURE 4: AUDIT STATUS (N=118)

<table>
<thead>
<tr>
<th>Status</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed</td>
<td>75%</td>
</tr>
<tr>
<td>In progress</td>
<td>14%</td>
</tr>
<tr>
<td>Excluded</td>
<td>11%</td>
</tr>
<tr>
<td>(terminal care, non-participant, lost to follow-up)</td>
<td></td>
</tr>
</tbody>
</table>

Note: ‘in progress’ refers to cases that have an outstanding surgical case form or first- or second-line assessment form.

COMMENT

- A total of 75% (89/118) of cases had proceeded to and completed the audit process. This is an increase of 6% from the previous year, and 19% from 2012. This improvement in the completion rate indicates an increased commitment to the audit by the ACT surgical community. The clinical information from these 89 deaths provides the patient profiles described in this report. It is the denominator in all analyses pertaining to outcomes from the audit unless stated otherwise.
- The full audit process had not been completed in 14% (16/118) of cases. This includes 5% (6/118) of cases in which the forms were not yet returned by the surgeon, 7% (6/118) of cases awaiting FLA, or with an incomplete FLA, 3% (3/118) of cases sent for SLA, and 1% (1/118) awaiting coroner’s results.
- Excluded from the audit were 11% (13/118) of cases. This is a significant drop from 2013, in which 17% of cases were excluded. Of the 13 excluded cases, 12 were identified as terminal cases in which palliative measures were instituted following initial patient assessment (10% of the total number of cases). The remaining case was excluded as it was not a surgical case.
- This completion rate of 75% is comparable to the nationally reported rate of 76% (ANZASM National Report 2013). It should be noted that:
  - The audit process relies not only on surgeons agreeing to participate, but on their timely completion and return of surgical case and assessment forms.
  - There will always be ACTASM forms pending, in light of the continuous nature of the audit.

2.2 Surgeon participation

2.2.1 Participation in the audit

During the period 1 January 2014 to 31 December 2014, 100% (78/78) of eligible surgeons from RACS participated in ACTASM, as shown in Figure 5. Surgeons are considered to be participating when they submit an ‘Agreement to Participate’ form and have no outstanding cases older than three months. Surgeons can opt to undertake the role of assessor when they submit the ‘Agreement to Participate’ form, although an assessor declaration form must also be completed.

In 2012 RANZCOG agreed to collaborate with RACS to collect mortality data related to gynaecology cases
within ACTASM. By the end of 2014, 67% (18/27) of eligible Fellows from RANZCOG were participating, as shown in Figure 5. This represents a 6% increase in participation from 2013. The current level of participation is comparable with other states, for example, the participation rate in Victoria is 62%. As mailouts, individual liaison and follow-up emails have not produced any further increases in participation, ACTASM has decided to follow the national decision to target gynaecologists who have an eligible case.

In 2012 ANZCA indicated interest in joining ACTASM. An extension to the Commonwealth Qualified Privilege Scheme to include Fellows of ANZCA was approved in September 2013, with the clinical director and project manager of ACTASM attending a regional meeting of ANZCA to discuss the project. Recruitment of Fellows commenced in January 2014, and 40% (27/68) of Fellows are currently participating.

### 2.2.2 Participation as assessors

A total of 78% (73/93) of participating consultants, including RANZCOG Fellows, have agreed to act as assessors. This includes acting as a first-line assessor, second-line assessor, or both (see Figure 5).

Of the 27 anaesthetists who have agreed to participate, 20 have agreed to act as a first-line assessor, second-line assessor, or both.

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**FIGURE 5: PARTICIPATING PUBLIC AND PRIVATE HOSPITALS, TREATING SURGEONS AND ASSESSORS IN THE ACT**

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### 2.3 Surgeon participation by specialty

The specialty distribution of participating surgeons is shown in Figure 6. All specialties are currently participating in ACTASM.

**FIGURE 6: SURGEON AGREEMENT TO PARTICIPATE BY SPECIALITY (N=78)**

---

### 2.4 Surgeon completion of surgical case forms

Overall, 96% (113/118) of SCFs relating to cases reported in 2014 were returned within the census date. This is higher than the national rate of 84%. The median time taken to return a SCF was 29 days, a significant drop from 43 days in 2013.

The information collected in the SCF contributes to a national dataset that is designed to provide a clear picture of surgical care provided across Australia. In some fields the treating surgeon is asked for a clinical opinion, and this information is crucial to the surgical picture. These fields must be completed for the audit to meet its core objective and enable the participants to...
learn from each other. Clinical opinion strengthens the meaning of, and gives credibility to, the national dataset.

The first-line assessor reviews the case and provides constructive feedback based on the SCF alone. Incomplete information on the SCF has a negative impact on the first-line assessor’s ability to review the case, and insufficient information is one of the triggers for an SLA. On occasion, an assessor has asked whether further information could be sought from the treating surgeon before referring the case for an SLA. This has met with varying degrees of success in the ACT.

The consultant in charge of the case can delegate the task of completing the SCF to a registrar or Fellow. This provides an opportunity for reflection for the registrar. It can also guide discussion of areas for improvement when the consultant reviews the SCF with the registrar. Figure 7 shows the classification of surgeon completing the SCF. The consultant is responsible for overseeing the information provided on the form. No data is available on the classification of surgeon who completed the form for the excluded cases.

**FIGURE 7: CLASSIFICATION OF SURGEON COMPLETING THE SURGICAL CASE FORM (SCF) (N=89)**

<table>
<thead>
<tr>
<th>Classification of Surgeon</th>
<th>Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant Service registrar</td>
<td>8%</td>
</tr>
<tr>
<td>SET trainee</td>
<td>8%</td>
</tr>
<tr>
<td>Service registrar</td>
<td>84%</td>
</tr>
</tbody>
</table>

Note: This includes all completed SCFs with the exception of cases that were excluded for terminal care (classification of surgeon completing SCF not indicated on excluded forms). SET: Surgical Education and Training.

### 2.5 Hospital participation

#### 2.5.1 Participating hospitals

The two public and four private hospitals within the ACT currently participate in the audit by reporting surgically-related deaths to ACTASM. Hospitals in the ACT range from small private hospitals to large public teaching hospitals. In the period 1 January 2014 to 31 December 2014 there were three hospitals that reported deaths. The other participating hospitals had no notifications during the audit period.

#### 2.5.2 Time in hospital before death

The average length of stay of patients in hospital is shown in Figure 8 below.

**FIGURE 8: TIME IN HOSPITAL BEFORE DEATH (N=89)**

<table>
<thead>
<tr>
<th>Length of stay</th>
<th>Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1-2 days</td>
<td>0%</td>
</tr>
<tr>
<td>3-5 days</td>
<td>5%</td>
</tr>
<tr>
<td>6-8 days</td>
<td>10%</td>
</tr>
<tr>
<td>9-11 days</td>
<td>15%</td>
</tr>
<tr>
<td>12-14 days</td>
<td>20%</td>
</tr>
<tr>
<td>15-17 days</td>
<td>25%</td>
</tr>
<tr>
<td>18-20 days</td>
<td>30%</td>
</tr>
<tr>
<td>&gt;20 days</td>
<td>0%</td>
</tr>
</tbody>
</table>

- The median length of stay in hospital was five days, with a range of less than 1 day to 54 days. The mean length of stay was 10 days.
- In 55% (49/89) of cases the patient died within the first week of admission. A further 20% (18/89) of patients died in the second week (data not shown).
- The longest patient admission was 54 days. This is significantly shorter than the longest patient admission in 2013, which was 99 days. However, both the mean and median length of stay have remained stable over the audit history (see Figure 9).

**FIGURE 9: COMPARISON OF MEAN AND MEDIAN LENGTH OF STAY, 2011 TO 2014**
3 PATIENT PROFILE

KEY POINTS
- Patients admitted as emergencies with acute conditions comprised 90% of audited deaths.
- The median age was 74 years for males and 84 years for females.
- One or more significant comorbidities, which were reported as contributing to the death of the patient, were present in 90% of audited cases.
- An ASA score of 4 or more was recorded in 54% of cases.
- 93% of patients were admitted as public patients.
- The clinical risk profile indicates that the majority of deaths occurred in patients with comorbidities presenting with acute life-threatening conditions.

3.1 Age and gender

Eighty-nine cases had completed the audit process. Figure 10 shows the distribution of cases by age group and gender.

**FIGURE 10: GENDER DISTRIBUTION BY AGE BRACKET (N=89)**

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Median</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41-60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61-80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>81+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**COMMENT**
- There was a difference of 10 years between the median age of males (74 years) and females (84 years).
- The gender distribution of cases was 62% male (55/89) and 38% female (34/89). This gender distribution is considerably different to that of previous years, as shown in Figure 11.

**FIGURE 11: MALE TO FEMALE RATIO BY AUDIT PERIOD, 2011 TO 2014 (N=89)**

<table>
<thead>
<tr>
<th>Audit period (year)</th>
<th>Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>Male</td>
</tr>
<tr>
<td>2012</td>
<td>Female</td>
</tr>
<tr>
<td>2013</td>
<td>Male</td>
</tr>
<tr>
<td>2014</td>
<td>Female</td>
</tr>
</tbody>
</table>

3.1.1 Admission type

Emergency admissions accounted for 90% of cases (80/89) and public patients accounted for 93% of cases (83/89) (data not shown).
3.2 Specialty
All surgeons in the ACT participate in the ACTASM. Figure 12 shows the breakdown of this participation by specialty.

**FIGURE 12: PATIENT DEATHS BY SPECIALTY (N=89)**

<table>
<thead>
<tr>
<th>Surgical specialty</th>
<th>Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General surgery</td>
<td>37%</td>
</tr>
<tr>
<td>Orthopaedic surgery</td>
<td>24%</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>12%</td>
</tr>
<tr>
<td>Vascular surgery</td>
<td>8%</td>
</tr>
<tr>
<td>Cardiothoracic surgery</td>
<td>4%</td>
</tr>
<tr>
<td>Urology</td>
<td>3%</td>
</tr>
<tr>
<td>Otolaryngology Head and Neck</td>
<td>1%</td>
</tr>
</tbody>
</table>

**COMMENT**
- The majority of patient deaths occurred within General surgery (37%) and then Orthopaedic surgery (24%), Neurosurgery (12%), Vascular surgery (8%), Cardiothoracic surgery (4%), Urology (3%) and Otolaryngology Head and Neck surgery (1%).
- The apparent increase in Neurosurgery cases noted in 2013 has not been noted this year. The increase in 2013 was likely due to a higher rate of completion for SCFs, which led to a corresponding increase in the number of cases being included for reporting.

3.3 Clinical Risk Profiles

3.3.1 American Society of Anesthesiologists status
The ASA grade is an internationally recognised classification of perioperative risk. An ASA grade is assigned to a preoperative patient by an anaesthetist. The surgeon was asked to grade their patients in the SCF using this scale. ASA grade definitions can be seen in Table 2 below and the distribution of grades within audited cases is shown in Figure 13.

The American Society of Anesthesiologists (ASA) status is an international measure of patient risk used by anaesthetists. The ASA grades and their characteristics are:
1. A normal healthy patient.
2. A patient with mild systemic disease.
3. A patient with moderate systemic disease.
4. A patient with severe systemic disease that is a constant threat to life.
5. A moribund patient unlikely to survive 24 hours, who is not expected to survive without an operation.
6. A declared brain-dead patient whose organs are being removed for donor purpose.

The frequency of ASA grades according to year are provided in Figures 13.

**FIGURE 13: DISTRIBUTION OF AMERICAN SOCIETY OF ANESTHESIOLOGISTS (ASA) GRADES, 2011 TO 2014 (N=308)**

<table>
<thead>
<tr>
<th>Audit period (years)</th>
<th>Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>10%</td>
</tr>
<tr>
<td>2012</td>
<td>20%</td>
</tr>
<tr>
<td>2013</td>
<td>30%</td>
</tr>
<tr>
<td>2014</td>
<td>40%</td>
</tr>
<tr>
<td>2011-2014</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Note:** data not available in non-operative cases

**COMMENT**
- The proportion of cases with an ASA grade of 4 or higher was slightly lower in 2014 compared with 2013 (61%) and 2012 (63%) (see Figure 13). ASA rating was an issue investigated by the ACTASM Management Committee in 2012, due to the ACT having a slightly lower rate than that seen nationally, however no obvious cause was determined. This year the Clinical Director reviewed all cases with an ASA rating of one or two from 2013-2014. The majority of cases were found to be trauma occurring in otherwise healthy patients, with a small number of cases who presented as healthy individuals but were found to have advanced systemic disease after investigation. No issues were identified, however in recommended upgrades to the database, it was proposed that a drop-down box of explanations for each of the ASA grades be implemented to reduce the potential misclassification of cases.
- The frequency of high ASA grades indicates that most deaths occurred in patients whose preoperative health meant they were considered high risk.
- An ASA grade of 4 or higher was reported by the surgeon in 54% of cases (43/80). This is the same as the nationally reported figure1.
3.3.2 Patients with comorbidities

Surgeons were asked to identify the following comorbidities in addition to the primary medical (presenting) problem: cardiovascular, respiratory, renal, hepatic, neurological, advanced malignancy, diabetes, obesity and age (see Figure 14). A patient may present with more than one comorbidity.

**FIGURE 14: FREQUENCY OF COMORBIDITIES (N=232 COMORBIDITIES IN 80 PATIENTS)**

*Other comorbidities covered a wide range including smoker and previous malignancies. Data not available: n=9.*

**COMMENT**

- The most common comorbidities were cardiovascular, advanced age and respiratory issues.
- One or more significant comorbidities, considered to have increased the patient's risk of death, was present in 90% of audited cases (80/89). This is comparable to 88% nationally.¹

3.3.3 Patients with a malignancy

Out of the 82 closed cases (data not available in seven cases), malignancy was ‘present’ in 26% (21/82) of cases and ‘metastatic’ disease present in 11% (9/82) of cases. Surgeons considered that the malignancy ‘contributed to death’ in 13% (11/82) of cases. Figure 15 provides an overview of patients with malignancy.

**FIGURE 15: PATIENTS WITH MALIGNANCY (N=82)**

Data not available: n=7.

3.4 Surgeon perception of risk status

Treating surgeons were asked to record the overall risk of death for each patient prior to any surgery (see Figure 16).

**FIGURE 16: PATIENT’S RISK OF DEATH AS PERCEIVED BY TREATING SURGEONS (N=61)**

Note: this question is only completed on the SCF for cases in which the patient underwent a surgical procedure. Data not available: n=28.

**COMMENT**

- The perceived risk of death was considerable or expected in 67% (41/61) of cases, compared with 62% nationally.¹
- The perceived risk was considered minimal or small in 5% (3/61) of cases.
- This provides further evidence of the high-risk profile of patients suggested by the mean age, ASA score and associated comorbidities.
KEY POINTS

- In 80% (71/89) of cases assessors deemed that the DVT prophylaxis provided was appropriate.
- Fluid balance in the surgical patient is an ongoing challenge, with surgeons reporting 14% (12/88) of cases as having had fluid management issues.
- Critical care support was provided to 63% (55/88) of patients during their admission. The review process suggested that 3% (1/33) of patients who did not receive treatment in a critical care unit could have benefitted from it.

4.1 Deep vein thrombosis prophylaxis

- The treating surgeon was asked to record whether DVT prophylaxis was given and, in instances where it was provided, document the form of prophylaxis used (see Figure 17). If DVT prophylaxis was not given the surgeon was asked to provide the reason it was withheld. Assessors were asked to review these decisions in terms of their appropriateness.
- The use of DVT prophylaxis was recorded for 82% (69/84) of patients (note data not available in five cases). Of the patients who did not receive DVT prophylaxis, the surgeons indicated that it was not considered appropriate, or was an active decision to withhold, in 18% (15/84) of cases.
- Assessors viewed the use of DVT prophylaxis as appropriate in 81% of cases (71/88), (note data not available in one case). No cases were considered by assessors to have had inappropriate DVT prophylaxis, however in 19% (17/88), of cases the assessor considered the appropriateness of the prophylaxis to be unknown. There were 140 instances of DVT prophylaxis use in 71 cases. Figure 17 indicates the number of patients who received DVT prophylaxis according to the method used.

FIGURE 17: TYPE OF DEEP VEIN THROMBOSIS PROPHYLAXIS USED (N=140 INSTANCES IN 71 CASES)

| Type of prophylaxis given | Instances (
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Heparin (any form)</td>
<td>70</td>
</tr>
<tr>
<td>TED stockings</td>
<td>60</td>
</tr>
<tr>
<td>Sequential compression</td>
<td>40</td>
</tr>
<tr>
<td>Aspirin</td>
<td>30</td>
</tr>
<tr>
<td>Warfarin</td>
<td>20</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
</tr>
<tr>
<td>Clexane</td>
<td>0</td>
</tr>
</tbody>
</table>

TED: thromboembolic deterrent. Other agent recorded as Clexane. Data not available: n=4 cases.
4.2 Fluid management
This section and Figure 18 shows the level of fluid balance appropriateness in 88 patients.

**FIGURE 18: ISSUES IN FLUID BALANCE (AS DETERMINED BY SURGEONS AND ASSESSORS)**

Data not available: n=1. Note: surgeons: n=88; assessors: n=88.

**COMMENT**
- Surgeons reported fluid management issues in 14% (12/88) of cases. In comparison, assessors reported fluid management issues in 11% of cases (10/88). Assessors reported that fluid balance was unknown in 25% (22/88) of cases. Nationally, assessors felt that 6% of cases had issues with fluid balance.¹
- The high rate of unknown responses by assessors indicates that there was insufficient information provided on the SCF regarding this aspect of care.

4.3 Provision of critical care support to patients
The treating surgeon was asked to record whether a patient received critical care support in an ICU or HDU before or after surgery. The assessors reviewed the appropriateness of the use of critical care support, although it is recognised that this is a subjective assessment of needs and potential benefit.

During their admission, 63% (55/88) of patients received care in an ICU, HDU or both (note data not available in one case). In the 38% (33/88) of cases in which the patient did not go to critical care, the assessors considered that one patient (1%) would have benefited from an admission to the ICU.

Surgeons were satisfied with the care delivered in all cases admitted to the ICU or HDU.

4.4 Antibiotic regime
Surgeons were asked whether they considered the antibiotic regime to have been appropriate (see Figure 19).

**FIGURE 19: APPROPRIATENESS OF ANTIBIOTIC REGIME (N=86)**

Data not available: n=3.

**COMMENT**
- The surgeon considered the antibiotic regime to be appropriate in 91% (78/86) of cases. In 7% (6/86) of cases the appropriateness was unknown and for 2% (2/86) of cases there was no response provided.
- The patient died with a clinically significant infection in 36% (31/86) of cases. Of the patients who died with a clinically significant infection, 58% (18/31) were acquired during their admission.
- The timing of infections acquired during admission comprised 2% (2/86) preoperative, 1% (1/86) surgical site infection, 3% (3/86) other invasive site infection, and 13% (11/86) postoperative. In one case the timing was not indicated (data not shown).
- Surgeons indicated that the type of infection present was pneumonia (n=10), sepsicaemia (n=9) systemic infection (n=7) and other (n=5).
5 CAUSE OF DEATH

**KEY POINTS**
- The most frequently reported causes of death were respiratory/pneumonia, cardiac issues and sepsis.

### 5.1 Frequency of causes of death

**FIGURE 20: MOST COMMON CAUSES OF DEATH (N=110 CAUSES OF DEATH REPORTED IN 89 PATIENTS)**

CVA: cerebral vascular accident; UTI: urinary tract infection.

**COMMENT**
- There were 110 causes of death reported for 89 cases, with some cases being attributed more than one cause of death (see Figure 20).
- The most common causes of death were respiratory failure/pneumonia (21 cases), cardiac issues (20 cases), sepsis (12 cases), multiple organ failure (11 cases), neurological causes (14 cases) and bowel ischemia (7 cases).
5.2 Establishing cause of death

The cause of death recorded by the treating surgeon was based on the clinical course of the patient and any relevant supporting evidence from investigations. Where doubt exists around the circumstances leading to death the case may be referred to the coroner. In other instances, where the cause of death is not clear, a postmortem examination may be requested. This latter method of confirming the cause of death is being requested with decreasing frequency.

Surgeons were asked whether the patient was referred for a postmortem examination. Table 2 provides an overview of postmortems recorded.

TABLE 2: OVERVIEW OF POSTMORTEM STATUS IN THE ACT (N=88)

<table>
<thead>
<tr>
<th>Patients (%)</th>
<th>Postmortem performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>36%</td>
<td>No</td>
</tr>
<tr>
<td>24%</td>
<td>Unknown</td>
</tr>
<tr>
<td>32%</td>
<td>Yes - coroner</td>
</tr>
<tr>
<td>3%</td>
<td>Yes - hospital</td>
</tr>
<tr>
<td>5%</td>
<td>Refused</td>
</tr>
</tbody>
</table>

Data not available: n=1

COMMENT

- A coronial postmortem was performed on 32% (28/88) of patients and a hospital postmortem was performed on 3% (3/88) of patients. A postmortem was not performed on 36% (32/88) of patients and in 24% (21/88) of cases it was not known whether a postmortem was performed.
- The overall ACT rate of postmortems (35%) is higher than the national average of 15% (data not shown). 1
- Surgeons indicated that they would have preferred that a postmortem was conducted in 11% (3/28) of the cases where one was not undertaken.
- Surgeons had read the postmortem report prior to completing the SCF in 19% (5/27) of cases where a postmortem was undertaken.
6 PROFILE OF OPERATIVE INTERVENTION

KEY POINTS
- The patient had at least one surgical procedure in 69% (61/89) of cases. Altogether there were 75 procedures performed on 61 patients.
- Consultant surgeons carried out 63% (47/75) of the procedures, with the remaining procedures performed by registrars or SET trainees, usually in the presence of a consultant.
- The most common postoperative complications were pneumonia/respiratory issues (8% of cases), procedure-related sepsis (6%) and cardiac issues (6%).

6.1 Operative intervention
- At least one surgical procedure was performed on 69% (61/89) of patients during their admission, compared with 75% nationally. More than one operation was performed on 13% (12/89) of patients, a decrease from 20% in the 2013 ACTASM Report. The highest number of procedures on one patient was 3, a considerable reduction from the 2013 ACTASM Report, where a single patient had 10 procedures.
- Surgeons provided a variety of reasons why some patients did not undergo an operative procedure. Multiple reasons were provided in some cases, while for other cases there was no reason provided. In the 31% (28/89) of cases in which there was no surgery performed, surgeons indicated that:
  - in 8 cases it was not a surgical problem;
  - in 12 cases it was an active decision not to operate;
  - in 4 cases the patient refused an operation;
  - in 3 cases there was a decision to limit treatment;
  - in 5 cases there was rapid death prior to surgery;
  - and in 3 cases the surgeon did not indicate a reason.
- The finding of a terminal situation led to the procedure being abandoned in 5% of cases (4/89). Nationally, this also occurred in 5% of cases (data not shown).
- Note: percentages not included as in some cases there was more than one reason provided.

6.2 Timing of surgical episodes
The critical nature of a patient’s condition determines the timing for surgery. Of the 75 procedures performed, 13% (10/75) were elective, 27% (20/75) were scheduled emergency (over 24 hours post admission), 35% (26/75) were emergency (less than 24 hours post admission) and 24% (18/75) were immediate (less than two hours post admission). The timing of surgical episodes is shown in Figure 21.

FIGURE 21: TIMING OF SURGICAL EPISODES (N=75 PROCEDURES PERFORMED ON 61 PATIENTS)

Note: some cases involved more than one operation.
6.3 Seniority of surgeon operating

The clinician completing the SCF has to record the seniority of the surgeon who performed the surgery (see Figure 22).

**FIGURE 22: SENIORITY OF OPERATING SURGEON (N=75 PROCEDURES PERFORMED ON 61 PATIENTS)**

In terms of the first operation for each patient, 64% (39/61) of procedures were performed by a consultant surgeon. For second and subsequent operations, 57% (8/14) of procedures were performed by a consultant surgeon. This is a change from 2013 in which a consultant surgeon performed 76% (25/33) of second and subsequent procedures, and may be due to the lower number of cases in 2013 that involved more than one procedure. The percentage of second and subsequent operations performed by a consultant surgeon in the ACT in 2014 (57%) is comparable to that of 2012 (61%).

**COMMENT**

- No operations in the audit group were undertaken by an International Medical Graduate or general practitioner.
- All surgical procedures were attended by an anaesthetist.

6.4 Postoperative complications

Surgeons were asked to report on definable postoperative complications. Figure 23 shows the postoperative complications experienced and the numbers of cases involved.

**FIGURE 23: TYPES AND FREQUENCY OF POSTOPERATIVE COMPLICATIONS (N=31 COMPLICATIONS IN 25 CASES)**

SET: Surgical Education and Training.

Note: A total of 75 procedures were performed on 61 patients. More than one level of surgeon was recorded as operating in seven cases (9%).
COMMENT

• At least one postoperative complication was experienced by 28% (25/89) of patients, compared with 32% nationally in 2013.\(^1\)
  Overall, 9% (8/89) of patients had an unplanned return to theatre, compared with 15% of patients’ nationally.\(^1\)
• The most common postoperative complication was pneumonia/respiratory issues, which occurred in 8% (7/89) of cases. Procedure-related sepsis occurred in 6% of cases (5/89), cardiac issues in 6% of cases (5/89), tissue ischaemia in 3% of cases (3/89), and intestinal issues in 3% of cases (3/89).

6.5 Anaesthetics

ANZCA commenced participation in the audit process in February 2014. Anaesthetic cases may be referred in two ways, either self-reporting by the anaesthetist; or by the surgeon indicating on the Surgical Case Form that there was, or possibly was, an anaesthetic component to the death. All anaesthetic cases are reviewed by assessors from ANZCA.

6.5.1 Anaesthetic problems

Participating surgeons were asked whether there was a problem with the anaesthetic component of the surgery. In 97% (59/61) of cases in which an operation was performed the surgeon indicated that there were no anaesthetic issues. In 3% (2/61) of cases the surgeon felt that there was ‘possibly’ an anaesthetic problem. There were no cases identified by surgeons as ‘definitely’ having an anaesthetic problem. Nationally, a possible or definite anaesthetic problem was reported in 7% of cases.\(^1\)

Since ANZCA participation commenced, three cases have been referred for review by ANZCA assessors. Of these cases, only one was closed by the census date. Anaesthetic outcomes will therefore be reported in the 2015 report.

6.6 Transfers between hospitals in the ACT and NSW

A hospital transfer took place for 34% (30/89) of patients during their episode of care. This includes transfers between ACT hospitals, as well as interstate transfers from NSW. No patients were transferred from a private hospital to a public hospital within the ACT.

Cases in ACTASM include patients transferred from interstate, for which there is no jurisdiction to obtain the associated case notes and information. Should an assessor decide that a review of the care provided interstate may be of benefit, the case is referred to the CHASM managed in NSW by the Clinical Excellence Commission. This ensures that appropriate agreement has been given, right to reply is offered and that the insights gained can be used effectively to promote improvements in patient care.

As a measure of the quality of the clinical handover between hospitals, surgeons were asked to report on any delays or problems, the appropriateness of the transfer and the appropriateness of the level of care provided. They were also asked to report whether sufficient information was provided in the handover documentation.

Issues associated with the transfer of patients between hospitals, as recorded by surgeons, are shown in Figure 24.

**Figure 24:** Types of issues associated with patient transfers (n=10 issues in 7 patients)

<table>
<thead>
<tr>
<th>Cases (n)</th>
<th>Transfer delay</th>
<th>Inappropriate level of care</th>
<th>Transfer not appropriate</th>
<th>Insufficient clinical documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Types of Issues**

COMMENT

• In total, 23% (7/30) of transferred patients had some form of transfer issue. Data shown in this figure is comparable to the nationally reported rate of 11%.\(^1\) Ten issues in seven patients were raised in relation to transfers. In some cases there were issues raised concerning more than one aspect of the transfer.
• The most frequent issues raised were transfer delay at 7% (6/89), inappropriate level of care at 2% (2/89) and insufficient clinical documentation in 1% (1/89). In 1% (1/89) of cases the surgeon indicated that the transfer was not appropriate. There were no reported issues during the actual transfer.
• 34% (30/89) of patients were transferred during their episode of care compared with 26% nationally (data not shown).\(^1\)
7 PEER REVIEW OUTCOMES

KEY POINTS
• In 15% (13/89) of cases surgeons indicated that they would change some aspect of clinical care based on their review.
• In 94% (84/89) of cases assessors identified either no or minor issues in clinical management.
• In 6% (5/89) of cases assessors identified an area of concern or adverse event.
• Overall, assessors identified 20% (18/89) of cases as having areas for clinical improvement. These included issues with communication, preoperative assessment and workup, and complications of care.

7.1 Surgeon retrospective review
During the peer review process surgeons were asked to critically review the case and ask themselves whether they would have done anything differently in retrospect. In 15% (13/89) of cases the surgeon indicated that they would have done something differently, although it was recognised that this may not have made a difference to the outcome. Surgeons’ answers were grouped by meaning, and the most common themes were:
• change of procedure or not performing a procedure (n=3)
• earlier liaison with another specialist group (n=2)
• preoperative optimisation (n=2)
• communication issues (n=2)
• end of life care (n=2)
• correct ward or ICU use (n=2).

7.2 Second-line assessments
The peer review process is a retrospective examination of the clinical management of patients who died while under the care of a surgeon. All assessors (first- and second-line) must decide whether the death was a direct result of the disease process alone, or whether aspects of patient management may have contributed to the outcome. The first-line assessor decides whether the treating surgeon has provided enough information to allow for an informed decision on the appropriateness of management of the case. If inadequate information was provided, the first-line assessor requests an SLA. Other triggers for requesting an SLA are:
• where a more detailed review of the case could clarify events leading up to death and any lessons arising from the case
• where death was unexpected, for example in a young, fit patient with benign disease or in a day surgery case.
• A total of 92 cases had FLAs completed within the entire audit period. There were 9% (8/92) cases that were referred for SLA, however three of those cases had not been completed by the census date. The incomplete cases will be included in the 2015 report.

7.3 Clinical management issues
A primary objective of the peer review process is to determine whether death was a direct result of clinical management issues. There are two possible outcomes of the peer review process. The first is that the death was a direct outcome of the disease process and that the clinical management had no impact. The second is the perception that aspects of patient management may have contributed to the death of the patient.
Assessors are able to select from three categories when making an assessment of contributing factors, as outlined below.
• Area of consideration: the assessor believes an area of care could have been improved or different but recognises the issue is perhaps debatable. It represents a suggestion regarding treatment options or a minor criticism.
• Area of concern: the assessor believes that an area of care should have been better.
• Adverse event: an unintended injury or event that was caused by the medical management of the patient rather than by the disease process. The injury or event was sufficiently serious that it led to prolonged hospitalisation or to temporary or permanent impairment or disability of the patient; or which contributed to or caused death.
There are also predetermined outcomes that are classified as adverse events (e.g. anastomotic leak and pulmonary embolus). It must be emphasised that an adverse event does not imply negligence, as some adverse events will occur even with the best of care. For example, a fatal pulmonary embolism can occur even with the use of the best DVT prophylaxis. It also must be emphasised that an adverse event is not necessarily preventable and may not contribute to the death of the patient. The frequency and spectrum of clinical management issues are shown in Figure 25.
First- and second-line assessors may identify more than one issue of clinical management in each patient under review, and it is important that the impact of each clinical management issue is analysed and compared. In the tables below, all patients associated with an area of consideration, area of concern or adverse event are represented.

Note: all cases with incidents appear in every table, therefore the comments inevitably include the same cases.

### TABLE 3: PERCEIVED IMPACT ON CLINICAL OUTCOME OF CLINICAL MANAGEMENT ISSUES (N=89)

<table>
<thead>
<tr>
<th>Perceived impact</th>
<th>Issues*</th>
<th>Percentage of audited series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not affect outcome</td>
<td>6</td>
<td>7%</td>
</tr>
<tr>
<td>May have contributed to death</td>
<td>12</td>
<td>13%</td>
</tr>
<tr>
<td>Probably caused death</td>
<td>2</td>
<td>2%</td>
</tr>
</tbody>
</table>

* 20 issues associated with 18 cases

### COMMENT

In two cases the assessor considered that the clinical incident probably caused the patient’s death.

- In one case the incident was an adverse event that was associated with another clinical team. It was considered to be probably preventable and was referred to that team for further review.

- In the second case the incident was considered an area of concern, the lowest level of criticism, and was related to end of life decisions. It was considered not preventable and was associated with another clinical team.

In six incidents the assessor considered that the clinical incident may have contributed to the patient’s death:

- One was considered an adverse event. This incident was associated with the audited surgical team and was considered probably preventable. It was related to preoperative workup, which both the surgeon and assessor identified as a complex situation. Individualised feedback was provided.

- The other five incidents were areas of concern, and the themes included:
  - pre-hospital care and preoperative workup (n=2)
  - decision to operate (n=1)
  - postoperative complications (n=1)
  - hospital admission process (n=1).

### 7.3.1 Perceived impact of clinical management issues

First- and second-line assessors have to indicate:

- what impact any perceived issues of patient management might have had on the clinical outcome
- whether these issues were preventable.

### Clinical Management Issue

Note: there were 20 issues associated with 18 cases.

**COMMENT**

- No issues of clinical management were identified in 79% of cases (70/89). Added to areas of consideration (16%; 14/89), 94% (84/89) of cases had no or minor criticism. Nationally, 88% of cases had no or minor criticism.¹

- The identification of an area of concern or adverse event implies a greater degree of criticism of clinical management. An area of concern or adverse event was identified in 6% (5/89) of audited deaths, compared with 12% of cases nationally.¹ This is a lower percent than in previous years and may be due to the three outstanding SLAs.

- Themes that emerged from the 20 identified clinical incidents were:
  - communication issues (n=5)
  - complications of care (n=3)
  - preoperative assessment and workup (n=3)
  - delay to surgery (n=2)
  - decision to operate/different procedure (n=2)
  - fluid management (n=2)
  - resident medical officer issues (n=2)
  - transfer issues (n=1).
All surgeons involved received individualised feedback and, where appropriate, the identified team was notified.

### TABLE 4: PERCEIVED PREVENTABILITY OF CLINICAL ISSUES (N=89)

<table>
<thead>
<tr>
<th>Perceived Preventability</th>
<th>Issues*</th>
<th>Percentage of audited series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definitely preventable</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Probably preventable</td>
<td>6</td>
<td>7%</td>
</tr>
<tr>
<td>Probably not preventable</td>
<td>9</td>
<td>10%</td>
</tr>
<tr>
<td>Definitely not preventable</td>
<td>2</td>
<td>2%</td>
</tr>
</tbody>
</table>

*19 issues associated with 18 cases

**COMMENT**

In two cases the assessor considered that the clinical incident was **definitely preventable**.

- In one case the incident was related to pre-hospital care and in the second case it was related to admission processes. In both cases the assessor considered the incident may have contributed to the patient’s death.

Six incidents were considered **probably preventable**. The themes associated with the six incidents were:

- preoperative workup (n=2)
- perioperative complications (n=1)
- delay to surgery (n=1)
- postoperative complications (n=1)
- communication issues (n=1).

### TABLE 5: PERCEPTION OF CLINICAL TEAM RESPONSIBLE FOR CLINICAL ISSUES (N=89)

<table>
<thead>
<tr>
<th>Clinical team</th>
<th>Issues*</th>
<th>Percentage of audited series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audited team</td>
<td>8</td>
<td>9%</td>
</tr>
<tr>
<td>Another clinical team</td>
<td>8</td>
<td>9%</td>
</tr>
<tr>
<td>Hospital issue</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>3%</td>
</tr>
</tbody>
</table>

* 20 issues associated with 18 cases; some clinical incidents were attributed to two teams

**COMMENT**

The assessor attributed responsibility for the clinical event to clinical teams or systems issues as follows:

- Eight cases were associated with the audited surgical team. Individualised feedback was provided.
- Eight cases were associated with another clinical team. Feedback was provided where appropriate.
- Two cases were associated with an individual hospital. Feedback from these cases has been included in the quarterly reports, which were developed to provide timely information on themes emerging from the audit.
- All surgeons receive individual feedback on their cases, including comments from assessors regarding the issues raised, alternative opinions on treatment options and suggested areas for improvement. Cases which contain insights that are of potential value to the wider surgical community are deidentified and included in the National Case Note Review Booklet or the ACTASM Case Note Review Booklet.

### 7.4 Improvements in care

#### 7.4.1 Assessors’ views on improvements in care

Assessors identified areas of management that they thought could be improved. These included preoperative care, the decision to operate, and intraoperative and postoperative management (see Figure 26).

**FIGURE 26: ASSESSOR PERCEPTION OF AREAS OF CLINICAL MANAGEMENT THAT COULD BE IMPROVED (N=29 ISSUES)**

<table>
<thead>
<tr>
<th>Management Improvement Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative management</td>
</tr>
<tr>
<td>Operation decision</td>
</tr>
<tr>
<td>Operation timing</td>
</tr>
<tr>
<td>Intraoperative management</td>
</tr>
<tr>
<td>Postoperative care</td>
</tr>
<tr>
<td>Fluid management</td>
</tr>
</tbody>
</table>

**COMMENT**

- In 7% (6/89) of cases the assessors considered that there could have been improvements to preoperative care.
- In 4% (4/89) of cases the assessors considered that there could be have been a change regarding the decision to operate, while in 3% (3/89) of cases the assessors questioned the...
In 1% (1/89) of cases the assessors considered that there was an issue in intraoperative management, and in a further 4% (4/89) of cases there was an issue in the postoperative care.

In 11% (10/89) of cases the assessors considered that there were issues related to fluid management.

### 7.4.2 Surgeon views on improvements in care

As outlined in section 7.1, surgeons indicated that in 15% (13/89) of cases they would have changed some aspect of patient care (details in section 7.1). Surgeons were further asked to identify specific areas of clinical management which could be improved upon, with the same criteria asked of the assessors (data shown in 7.4.1). This further emphasises the value of the reflection-on-practice aspect of the audit, providing the surgeon with an opportunity to review the episode of care and identify areas for improvement (see Figure 27).

**FIGURE 27: SURGEON PERCEPTION OF AREAS OF CLINICAL MANAGEMENT THAT COULD BE IMPROVED (N=89)**

<table>
<thead>
<tr>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• In 18% (16/89) of cases the surgeon would increase preoperative optimisation prior to surgery.</td>
</tr>
<tr>
<td>• In 13% (12/89) of cases the surgeon would review the timing of the procedure.</td>
</tr>
<tr>
<td>• In 4% (4/89) of cases the surgeon would review the decision to operate.</td>
</tr>
<tr>
<td>• In 4% (4/89) of cases the surgeon would change the procedure.</td>
</tr>
<tr>
<td>• In 4% (4/89) of cases the surgeon would improve the patient’s postoperative care.</td>
</tr>
<tr>
<td>• In 3% (3/89) of cases the surgeon would review the patient’s intraoperative care.</td>
</tr>
<tr>
<td>• In 1% (1/89) of cases the surgeon would review the grade of the surgeon operating.</td>
</tr>
</tbody>
</table>

Surgeons perceived that the areas of preoperative care and operation timings to be areas that could be improved. This differs from the assessors perception of areas for clinical management improvement (section 7.4.1), with the assessors indicating fluid management as the area that required most improvement.
8 CONCLUSION

Commitment to the audit within the ACT is high with 100% participation by both RACS Fellows and ACT hospitals, in this, the fourth ACTASM Report. The participation rate for RANZCOG Fellows is slowly increasing and now stands at 67%, which is comparable to the national participation rate. ANZCA commenced participation in February 2014, and their participation currently stands at 40%.

As the ACT now has four full years of data, some trending has been possible in this year’s report. This has enabled comparisons with previous ACT outcomes, as well as national figures, allowing a more complete representation of annual results.

- The majority of patients were emergency admissions with at least one comorbidity.
- An ASA rating of 4 or higher was reported in 54% of cases in 2014. This figure is the same as the nationally reported figure of 54%; however it was slightly lower than the figures reported for the ACT in 2013. The ACTASM Management Committee investigated the ASA rating in 2011, following the slightly lower rate than seen in the ACT than nationally that year. No obvious cause was determined and the variation may be due to smaller size of the jurisdiction.
- Assessors opinion on the appropriate use of DVT prophylaxis, fluid balance and the use of critical care facilities remained relatively stable across audit years.
- Surgeons reported that 36% of patients died with a clinically significant infection, with 20% acquiring the infection during their hospital stay. This figure is comparable to the 2013 Report, but slightly higher than the national average. An investigation into this event was undertaken following the 2013 ACTASM Report but did not identify a reason. The distribution of infection throughout Australia varies due to some states having a higher rate of remote areas, where patients may delay seeking medical assistance.
- Surgeons indicated that on review they would change some aspect of clinical care in 15% of cases (13/89). The areas identified were similar to those identified in the 2013 report, with the notable addition of end of life care issues. Other issues identified were:
  - change of procedure or not performing a procedure
  - preoperative optimisation
  - earlier liaison with another specialist group
  - communication issues.
- In the majority of cases assessors believed that appropriate care had been received by the patient, with 94% (84/89) of cases having no or minor issues in clinical management. In 6% (5/89) of cases assessors identified an area of concern or an adverse event. The percentage of ACT cases with an area of concern or adverse event is lower than the nationally reported figure of 12%.
- Assessors considered that care could have been improved in 18 cases. In total, 20 issues were highlighted, including:
  - communication issues
  - complications of care
  - preoperative assessment and optimisation
  - delay to surgery
  - decision to operate/different procedure
  - fluid management
  - resident medical officer issues
  - transfer issues.
9 ACKNOWLEDGMENTS

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  - A/Professor Wendy Babidge Director, Research, Audit and Academic Surgery Division
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10 REFERENCES

