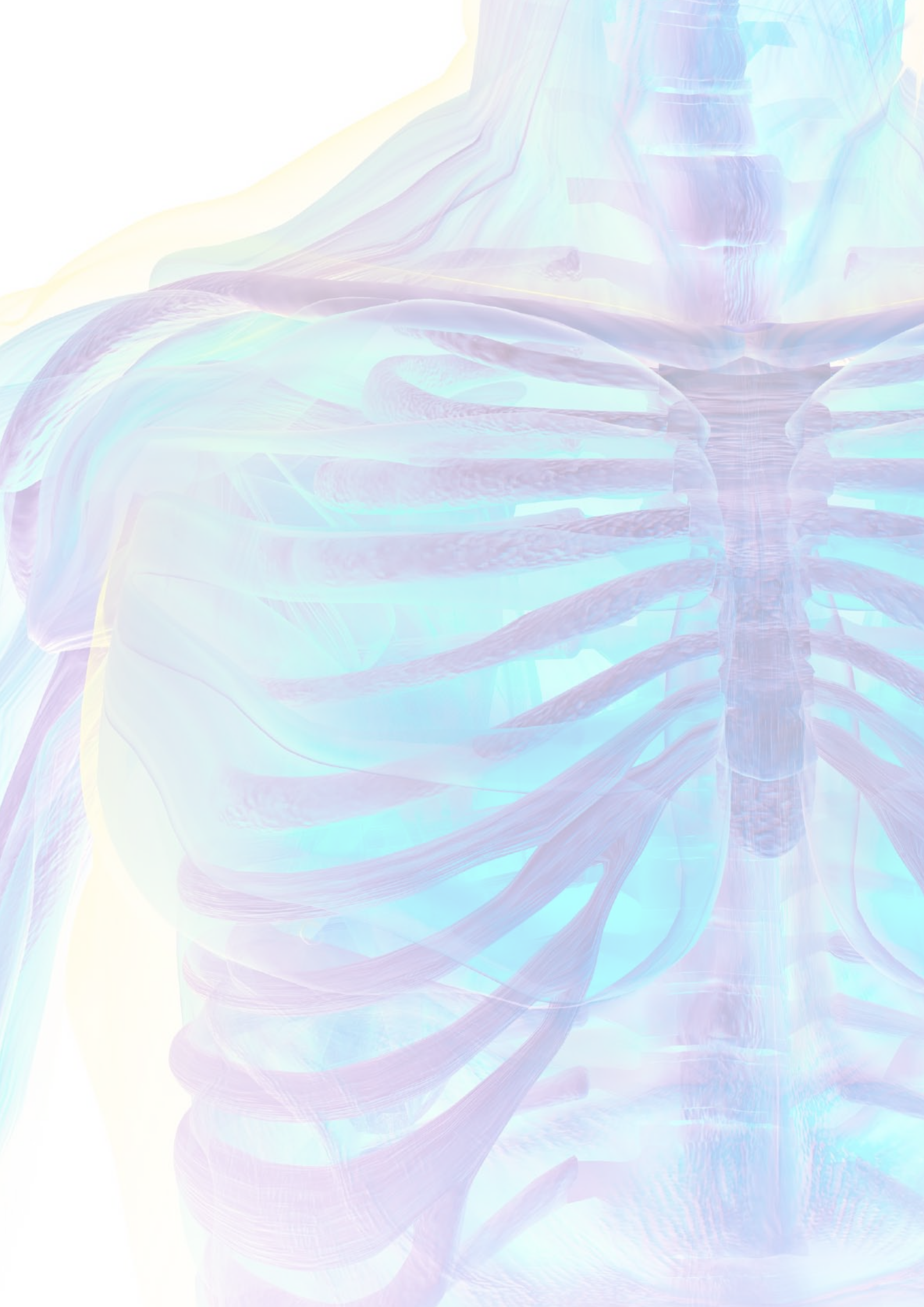


ROYAL AUSTRALASIAN  
COLLEGE OF SURGEONS

**Australian and New Zealand  
Audit of Surgical Mortality**

**National Report 2010**





## Contact

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The information contained in this annual report has been prepared on behalf of the Royal Australasian College of Surgeons, Australian and New Zealand Audit of Surgical Mortality Steering Committee. The Australian and New Zealand Audit of Surgical Mortality, including the Western Australian, Tasmanian, South Australian, the Australian Capital Territory, Northern Territory, New South Wales, Victorian and Queensland audits of surgical mortality, has protection under the Commonwealth Qualified Privilege Scheme under Part VC of the *Health Insurance Act 1973* (gazetted 6 November 2006).



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## Chairman's Report

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This year sees the production of the second annual report of the Australian and New Zealand Audit of Surgical Mortality. At the time of writing, all states and territories within Australia are participating and have now produced almost twelve months of data. Not all of this is reflected in the current report, as the period to be reported concludes at the end of 2010. To now have standardised data being collected across Australia represents an enormous achievement for the audit, which started out as a state-based audit in Western Australia. The considerable financial commitment made to the audit from all the states and territories is a great vote of confidence in the value of such an enterprise. It is now our responsibility to deliver on its promise. To this end, the Committee has been looking at issues regarding the generation of research data, the participation of the entire health sector and authorship of papers.

One of the challenges that remains to be dealt with is the number of private hospitals that are not participating, or have yet to participate, in the collection of data in Queensland and New South Wales. There may be a perception by those state governments that the audit process and participation in the private sector is not an important requirement. In the other remaining states however, this collection is funded by the state governments and encouragingly, their participation levels are very high. It is hard to understand why any government would wish patients being treated within the private sector not to be subjected to the same scrutiny and assessment as those treated within the public sector. Similarly, private hospitals should wish to ensure that the standards they deliver are at the highest level; a national audit process would only benefit the hospitals and their patients in maintaining the highest standards of care. Approaches are being made to the large hospital chains in order to gain their engagement and it is expected that more will agree to participate over the next year, even if it is at their cost in the short term.

What value such a mortality audit imparts is not always easy to characterise. It is clear that substantial publications can be generated from the enormous dataset being generated. However, of greater importance will be an overall downward trend in deaths associated with surgery. This will take time to appear nationally. Trend data from the longest running audit suggests a decrease in the number of deaths reported following surgery over time. The feedback to surgeons of problems, the careful analysis of their genesis and change in practice can all lead to a reduction in surgical deaths. The recognition of deep vein thrombosis prophylaxis is making a significant impact on surgical mortality and has been clearly demonstrated by the audit. Management of the deteriorating patient and appropriate fluid resuscitation are other areas that have now been brought to the attention of surgeons from their own data, rather than from reports emanating from overseas centres.

A further challenge that remains before us is to gain one hundred per cent participation from the surgical workforce. It is now mandated by the Royal Australasian College of Surgeons (the College) that participation in the audit must occur where the audit is available to the surgeon. If this does not take place, then potentially the requirements of the Continuing Professional Development (CPD) program cannot be fulfilled by the surgeon. Without credible CPD, it is impossible to gain registration with the national registration authority currently active across Australia. This should lead to one hundred per cent compliance, at least for Fellows of the College, and with it an accurate and comprehensive snapshot of surgical mortality.

While there is every reason to be delighted with the progress of the audit to its current stage, there are considerable challenges yet to be met. I look forward to resolving these important issues over the next twelve months.

Professor Guy Maddern  
Chairman, ANZASM



## Shortened forms

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ACTASM	Australian Capital Territory Audit of Surgical Mortality
ANZASM	Australian and New Zealand Audit of Surgical Mortality
ASA	American Society of Anaesthesiologists
ASM	audit of surgical mortality
CHASM	Collaborating Hospitals Audit of Surgical Mortality
CPD	Continuing Professional Development
CVA	cerebrovascular accident
DVT	deep vein thrombosis
ENT	ear, nose and throat
FLA	first-line assessment
GP	general practitioner
ICU	intensive care unit
IQR	interquartile range
NTASM	Northern Territory Audit of Surgical Mortality
QASM	Queensland Audit of Surgical Mortality
RAAS	Research, Audit and Academic Surgery
SAAPM	South Australian Audit of Perioperative Mortality
SCF	surgical case form
SLA	second-line assessment
TASM	Tasmanian Audit of Surgical Mortality
VASM	Victorian Audit of Surgical Mortality
VTE	venous thromboembolism
WAASM	Western Australian Audit of Surgical Mortality



# Executive summary

## Background

The Australian and New Zealand Audit of Surgical Mortality (ANZASM) is an independent external peer review of surgical mortality in all states and territories of Australia. Each audit of surgical mortality (ASM) is funded by its state or territory department of health (Western Australia, Victoria, South Australia, Queensland, Tasmania, Australian Capital Territory and Northern Territory). New South Wales provides comparable data to ANZASM but is independently managed by the Clinical Excellence Commission of New South Wales.

## Surgeon participation

Surgeon participation in the ASMs rose to 81% by the end of 2010 (5573 of 6892 College Fellows), up from 60% in 2009. These numbers include Fellows who work in hospitals that are not yet participating in the audit, but may have indicated their intention to participate in the audit process.

## Hospital participation

Four hundred and five public hospitals in Australia are now participating, with only 35 yet to commit to the audit. Private sector participation is lower, particularly in Queensland and New South Wales.

## Analysis

This report contains a comparative analysis of cases reported to ANZASM from January 2009 to December 2010. Some data are missing due to incomplete information provided in surgical case forms (SCFs); where this occurs, it is noted in the text.

## Audit numbers

From 1 January 2009 to 31 December 2010 a total of 11303 deaths were reported to ANZASM. Out of these 11303 deaths, 6507 cases had proceeded to and completed the audit process by the census date. The clinical information from these 6507 deaths provides the patient profiles described in this report.

The remaining 4796 cases were not included in the audit. These cases were either excluded from the audit (admitted for terminal care, inappropriately attributed to surgery or treated by surgeons not participating in the audit) or had not completed the full audit (peer review) process at the census date. Cases that had not completed the audit process and are therefore still under review will of course be captured in the next year's report.

## Demographic profile of audited cases

Of the 6507 audited cases, the mean (standard deviation) age was 86 ( $\pm 17$ ) years. The age range varied from 1 day old to 107 years. Males represented 54% of cases while 46% were female. The median and interquartile age range for males and females was 76 years (64–83) and 80 (70–87) years, respectively.

## Risk profile of audited cases

The majority (91%) of audited deaths occurred in patients admitted as emergencies with acute life threatening conditions and with significant coexisting illness. In 83% of cases at least two preexisting medical conditions (comorbidities) were recorded.

## Risk management

In general, venous thromboembolism (VTE) prophylaxis strategies were being appropriately applied. In 82% (1008/1236) of cases where prophylaxis was consciously withheld by the treating surgeons, assessors agreed with the decision to withhold.

Most patients (92%) deemed to require critical care support did receive it. In only 8% of the remaining cases where patients did not receive critical care, reviewers felt the patient may have benefited from it. The current audit dataset does not allow identification of the reasons behind this.

## Profile of operative intervention

In 4735 (75%) cases, patients underwent at least one surgical procedure.

Twenty-five percent of patients did not have surgery during their final in-patient admission. These patients were typically terminally ill, those who experienced a rapid decline in health before a surgical procedure could start or their condition was not deemed suitable for surgery (although the patient was originally admitted under the care of a surgeon).

A total of 6512 separate surgical episodes were recorded for these 4735 patients, demonstrating that an individual patient can have more than one visit to the operating room during a single admission. In 93% of the 6512 operative episodes, the consultant surgeon was the decision-maker and in 66% of cases a consultant surgeon performed the surgery.

Of the 4735 patients who had surgery, 11% had an unplanned return to the operating theatre because of complications.

## Patient transfers

Despite some improvement, there are still issues around transfer of patients to other hospitals. This is a concern as it is essential that all clinicians involved have a complete picture of the patient's issues upon presentation. Insufficient clinical documentation (16%) over the audit period is a concerning criticism. Inappropriateness of transfer (32%) and transfer delay (32%) were the most common criticisms. However over the audit period, the frequency of inappropriate transfers decreased by 4% in 2010.

## Peer-review outcomes

The number of cases referred for second-line assessment (SLA, or case note review) during the audit period was 763 (12%) of the 6507 audited cases. Referral for SLA varied from 5% to 16% among regions. The rate of SLA is not a reliable measure of the incidence of clinical issues, as referral for SLA is often required due to inadequate information in the SCF. This was the case in 69% of SLAs.





The most common criticism made by assessors was delay in delivering definitive treatment. However, only 34% of these delays were attributed to the surgical team. This finding, replicated in all regions, has led the regional ASMs to develop and deliver a series of education programs aimed at surgeons and junior and senior hospital staff, which address the various facets of 'delay'.

Clinical issues were described in 26% of cases. However significant criticism of patient care were reported in 13% of cases. However of all clinical issues, issues concerning clinical management were perceived to have *probably* contributed to the adverse outcome in 4% of patients. The perceived relationship of clinical management to outcome was less clear in the remaining cases.

### Comparison of data between the 2009 and 2010 audit periods

When data are compared between the two audit periods, trends start to emerge. On a positive note:

- Surgeon participation has increased from 60% to 81%
- VTE prophylaxis utilisation went up from 72% to 76%
- There was an apparent reduction in some postoperative complications (particularly anastomotic leak and vascular graft occlusion)
- The overall frequency of issues related to patient transfer fell from 36% to 32%
- The frequency of adverse events remained low at 5%

However:

- There has been an apparent increase in some postoperative complications (e.g. endoscopic perforations)
- There has been an increase in the frequency of poor communication of clinical information during patient transfer between hospitals from 12% to 20%
- There was an increase in 2010 of cases where critical care support was not being provided to patients. This apparent increase in patients not receiving critical care does not necessarily indicate a lack of critical care facilities

It should be noted that where no comparative data are given, there was no significant difference between the 2009 and 2010 audit periods.

### Recommendations and key points

The recommendations are as follows:

- Continue to increase participation of surgeons and hospitals towards 100%
- Introduce participation by the private hospital sector in both Queensland and New South Wales
- Introduce the audit program in New Zealand
- Look for emerging trends in mortality and address these where possible through ongoing educative and interactive seminars

- Improve on the quality and effectiveness of communications within the clinical teams
- Procedure-related sepsis is an ongoing issue and needs to be addressed
- Prepare and deliver a national case note review booklet twice a year for distribution to surgeons, Trainees and other clinical staff involved in patient care
- Ensure greater completeness and accuracy of the SCFs. The failure to fully complete the forms substantially detracts from data quality. Missing data in the SCF prevents assessors from reaching a conclusion regarding the need for further investigation and greatly reduces the amount of data available for analysis by ANZASM. Increased clinical information could lead to a reduction in requests for SLAs being carried out due to a lack of information in SCFs.



# 1. Introduction

## KEY POINTS

The Australian and New Zealand Audit of Surgical Mortality (ANZASM) is an external peer-review audit by surgeons of deaths that occur under their surgical care.

- This report is a review of all deaths notified during the period 1 January 2009 to 31 December 2010.
- ANZASM's main roles are to inform, educate, facilitate change and improve quality of surgical practice.
- This report is an analysis of the 6507 cases that completed the full audit process.

## 1.1 Background

The Royal Australasian College of Surgeons became responsible for the management of the Western Australian Audit of Surgical Mortality (WAASM) in 2005 following its establishment in 2001. WAASM was modeled on the Scottish Audit of Surgical Mortality, which has operated successfully since 1988. The College has expanded the program to other states and territories under the umbrella of ANZASM.

Complete data for the period 1 January 2009 to 31 December 2010 are included in this report from Western Australia, South Australia, Tasmania, Victoria, New South Wales and Queensland. The Australian Capital Territory and Northern Territory joined the program during 2010.

## 1.2 Objectives

The principal aims of the audit are to inform, educate, facilitate change and improve quality of practice within surgery. The primary mechanism is peer review of all deaths associated with surgical care. The audit process is designed to highlight system and process errors and to identify trends in surgical mortality. It is intended as an educational rather than a punitive process.

## 1.3 Structure and governance

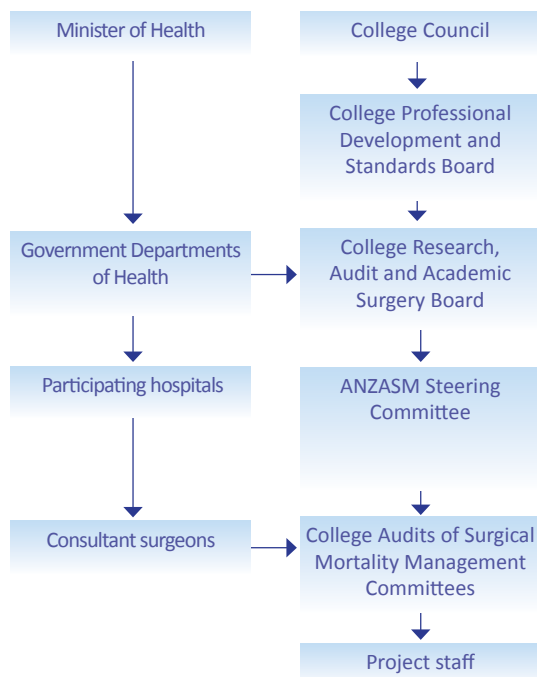
ANZASM is managed by the Research Audit and Academic Surgery Division of the College. ANZASM oversees the implementation and standardisation of each regional audit to ensure consistency in audit processes and governance structure across all jurisdictions (see Figure 1).

The individual regional audits are funded by their departments of health. The College provides infrastructure support and oversight to the project.

Participation by surgeons has been mandated as part of the College's Continuing Professional Development program since January 2010.

ANZASM receives protection under the Commonwealth Qualified Privilege Scheme, part VC of the *Health Insurance Act 1973* (gazetted 6 November 2006).

Figure 1: Governance structure of the ANZASM



ANZASM: Australian and New Zealand Audit of Surgical Mortality; Royal Australasian College Of Surgeons

## 1.4 Methodology

In brief, individual regional audits of surgical mortality are notified of in-hospital deaths associated with surgical care. The method of notification varies by region. All cases in which a surgeon was responsible for, or had significant involvement in, the care of a patient are included in the audit, whether or not the patient underwent a surgical procedure.

The clinical details pertaining to the management of each case are recorded on a standard, structured surgical case form (SCF) completed by the consultant or treating surgeon associated with the case. The completed SCF is returned to the appropriate audit of surgical mortality office, where it is de-identified and sent for first-line assessment (FLA) by a surgeon from the same surgical specialty but from a different hospital. This means the first-line assessor is unaware of the name of the deceased, the treating surgeon or the hospital where the death occurred.

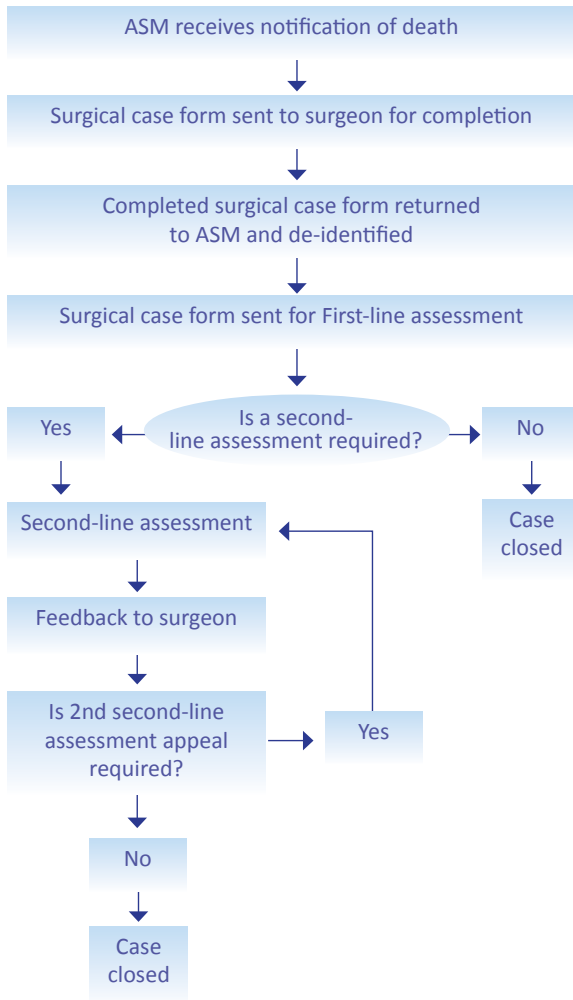
There are two possible outcomes of this FLA:

- The information provided by the treating surgeon is adequate to reach a conclusion about the case and to identify any issues of management, if present.
- A further in-depth assessment (second-line assessment (SLA) or case note review) is necessary either:
  - > for clarification of issues of patient management identified or suspected by the first-line assessor, or
  - > because the information provided by the treating surgeon was inadequate to reach a conclusion.



Where an SLA is deemed necessary, assessors are selected using the same criteria as for first-line assessors. The audit process is outlined in Figure 2.

**Figure 2: The audit process**



ASM: audit of surgical mortality.

## 1.5 Providing feedback

The principal aim of the ANZASM is education as a component of surgeons' CPD. This is achieved by providing commentary obtained during the audit process directly back to the treating surgeon as well as de-identified cases in a national case note review booklet. The individual regional audits also produce their own annual reports as well as case note review series, which highlight particular issues in patient management.

## 1.6 Reporting conventions

### 1.6.1 Reporting clinical incidents

In the structured SCF, the surgeon is asked to document whether there were any clinical incidents during the care of the patient. The surgeon is asked to:

- report on the perceived impact of the incident on the outcome by stating whether the incident:

- > made no difference to the outcome
- > may have contributed to death
- > caused the death of a patient who would otherwise have been expected to survive

- provide their perception as to preventability, using the following categories:
  - definitely preventable
  - probably preventable
  - probably not preventable
  - definitely not preventable
- indicate which clinical area was most responsible for the incident/event:
  - audited surgical team
  - another clinical team
  - hospital
  - other.

First and second-line assessors also complete the same assessment matrix.

### 1.6.2 Analysis of clinical incidents

A primary objective of the ASM peer-review process is ascertaining if death was a direct result of the disease process alone, or if aspects of management of the patient might have contributed to that outcome. Where there is a perception that the clinical management may have contributed to death, ANZASM specifies a spectrum of criticism to be used by assessors:

- *an area for consideration*: where the assessor believes an area of care could have been improved or different, but recognises that the issue is perhaps debatable
- *an area of concern*: where the assessor believes that an area of care should have been better
- *an adverse event*: an unintended injury or event that was caused by the medical management of the patient rather than by the disease process, and which was sufficiently serious to lead to prolonged hospitalisation; or to temporary or permanent impairment or disability of the patient; or which contributed to or caused death. Specific complications (e.g. pulmonary embolus, anastomotic leak) are by definition adverse events.

### 1.6.3 Data analysis

The 2010 report covers deaths reported to ANZASM from 1 January 2009 to 31 December 2010, censored on 31 March 2011. The full audit process takes an average of two months from notification of death to completion. This means that some cases are still under review and their outcomes are not available for this report. These cases will of course be featured in the next report. Patients admitted for terminal care are excluded from the full audit process.

For the purposes of collating data for this national report, data are encrypted, sent to and stored in a central Structured



Query Language server database with a reporting engine. All transactions are time-stamped. All changes to audit data are recorded in an archive table enabling a complete audit trail to be created for each case. An integrated workflow rules engine supports the creation of letters, reminders and management reports. This system is designed and supported by Alcidion Corporation (Adelaide).

The data are analysed using the Statistical Package for Social Sciences, version 15.0, statistical package STATA version 10.1, and Microsoft Office Excel (2010). Numbers in the parentheses in the text (n) represent the number of cases analysed. As not all data points were completed, the total number of cases used in the analyses varies. The total numbers of cases (n) included in individual analyses are provided in all tables and figures in the report.



## 2. Audit participation

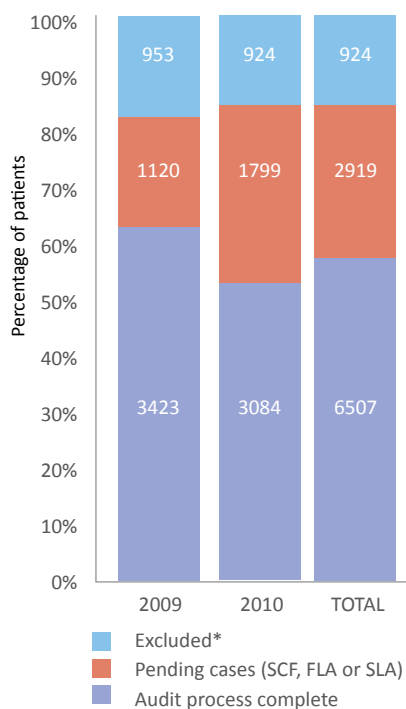
### KEY POINTS

- On a national basis, surgeon participation is 81%. This may be an underestimate of true intent to participate as not all hospitals are participating, particularly in the private sector in Queensland and New South Wales.
- Since January 2010, participation in ANZASM has been made a mandatory component of CPD. It is expected that this will encourage more surgeons to participate further.
- The SCF return rate at census date for those participating surgeons is 74%.
- Three hundred and seventy out of a potential 405 public hospitals are currently participating in the audit program.

### 2.1 Audit numbers

During the period January 2009 to December 2010, ANZASM received 11303 notifications of death associated with surgical care as shown in Figure 3 below.

Figure 3: Audit status at census date (n=11303)



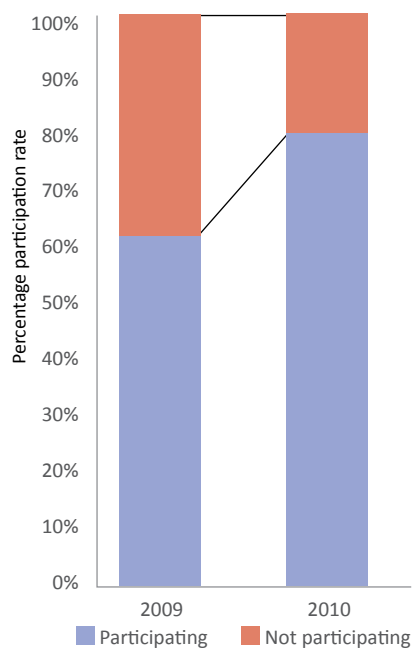
\* Excluded cases were non-surgical, non-participant or terminal care cases. FLA: first-line assessment; SCF: surgical case form; SLA: second-line assessment.

#### Comment

From 1 January 2009 to 31 December 2010 a total of 11303 deaths were reported to ANZASM.

- Of these, 6507 cases had proceeded to and completed the audit process by the census date. The clinical information from these 6507 deaths provides the patient profiles described in this report and is the denominator in all analyses pertaining to outcomes from the audit, unless stated otherwise.
- The remaining 4796 cases were not included in the audit for the following reasons:
  - > Excluded as they were admitted for terminal care, inappropriately attributed to surgery or treated by surgeons not participating in the audit (n=1877).
  - > Had not completed the full audit (peer review) process at the census date (n=2919).
  - > The audit process relies not only on surgeons agreeing to participate, but also on their timely completion and return of surgical case and assessment forms (see Figures 4 and 5).

Figure 4: Participation by surgeons (n=6892)

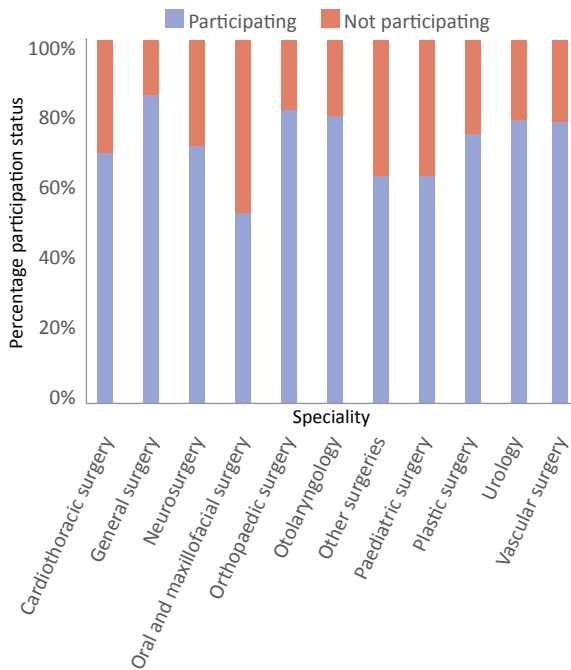


#### Comment

- At the end of 2010, 5573 of 6892 eligible Fellows (81%) had agreed to participate. This is a 21% increase in participation from the previous year, and can be largely attributed to the College mandating the participation in the mortality audit process in January 2010. Participation is now an essential component of recertification for CPD. It is hoped that higher numbers of participating surgeons can be achieved in the next audit period.
- Some reasons given for surgeons' non-participation included working in hospitals not currently participating in the audit, retirement or having gone overseas.



**Figure 5: Surgeon agreement to participate by surgical speciality**



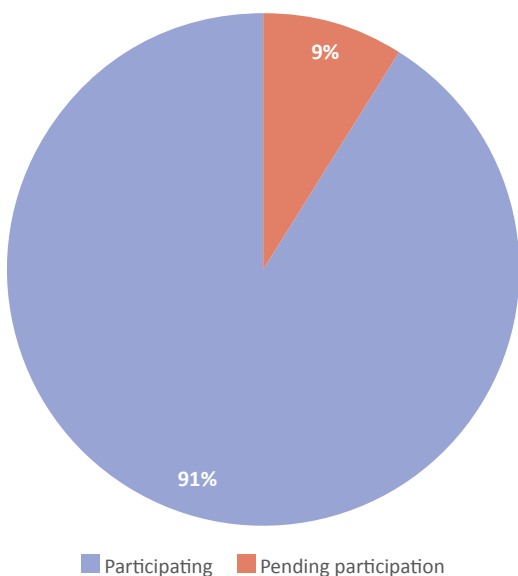
**Comment**

- Participation rates demonstrate variation among the specialities.
- The 'Other surgeries' category includes specialties in which surgeons participate: anaesthesia, intensive care unit (ICU), medicine, neurology, obstetric and gynaecological, oncology, ophthalmology, otology, thoracic medicine, trauma and transplant.

**2.2 Public hospital participation**

The majority of public hospitals in participating states have agreed to take part in the audit program. Four hundred and five hospitals have agreed to be involved; only 35 (9%) are yet to commit (see Figure 6).

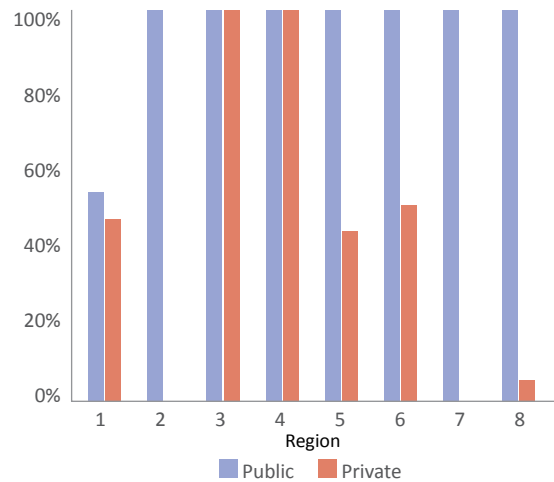
**Figure 6: Hospital agreement to participate (405)**



**Comment:**

Private hospital recruitment has commenced in most regions. However, private sector participation varies and is related to individual region funding arrangements. ANZASM is actively pursuing greater private sector participation in Queensland and New South Wales.

**Figure 7: Hospital participation by region**



**Comment:**

- Nationally since the end of 2010, there has been an increased recruitment drive into both the public and the private sector to join the audit process, and generally private sector participation is positive.
- However ANZASM would like to encourage the states where no private sector participation is evident, to consider enrolment as these deaths are just as crucial to review as the public sector.



### 3. Demographic profile of audited cases

#### KEY POINTS

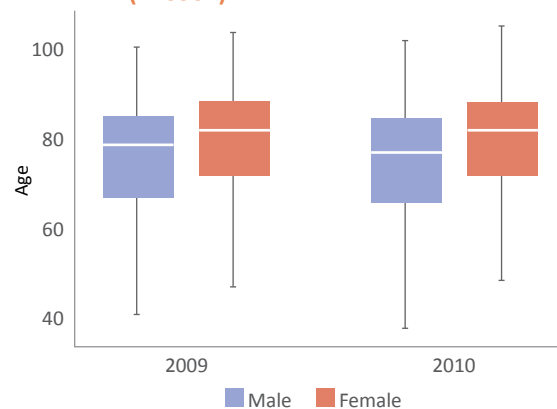
- A majority (87%) of audited deaths occurred in patients admitted as emergencies with potentially acute conditions. The mean age and spectrum of comorbidity in audited deaths indicates that surgical mortality predominantly occurs in the sick and elderly.

Figures 8, 9 and 10 are box and whisker plots, in which:

- the central box represents the values from the lower to upper quartile (25<sup>th</sup>–75<sup>th</sup> percentiles)
- the middle line represents the median value
- the vertical line extends from the minimum value to the maximum value, excluding outliers and extreme values (i.e. values larger than the upper quartile and plus 1.5 or 3 times the inter-quartile range (IQR)).

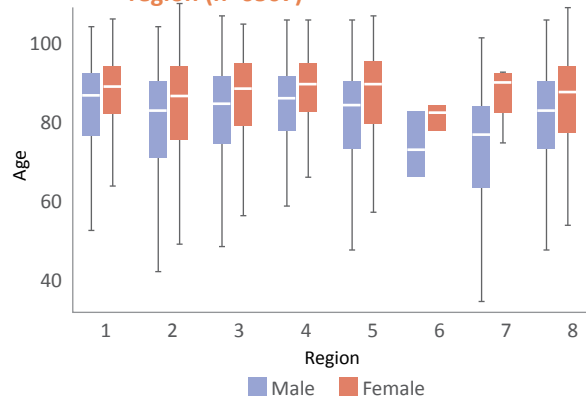
#### 3.1 Age and gender

Figure 8: Age distribution of deaths by gender and year (n=6507)



Note: Excludes extreme values.

Figure 9: Age distribution of deaths by gender and region (n=6507)

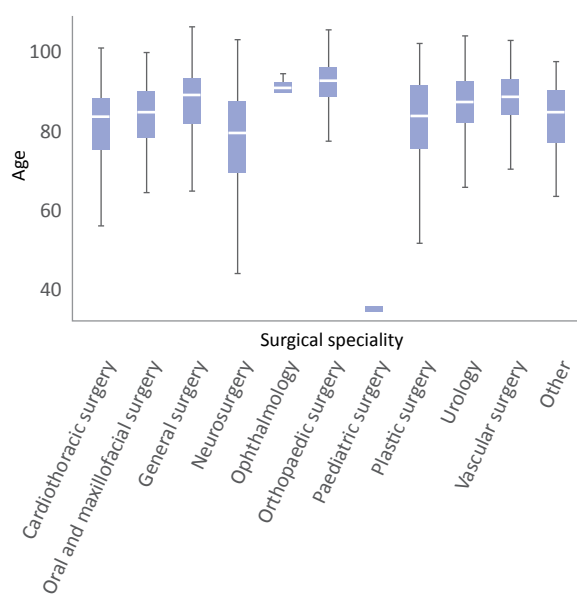


Note: Excludes extreme values.

#### Comment

- The gender distribution of audited deaths was generally similar across the regions.
- The male to female gender ratio was 54:46.
- The median age for males and females was 76 and 80 years respectively. The IQR for males was 64–83 years and for females 70–87 years.
- Females predominated in the 85–95 year range, whilst males predominate in the 75–84 year age range (data not shown in this graph).

Figure 10: Age distribution of deaths by surgical speciality (n=6507)



Note: Extreme values have been excluded.

'Other' speciality includes trauma and transplant, otology, otolaryngology, anaesthesia, general practitioners, obstetrics and gynaecology. ENT: ear, nose and throat.

#### Comment

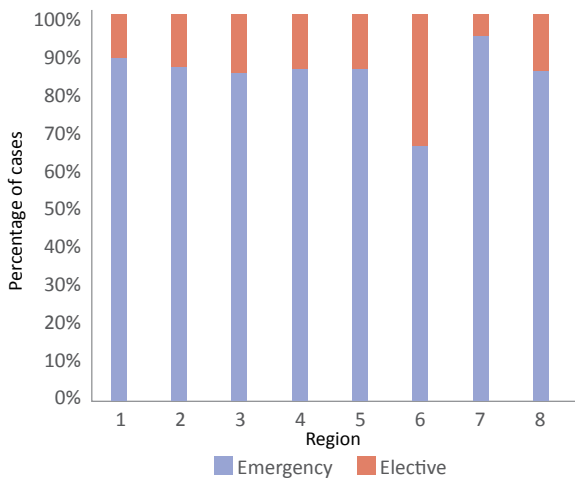
- The mean age at death is relevant to the case-mix of individual specialties.

#### 3.2 Acuity of audited cases

The 'acuity' status of audited cases indicates whether patients were admitted electively or as emergencies (see Figures 11, 12 and 13).



**Figure 11: Acuity of cases (n=6395)**

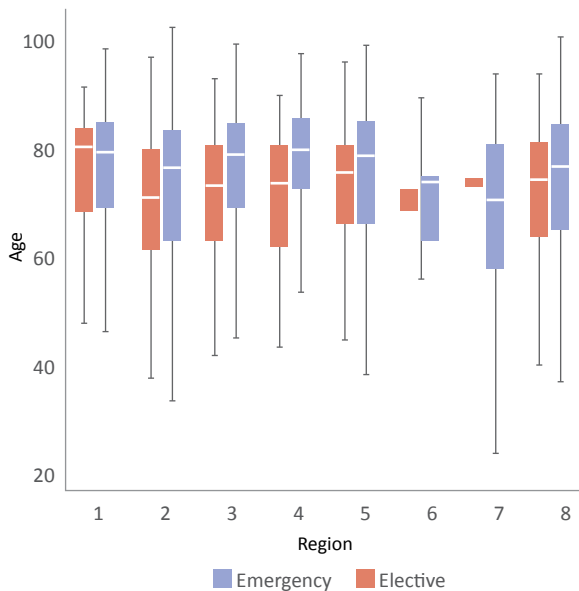


Missing data: n= 112 (2%).

**Comment**

- The majority (87%) of audited deaths occurred in patients admitted as emergencies for acute life-threatening conditions (data not shown).

**Figure 12: Age distribution of deaths by acuity and region (n=6395)**



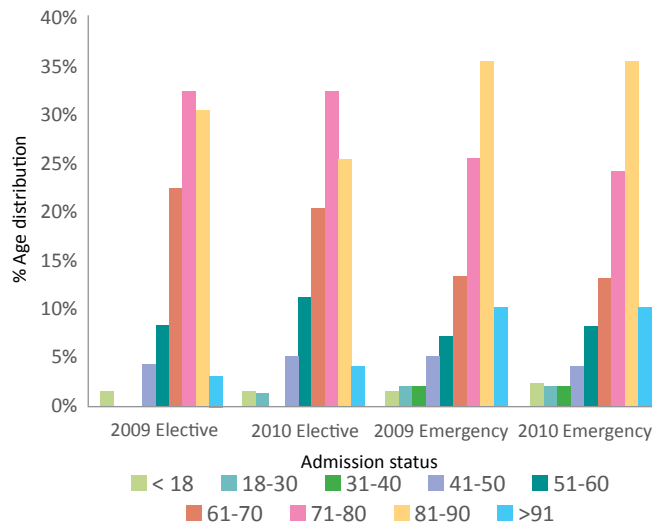
Missing data: n= 112 (2%)  
Note: Extreme values have been excluded.  
Elec: elective; Emerg: emergency.

**Comment**

Patients who died following emergency admission were older than those who died following elective admissions ( $p < 0.001$ ) (data not shown).

The median age of death for emergency admissions was 79 years and for elective admissions was 75 years (data not shown).

**Figure 13: Age distribution by urgency status in 2009 and 2010 (n=6395)**



**Comment**

The age distribution of emergency and elective deaths has been similar over time.

Emergency surgery in the 81-90 years age group was associated with the greatest mortality.

**3.3 Risk profile of audited cases**

This section reviews the risk profile of audited cases. This includes the American Society of Anesthesiologists (ASA) status, reported comorbidities and the treating surgeon's perception of risk of death.

**KEY POINTS**

- The clinical risk profile indicates that the majority of deaths occurred in patients with coexisting illness presenting with acute life-threatening conditions.
- Eighty-three per cent of cases in this audited series were reported to have had at least two preexisting medical conditions (comorbidities).

**3.4 American Society of Anesthesiologists status**

The ASA status is an international measure of patient risk used by anaesthetists.

ASA grade characteristics:

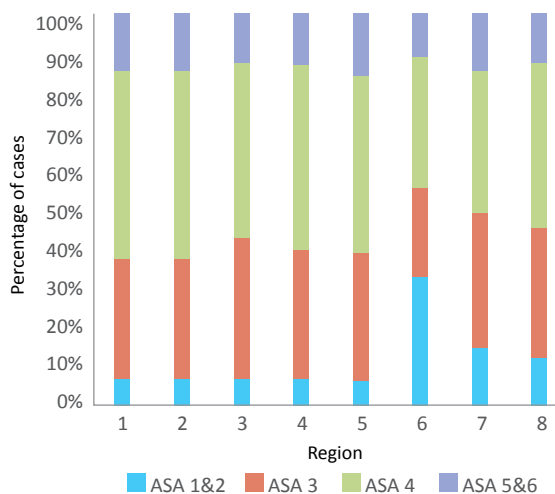
- A normal healthy patient.
- A patient with mild systemic disease.
- A patient with moderate systemic disease
- A patient with severe systemic disease that is a constant threat to life.
- A moribund patient unlikely to survive 24 hours, who is not expected to survive without an operation.
- A declared brain-dead patient whose organs are being removed for donor purpose.

The ASA grades according to region, year, specialty and admission status are provided in Figures 14, 15, 16 and 17.





Figure 14: ASA grades by region (n=6132)



Missing data: n=375 (6%).  
ASA: American Society of Anesthesiologists.

**Comment**

- The majority (90%) of patients had an ASA grade greater than or equal to 3, indicating that a moderate to severe degree of systemic disease was present at the time of treatment (data not shown).
- The risk status as indicated by the ASA score was generally similar in all regions.
- There was a significant amount of missing data in some regions (data not shown).

Figure 15: Distribution of ASA grades by year (n=6132)

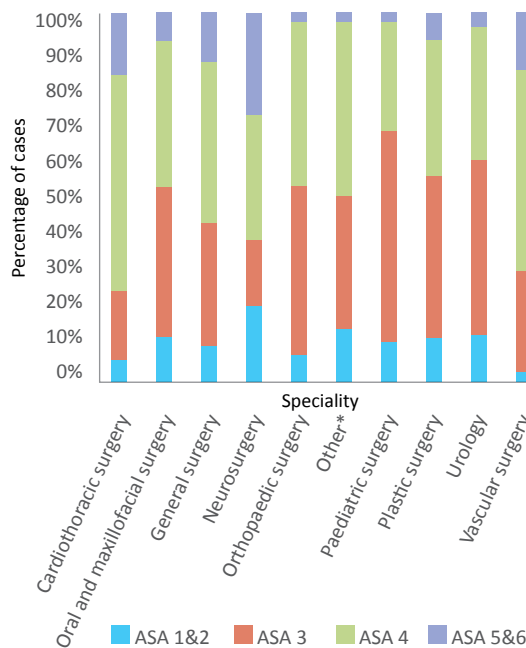


Missing data: n=375 (6%).  
ASA: American Society of Anesthesiologists.

**Comment**

- There were no major differences during the two audited periods. ASA greater than or equal to 4 was similar across time at around 55%.

Figure 16: ASA grades by surgical speciality (n=6132)

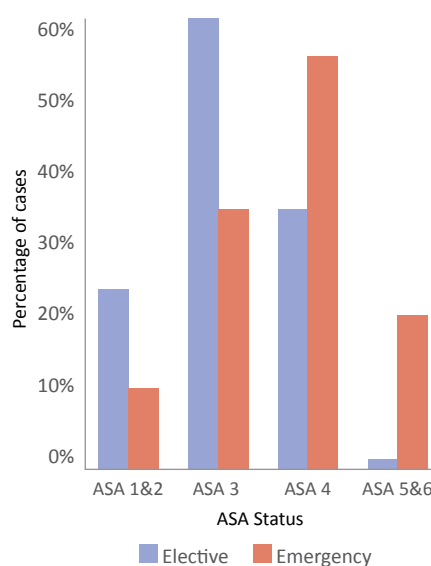


Missing data: n=375 (6%).  
\*Other surgeries included trauma, obstetrics and gynaecology, ophthalmology and oral and maxillofacial surgeries.  
ASA: American Society of Anesthesiologists; ENT: ear, nose and throat.

**Comment**

- There was some variation in ASA grades among the sub-specialties, which reflects the case-mix of the individual specialties.

Figure 17: Frequency of ASA grades by admission status (n=6049)



Missing data: n=458 (8%).  
ASA: American Society of Anesthesiologists.



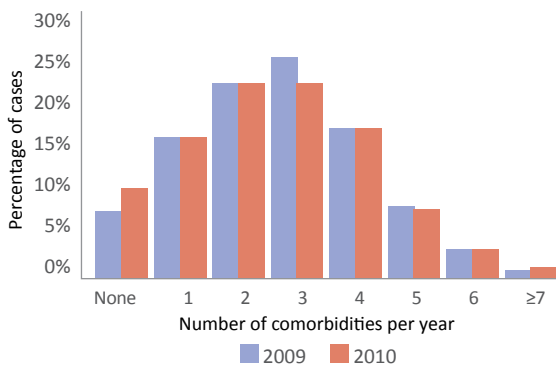
**Comment**

- Eighty percent of elective and 92% of emergency patients were described as having an ASA score greater than or equal to 3.

**3.5 Comorbidity**

Surgeons are asked to record all known comorbidities (coexisting medical conditions) additional to the primary medical (presenting) problem. The frequency of multiple comorbidities in individual patients per year is provided in Figure 18.

**Figure 18: Frequency of multiple comorbidities in individual patients across audit years (n=6285)**

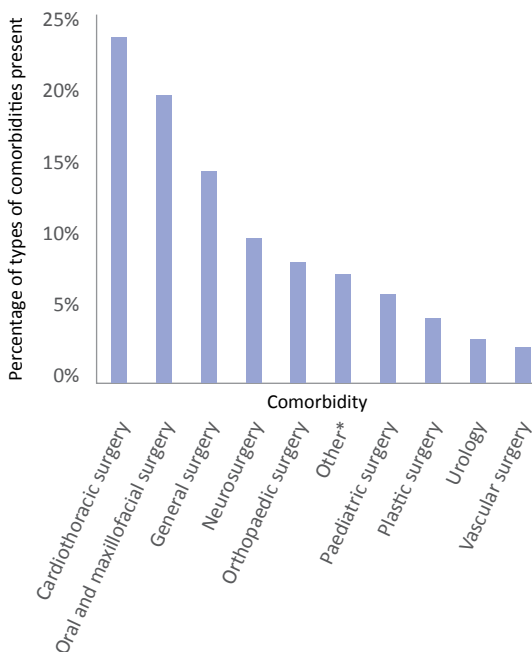


Missing data: n=222 (4%).

**Comment**

- In 5720 (91%) of 6285 audited cases, comorbidities were reported.
- Most patients (83%) had at least two comorbidities. This is further evidence of significant preexisting illness in this group of audited deaths.
- The frequency of specific comorbidities is provided in Figure 19.

**Figure 19: Frequency of specific comorbidities (16736 comorbidities in 6285 patients)**



Missing data: 222 cases (3%).

\*Other comorbidities covered a wide range and included alcohol abuse, anaemia, anticoagulation, bowel ischaemia, cachexia, cellulitis, coagulopathy, dementia, human immunodeficiency virus/acquired immunodeficiency syndrome, malnutrition, motor neurone disease, polymyalgia rheumatica, rheumatoid arthritis, sepsis and systemic lupus erythematosus.

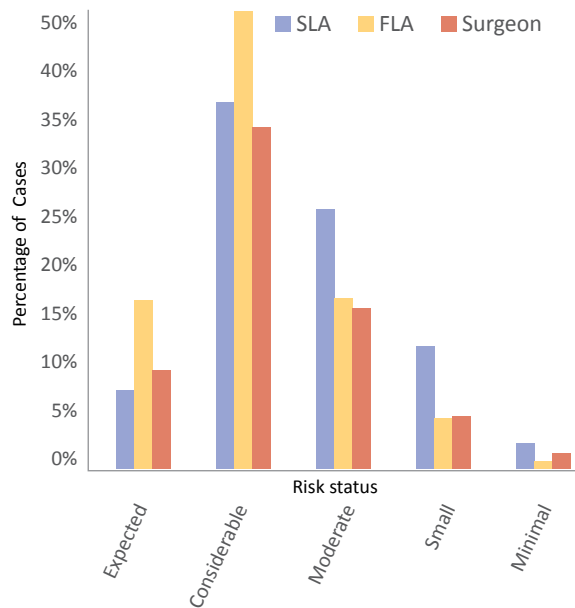
**Comment**

- The most common comorbidities – cardiovascular, advanced age and respiratory disease – were similar in terms of incidence in both male and female patients (data not shown).
- There were no major differences found between the two years of the audited period (data not shown).

**3.6 Surgeon perception of risk status**

The treating surgeon and assessors are asked to record the perceived risk of death of the patient at the time of treatment (see Figure 20).

**Figure 20: Risk of death as perceived by treating surgeon and assessors (n=6285)**



FLA: first-line assessor; SLA: second-line assessor.

Missing data: 222 cases (4%).

**Comment**

- The perceived risk of death, as reported by surgeons, was considerable or expected in 48% of cases and small or minimal in only 8% of cases. This is further evidence of the high-risk profile suggested by the mean age, ASA score and associated comorbidity.
- The agreement level between first- and second-line assessors' assessment of likelihood of death was fair, with a kappa score of 0.3.





## 4. Risk management strategies

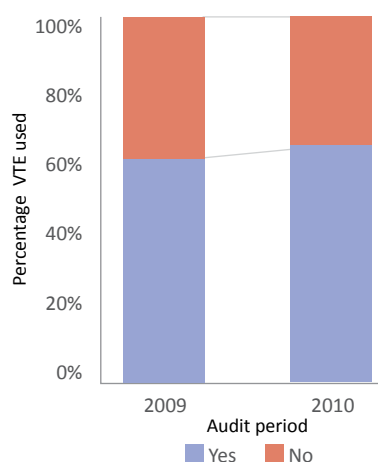
### 4.1 Prophylaxis for venous thromboembolism

#### KEY POINTS

- Venous thromboembolism (VTE) prophylaxis use was recorded in 4775 of 6183 (77%) patients and the utilisation rate varied from 68% to 100% of cases across the regions.
- In this audited series of deaths, the VTE prophylaxis provided was generally deemed as appropriate. However, in 5% of cases where prophylaxis was consciously withheld by the treating surgical team, assessors disagreed with the decision to withhold.
- In the majority of instances, those patients expected to benefit from critical care support did receive it. The review process suggested that some 8% of cases who did not receive treatment in a critical care unit would most likely have benefited from it.
- Fluid balance in the surgical patient is an ongoing challenge. In this series, 10% of cases were perceived to have had poor management of their fluid balance.
- Missing data continues to be a problem in this section of the dataset.

The treating surgeon is asked to record if deep vein thrombosis (DVT) prophylaxis was given and what prophylaxis was actually used (see Figures 21 and 22). If not given, the reason it was withheld is requested and the assessors review the appropriateness of these decisions.

**Figure 21: VTE prophylaxis used during the audit period (n=6183 cases)**

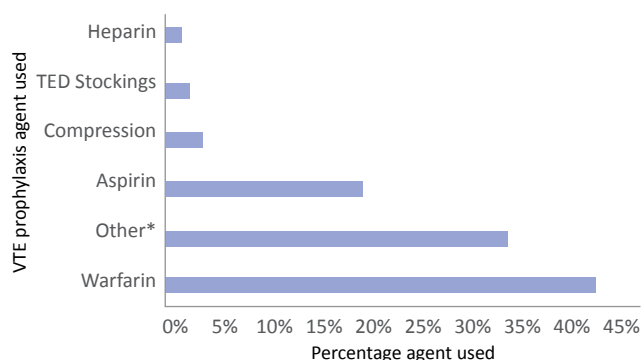


Missing data n=324 (5%).  
VTE: venous thromboembolism.

#### Comment

- VTE prophylaxis was used in 4775 of 6183 (77%) of cases.

**Figure 22: Type of VTE prophylaxis used (8517 instances in 4775 cases)**



\*Other agents recorded were calf compression, Clexane, Clopidogrel, Danaparoid, Enocaprin, Enoxaparin, early mobilisation, Fragmin, inferior vena cava filter, Lipirudin and Plavix.  
TED: thromboembolic deterrent; VTE: venous thromboembolism.  
Missing data n=238 (5%).

#### Comment

- In the 4775 patients who received prophylaxis, the most frequently used agents were Heparin (41%) and TED stockings (33%).

**Table 1: Distribution of VTE prophylaxis used by region (8517 instances in 4775 patients)**

VTE prophylaxis agents used	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8
Heparin	46%	35%	43%	50%	47%	33%	42%	39%
TED stockings	31%	35%	36%	24%	31%	33%	31%	32%
Compression	16%	21%	11%	20%	12%	22%	15%	24%
Aspirin	2%	5%	4%	4%	4%	0%	0%	2%
Other*	3%	2%	5%	1%	4%	6%	8%	1%
Warfarin	2%	2%	1%	1%	2%	6%	4%	2%

\*Other agents recorded were calf compression, Clexane, Clopidogrel, Danaparoid, Enocaprin, Enoxaparin, early mobilisation, Fragmin, inferior vena cava filter, Lipirudin and Plavix.  
TED: thromboembolic deterrent; VTE: venous thromboembolism.

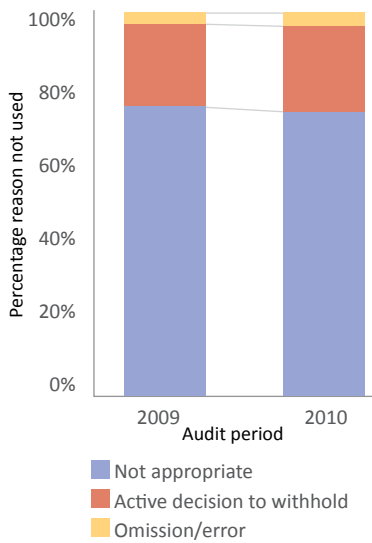
#### Comment

- VTE prophylaxis use varied from 68% to 100% across the regions (data not shown).
- There were variations in the use of certain forms of prophylaxis across the regions, particularly for use of compression, TED stockings and Heparin.
- Missing data accounted for 324 (5%) of the 6507 cases.

The reasons for not using VTE prophylaxis are shown in Figure 23.



**Figure 23: Stated reasons for non-use of VTE prophylaxis (n= 1170)**

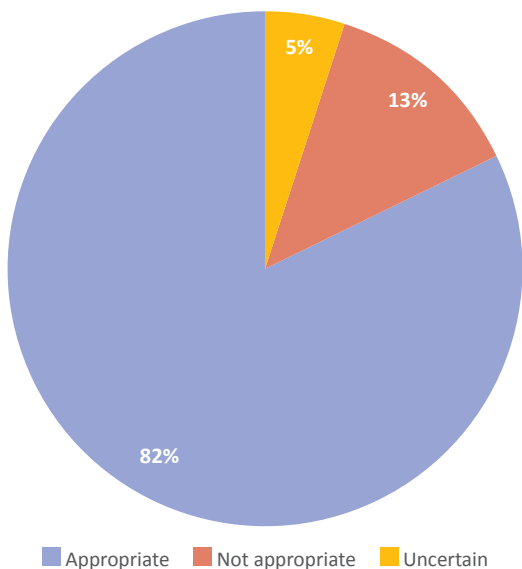


Missing data: n=238 (17%).  
VTE: venous thromboembolism.

**Comment**

- Non-use of VTE prophylaxis was due to error or omission in only 38 of the 1170 cases (3%). In the majority of instances prophylaxis was withheld for clinical reasons. There was no change in trend during the audited periods.
- In 1132 (97%) of 1170 patients the decision to withhold VTE prophylaxis was either deemed not appropriate or was an active decision by the treating surgeon.
- The assessors' perception of the appropriateness of the decision to withhold VTE prophylaxis is shown in Figure 24.

**Figure 24: Assessor perception of appropriateness of surgeon's decision to withhold VTE prophylaxis (n= 1170)**



Missing data: n=172 (15%).  
VTE: venous thromboembolism.

**Comment**

- In circumstances where a case underwent an SLA, the assessor's view is recorded. Assessors concluded that the decision to withhold DVT prophylaxis had been appropriate in 1008 (82%) of the 1236 audited cases.
- The agreement level between the first- and second-line assessors was poor (kappa score 0.13).

**4.2 Provision of critical care support to patients**

The treating surgeon is asked to record whether or not a patient received critical care support in an intensive care or high dependency unit before or after surgery (see Figure 25). The first- and second-line assessors review the appropriateness of the use of critical care support. It is recognised that this is a subjective assessment of needs and potential benefit.

The SCF was revised in August 2010 to identify the reasons why patients did not receive critical care support and to overcome the large amount of missing data in this section. There are not yet enough data arising from the new questions to comment. It is hoped that this revised and improved question will encourage surgeons to complete the form and thus ensure sufficient data for analysis in this area of care.

**Figure 25: Provision of critical care support during audit period (n= 4901)**



Missing data: 1606 (25%).

**Comment**

There was an increase in 2010 of cases where critical care support was not being provided to patients. This apparent increase in patients not receiving critical care does not necessarily indicate a lack of critical care facilities.

The assessors perceived that 8% of patients who did not receive critical care support might have benefited from critical care; however, due to the changes in the SCF the cross reference between surgeon and assessor opinion cannot be performed suitably at this time due to differences in data groups.

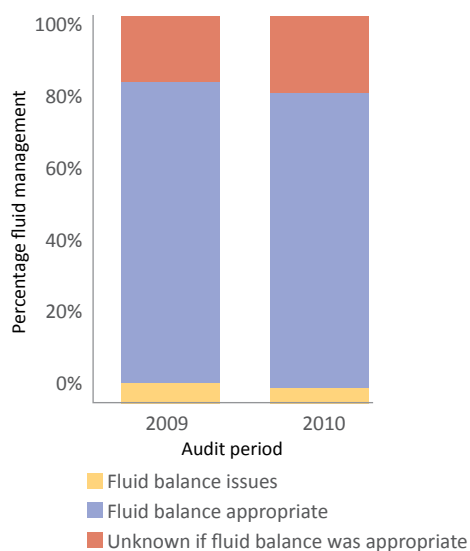
There was a high proportion of missing data in response to this question in 2009. As a result of this, ANZASM has revised the question to improve the reporting for this question.



### 4.3 Fluid management

This section looks at the appropriateness of fluid balance in 5870 patients (see Figure 26).

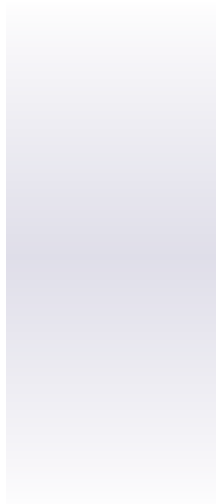
**Figure 26: Fluid management (6491 assessments in 5870 patients)**



Missing data: 637 (11%) first or second-line assessments.

#### Comment

- In 570 (10%) cases, surgeons felt there was an issue with fluid balance. In a further 14% of cases assessors indicated the evidence provided was inadequate to reach a conclusion.
- There was 'poor agreement' between the first- and second-line assessors' perception of appropriateness of fluid balance management (kappa score 0.18). In the cases they reviewed, 7% of first-line assessors and 23% of second-line assessors said that fluid balance was a problem.
- The percentage of missing data (11%) in this section prevents further identification of trends and hinders the analysis of the data.





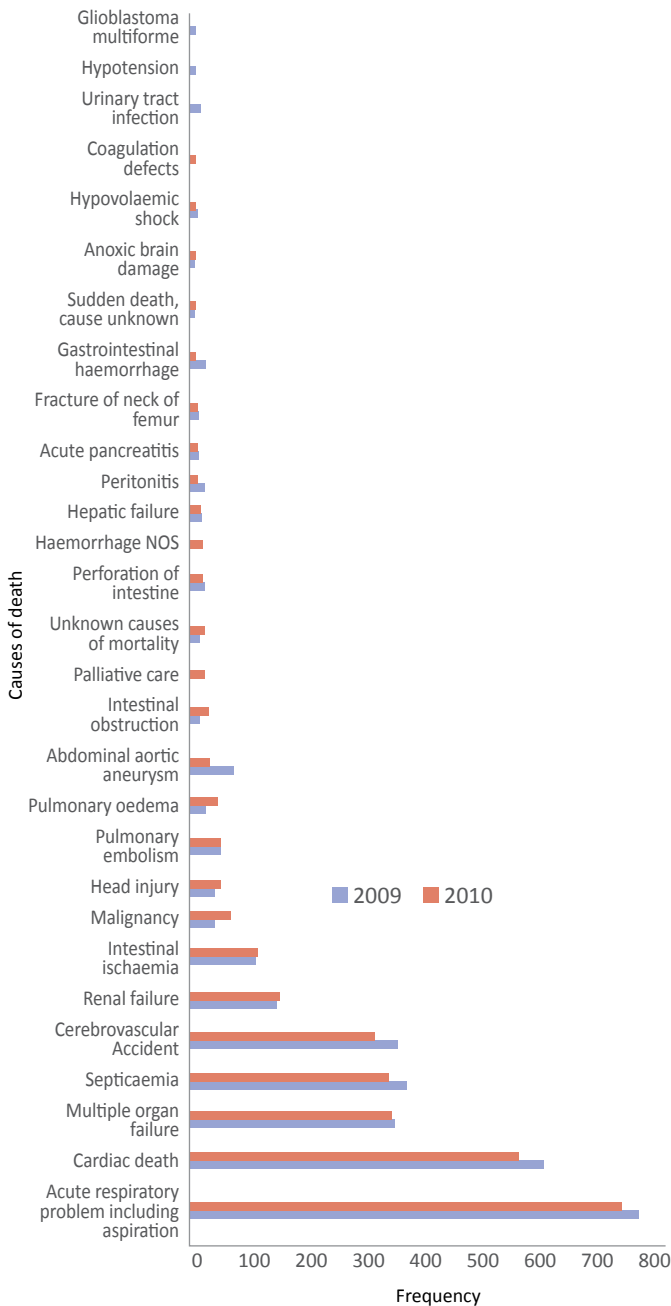
# 5. Cause of death

## 5.1 Frequency of causes of death reported in audited cases

### KEY POINTS

- The most frequent causes of death were respiratory failure, cardiac death, multi-organ failure and septicaemia (see Figure 27).

Figure 27: Causes of death where n≥10 (8745 causes of death recorded for 6445 patients)



Missing data: 62 (1%).

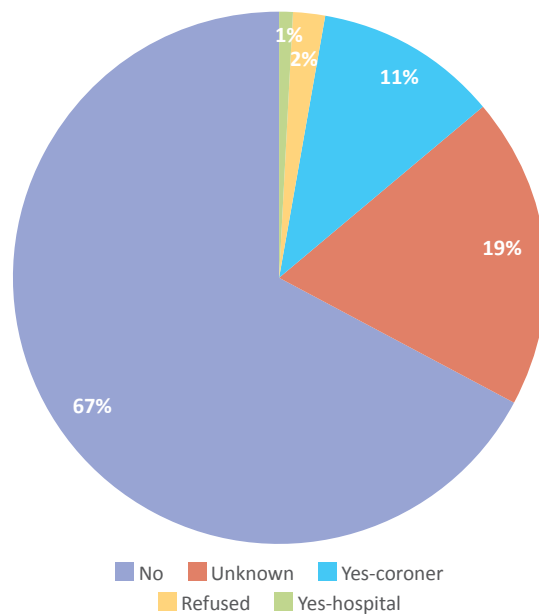
### Comment

- Causes of death were consistent over the entire audit period.
- There may be instances where a patient has multiple diagnoses on presentation to hospital.

## 5.2 Establishing cause of death

The cause of death recorded by the treating surgeon is based on the clinical course of the patient and any relevant supporting evidence from investigations. Where doubt exists around the circumstances leading to a 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 cause of death is requested with decreasing frequency. An overview of postmortems performed is shown in Figure 28 and Table 2.

Figure 28: Overview of postmortems performed (n=6297)



Missing data: 210 cases

Table 2: Overview of postmortems performed by region

Postmortem status	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7	Region 8
No	64%	65%	62%	68%	56%	33%	54%	62%
Unknown	25%	19%	13%	17%	20%	11%	15%	20%
Yes - coroner	10%	11%	6%	9%	15%	56%	19%	12%
Yes - hospital	0%	2%	1%	2%	2%	0%	4%	2%
Refused	0%	2%	3%	2%	5%	0%	0%	2%
Missing	1%	1%	15%	2%	2%	0%	8%	2%



#### Comment

- A coronial or hospital postmortem was performed in only 846 (13%) of the 6297 audited cases. In some of the regions, the numbers were too low to interpret.
- In 4205 (67%) cases no postmortem was performed. In 193 (11%) out of 1694 cases, the treating surgeon had indicated a preference that a postmortem be performed (there were 2332 cases of missing data in this question).
- The majority of postmortems carried out were coronial. The need for coronial input varied among regions.
- The low rate of postmortems limits confirmation of cause of death.
- There were no significant changes in trends during the audit period (data not shown).



## 6. Profile of operative intervention

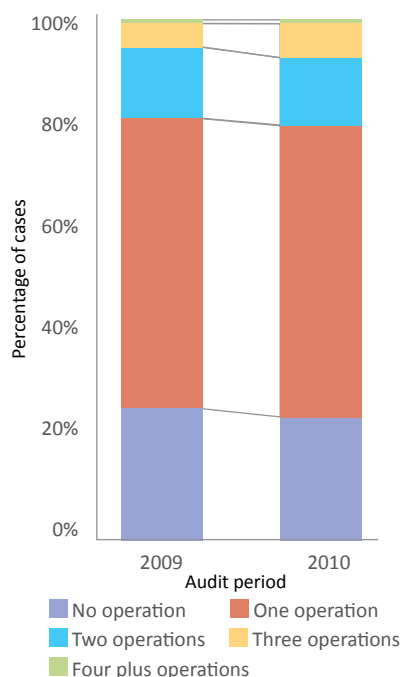
### KEY POINTS

- Seventy-five percent (4735) of 6307 patients had a surgical procedure.
- Some patients required more than one visit to the operating room during their hospital stay: 6512 separate surgical episodes were recorded in the 4735 patients.
- A consultant surgeon made the decision to operate in 93% of instances and performed 66% of the operations. This bias towards consultant surgeons performing the surgery is appropriate when the risk profile of this group of patients is considered.
- The rate of subsequent (unplanned) returns to theatre was 11%. Often multiple additional episodes of surgery were needed.
- The most common postoperative complications recorded were procedure-related sepsis, postoperative bleeding, tissue ischaemia and anastomotic leaks after bowel surgery.

### 6.1 Operative rate

The frequency of multiple operations on individual patients is shown in Figure 29.

**Figure 29: Frequency of multiple operations on individual patients (n=6307)**



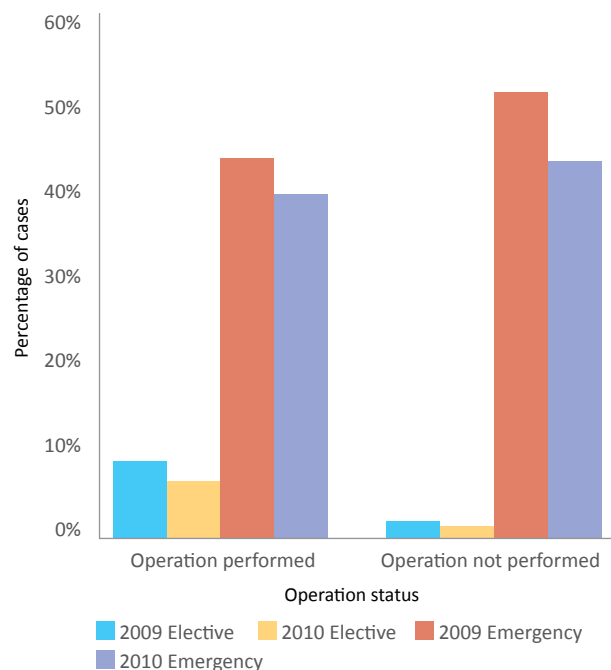
Missing data: 200 cases (3%).

### Comment

- In 75% of 6307 audited cases, patients underwent at least one episode of surgery either during their last admission or within 30 days prior to death.
- Twenty-five per cent of patients had no surgery during their final inpatient admission.
- A total of 6512 operative episodes were undertaken on the 4735 patients who had surgery; this reflects the fact that an individual patient can have more than one episode of surgery during their admission.
- The majority of patients (55%) had just one operation.
- Twenty per cent of patients had more than one surgical episode.
- There has been relatively little change in the number of operations on individual patients over the 2009–10 audit periods.

Operative episodes by urgency type are shown in Figure 30.

**Figure 30: Operative episodes performed by urgency type (6318)**



Missing data: 189 (3%) cases.

### Comment

- Deaths where no operation was performed occurred in 49 (6%) of elective admissions and in 1501 (27%) of emergency admissions (data not shown). The decision not to operate was generally an active decision to palliate an irretrievable situation.

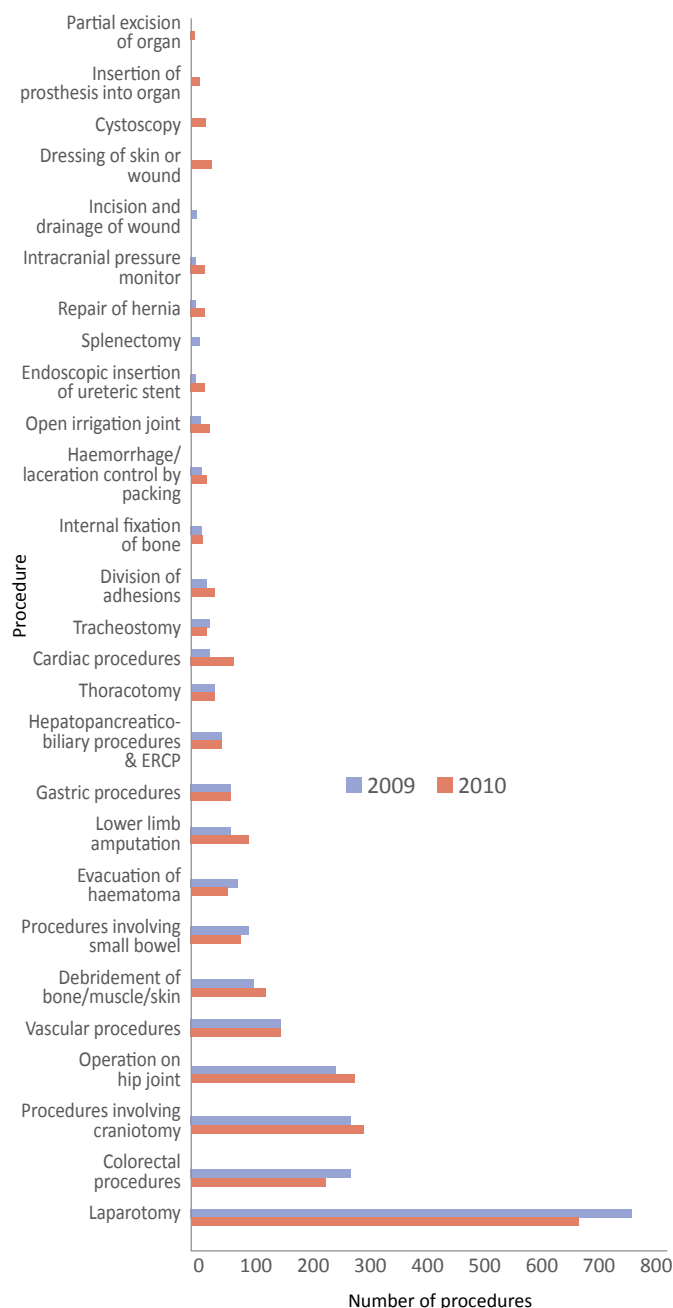




## 6.2 Frequency of specific operative procedures

The frequency of specific operative procedures in individual patients is shown in Figure 31.

Figure 31: Types of procedure where >10 (n=6512)



Note; ERCP - Endoscopic retrograde cholangiopancreatography

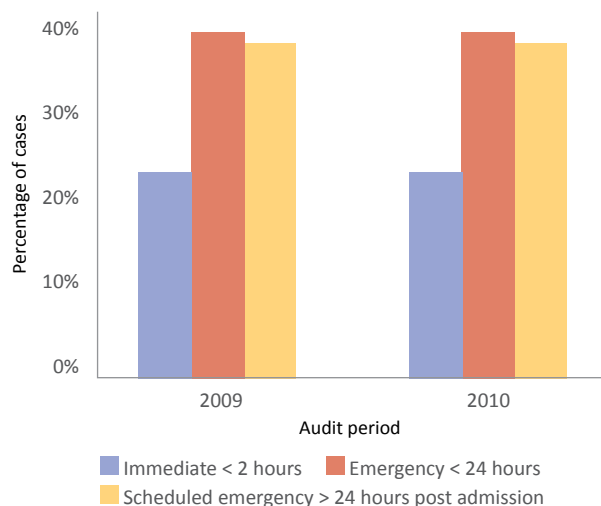
### Comment

- A patient can undergo multiple procedures during the same admission and during the same surgical 'episode'.
- The procedures with the highest listed frequency are often associated with emergency admission for trauma or other acute pathology.

## 6.3 Timing of emergency episodes

The timing of emergency surgical episodes is shown in Figure 32.

Figure 32: Timing of emergency surgical episodes (5019)



Missing data: 240 (5%).

### Comment

- The time criticality of a patient's condition predicts the timing of any surgery.
- Of the 6512 operative episodes in the audited series, 5019 (77%) were classified as emergencies.
- Overall, 2883 (57%) of emergency admissions to a surgical unit went to surgery within 24 hours of admission. The scheduling problems associated with managing these urgent cases are well recognised.
- The majority of emergency surgery is performed in the public sector (data not shown).

According to a 2008 report on the status of Australian public hospitals, emergency surgery occurs in the most urgent or critical cases and generally needs to be performed within 24 hours. In 2008–09 over 262,000 emergency surgeries were performed, with the majority carried out in public hospitals<sup>1</sup>. This has led to the development of acute surgical units in some areas. Such units have preferential access to the operating suites to expedite treatment. Strategies to manage this issue have been proposed.

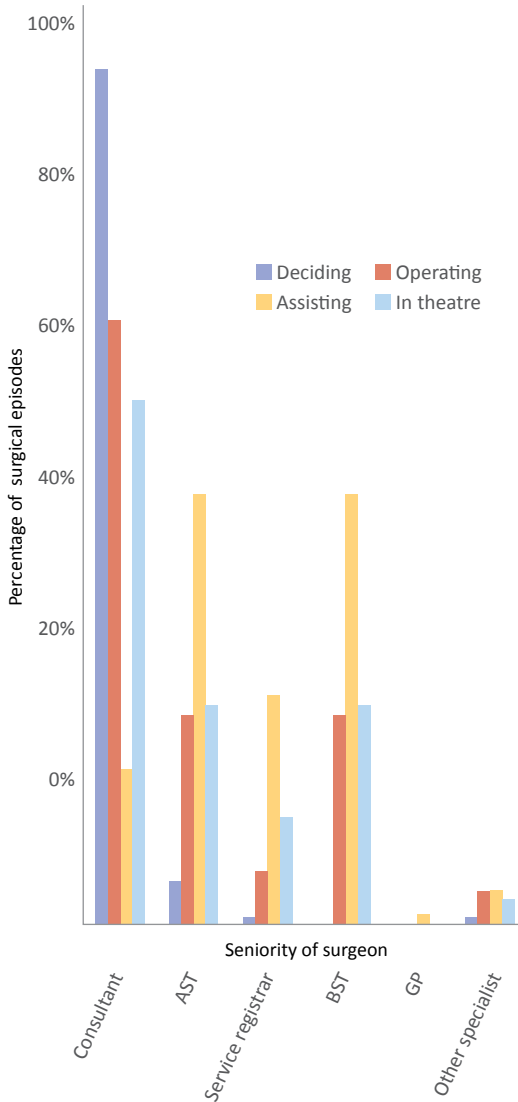
### 6.3.1 Seniority of surgeon performing surgery

The surgeon completing the SCF has to record the seniority of the surgeon who made the clinical decision to operate and who performed the surgery (see Figure 33).

<sup>1</sup> Royal Australasian College of Surgeons 2008. Position statement on emergency surgery, Royal Australasian College of Surgeons, Melbourne, viewed 12 December 2010, [http://www.surgeons.org/media/7985/FES\\_FES\\_2269\\_P\\_Position\\_Statement\\_Emergency\\_Surgery.pdf](http://www.surgeons.org/media/7985/FES_FES_2269_P_Position_Statement_Emergency_Surgery.pdf).



**Figure 33: Seniority of surgeon making the decision and performing the surgery (6512 procedures in 4735 patients)**

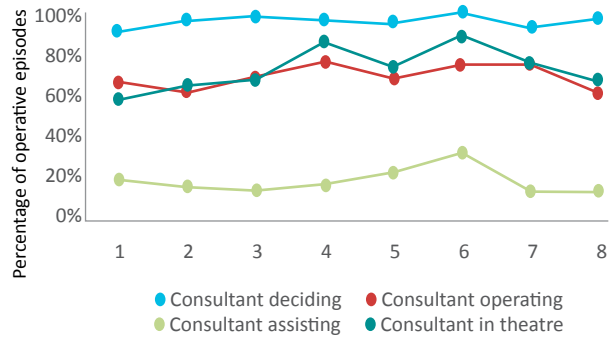


AST: Advanced Surgical Trainee; BST: Basic Surgical Trainee; GP: general practitioner.

**Comment**

- In 93% of cases, the consultant surgeon made the decision to operate and in 66% of cases they performed the operation.
- There has been little change in the proportion of consultant surgeons deciding and operating over the full audit period (data not shown).
- A consultant anaesthetist was present in 5956 (96%) of the 6174 operative episodes (there were missing data in 338 episodes) (data not shown).
- There may be more than one grade of surgeon deciding, operating, assisting or in theatre for each episode.

**Figure 34: Consultant involvement by region performing surgery (6512 procedures in 4735 patients)**



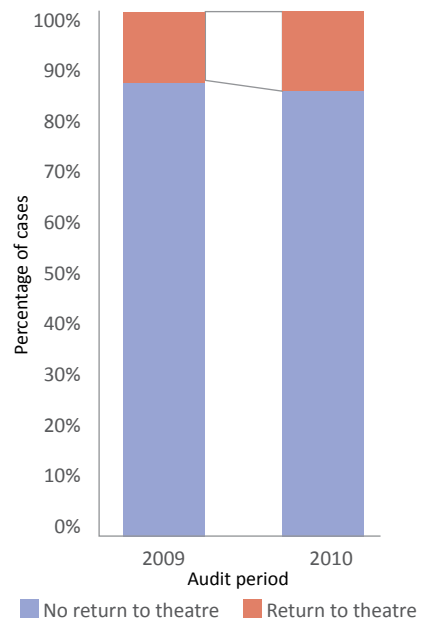
**Comment**

- There was some variation across regions for consultant involvement, that is, operating and assisting in surgery (see Figure 34). These differences reflect local approaches to surgical training and staffing levels.

**6.4 Unplanned return to theatre**

The treating surgeon has to indicate if there was an unplanned return to the operating theatre following the initial operative procedure.

**Figure 35: Patients requiring unplanned return to theatre (n=5948)**



Missing data 559 (9%).

**Comment**

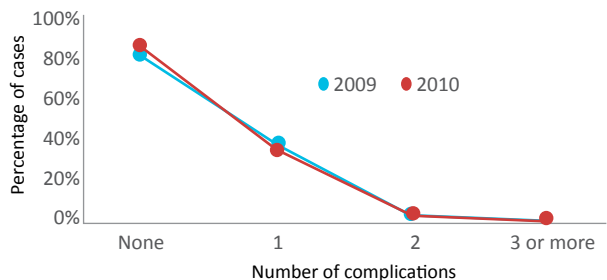
- In 11% of 5948 audited cases, there was a need for an unplanned return to theatre (see Figure 35).
- The proportion of patients requiring a return to theatre was relatively unchanged during the audit period.



## 6.5 Postoperative complications

The treating surgeon has to record any complications that occurred following a surgical procedure.

**Figure 36: Patients developing postoperative complications (n=4735)**

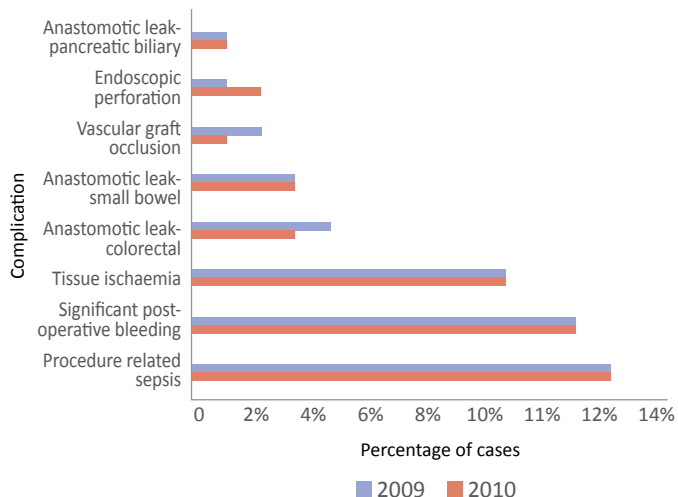


Missing data: 363 (8%).

### Comment

- Postoperative complications were reported in 1539 (33%) of the 4735 audited cases.
- The significance of these complications in relation to the eventual outcome was not stated. Significance will of course vary from minor (with no effect on outcome) to major (leading to death).

**Figure 37: Frequency of postoperative complications where  $\geq 10$  (n=765)**

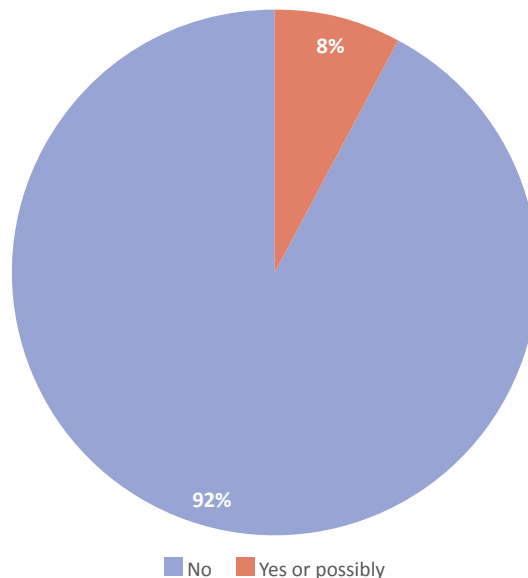


### Comment

- The most common postoperative complications over the audit period were procedure-related sepsis, postoperative bleeding, tissue ischaemia and anastomotic leaks following bowel surgery.
- There has been a decrease in some postoperative complications between 2009 and 2010, e.g. colorectal anastomotic leaks and vascular graft occlusion.
- Only complications with a frequency of more than ten patients have been listed here. The remainder included cardiac complications, pneumonia, renal failure, cerebrovascular accident (CVA), pulmonary embolism, multi-organ failure, sepsis and respiratory failure.

## 6.6 Anaesthetic problems

**Figure 38: Patients recorded as having had anaesthetic problems (n= 4735)**



Missing cases: n=149 (3%).

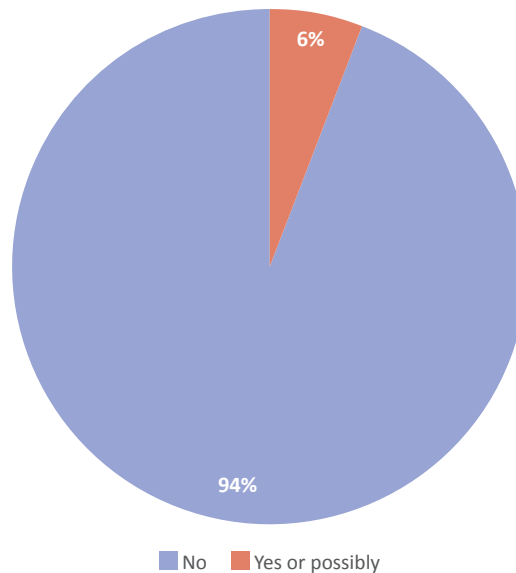
### Comment

- Anaesthesia was suggested as a significant factor in the outcome of 66 patients (1%) who had a surgical procedure. In 341 cases (7%) anaesthesia was, or was possibly, involved in the outcome (data not shown).
- The proportion of deaths where anaesthetic issues were raised was relatively unchanged between 2009 and 2010 (data not shown).

## 6.7 Operative procedure abandoned

The treating surgeon has to record if they abandoned any surgical procedure and the reasons for doing so. See Figure 39 for the occurrence of abandoned procedures in 2009 and 2010.

**Figure 39: Abandoned operations (n=5670)**



Missing data: 842 (13%).



#### Comment

- If the surgeon finds during surgery that the patient is suffering from an incurable and untreatable disease, this may lead to a decision to abandon the operative procedure. Such a decision was made in 6% of audited cases.
- The proportion of abandoned operations was unchanged between 2009 and 2010.

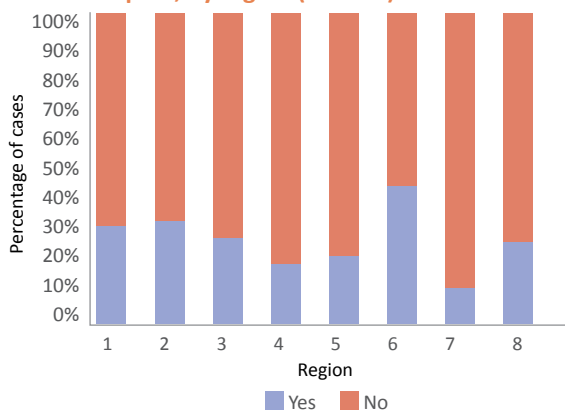


# 7. Patient transfer issues

## 7.1 Frequency of need for transfer

The audit process examines transfers between hospitals. Transfer is typically necessitated by the need for a higher level of care or specific expertise.

Figure 40: Frequency of need for transfer to another hospital, by region (n=6308)



Missing data: 199 (3%).

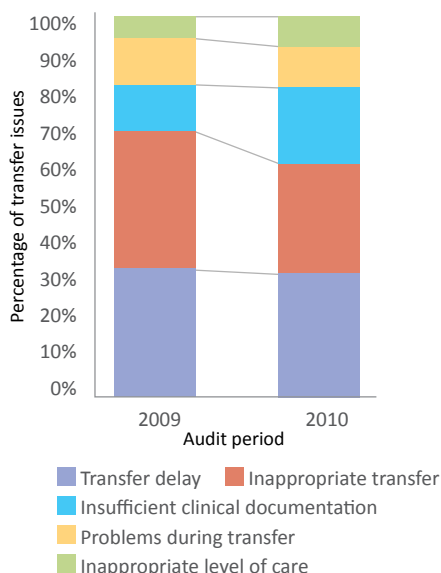
### Comment

- Twenty-eight percent (1741) of audited cases required transfer between hospitals. The need for transfer varied among regions and probably reflects the geographic distribution of available health care facilities.

## 7.2 Issues associated with patient transfer

The treating surgeon is asked to record any issues associated with the transfer of patients between hospitals.

Figure 41: Type of transfer issues (580 issues in 1741 transferred patients)



### Comment

- In 580 (33%) of the 1741 transferred patients, issues related to transfer were raised by assessors or surgeons. This indicates there was some criticism of an aspect of the transfer in a third of all patient transfers.
- The most frequent issues raised were inappropriateness of transfer (32%) and delay in transfer (32%). Over the audit period, the frequency of inappropriate transfers decreased from 36% in 2009 to 28% in 2010. The frequency of delay in transfer of a patient was unchanged.
- Insufficient clinical information provided by transferring hospitals accounted for 92 (16%) of the 580 issues raised in the audited period. Overall figures rose during the audit period from 12% in 2009 to 20% in 2010. This is a concern as communication is essential to ensure that all clinicians involved have a complete picture of a patient's health status.



# 8. Peer-review outcomes

## KEY POINTS

- SLA was requested in 12% of audited cases. A lack of information provided by treating surgeons was the most frequent cause of referral for SLA.
- The most common criticism leveled was delay in the delivery of definitive treatment.
- From 1 January 2009 to 31 December 2010, ANZASM identified 535 (8%) cases that experienced some form of delay. This could be either delay in diagnosis, delay in transfer or delay in presentation to hospital. The treating surgical team was deemed responsible for 40% of these treatment delays and 35% were attributed to other clinical teams in the hospital. The majority of the other cases with delays (25%) were attributed to emergency departments, radiology departments, referring hospitals, GPs and patient-related factors.
- Clinical issues described as areas of consideration, concern or adverse events represent significant criticism of patient care. In only 4% of patients were these issues of clinical management perceived to have *probably* contributed to the death of the patient.

### 8.1 Second-line assessments

The peer-review process is a retrospective examination of the clinical management of patients who died whilst under the care of a surgeon. All assessors (first- and second-line) must decide if the death was a direct result of the disease process alone, or if aspects of the management of the patient may have contributed to the outcome.

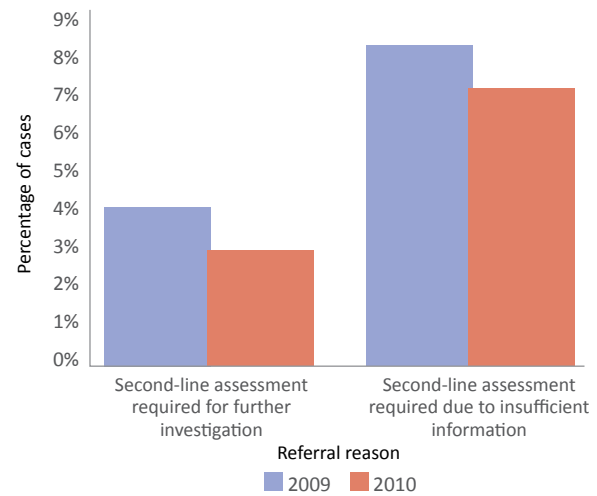
A total of 6507 cases underwent FLA. The first-line assessor decides if the treating surgeon has provided enough information to allow them to reach an informed decision on the appropriateness of management of the case. If inadequate information was provided then the first-line assessor requests an SLA or case note review. Other triggers for requesting SLA are:

- where a more detailed review of the case could better clarify events leading up to death and any lessons emanating from the case under review
- where death was unexpected, e.g. in a young fit patient with benign disease or in a day surgery case.

The number of SLAs required has slightly increased mainly because of a lack of information. This is an indirect measure of true surgeon compliance in the audit process. SLAs required for the other triggers are for suspected issues of clinical management.

The reason for referral to SLA is shown in Figure 42.

Figure 42: Reason for referral for second-line assessment (n=6494)

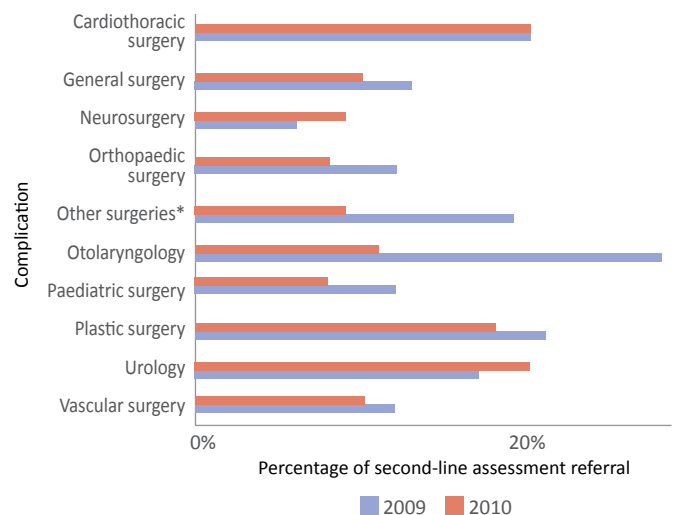


Missing data: 13 (<1%).

#### Comment

- An SLA was requested in 763 (12%) of the 6507 audited cases across the census period. Lack of adequate information provided by the treating surgeon in the SCF was the trigger in 69% of these requests.
- The need for an SLA can often be avoided if the surgeon completes the SCF properly and provides adequate information.

Figure 43: Frequency of need for SLA among surgical specialties (763 SLA in 6504 cases)



\*Other surgeries covers the following specialties: anaesthesia, intensive care unit, medical only, neurology, oncology, ophthalmology, obstetrics and gynaecology, oral and maxillofacial, otology, thoracic medicine, trauma and transplant.

Missing data: 3 cases (<1%).

#### Comment

- There was some variation in the SLA rate among specialties and across the audit period with an overall drop in the need for SLA in most specialties in 2010. The exceptions to this were specialties with a low number of deaths.



## 8.2 Clinical management issues

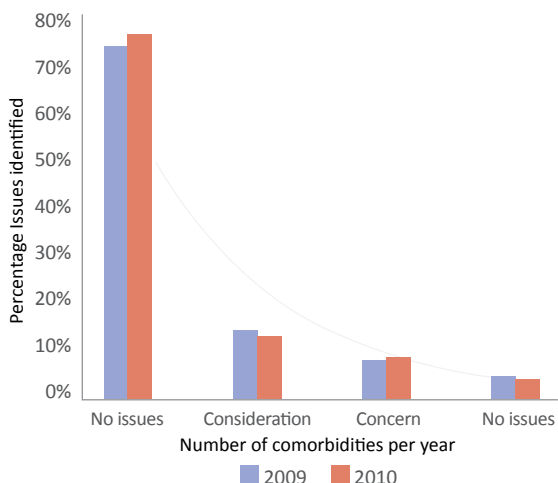
A primary objective of the peer-review process is determining if death was a direct result of the disease process alone, or if aspects of the management of a patient might have contributed to that outcome.

There are two possible outcomes: either the death was a direct outcome of the disease process and the clinical management had no impact on the outcome, or there was a perception that aspects of patient management may have contributed to the death of the patient.

Where there is a perception that the clinical management may have been problematic, ANZASM has specified a range of criticism from which the assessor can choose:

- 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 very 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, and which was sufficiently serious to lead to prolonged hospitalisation, or to temporary or permanent impairment or disability of the patient, or which contributed to or caused death. In addition there are predetermined outcomes classified as adverse event, e.g. anastomotic leak, pulmonary embolus.

**Figure 44: Frequency and spectrum of clinical management issues recorded per patient over time (n=6478)**



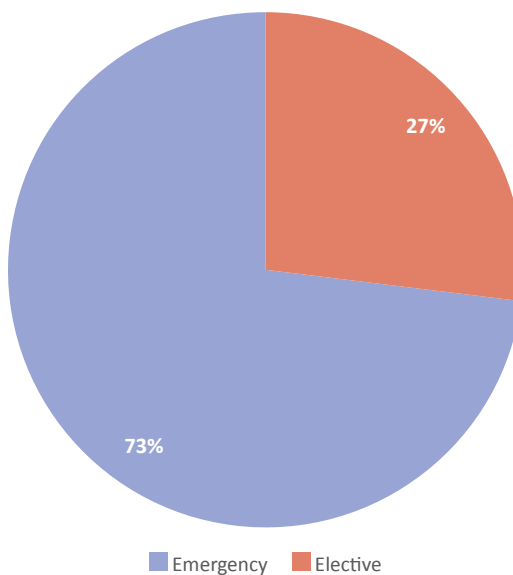
Note: Missing data 29 (<1%).

### Comment

- Figure 44 demonstrates the degree of criticism of clinical management recorded per patient. Where a number of criticisms were made in any one case, the most severe degree of criticism is attributed.

- ANZASM primarily focuses upon areas of concern and adverse events. Data on areas of consideration are collected, but they are minor suggestions with minimal impact on patient outcome.
- In 4775 (74%) of 6478 audited cases, assessors felt there were no issues of clinical management. When this is combined with areas of consideration (880 instances), the total number of cases with no or minor criticism only was 5655 (87%).
- The number of cases with no clinical management issues has remained constant over time (data not shown).
- If an assessor flags an area of concern or adverse event, this implies significant criticism of clinical management. In this series this occurred in 823 (13%) of audited deaths (see Table 4 in Section 8.2.1 for further information).
- Adverse events have decreased by 57 (1%), from 185 cases in 2009 to 128 cases in 2010.

**Figure 45: Frequency of clinical management issues by admission type (3171 issues in 1703 patients)**



Missing data: 71(4%).

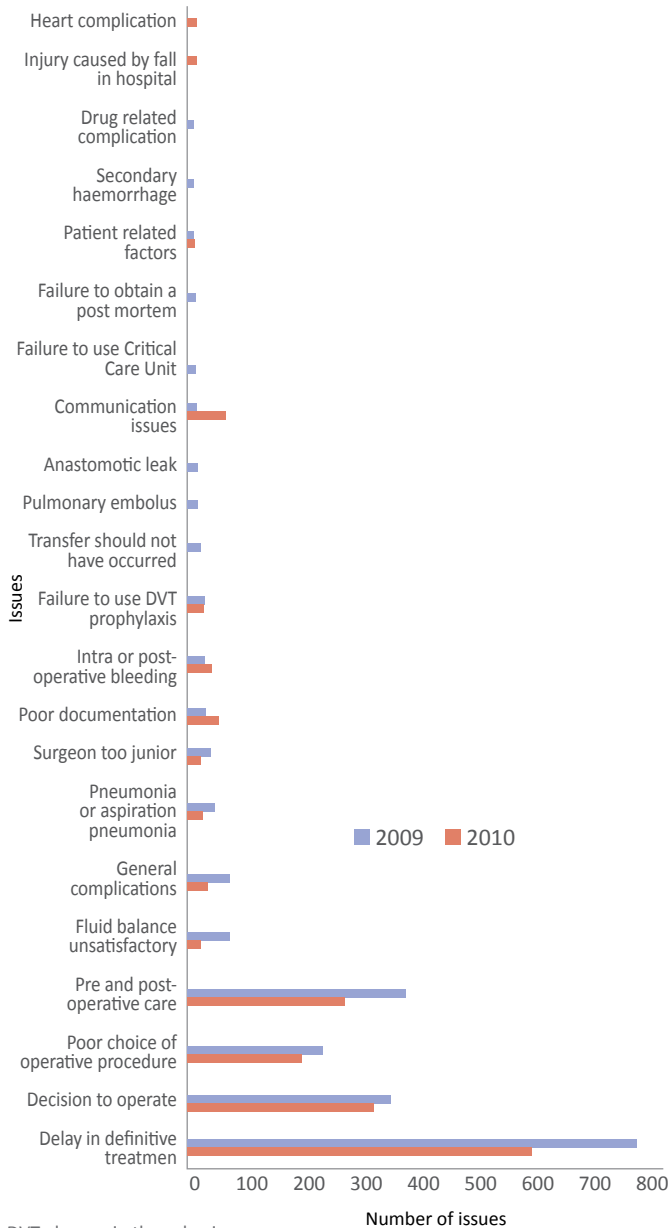
### Comment

- A total of 3171 specific issues of clinical management were identified in 1703 patients. Each patient can have more than one issue of clinical care.
- The incidence of clinical issues was higher in emergency (73%) than elective.

The frequency of specific clinical management issues is shown in Figure 46.



**Figure 46: Frequency of specific clinical management issues if  $\geq 10$  (n=3171)**



DVT: deep vein thrombosis.

**Comment:**

- Delays in implementing definitive treatment are frequently-perceived criticisms of patient management. These delays can be due to a number of issues, not all the responsibility of the treating surgeon. These include geographical issues, diagnostic problems in the emergency department, inappropriate diagnosis, need for transfer, availability of theatre and communication issues.
- It should be highlighted that in 2010 there has been a notable drop in the number of cases where a delay in definitive treatment was an issue.

- A study<sup>2</sup> has shown that hospital patients whose condition is unstable often receive suboptimal resuscitative care before their admission to critical care, and have highlighted problems in both prompt detection of patients whose conditions is deteriorating, and the coordination and timely delivery of an appropriate response to that deterioration.
- The decision to proceed to surgery and the choice of operative procedure adopted are issues that are frequently debated in the assessment process.
- Good communication among those involved in patient care is essential to ensure the treatment plan is properly understood and coordinated. Poor communication has gone up to 4% of the specific issues identified in 2010.
- In 2010 the International Journal of Nursing Studies reported that:
  - In surgery effective communication is vital, and its absence is evident in poor transfer of critical information, impaired decision making and may ultimately lead to patient harm.<sup>3</sup>

The attribution of responsibility for treatment delays is shown in Figure 47.

**Figure 47: Attribution of responsibility for treatment delays (643 delays reported in 6409 patients)**



Missing data: 98 cases (1.5%).

**Comment**

- In 565 (9%) patients there was perceived to be a delay in implementation of definitive treatment.
- The surgeon was deemed responsible for 39% of these delays in 2009 and for 40% in 2010.
- There has been a drop from 15% in 2009 to 11% in 2010 where the hospital was deemed responsible for a delay in treatment.

<sup>2</sup> Jenkins PF, Thompson CH, Barton LL. Clinical deterioration in the condition of patients with acute medical illness in Australian hospitals: improving detection and response. MJA 2011;194(11):596–8.

<sup>3</sup> Gillespie BM, Chaboyer W, Murray P. Enhancing communication in surgery through team training interventions: a systematic literature review. AORN Journal 2010;92(6):642–57.





- An increasing number of treatment delays were apportioned to other clinical areas (34% in total). This category included emergency departments, radiology departments, other hospitals and patient-related factors.
- It should be noted that more than one team may be responsible for any perceived delays in treatment.

### 8.2.1 Perceived impact of clinical management issues

First- and second-line assessors have to indicate:

1. what impact any perceived issues of patient management might have had on the clinical outcome
2. whether or not these issues were preventable
3. which clinical team was responsible for the issues.

A three- or five-part 'Likert' scale is used to stratify responses to questions 1 and 2. The clinical teams felt to be responsible for management issues are recorded in question 3.

First- and second-line assessors may identify more than one issue of clinical management in each patient under review. It is important therefore that the impact of any of these criticisms on an individual patient's outcome is analysed and compared. In the tables below all patients associated with an area of consideration, concern or adverse events are presented. Tables 3, 4, 5 and 6 show data that are patient-focused rather than incident-focused. Table 7 looks at attribution of responsibility for the clinical issues reported.

**Table 3: Most severe clinical management issues by specialty**

Surgical specialty	Adverse events	Concern	Consideration	No issues
Cardiothoracic surgery	11%	12%	18%	59%
General surgery	5%	9%	15%	71%
Neurosurgery	2%	5%	9%	84%
Orthopaedic surgery	4%	6%	11%	79%
Otolaryngology head and neck	10%	6%	21%	63%
Other*	0%	13%	8%	79%
Paediatric surgery	0%	13%	10%	77%
Plastic surgery	3%	15%	15%	67%
Urology	6%	12%	17%	65%
Vascular surgery	4%	9%	15%	72%
All cases	5%	8%	13%	74%

\*Other surgeries cover the following specialties: anaesthesia, intensive care unit, medical only, neurology, oncology, ophthalmology, obstetrics and gynaecology, oral and maxillofacial, otology, thoracic medicine, trauma and transplant.

### Comment

- This analysis compares the incidence of significant criticism of clinical care (areas of concern, adverse events) and no issues by specialty.

**Table 4: Degree of criticism of patient management per patient (n=6478)**

Degree of criticism of patient management	Number of patients	% of audited series (n=6478)
No issue of management identified	4775	74%
Area of consideration	880	13%
Area of concern	510	8%
Adverse event	313	5%
Total	6478	100%

Missing data: 29 cases (<1%).

### Comment

- There was significant criticism (area of concern or adverse event) of clinical management in 13% of cases in this audited series.
- If a patient had more than one clinical incident noted, then the most severe has been used in this data set.
- The incidence of significant management issues reflected minimal variation across regions (data not shown).

**Table 5: Perceived impact on clinical outcome in the area of consideration and concern, and adverse event group (n=6448)**

Perceived impact on clinical outcome	Number of patients	% of audited series (n=6448)
No issue of management identified	4775	74%
Did not affect clinical outcome	393	6%
May have contributed to death	1032	16%
Probably caused death	248	4%
Total	6448	100%

Missing data: 59 cases (1%).

### Comment

- This table indicates the perceived impact of an area of consideration, concern or adverse event on the clinical outcome.
- In only 4% of patients were the perceived issues of clinical management felt to have probably caused the death of the patient.
- The perceived relationship of clinical management to outcome was less clear in the 16% of cases.



**Table 6: Perceived preventability of clinical issues in the areas of consideration and concern, and adverse event group (n=6313)**

Perceived preventability of clinical issues	Number of patients	% of audited series (n=6313)
No issue of management identified	4775	75%
Definitely preventable	257	4%
Probably preventable	717	11%
Probably not preventable	514	8%
Definitely not preventable	50	1%
Total	6313	100%

Missing data: 194 cases (3%).

**Comment**

- This table details the preventability of clinical management issues as indicated by reviewers.
- The assessors felt that 15% of clinical incidents detected were preventable.
- In the area of concern and adverse event group 5% clinical incidents detected were considered preventable (data not shown).

**Table 7: Perception of clinical team responsible for clinical issues (n=1582)**

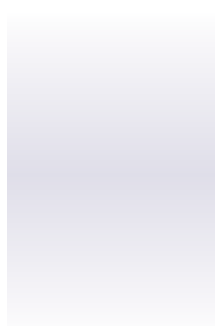
Clinical team felt to be responsible	Number of patients	% of audited series (n=1582)
Surgical team	900	57%
Other clinical team	412	26%
Hospital issue	124	8%
Other*	146	9%
Total	1582	100%

Missing data: n=150 (9%).

\*'Other' refers to the transferring hospital, blood bank/ transfusion services, emergency department, the general practitioner or referring doctor, the ambulance service, remote areas or lack of sufficient staff.

**Comment**

- First and second-line assessors indicated that the surgical team was responsible for 57% of the perceived clinical issues of the 1582 patients.





## 9. Conclusions

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The Audits of Surgical Mortality are in an excellent position to utilise the extensive information learned to promote safer health care practices. There is significant value to the Australian health consumer community at large in the audit continuing as a quality assurance activity, in order to maintain the forthright participation of surgeons and in order to grow and enhance the existing data on surgical mortality.

Achievements:

- The workshops and seminars have been facilitated based on reports, plus more in-depth investigations of the issues. These activities have increased the quantity and quality of information disseminated on issues that have greatly affected clinical governance and patient care across the country. Further workshops have been planned for Tasmania, Victoria and South Australia in early 2012.
- Roll-out of 'Fellows Interface' web-based tool is a new initiative which provides users with a dynamic, user-friendly tool to enter SCFs and complete FLAs online.
- Production and delivery of national case note review booklet twice a year for distribution to surgeons, Trainees and other clinical staff involved in patient care.

A greater national awareness and acknowledgment of the value of the audit amongst health professionals should see increased surgical participation and data completeness of forms and thus enable further, in-depth trend analysis and informative reporting.

The College and the state Departments of Health can be rightly proud of this important initiative to promote best practice across the nation.



## 10. Acknowledgments

The Australian and New Zealand Audit of Surgical Mortality (ANZASM) would like to acknowledge the support and assistance of those individuals and institutions that have helped in the continuation and development of this project, including:

- participating surgeons
- first-line assessors
- second-line assessors
- hospital medical records departments
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# Notes

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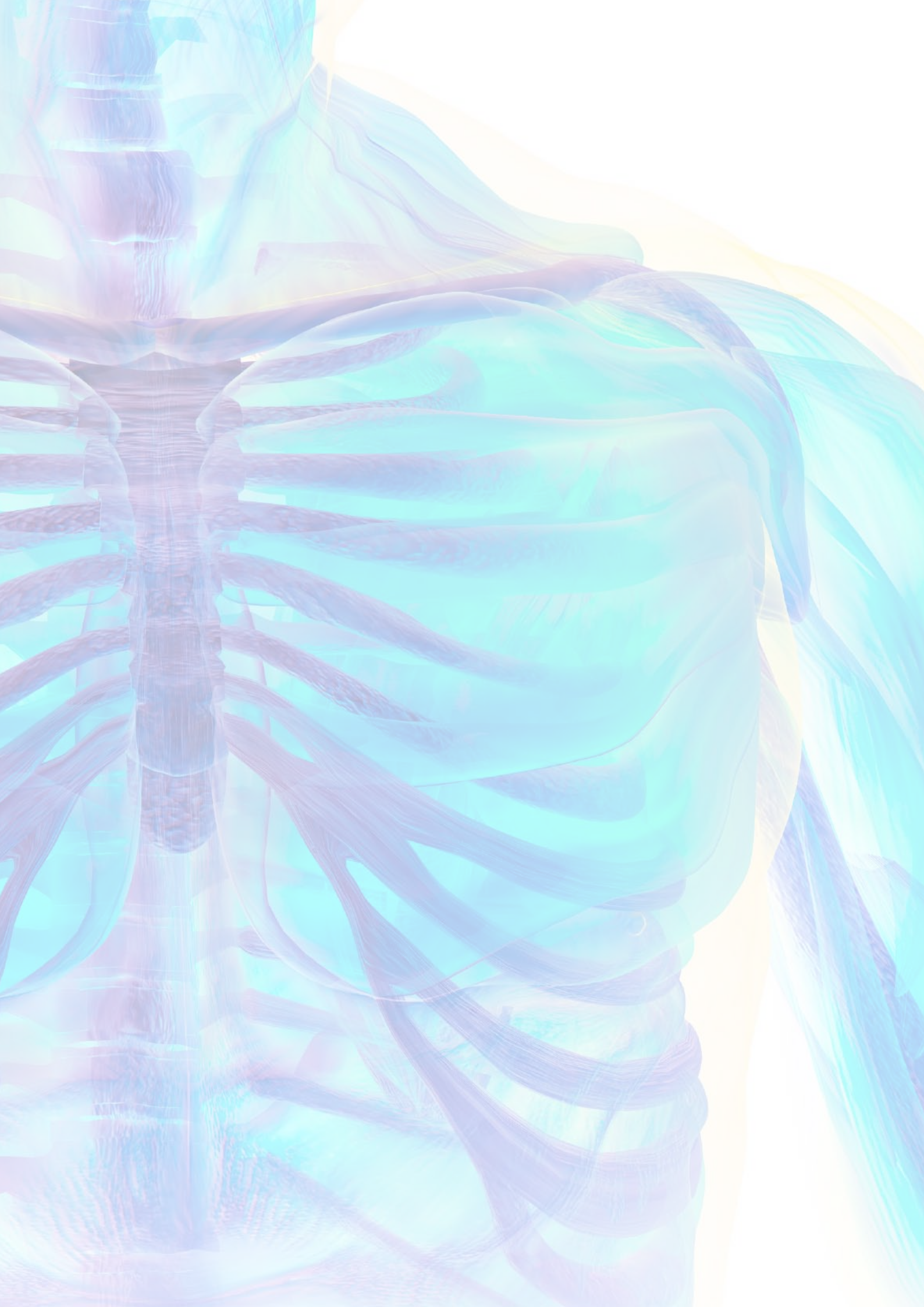
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# Notes

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COLLEGE OF SURGEONS

**Australian and New Zealand  
Audit of Surgical Mortality**

**National report 2010**

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