

# Royal Australasian College of Surgeons



## ANNUAL REPORT 2012





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COLLEGE OF SURGEONS

## Contact

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

The information contained in this annual report has been prepared by the Royal Australasian College of Surgeons, Tasmanian Audit of Surgical Mortality Management Committee. The Australian and New Zealand Audit of Surgical Mortality, including the Tasmanian 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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# Chairman's Report

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I am pleased to present the 7th Annual Report of the Tasmanian Audit of Surgical Mortality. Originally a stand-alone entity, based upon the Western Australian model, TASM is now part of a bi-national audit system (ANZASM), under the aegis of the Royal Australasian College of Surgeons and funded by the Tasmanian Department of Health and Human Services. TASM can claim to be a truly comprehensive audit, with 100% of hospitals (public and private) and surgeons within the State participating. The Tasmanian audit is also unique within Australia in encompassing gynaecologists, ophthalmologists and anaesthetists within its participants, in addition to all specialties covered by RACS.

As you know, the College holds that involvement in clinical audit is an essential facet of continuing professional development (CPD), and has made participation in ANZASM a mandatory part of the CPD program for those in operative practice. For its part, the DHHS sees TASM as a significant component of its own Service Quality and Improvement process, and as an element of its accreditation against the National Safety and Quality Health Service Standards.

As in previous years, most deaths occurred in elderly patients with major comorbidities, admitted as emergencies. It is notable though that the total number of deaths under surgical care has dropped by a third over the last two years of reporting (from 189 cases to 122). This most probably represents transfer of non-surgical cases, for example those admitted for terminal care, to other units prior to death. More encouragingly, however, the number and proportion of cases with identified areas of concern on assessment has also decreased. Whether or not this can be attributed in whole or in part to changes in care associated with this audit, the reduction in the number of events where it was felt that care might have been improved is most encouraging.

Certain factors continue to be identified as areas of concern each year - delays in definitive treatment, access to high dependency and intensive care services, fluid management and DVT prophylaxis; and these are all areas which should be amenable to further improvement. TASM has a role to play in creating such improvements, and to this end has implemented a schedule of workshops around the state, as an educational process to address potential deficiencies in care. This year saw, 'Distance Delays and the Deteriorating Patient' forums being presented in three state-wide areas and over 400 attendees.

I hope that this report will be of interest to all surgeons, and the committee always welcome feedback from them about the audit process. I would like to thank the surgical community for cooperation in the audit, and particularly the first- and second-line assessors, whose commitment to the process is essential to its acceptance and utility. It is important also to recognise the role of the College, which supports the process most especially in the person of the Project Manager, Ms Lisa Lynch. Furthermore the committee would also like to acknowledge the cooperation of the quality and health information management departments in all participating hospitals, and the financial support of the DHHS.

Rob Bohmer

Chairman

TASM





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The Tasmanian Department of Health and Human Services is pleased to be able to provide support to the Tasmanian Audit of Surgical Mortality. The ongoing assessment of our individual clinical practice by our peers is a cornerstone of our individual and collective professionalism and a key component of our individual and organisational clinical governance. The Department applauds the commitment of RACS and of Tasmania's clinicians to the delivery of safe, high quality care. The TASM and national audits continue to provide evidence of improvements in surgical and operative practice.

The department wishes to work closely with clinicians to ensure that care is safe, effective and patient centred. In order to monitor and resource care delivery effectively, the department needs clinical input to understand 'what good care looks like'. Audits such as TASM are thus a fundamental component of the monitoring of the Tasmanian healthcare system.

The department welcomes this report and looks forward to continuing to work closely with Tasmanian clinicians and the Tasmanian Audit of Surgical mortality to support improvements in care delivery.

Grant Phelps

Medical Director Service Quality and Improvement

# Abbreviations

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ANZCA	Australian and New Zealand College of Anaesthetists
ANZASM	Australian and New Zealand Audit of Surgical Mortality
ASA	American Society of Anaesthesiologists
DHHS	Department of Health and Human Services
DVT	deep vein thrombosis
ESWL	extracorporeal shock wave lithotripsy
FRACS	Fellow of the Royal Australasian College of Surgeons
GI	gastrointestinal
HDU	high dependency unit
ICU	intensive care unit
IMG	international medical graduate
INR	International Normalized Ratio
NSW	New South Wales
RAAS	Research, Audit and Academic Surgery Division
SCF	surgical case form
SET	Surgical Education and Training
SPSS	Statistical Package for Social Sciences
TAS	Tasmania
TASM	Tasmanian Audit of Surgical Mortality



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## Executive summary

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### Background:

The Tasmanian Audit of Surgical Mortality (TASM) is an external, independent, peer-review audit of the process of care associated with surgically related deaths in Tasmania.

TASM is funded by the Tasmanian Department of Health and Human Services (DHHS) and has statutory immunity under both state and federal legislation.

In 2005 the Royal Australasian College of Surgeons took responsibility for oversight of the Western Australian Audit of Surgical Mortality project. Subsequently the College established the Australian and New Zealand Audit of Surgical Mortality (ANZASM). Similar mortality audits have been established in South Australia, Queensland, Victoria, Australian Capital Territory and Northern Territory. New South Wales (NSW) provides comparable data to ANZASM but is independently managed by the Clinical Excellence Commission of NSW.

### Audit numbers:

- There were 122 deaths in this reporting period (compared to 159 in 2011); 116 surgical case forms (SCF) were returned to TASM and six remain outstanding, awaiting completion of the audit process. The return rate is 95%.
- Twenty-one cases were terminal care and therefore were excluded from the audit process.
- Therefore, a total of 95 cases were assessed (these cases provide the data for this report).

#### *Surgeons*

- All consultant surgeons in Tasmania are participating in TASM. It is important to acknowledge the surgeons in Tasmania for their participation and commitment in the audit process.

#### *Hospitals*

- All 13 Tasmanian private and public hospitals currently participate in TASM.
- Of all cases, 85% were admitted as emergencies, of which 63% had an operation died within 30 days.
- All elective admission patients died within 30 days following an operation.
- A total of 25% of all patients had no operation but died.
- After their first operation, 14% of patients were reported to have had unplanned return to theatre.
- Patients were transferred from one hospital to another in 15% of cases (refer to section 3.2.2 for further details).

#### *Patients*

- Of the total audited cases, males accounted for 52% and their median age was 76.
- A total of 88% of cases presented with at least one significant comorbidity (refer to section 3.3.8 for further details).



- A total of seven per cent of cases were referred for second-line assessment (case note review) compared with the national rate of 12% (ANZASM National Report 2012).
- 48% of cases had an American Society of Anesthesiologists (ASA) grade of 4 or above.

#### *Cases with clinical incidents*

- 10 (11%) of cases were associated with areas of concern or adverse events.
- One case was associated with an adverse event that caused the death and was considered probably preventable.

### **Main messages:**

- The majority of patients reported in this audit were elderly and in general:
  - > had several pre-existing comorbidities
  - > were at considerable risk with surgery
  - > had undergone emergency surgery.
- There are several recognised characteristics associated with high risk of death at surgery. Many patients in this audit had more than one high-risk factor at the time of or following surgery. For example:
  - > 88% of cases had at least one serious comorbidity.
  - > 67% of cases were over 70 years of age.
  - > 19% of cases had unplanned admissions to the intensive care unit (ICU) following surgery.
- In 44% of cases patients experienced complications postoperatively. In the 2<sup>nd</sup> ANZASM National report, 33% of patients experienced further complications.
- According to assessors, management could have been improved in preoperative and postoperative care, but there was rarely a problem with intraoperative care.
- Timing in surgical management (delays in surgery, delay to diagnosis) could also be improved.
- The audit should continue to review falling surgical mortality rates to ascertain whether the audit process has contributed to the reduction of surgical mortality in Tasmania. This could identify trends in which further perioperative improvements can be made in collaboration with the Department.



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# 1. Introduction

## Key points:

- The Tasmanian Audit of Surgical Mortality (TASM) audits surgically related deaths in Tasmania.
- This report contains data from 1 July 2011 to 30 June 2012, as well as comparisons with data from earlier years for some data points.
- The TASM process involves self-reporting by surgeons and peer review by first- and second-line assessors.
- TASM exists to inform, educate, facilitate change and improve practice. It achieves this by providing expert analysis and feedback to surgeons, hospitals and the community.

## 1.1 Background

The Tasmanian Audit of Surgical Mortality is an external and independent peer-review audit of the process of care associated with deaths occurring during surgical admissions in Tasmania. The audit is funded by the Department of Health and Human Services (DHHS) Tasmania and its methodology is based on the Scottish Audit of Surgical Mortality.

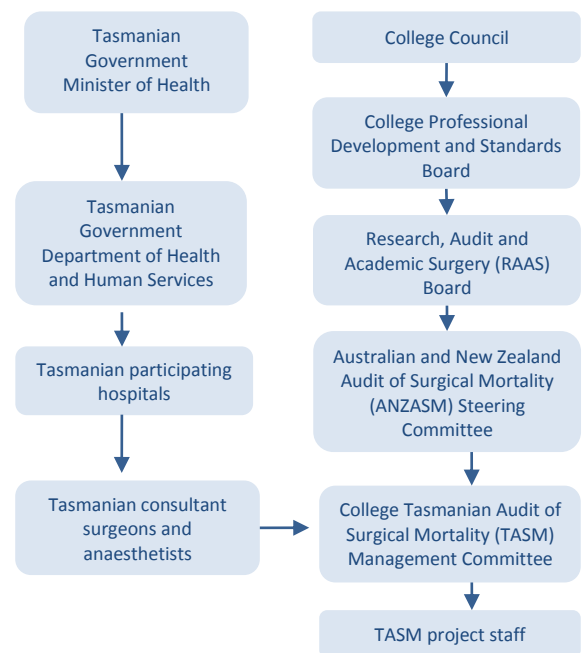
The Royal Australasian College of Surgeons oversees, manages and provides infrastructure support to the audit. In 2005 the College formed the Australian and New Zealand Audit of Surgical Mortality (ANZASM) with the purpose of extending mortality audits to all Australian states and territories. This was achieved in 2010.

## 1.2 Project governance and confidentiality

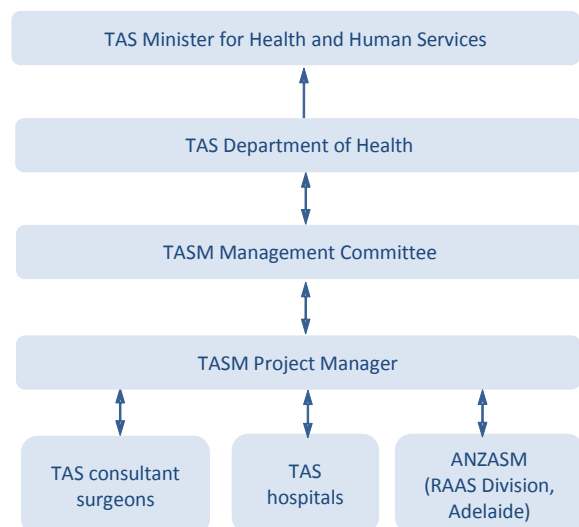
The governance structure of ANZASM is illustrated in Figure 1. The regional TASM governance structure is illustrated in Figure 2.

The Royal Australasian College of Surgeons Tasmanian Audit of Surgical Mortality Management Committee has been gazetted as a Quality Assurance Committee under the Tasmanian *Health Act 1997* and also has protection under the Commonwealth Qualified Privilege Scheme under Part VC of the *Health Insurance Act 1973* (gazetted 23 August 2011).

**Figure 1: Governance structure of the Royal Australasian College of Surgeons, ANZASM and TASM**



**Figure 2: Regional audit governance structure**



TAS: Tasmania;

TASM: Tasmanian Audit of Surgical Mortality;

ANZASM: Australian and New Zealand Audit of Surgical Mortality

## 1.3 The audit process

### 1.3.1 Notification of deaths

TASM audits public and private hospital deaths that occurred when a surgeon was involved in the management of a patient (i.e. where the patient was admitted under a surgeon or transferred to a surgeon's care during that admission), whether or not the patient underwent a surgical procedure.

The medical records departments of the participating hospitals, both public and private, notify TASM of all surgically-related deaths. Each participating hospital is aware of TASM's inclusion criteria (see 1.3.4) and reports those deaths weekly or monthly (via secure email).

### 1.3.2 Methods

TASM receives notification, enters that data in a secure database, and then sends a surgical case form (SCF) to the consultant surgeon for completion. Events associated with the death are reported by the surgeon on the SCF against the following criteria:

- *Area for consideration* — where the clinician believes an area of care could have been improved or different, but recognises that there may be debate about this
- *Area of concern* — where the clinician believes that an area of care should have been better
- *Adverse event* — an unintended 'injury' caused by medical management, rather than by the disease process, which is sufficiently serious to:
  - > lead to prolonged hospitalisation
  - > lead to temporary or permanent impairment or disability of the patient at the time of discharge, or
  - > contribute to or cause death.

The consultant surgeon is responsible for the completion of the SCF and returns it to TASM. The SCF is then de-identified and sent to a different surgeon for peer-review or first-line assessment. The first-line assessor is a consultant surgeon of the same specialty who may be from a different hospital to the original surgeon. The audit allows for cases to be sent interstate for review when deemed necessary in certain sub-specialties.

The first-line assessor determines whether the case should undergo further assessment (second-line assessment), which involves reviewing the medical records of the case. The first-line assessor may also close the case at this stage. The first-line assessor may find no clinical incidents, or may find clinical incidents which do not need further assessment.

Cases undergo a second-line assessment if:

- an area of concern has been identified or an adverse event is thought to have occurred during the clinical care of the patient that warrants further investigation
- there is insufficient information on the SCF for the assessor to reach a conclusion



- a report could usefully draw attention to ‘lessons to be learned’, either for clinicians involved in the case, or as part of the collated case note review booklet, for wider distribution within the surgical community.

The second-line assessor is a senior consultant surgeon of the same specialty but from another hospital to the original surgeon. On rare occasions there is a lack of assessors in a particular specialty so a process of interstate assessments is practised for those cases, under the umbrella of ANZASM.

### 1.3.3 Providing feedback

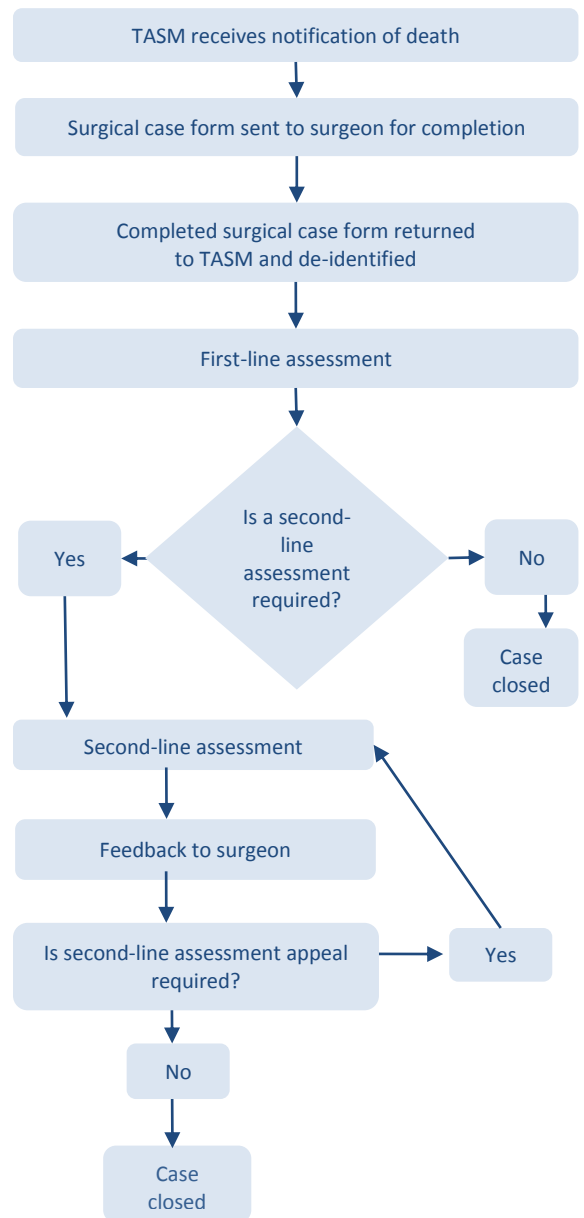
Surgeons receive feedback from first-line assessors about each of their cases through TASM. They also receive extensive reports after each second-line assessment. TASM provides guidelines for assessors when completing such forms.

In addition, aggregated feedback in the form of annual reports and case note review booklets are disseminated to all surgeons and hospitals via the College website. The public can only access the annual report via the website. This aggregated feedback and related clinical events are not linked to individual patients, surgeons or hospitals. The process is managed by the TASM Project Manager following ANZASM guidelines and is coordinated through a secure database.

TASM provides feedback in the following ways:

- Surgeons receive written feedback from first- and second-line assessors (de-identified) on their TASM cases.
- Hospitals participating in TASM may request reports on aggregated, de-identified data relating specifically to their hospitals and comparing them to the averages of other hospitals.

**Figure 3: The Tasmanian Audit of Surgical Mortality methodology**



TASM: Tasmanian Audit of Surgical Mortality

Note: Alternatively, surgeons can enter surgical case forms and first-line assessments online using the Fellows Interface.

### 1.3.4 Audit inclusion and exclusion criteria

TASM includes all deaths that occurred in a participating hospital when:

- the patient was under the care of a surgeon (surgical admission), whether or not an operation was performed

- the patient was under the care of a physician (medical admission), and subsequently underwent a surgical procedure.

Note: Terminal care cases are excluded from the full audit process.

If a case does not fulfil either of the above criteria, it is excluded from the audit by the notifying hospital. If TASM is notified of a death and decides it does not fall within the inclusion criteria, the death is excluded.

TASM also includes cases that fall under the care of specialists from the following colleges:

- The Royal Australasian College of Dental Surgeons
- The Royal Australian and New Zealand College of Obstetricians & Gynaecologists
- The Australian and New Zealand College of Anaesthetists
- The Royal Australian and New Zealand College of Ophthalmologists.

## 1.4 Reporting conventions

### 1.4.1 Terminology

Surgeons and assessors are asked to:

- give their opinion as to whether the incident was preventable, under the categories:
  - > definitely
  - > probably
  - > probably not
  - > definitely not

(For this report, both the categories of 'definitely' and 'probably' are referred to as being preventable.)

- indicate who the incident was associated with, categorising this information as:
  - > audited surgical team
  - > another clinical team
  - > hospital

> other

- report on whether the event:
  - > made no difference to outcome
  - > may have contributed to death
  - > caused the death of a patient who would otherwise have been expected to survive.

### 1.4.2 Assessor opinion

The areas for consideration, areas of concern and adverse events contained in this report were events ascribed to the case by either the first-line assessor or the second-line assessor (referred to as 'assessors').

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

### 1.4.3 Focus of reporting

TASM reports focus primarily on areas of concern and adverse events (see 1.3.2).

Areas for consideration are excluded from this analysis because they usually make no difference to outcome and are simply an indication that there were different options. However, areas for consideration are included in the data collection process to facilitate reporting of 'less serious' events, which is important for improving overall patient care.

Some cases were associated with more than one clinical incident. In this situation, where analysis of clinical incidents was reported by case, the most serious incident was ascribed to the case.

### 1.4.4 Missing data

Numbers in parentheses in the text (n) represent the number of cases analysed. Not all data were complete; therefore, the total number of cases used in different sections of the analysis varies.



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#### 1.4.5 Data analysis

TASM analysed areas of concern or adverse events ascribed to each case by assessors. 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 which includes a reporting engine. All transactions are time stamped. All changes to audit data are written to an archive table enabling a complete audit trail to be created for each case.

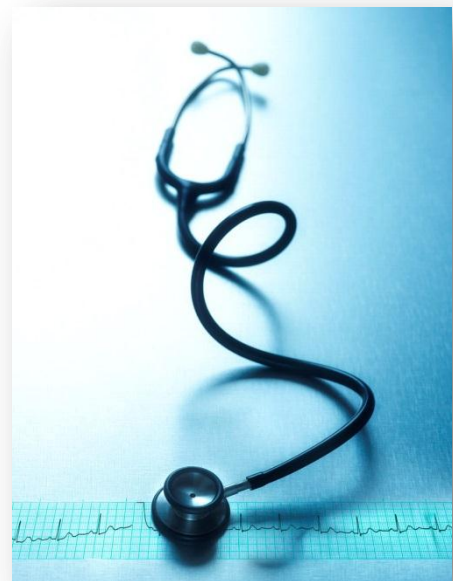
An integrated workflow rules engine supports the creation of letters, reminders and management reports. This system is designed and supported by Alcidion Corporation (Adelaide). The Project Manager enters all data from each TASM form. Alternatively, surgeons may enter the surgical case forms and first-line assessments online using the Fellows Interface.

The most frequent data-entry difficulty is found at question 9 on the SCF. Question 9 is a free-form question and contains at least a paragraph of handwritten information, which can sometimes be difficult to read and interpret.

Data are downloaded from the secure database into Microsoft Excel 2010 spreadsheets and then analysed using IBM Statistical Package for Social Sciences (SPSS) Version 19. Data are cleaned using logic testing before analysis. Variables are checked for extreme or illogical values and corrections are made to the original data. Once cleaned, the data are downloaded again before analysis. Twelve tables are downloaded and copied into SPSS. A key variable is used that is common to all tables.

Generally, simple frequencies and cross tabulations are used after selecting for the correct criteria for the particular analysis. When indicated, data are checked against the original SCF and assessment forms. Medical records departments, surgeons, the Coroner's Office reports and the Chairman are all resources used by TASM to maintain data integrity.

Qualitative analysis is done using standard techniques. The Project Manager and Chairman independently classify all qualitative information into groups. These groupings are then compared and any differences discussed, until consensus is reached.

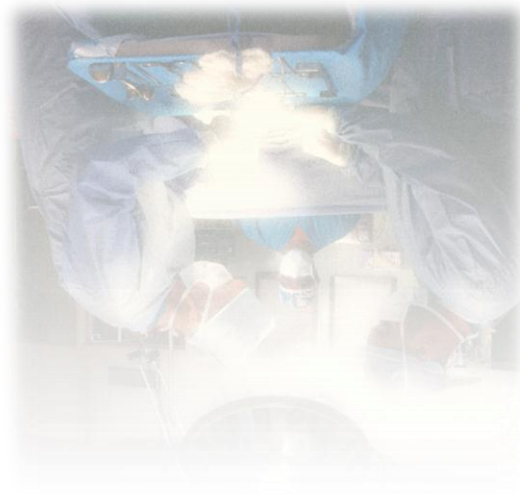


## 2. Audit 2012

### 2.1 Overview of TASM 2012

#### Key points:

- A total of 122 surgically-related deaths were reported to TASM from 1 July 2011 to 30 June 2012.
- The number of deaths under the care of a surgeon showed a decrease from the previous report of 159 deaths.
- All 143 Tasmanian consultant surgeons (100 %) are involved in the audit process.
- The SCF return rate at census date for those participating surgeons is 95%.
- TASM's process is consistent with all ANZASM audits and allows for independent peer-review of all cases.
- As all Tasmanian surgeons are participating, where possible cases were assessed by a surgeon who did not work in the hospital in which the patient died.



The TASM 2012 Annual Report includes data collected from 1 July 2011 to 30 June 2012. As this audit is a work in progress, some assessments from 2011 were returned to TASM during 2012. Therefore, this report also includes finalised data from the TASM 2011 Annual Report.

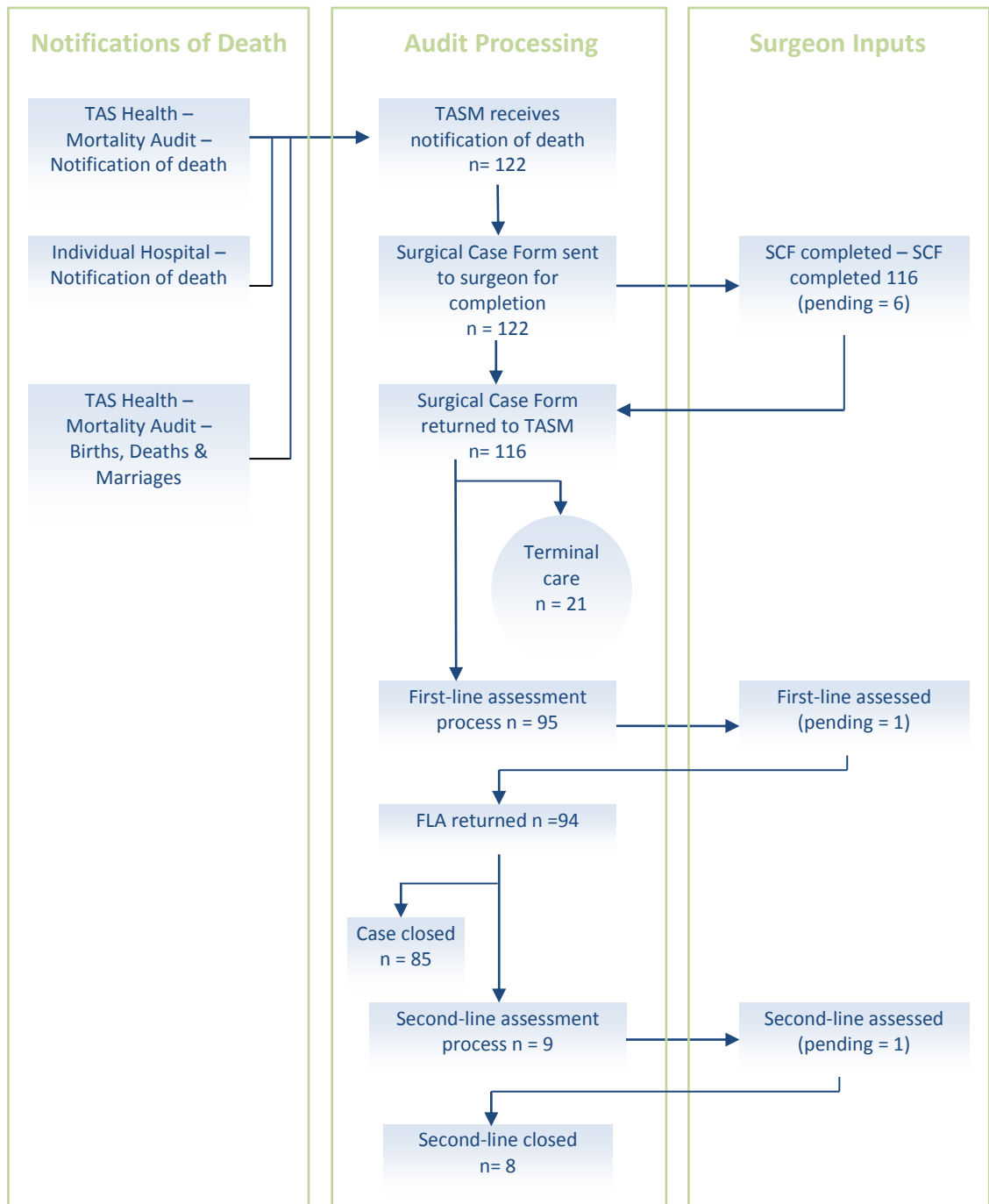
In addition, some cases were reported in 2012 but not completed during the audit period. At the end of the reporting period:

- six SCFs are pending
- one first-line assessment is pending
- two second-line assessments are pending.

There will always be TASM forms pending. This reflects the continuous nature of the audit as surgeons interact with TASM on a regular basis.



Figure 4: Populated flow chart for 2012



TAS = Tasmania; SCF = surgical case form.



## 3. Results

### 3.1 Surgeons

TASM's role is to inform, educate, facilitate change and improve practice by providing feedback to surgeons.

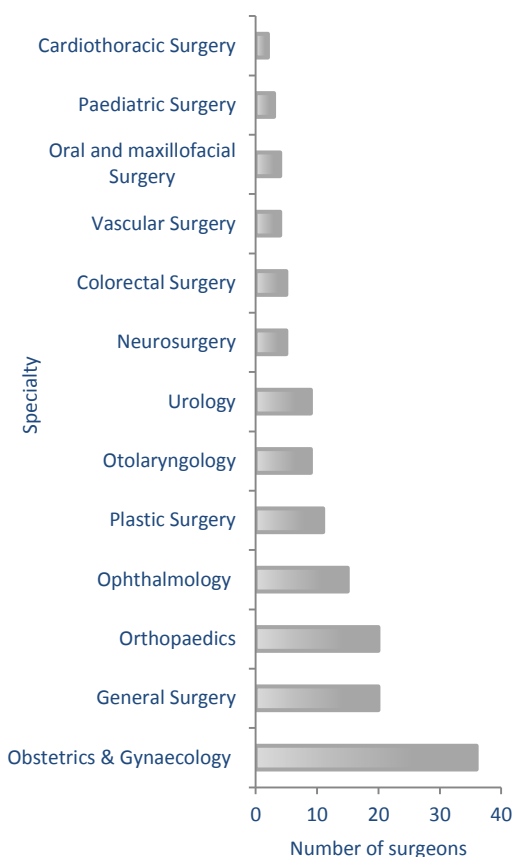
#### Key points:

- All 143 Tasmanian consultant surgeons are participating in TASM.
- Agreement to be a first- and/or second-line assessor in the audit has continued to increase.
- Of the surgeons, 62% (88/143) are Fellows of the Royal Australasian College of Surgeons.
- Participation in the audit is now considered mandatory for continuing professional development recertification by the Royal Australasian College of Surgeons.
- The other 38% of surgeons (55/143) are made up of obstetricians and gynaecologists, ophthalmologists and international medical graduates (IMGs) who are 'area of need' specialists on short- and long-term contracts.
- Surgeon participation is now mandatory in most hospitals in Tasmania, and is part of the surgeon

#### 3.1.1 Surgeon participation by specialty

The specialty distribution of participating surgeons is seen below in Figure 5.

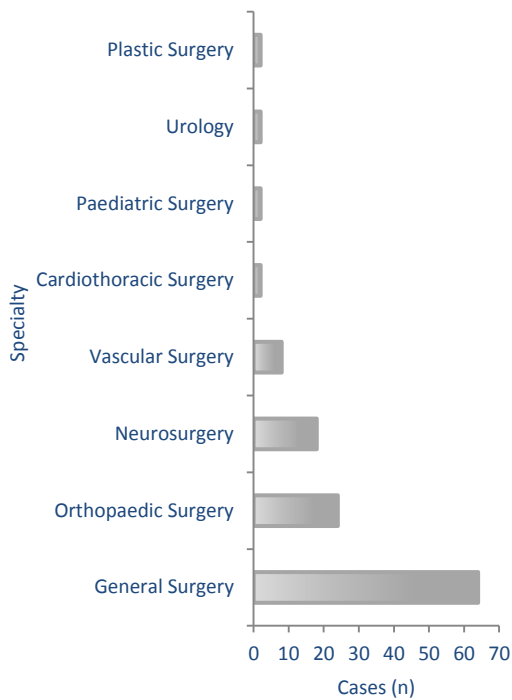
Figure 5: Specialty of participating surgeon



#### Comment

Surgeons are considered to be participating when they submit an SCF or an agreement of consultant participation form. Many of these surgeons have never been involved with a surgical death which meets the TASM criteria. Due to the inclusion of visiting surgeons on short-term contracts or locum appointments, numbers will fluctuate. Numbers in Figure 6 only relate to the reporting period.

**Figure 6: Number of deaths notification by specialty**



### 3.1.2 Surgeon completion of surgical case forms

The proportion of SCFs returned by surgeons is high compared to the national average (68%) in 2011. For deaths reported from July 2011 to June 2012, 95% (116/122) of SCFs were returned by the end of December 2012.

### 3.1.3 Grade of surgeon completing the surgical case form

Table 1 outlines the grade of surgeon completing the SCF. It is pleasing to note that SET are exposed to the TASM process; however, it is equally important to ensure that there is 'signoff' by the consultant surgeon involved.

**Table 1: Grade of surgeon completing the SCF**

Grade of surgeon completing form	%
Consultant	94%
Service registrar	1%
IMG	1%
SET trainee	4%

IMG = international medical graduate;

SET = Surgical Education and Training.

### 3.1.4 Grade of surgeon operating

Table 2 highlights the proportion of consultants operating on TASM cases.

**Table 2: Grade of surgeon operating**

	Deciding	Operating
Consultant	95%	84%
Service registrar	0%	5%
IMG	0%	0%
SET Trainee	5%	11%

IMG = international medical graduate;

SET = Surgical Education and Training.

### 3.1.5 In retrospect

Surgeons were asked, 'In retrospect, would you have done anything differently?' Thirteen percent (16/122) of surgeons answered that they would have done something differently. These answers related to:

- 10 General Surgical cases
- 2 Cardiothoracic cases
- 2 Orthopaedic cases
- 1 Neurosurgical case
- 1 Vascular case.

Surgeons' answers were analysed using standard qualitative analysis procedures. The most common responses were:

- Review use of beta-blockers in patients with advanced Chronic Cardiac Failure (CCF).
- Review need for surgery and ASA classification.
- Discuss with registrars the reporting of relative radiology findings with consultants.
- Patient should have been worked up more thoroughly at referring hospital thus bringing forward time to operating theatre.
- Review fluid management in at-risk patients.

- Consider abandoning operation when intraoperative findings greatly change prognosis of patient (2).
- Should have involved going to a liver unit for surgery.
- Discuss with team the importance of being vigilant of aspiration in vulnerable patients.
- In retrospect it is difficult to see how some situations can be prevented.
- In a critical patient requiring theatre, delays should be avoided when possible and all staff notified of the urgency.
- In the case of an elderly patient at relatively high risk, I think a second colonoscopy and gentle balloon dilation and observation should have been pursued instead of the decision to operate.
- Considered diagnosis of intestinal ischaemia and seek input from vascular unit for management.
- If sufficient endovascular interventional support had been available, intra-arterial Verapamil or angioplasty would have been considered for treatment of vasospasm.
- Earlier Magnetic Resonance Imaging (MRI) and operation.
- Possibly revision of cup at time of initial revision. Patient elderly and stem revision Open Reduction with Internal Fixation (ORIF) femur had already detailed significant risk of blood loss as reduction was stable revision. Despite vertical cup and anterior rim fracture, insert was not undertaken. If it was hip may not have dislocated postoperatively, and may not have aspirated later in hospital.

## 3.2 Hospitals

Staff members from patient information management services and medical records departments notify TASM of all surgically-related deaths. Each participating hospital is aware of TASM's inclusion criteria (see 1.3.4)

and reports those deaths weekly or monthly (via password-protected email).

### Key points:

- Four public and nine private Tasmanian hospitals participate in TASM.
- In total, 10% (18/188) of all cases were transferred from one hospital to another (1 cardiothoracic, 1 vascular, 2 orthopaedic, 6 general surgery & 8 neurosurgery).

### 3.2.1 Hospital participation

#### Participating hospitals

13 Tasmanian public and private hospitals are currently participating:

- Calvary Health Care Tasmania
  - > Lenah Valley Campus
  - > St John's Campus
  - > St Luke's Campus
  - > St Vincent's Campus
- Hobart Day Surgery
- Hobart Private Hospital
- Launceston General Hospital
- Mersey Community Hospital
- North West Private Hospital
- North West Regional Hospital
- Royal Hobart Hospital
- St Helen's Private Hospital
- The Eye Hospital.

### 3.2.2 Transfers

Patient transfer to centres with greater surgical capability is fundamental to good patient care in a regionalised state such as Tasmania.

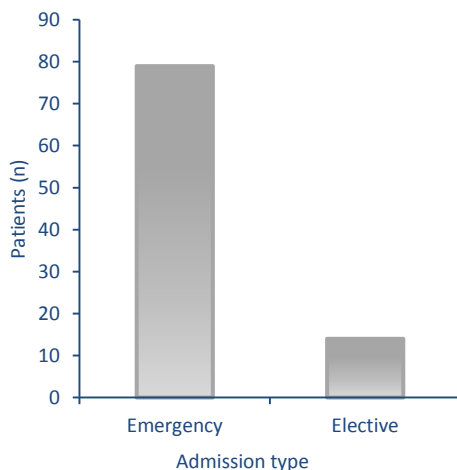
### During 2012:

- In total, 15% (18/122) of all cases were transferred from one hospital to another. These included:
  - > Neurosurgery cases, 8 transfers
  - > General surgery cases, 6 transfers
  - > Orthopaedic cases, 2 transfers
  - > Cardiothoracic cases, 1 transfer
  - > Vascular cases, 1 transfer
- Most transfers took place between two public hospitals – The Royal Hobart Hospital and the North West Regional Hospital.
- The median distance transferred was 200 kilometres.

### 3.2.3 Hospital admissions

- Of all hospital admissions, 15% of cases were admitted to private hospitals and 85% to public hospitals.
- Of all cases, 85% (79/93) were emergency admissions (see Figure 7). This is slightly down from 88% in the 2011 report. (There is no admission data on the 6 pending cases.)
- Of all emergency admissions, 63% (50/79) had operations within the audit period.
- Fifteen per cent (14/93) of cases were elective admissions.

**Figure 7: Emergency and elective admissions**



Note: Missing data in 29 (24%) of cases

### 3.2.4 Delays in main surgical diagnosis

The number of delays in the main surgical diagnosis recorded per year from 2006 to 2012 can be seen in Table 3.

**Table 3: Delays in main surgical diagnosis**

Year	No. delays
2006	10 cases
2007	18 cases
2008	13 cases
2009	12 cases
2010	6 cases
2011	5 cases
2012	10 cases

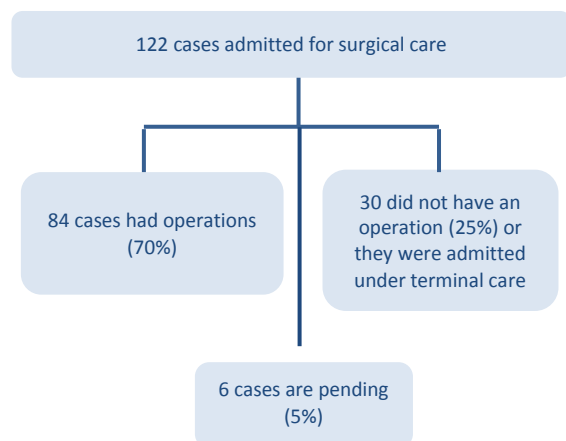
The main reasons for the delays were:

- Medical unit – results not seen
- Surgical unit – results not seen
- Surgical unit – unavoidable factors
- Surgical unit – failure to do correct test
- Surgical unit – initial improvement on conservative management
- Surgical unit – delay to imaging
- Another unit – misinterpretation of results
- Emergency Department – misinterpretation of results

### 3.2.5 Cases with operations

Figure 8 shows the proportion of cases that had an operation. In total, 122 cases were audited by TASM. It should be noted that some had more than one operation.

**Figure 8: TASM operative and non-operative cases**



Note: missing data in 2% (2/122) of cases.

#### Comment

69% (84/122) of all deaths occurred in two hospitals, reflecting the high volumes of surgery that occur in these hospitals.

#### Emergency admissions

In total, 63% (50/79) of emergency admissions underwent operations, some patients more than one. There were 86 operations in total.

- In 22% (19/86) of cases, patients had scheduled emergency operations (> 24 hours after admission).
- In 37% (32/86) of cases, patients had an emergency operation (< 24 hours).
- Patients in 16% (14/86) of cases had an immediate operation (< 2 hours).
- A total of 22% (19/86) of patients underwent elective operations. (There was a change in their admission status).
- There were missing data in 3% (2/86) of cases.

#### Elective admissions

All 14 elective admissions underwent operation.

### 3.2.6 Cases where surgery was not performed

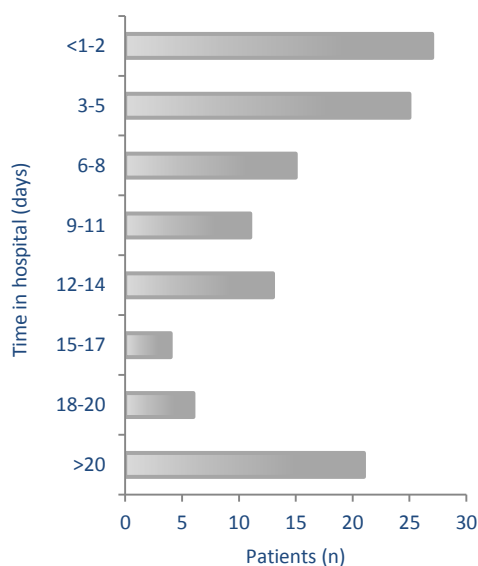
- In 25% (30/122) of all cases, patients had no operation (21 were terminal care admissions).
- The reasons given for not having an operation were:
  - > An active decision was made by the consultant surgeon not to operate (n=24).
  - > A decision was made to limit treatment (n=4).
  - > It was not a surgical problem (n=3).
  - > The patient refused the operation (n=4).
  - > Rapid death occurred (n=6).

Two or more reasons may have been assigned to a case.

### 3.2.7 Time in hospital before death

- The median length of stay in hospital was eight days, with the range <1 day to 41 days (n=122).
- In 22% (27/122) of cases, patients were in hospital for <1 to 2 days (see Figure 9).

**Figure 9: Time in hospital before death**





### 3.2.8 Use of intensive care or high dependency units

The treating surgeons and assessors were asked, 'Was ICU/HDU (high dependency unit) used?', and: 'If not, should it have been used?' Table 4 outlines the key responses.

**Table 4: Use of ICU or HDU**

<i>Was ICU/HDU used?</i> Surgeon' responses	Percentage of cases (%)
ICU/HDU was used	61%
<i>If not, should ICU/HDU have been used?</i> Assessors' responses	Percentage of cases (%)
ICU should have been used	0%
HDU should have been used	0%

ICU: intensive care unit; HDU: high dependency unit.

Note: Missing data in 29 (23%) of cases

Surgeons were also asked: 'Was the surgical team satisfied with the critical care unit (ICU or HDU) management of this patient?' In 100% (37/37) of cases, surgeons responded that they were happy with the care. There were no cases where the surgeons responded that they were not satisfied with the care.

## 3.3 Patients

The patients whose deaths were audited by TASM were predominantly elderly, with multiple and significant comorbidities, and had been admitted for emergency surgery.

The patient characteristics in 2012 are similar to the patient characteristics stated in the 2011 Annual Report. Further details are presented below.

### 3.3.1 Demographics

- In total, 122 deaths were reported to TASM in the study period. Of these deaths:
  - > 116 (95%) SCFs had been completed by June 2012.

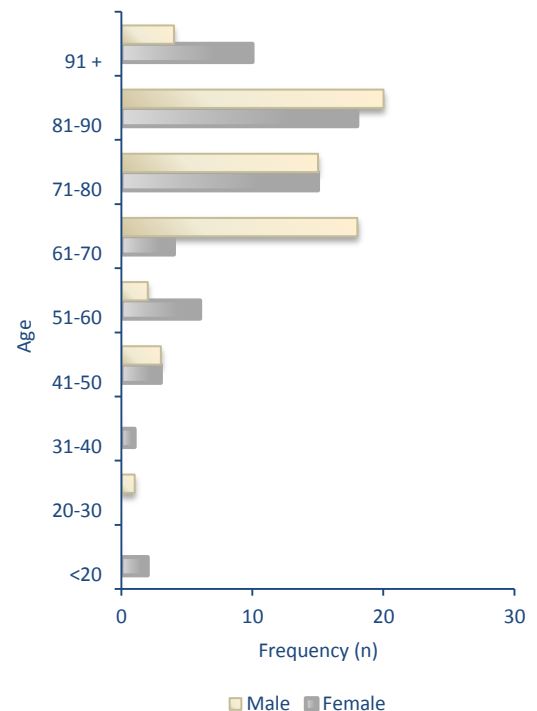
- > The median age at death was 76 years.
- > 52% of patients were males.
- > 54% had an American Society of Anesthesiologists (ASA) grade of at least 4.
- > At least 88% had one significant comorbidity that surgeons considered could contribute to death.

### 3.3.2 Age distribution

Figure 10 displays the age distribution of patients for cases notified by hospitals (n=122).

- The median age of patients in 2012 was 76 years, with a range of 0 years to 102 years.
- The age mode (the most frequent age) was 75 years, down from 81 years in the 2011 report.
- There were 14 patients aged between 91 and 102 years.

**Figure 10: Age distribution by gender**





	<20	20-30	31-40	41-50	51-60	61-70	71-80	81-90	91+
Male	0	1	0	3	2	18	15	20	4
Female	2	0	1	3	6	4	15	18	10

### Comment

Figure 10 indicates the age and sex distribution of all reported cases. Patients between the age of 71 and 90 years account for approximately 56% of all cases. The 81-90 year range remains the predominant group in the sample. Males had the highest number of deaths in the 81-90 age range whereas females had the most number of deaths in the 91 plus year age range.

### 3.3.3 Gender distribution

Figure 10 indicates the gender distribution of all reported cases:

- 52% male
- 48% female.

### 3.3.4 Patients by specialty of surgeon

Table 5 shows the proportion of patients treated by surgeons of different specialties.

**Table 5: Patients by specialty of surgeon**

Specialty	Frequency	%
Cardiothoracic surgery	2	2
ENT(OHN)	0	0
General surgery	64	52
Neurosurgery	18	14
O & G	0	0
Ophthalmology	0	0
Orthopaedic surgery	24	20
Paediatric surgery	2	2
Plastic surgery	2	2
Urology	2	2
Vascular surgery	8	6
<b>Total</b>	<b>122</b>	<b>100</b>

ENT: ear, nose and throat;

OHN: otolaryngology, head and neck;

O & G: obstetrics and gynaecology.

### Comment

General surgery, Neurosurgery and Orthopaedic Surgery reported the most deaths, and these specialties also have the highest workloads due to the correlation with the number of surgeons within that specialty and/or considerable major trauma cases.

### 3.3.5 American Society of Anesthesiologists (ASA) grades

The American Society of Anesthesiologists (ASA) grade (see Table 6) is an internationally recognised classification of perioperative risk. An ASA grade is assigned to a Tasmanian hospital patient before an operation.

**Table 6: ASA grade definitions**

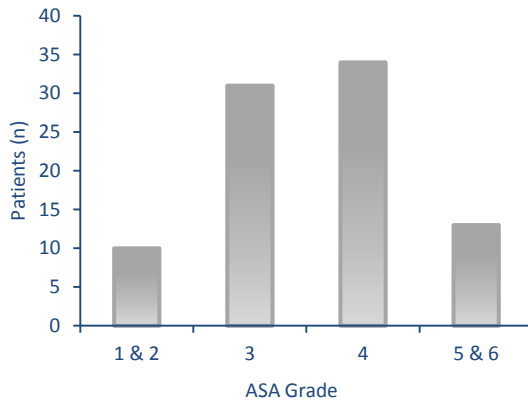
ASA grade	Characteristics
1	A normal healthy patient
2	A patient with mild systemic disease
3	A patient with severe systemic disease which limits activity, but is not incapacitating
4	A patient with an incapacitating systemic disease that is a constant threat to life
5	A moribund patient who is not expected to survive 24 hours, with or without an operation
6	A brain dead patient for organ donation

Figure 11 profiles the ASA grade of all TASM cases. Of all patients who died 79% (80/101) had an ASA grade of 3 or higher (data not shown).



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**Figure 11: American Society of Anesthesiologists grades**



Note: Missing data in 12% (12/101) of cases.

### Comment

A large proportion (48%) of patients had an ASA grade greater than or equal to 4, indicating that a moderate to severe degree of systemic disease was present at the time of treatment (data not shown).

### 3.3.6 Anaesthetic-associated deaths

Two of the deaths were reported by the surgeon to be associated with the anaesthetic and six to be possibly associated with the anaesthetic.

TASM links these deaths with the anaesthetist and completes a similar audit process to that described above. These results are reported to the National Mortality Committee of the Australian and New Zealand College of Anaesthetists (ANZCA), which publishes a triennial report based on mortality data forwarded from each state. The latest triennial report can be found at [anzca.edu.au](http://anzca.edu.au), entitled "Safety of Anaesthesia - A review of anaesthesia related mortality reporting in Australia and New Zealand 2006-2008". Data is being collected for the triennial report 2009-2011.

### 3.3.7 Malignancy

Malignancy was present in

- 25% (30/122) of all the cases. This is down from 29% in the 2011 report. Malignancy contributed to death in 60% (18/30) of those cases. (Malignancy did not contribute to the death in 25% of cases and it was unknown if it contributed in 11% of cases).
- 32% (30/93) of all patients who had operations.
- A higher proportion of elective cases having operations; 43% (6/14) compared with 30% (24/79) of emergency cases having operations.

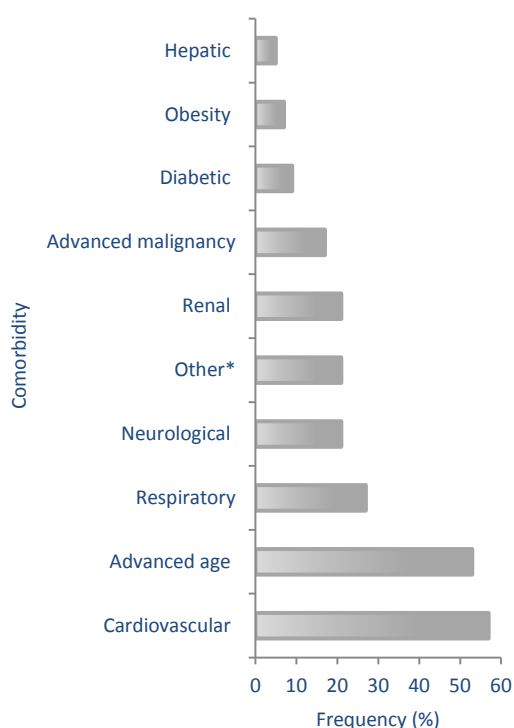
### 3.3.8 Comorbidities

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 Table 7. Of all cases (emergency and elective) admitted for surgical care (88% (85/97)) had comorbidities that increased the risk of death before surgery. Only 10 cases had no comorbidities. In two cases, it was unknown if the patient had comorbidities or not.

In Figure 12 the types of comorbidities are presented by frequency. The most common comorbidity present was cardiovascular disease, found in 57% of all cases (up from 48% in the previous report).



**Figure 12: Types of comorbidities present by frequency**



\* 'Other' comorbidities included chronic malnutrition, debility, atrial fibrillation, Rheumatoid Disease, severe hypothermia, myasthenia gravis, hypertension, polycythemia rubra vera, cachexia, pulmonary fibrosis, intermittent bowel obstruction, gastrointestinal tract bleeding.

**Comment**

Cardiovascular issues, advanced age and respiratory failure are the most common types of comorbidities.

**Table 7: Types of comorbidities present (2006-2012)**

	2006	2007	2008	2009	2010	2011	2012	Total
Cardio	82	78	97	78	91	60	57	543
Respiratory	11	13	17	12	13	15	27	108
Renal	2	5	2	3	6	2	21	41
Hepatic	1	4	0	3	1	4	5	18
Neuro	6	3	6	8	10	15	21	69
Advanced malignancy	3	6	5	10	7	6	17	54
Diabetes	3	0	1	0	0	0	9	13
Obesity	0	1	2	1	1	0	7	12
Age	4	4	9	9	16	17	53	112
Other*	8	4	2	0	2	4	21	41

\* 'Other' comorbidities included chronic malnutrition, dementia, debility, intellectual disability, atrial fibrillation, brain dysfunction decondition, Rheumatoid Disease, severe hypothermia, myasthenia gravis, hypertension, polycythemia rubra vera, cachexia, pulmonary fibrosis, intermittent bowel obstruction, gastro intestinal tract bleeding.  
Cardio = cardiovascular, Neuro = neurosurgical

The eight per cent (10/122) who did not have comorbidities present but who died were predominantly:

- Orthopaedic and general surgical patients
- females
- emergency admissions
- at moderate or considerable risk of death
- in hospital for an average of 13 days.

**3.3.9 Risk of death before surgery**

Surgeons were asked to rate the overall risk of death (before any surgery) for each patient:

- It was noted that 60% were at considerable or more risk, according to the admitting surgeons.



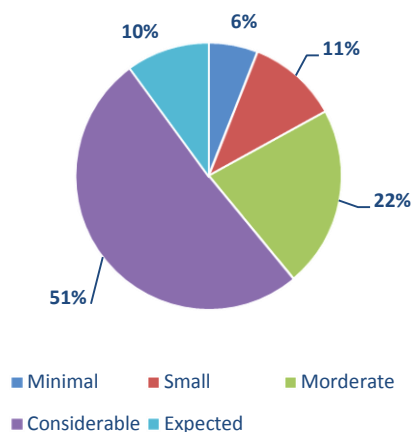
- 10 patients were recorded as being at minimal or small risk. These patients are listed in Table 8.

**Table 8: Minimal or small -risk patients (cause of death)**

Main causes of death	Number of patients
Aspiration pneumonia	1
Respiratory failure	1
Acute myocardial infarction	1
Cardiovascular accident	1
Acute cardiorespiratory failure	1
Sepsis secondary small bowel perforation	1
Sepsis and Multisystem organ failure secondary to perforated peptic ulcer	1
Cardiac arrest? clostridium difficile toxicity	1
Severe pneumonia with respiratory failure	1
Multi-organ failure secondary to sepsis	1
Suicide	1

See Figure 13 for the risk of death distribution.

**Figure 13: Risk of death distribution (n=63, %)**



**Comment**

The overall risk of death before any surgery was given for 63 cases.

**3.3.10 Typical patient**

The 'typical patient' who died after surgically-related care in hospital:

- was male
- was approximately 76 years of age
- was in hospital for less than two days
- had no malignancy present
- had an incapacitating disease that was a constant threat to life on admission to hospital
- had deep vein thrombosis (DVT) prophylaxis
- had an operation
- did not have a postoperative complication
- did not need improvement in management before, during or after the operation.

**3.4 Classification of cases**

**3.4.1 Postoperative complications**

The postoperative complications recorded from 2007 to 2012 can be seen in Table 9.

**Table 9: Postoperative complications**

Postoperative complications	2007	2008	2009	2010	2011	2012
	%	%	%	%	%	%
Post-operative complications	38	47	40	41	39	44
Delay to recognise complications	7	16	10	13	8	15
Return to theatre	11	15	14	12	11	14
Unplanned admission to ICU	13	17	14	15	17	19
Hospital readmission	1	3	2	5	3	7
Fluid balance issue	5	7	7	6	7	7



The most recent national figure for postoperative complications is 33%<sup>1</sup>. Significance will of course vary from minor (with no effect on outcome) to major (leading to death).

### Postoperative Complications

- Several cases had more than one postoperative complication.
- There were 31 postoperative complications including:
  - > procedure-related sepsis (1)
  - > significant postoperative bleeding (2)
  - > GI tract leakage (3)
  - > tissue ischaemia (2)
  - > vascular graft occlusion (1)
  - > others include: cardiogenic shock, hepatic failure, cardiac failure, spread of tumour, dislocated prosthesis and aspiration pneumonia, cardiac arrest, myocardial infarction, pulmonary embolism, dysarthria and weakness, multiorgan failure, C Difficile enteritis, bowel obstruction, wound dehiscence, cerebral infarction, respiratory failure, ischaemic colitis and pancreatitis.

### 3.4.2 Prophylaxis of thromboembolism

The treating surgeon is asked to record if DVT prophylaxis was given and what prophylaxis was actually used (see Figure 14). If not given, the reason it was withheld is requested.

In 68% (69/101) of all cases, patients had DVT prophylaxis. (There was missing data in 6 cases.)

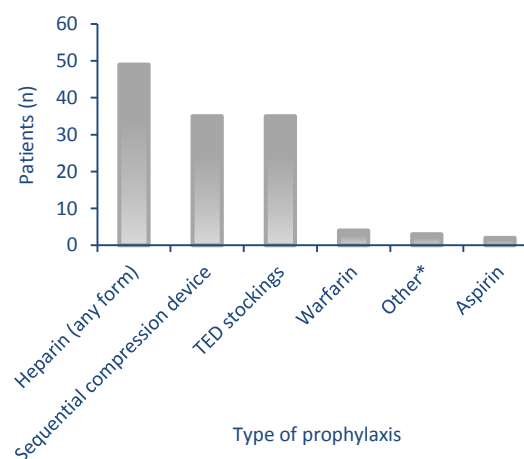
- 26% (26/101) of all cases did not have DVT prophylaxis.
- In total, 89% (56/63) of operated cases had DVT prophylaxis.
- In 16% (10/63) of operated cases, patients either did not have DVT prophylaxis or the surgeon did not know whether the patient had DVT prophylaxis.

Of those patients who did not receive DVT prophylaxis, the main reasons for withholding were:

- rapid death (1)
- age and comorbidities (3)
- active bleeding (3)
- patient for palliation (14)
- coagulopathy (2)
- patient on Warfarin (2)
- prematurity (1).

Figure 14 indicates the number of patients who had DVT prophylaxis and the method used.

Figure 14: Use of different methods of DVT prophylaxis



Note: TED: Thromboembolism deterrent  
Other agents recorded were Clexane, Clopidogrel, Danaparoid, Enocaprin, Enoxaparin, early mobilisation, Fragmin, inferior vena cava filter, Lipirudin and Plavix.

<sup>1</sup> The Australian and New Zealand Audit of Surgical Mortality, ANZASM *National Report 2010*, North Adelaide: Royal Australasian College of Surgeons, 2010. Available from <http://www.surgeons.org/ANZASM>.



### 3.4.3 Post-mortem

- 1) In only 9% (8/95) of cases was a coronial post-mortem performed.
- 2) In 60% (57/95) of cases a post-mortem was not performed.
- 3) In 3% (3/95) of cases a post-mortem was performed by the hospital.
- 4) In 2% (2/95) of cases a post-mortem was refused.
- 5) In 26% (25/95) of cases the post-mortem status was unknown.

### 3.4.4 Management of cases

In cases that had clinical incidents, surgeons and assessors felt that care sometimes could have been improved in particular areas (see Table 10).

**Table 10: Need for improvement in management of cases that had clinical incidents**

Area	Surgeons (n=98) %	First-line assessors (n=133) %	Second- line assessors (n=15) %
Preoperative management	7	8	1
Decision to operate	5	6	0
Choice of operation	2	2	1
Timing of operation	4	9	3
Intraoperative care	4	3	2
Experience of surgeon deciding	0	0	0
Experience of surgeon operating	0	0	0
Postoperative care	2	4	2

### Comment

Most commonly, improvement could have occurred in non-operative areas: preoperative care and postoperative care, timing of operation and intraoperative care. Within those areas, preoperative care improvements and timing of operation were the most commonly cited.

## 3.5 Clinical incidents

This section describes clinical incidents beyond the context of the individual case. It is important to have an epidemiological overview of clinical incidents and their levels of importance. The limitation in this data is that no numbers could be obtained for source populations. Therefore, comparisons are difficult and the data becomes simply observational. TASM hopes that in the future this will be rectified, so that more meaningful and useful information can be obtained.

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:

- 1) *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.
- 2) *Area of concern* – The assessor believes that an area of care should have been better.

- 3) *Adverse event* – This refers to 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.

### 3.5.1 Clinical incidents

There were 23 (48%) areas of concern and adverse events (note that there may be more than one area of concern or adverse event in patients, so the number of 23 does not mean 23 cases had an adverse event or an area of concern) reported by assessors. This is an increase from 15 (34%) events in the 2011 report. Of the 23 clinical incidents, 16 were areas of concern and seven were adverse events.

Assessors attributed these incidents to:

- Sump drain Left Upper Quadrant (LUQ) on full wall suction
- Wrong use of Cationic Colloidal Gold (CCG) sutures
- Missed diagnosis at referring hospital (probably did not delay the transfer to the treating hospital, but did delay operation)
- Choice of operation (should an end ileostomy have been performed instead of a primary anastomosis given the considerable concern about the patient's co-morbidities?)
- Ischaemic bowel/anastomotic leak
- Intraoperative haemorrhage
- Delay to first operation
- Delay in confirming diagnosis led to a delay in surgery
- Postoperative deterioration and management thereof
- Lack of continuity of care

- An earlier diagnosis and reduced delays may have led to a better outcome
- Delay to theatre (2)
- Anaphylaxis to administered agent that has previously been recognised and documented as an allergen
- Aspiration
- Postoperative neurological event
- Colon ischemia
- Missed free gas on chest X-ray
- Possibility that a vascular injury occurred to the caecum
- Pancreatitis and bleeding from bile duct
- Unacceptable delay in operating as patient was not fasted.

### 3.5.2 Associations for areas of concern and adverse events

- In total, 9/23 areas of concern or adverse events were associated with another clinical team.
- Of the reported areas of concern or adverse events, 9/23 were associated with the surgical team.
- 3/23 cases were associated with the hospital.

Note: Some areas of concern and adverse events had multiple associations.

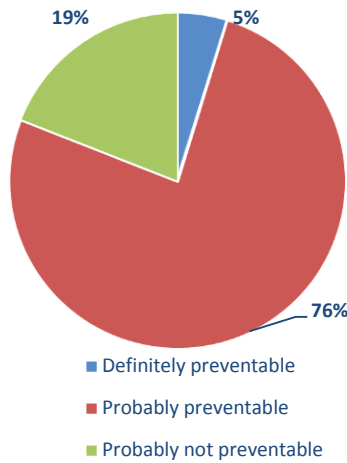
### 3.5.3 Preventability of areas of concern and adverse events

A total of 74% (17/23) of all areas of concern and adverse events (not cases) were probably or definitely preventable (see Figure 15).



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Figure 15: Preventability of areas of concern and adverse events



### 3.6 Cases with clinical incidents

This section provides the clinical context of the incidents noted by the assessors:

- In total, 95 cases were sent to assessment by first- or second-line assessors or both during the audit period.
- Seven per cent of closed cases (7/95) had at least one area of concern.
- Four per cent of cases (4/95) had at least one adverse event.

The number of cases with clinical incidents is displayed in Table 11.

Table 11: Cases with clinical incidents

Clinical incident	No. of cases
At least one area of consideration	16
At least one area of concern	7
At least one adverse event	3
An adverse event that caused death and was definitely preventable	1

#### 3.6.1 Adverse events

An adverse event is defined as:

*An unintended 'injury' caused by medical management, rather than by the disease process, that is sufficiently serious to lead to prolonged hospitalisation, or lead to temporary or permanent impairment or disability of the patient at the time of discharge, or have contributed to or have caused death.*

There were four cases with adverse events (1 preoperative, 0 intraoperative and 3 postoperative). All four adverse events occurred outside the operating theatre and were attributed to:

### Preoperative (n=1)

- Anaphylaxis to administered agent that has previously been recognised and documented as an allergen.

### Postoperative (n=3)

- Aspirated and had a hypoxic cardiac arrest
- Colon ischemia
- Pancreatitis and bleeding from bile duct.

### 3.6.2 Areas of concern

An area of concern is defined as:

*An incident where the clinician believes that an area of care should have been better.*

There were seven cases with areas of concern (3 preoperative, 1 intraoperative, 3 postoperative). Therefore, 86% (6/7) of areas of concern occurred outside the operating theatre.

The following reasons were given for these incidents:

### Preoperative (n=3)

- Unacceptable delay in operating because patient was not fasting
- An earlier diagnosis and reduced delays may have led to a better outcome
- Missed diagnosis at referring hospital caused delay to operation.

### Operative (n=1)

- Intraoperative haemorrhage

### Postoperative (n=3)

- Demonstrated free gas-result not brought to consultants attention by junior staff/registrar
- Postoperative neurological event
- Postoperative deterioration and management thereof.



## 4. Audit comparisons

A baseline for most aspects of surgical care has been constructed and comparisons can be made. See Table 12 for a comparison of audit baseline data from 2008 to 2012.

**Table 122: Audit comparisons (2008 - 2012)**

Aspect of surgical care	2008	2009	2010	2011	2012
Notifications of death	189	163	189	159	122
Males	53%	52%	57%	48%	52%
Median age (years)	79	79	79	71	76
ASA grade $\geq$ 4	56%	65%	63%	47%	48%
At least one significant comorbidity	90%	92%	92%	93%	88%
Elective admissions	17%	22%	10%	12%	15%
Delay in main surgical diagnosis	10%	8%	3%	3%	10%
No operation	31%	32%	43%	13%	25%
Cases with unplanned return to theatre	15%	13%	12%	11%	14%
Cases with unplanned admission to ICU	17%	14%	14%	17%	19%
Fluid balance an issue	7%	7%	6%	7%	7%
All cases DVT prophylaxis used	66%	72%	74%	72%	68%
Operated cases DVT prophylaxis used	79%	86%	85%	80%	89%
Cases assessed	78%	80%	93%	94%	95%
Second-line assessment requested	21%	15%	14%	9%	13%
Assessed cases with an area of concern or adverse event	17%	14%	11%	9%	19%
Assessed cases with an adverse event that caused death	3%	5%	5%	2%	1%
Assessed cases with an adverse event that caused death & was definitely preventable	0%	1%	0.5%	0%	1%

Overall there has been little change in the pattern of findings over the reporting period.



## 5. Audit limitations

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As an audit, the data are collected to provide feedback to surgeons, rather than for academic research. However, in audit terms, the data are of a high quality because every case had external peer-review.

The data are self-reported and a certain level of bias may be present, but independent assessors make their own assessments on the facts presented. The accuracy of the notifications of deaths to TASM cannot be guaranteed.





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## 6. Achievements

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

- The audit has had wide acceptance and cooperation from the surgeons.
- The use of all TASM-registered assessors, rather than a small panel of assessors, has spread the workload and involved as much of the workforce as possible.
- The use of interstate-registered assessors in some regions has ensured that the second-line cases remain de-identified. This is to ensure the independent peer-review process within the territory.
- Peer-reviewed feedback has been provided directly to individual surgeons, via assessors' comments, on individual cases. This is an essential component of the audit as it provides specific targeted information on a case by case basis.
- The case note review booklet containing around 12 illustrative cases is produced twice a year for distribution to surgeons and trainees (where requested). The cases are based on assessors' comments and all have a clinical message. These cases were identified as offering clinical insights, and have been well received by the surgical community.
- Workshops and seminars have been facilitated based on regional reports and in-depth investigations of issues identified. 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. There is a need to continue to identify emerging trends in mortality and to address these where possible through ongoing educative and interactive seminars.
- 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 audit will continue to encourage the use of the 'Fellows Interface' web-based tool as an important initiative which provides users with a dynamic, user-friendly tool to enter online SCFs and complete first-line assessments. This minimises data entry time, the risk of errors in data entry, and hastens turnaround time. The number of fields completed on Fellows Interface was noticeably higher.
- Improvements have been made to the surgical case form in order to collect more detail around a patient mortality with infection. This information will be included in the 2013 report.
- Improvement in the quality and effectiveness of communication within the clinical team, and with other teams involved in the patient's care, was identified as an area for future improvement and education.
- The audit has attracted the attention of the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG). We look forward to working with the Fellows from both Colleges as they actively participate in the audit process.

The College and the state departments of health can be proud of this important initiative to promote best surgical practice across the nation.

# Acknowledgements

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  - > A/Prof Wendy Babidge                      Director, RAAS Division
  - > Mr Gordon Guy                              ANZASM Manager.





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