



ROYAL AUSTRALASIAN  
COLLEGE OF SURGEONS



ANNUAL REPORT 2008

**SAAPM**  
South Australian Audit  
of Perioperative Mortality







# Contact

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- The information contained in this Project Report has been prepared by the Royal Australasian College of Surgeons South Australian Audit of Surgical Mortality Management Committee.
- SAAPM is a confidential project with legislative protection at a state level under the *SA Health Care Act 2008* under Part 7 (Quality improvement and research) and Part 8 (Analysis of adverse incidents).
- The Australian and New Zealand Audit of Surgical Mortality (ANZASM), including the South Australian Audit of Perioperative Mortality, is protected as a 'quality assurance' activity under the Commonwealth Qualified Privilege scheme, Part VC of the *Health Insurance Act 1973* (Gazetted 6 November 2006).







# Contents

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|  |           |
|--|-----------|
| Contact                                      | 3         |
| Contents                                     | 5         |
| Tables                                       | 6         |
| Figures                                      | 6         |
| Chairman's report                            | 7         |
| Abbreviations                                | 8         |
| Executive summary                            | 9         |
| Recommendations                              | 10        |
| <b>1. Introduction</b>                       | <b>11</b> |
| 1.1 The audit process and methodology        | 11        |
| 1.2 Categories of deaths investigated        | 12        |
| 1.3 Categorising clinical incidents          | 12        |
| <b>2. Audit participation</b>                | <b>13</b> |
| 2.1 Overview of participation                | 13        |
| 2.2 Surgeon participation                    | 13        |
| 2.3 Hospital participation                   | 13        |
| 2.4 Proforma completion                      | 14        |
| 2.5 Assessments                              | 14        |
| <b>3. Results</b>                            | <b>15</b> |
| 3.1 Age and sex distribution                 | 15        |
| 3.2 ASA grade                                | 15        |
| 3.3 Surgical diagnosis                       | 15        |
| 3.4 Comorbidities                            | 16        |
| 3.5 High dependency and intensive care units | 16        |
| 3.6 Clinical incidents                       | 16        |
| 3.7 Admission type                           | 18        |
| 3.8 Operative and non-operative data         | 19        |
| 3.9 Grade of surgeon operating               | 19        |
| 3.10 DVT prophylaxis                         | 19        |
| 3.11 Fluid balance                           | 20        |
| 3.12 Post-mortem                             | 20        |
| Acknowledgements                             | 21        |



## Tables

---

|            |   |    |
|------------|---|----|
| Table 2.1  | Hospital status and data collection initiation dates  | 13 |
| Table 2.2  | Number of proformas sent out by specialty   | 14 |
| Table 2.3  | Comparison of cases which have undergone assessment (2005- 2008)  | 14 |
| Table 3.0  | ASA classification  | 15 |
| Table 3.1  | The most frequently reported surgical diagnosis   | 15 |
| Table 3.2  | Actual use and assessor opinion of use of HDU or ICU (2007-2008)  | 16 |
| Table 3.3  | Patient outcome associated with areas of consideration, concern or adverse events reported by assessors         | 17 |
| Table 3.4  | Preventability of event associated with areas of consideration, concern or adverse events reported by assessors | 17 |
| Table 3.5  | Responsible unit associated with areas of consideration, concern or adverse events reported by assessors        | 17 |
| Table 3.6  | The areas of consideration reported by assessors in emergency and elective cases                                | 18 |
| Table 3.7  | The areas of concern reported by assessors in emergency and elective cases                                      | 18 |
| Table 3.8  | The adverse events reported by assessors in emergency and elective cases  | 18 |
| Table 3.9  | Clinical incident and admission status  | 18 |
| Table 3.10 | Number of operative and non-operative cases by specialty  | 19 |
| Table 3.11 | Reasons for non-operation   | 19 |
| Table 3.12 | Types of DVT prophylaxis used   | 19 |
| Table 3.13 | Reasons cited by surgeons for non use of DVT prophylaxis  | 20 |
| Table 3.14 | Post-mortem examinations  | 20 |

## Figures

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|            |   |    |
|------------|---|----|
| Figure 1.1 | Project governance structure                                  | 11 |
| Figure 1.2 | SAAPM audit process   | 11 |
| Figure 2.1 | Deaths reported to SAAPM between 1 July 2007 and 30 June 2008 | 13 |
| Figure 2.2 | Number of surgeons completing one or more proformas           | 13 |
| Figure 2.3 | Proportion of proformas completed by hospital                 | 14 |
| Figure 2.4 | Proportion of proformas completed by specialty                | 14 |
| Figure 3.1 | Age and sex distribution (07/08)*                             | 15 |
| Figure 3.2 | Comparison of ASA grade (06/07 – 07/08)                       | 15 |
| Figure 3.3 | Comorbidities in completed cases                              | 16 |
| Figure 3.4 | Grade of surgeon operating                                    | 19 |



## Chairman's report

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This is the third annual report of the South Australian Audit of Perioperative Mortality (SAAPM), which covers data from 1 July 2007 to 30 June 2008. During this period the audit has expanded steadily, with recruitment of new private and public hospitals in both the metropolitan and rural sectors. The audit now covers all the major public hospital sites in South Australia with an increasing input from the private hospital sector.

As a result of this expansion, the number of assessed cases has increased by 10%. The total number of clinical incidents recorded has fallen steadily since the introduction of the audit in 2005, suggesting that the process is having an impact on clinical practice. In particular, there have been improvements in the areas of deep vein thrombosis prophylaxis and consultant involvement in theatre procedures.

When the audit commenced there were concerns expressed by hospital staff and surgeons that the process might lead to unfair criticism of institutions or individual clinicians. Three years into the audit, it is clear that these concerns were unfounded. The system works well to maintain confidentiality and provide a third party assessment of clinical care. It also provides a state-wide overview of surgical care which is not achieved through individual 'in house' hospital mortality review.

The SAAPM audit is part of a national network of similar audits, coordinated through the Royal Australasian College of Surgeons by the Australian and New Zealand Audit of Surgical Mortality, with the eventual aim of providing nationally-based reports.

Databases have been established and are now in use by each state audit. It is hoped that online access for surgeons to enter their data will ultimately occur, which will streamline the processes of data submission and assessment.

Mortality audit is firmly established as part of the surgical landscape, and we continue to encourage all surgeons and hospitals to participate. I hope that this report will be of interest to all practising surgeons, and as always I would welcome feedback about the process.

Paul Dolan

Clinical Director

SAAPM



## Abbreviations

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|             |   |
|-------------|---|
| AAA         | Abdominal aortic aneurysm   |
| ANZASM SC   | Australian and New Zealand Audit of Surgical Mortality Steering Committee |
| ANZCA       | Australian & New Zealand College of Anaesthetists                         |
| AST         | Advanced Surgical Trainee   |
| DVT         | Deep vein thrombosis  |
| ED          | Emergency Department  |
| ENT         | Ear, Nose and Throat  |
| HDU         | High Dependency Unit  |
| GI          | Gastrointestinal  |
| ICH         | Intra-cranial haemorrhage   |
| ICU         | Intensive Care Unit   |
| INR         | International Normalised Ratio  |
| LMWH        | Low molecular weight heparin  |
| QASM        | Queensland Audit of Surgical Mortality                                    |
| RACDS       | Royal Australasian College of Dental Surgeons                             |
| RACP        | Royal Australasian College of Physicians                                  |
| RANZCOG     | Royal Australian & New Zealand College of Obstetricians & Gynaecologists  |
| RANZCP      | Royal Australasian College of Physicians                                  |
| SA          | South Australia   |
| SAAPM       | South Australian Audit of Perioperative Mortality                         |
| SA Health   | South Australian Department of Health                                     |
| SAH         | Subarachnoid haemorrhage  |
| SDH         | Subdural haematoma  |
| TASM        | Tasmanian Audit of Surgical Mortality                                     |
| The College | The Royal Australasian College of Surgeons                                |
| WAASM       | Western Australian Audit of Surgical Mortality                            |



# Executive summary

This annual report reflects the third year of data collection for the South Australian Audit of Perioperative Mortality (SAAPM). Established in 2005, with data initiation on 1 July of that year, the audit has reviewed 1478 surgically-related deaths to 30 June 2008.

SAAPM continues to function under the administration of The Royal Australasian College of Surgeons (the College) through funding from the South Australian Department of Health (SA Health), and in association with the Australian and New Zealand College of Anaesthetists (ANZCA).

## Death notifications

During the reporting period 1 July 2007 to 30 June 2008 there were **545** deaths reported to SAAPM by participating hospitals. This represents a 10% increase in notifications compared with the previous year. Hospital participation requires timely notification of deaths, and where necessary, that case notes are made available.

## Hospital participation

Hospital accrual continued during this period, with an additional two major private hospitals participating, and increased reporting from regional public hospitals.

## Surgeon participation

There were **141** surgeons whose patients were the subject of this report. Responses were received from **137** surgeons, giving a participation rate of **97%**.

## Proforma completion

Of the **545** proformas sent to surgeons, **418 (77%)** had been returned at the closure date for data analysis. This represents a slight decrease on the **80%** response rate for the previous year, and is comparable to the data available from similar mortality audits in other states.

## Assessments

After exclusion of terminal care cases (31) and those cases requiring ongoing assessment, there were **362** completed assessments forming the basis of this report.

## Assessment Processes

Changes in the ANZASM Policy have provided opportunities for interstate assessments to occur for those specialties that lack sufficient numbers of state assessors. This system should be expanded.

More local assessors from all specialties are required to speed up the assessment process and reduce the processing time for cases.

## Patient demographics

This year's data again shows that patients aged 71 to 90 years are the group most commonly represented. Most patients had comorbidities, with cardiovascular disease, respiratory problems and advancing age the most common factors noted.

## Operative and non-operative data

Operative procedures were performed in **61%** of the patients, and as previously found the most common diagnosis was a fractured hip. Despite this common orthopaedic admission, the greatest number of procedures was carried out by general surgeons. No operation was carried out in 39% of the study patients, for a variety of clinical reasons.

## Grade of surgeon operating

This year's data shows a definite trend towards greater consultant involvement in the treatment of patients who require a second or subsequent procedure. This issue has been raised in earlier SAAPM reports and it is encouraging to see a gradual change in practice.

## Use of HDU and ICU

Assessors felt that there was appropriate use of intensive care unit (ICU) and high dependency unit (HDU) facilities in over 98% of cases. There were only **6** instances (2%) where an assessor felt that a patient should have been admitted to an HDU bed during the patient's hospital course.

## Clinical incidents

The overall rate of clinical incidents has declined steadily from 20% in the initial report (2005/06) to 16% in the current report. Second-line assessments were requested in 5% of cases, down from 11% in the initial report. Due to a reclassification of adverse events, all anastomotic leaks are now included in this category, regardless of their effect on the patient outcome.

## DVT prophylaxis

Surgeons reported using DVT prophylaxis in 65% of all cases, which is a distinct increase on the rates of 57% and 59% recorded in past audit periods. As expected, a significant number of patients did not receive prophylaxis due to complicating medical conditions. Assessors felt that there was an inappropriate lack of prophylaxis in less than 1% of cases.

## Post-mortem

The post-mortem rate rose to 15%, from 12% in the last report. Most of these examinations were done as Coronial autopsies. There continue to be delays in obtaining feedback from these cases to the treating surgeons.



## Recommendations

### Notifications

- Large metropolitan teaching hospitals should report death notifications to SAAPM on a weekly basis.
- All other participating hospitals should report monthly and more frequently if possible.
- All Hospitals should identify an individual officer as the contact person for SAAPM audit staff to ensure continuity of data reporting.

### Hospital participation

- SA hospitals not participating in the SAAPM should be encouraged to participate by both the College and SA Health, on the basis that SAAPM is now an established state-wide quality management program.

### Surgeon participation

- Given the widespread acceptance of the audit by surgeons, those who are still not participating need to do so.
- The College and SA Health should consider incentives to encourage full participation.
- Clinicians need adequate time and facilities to participate in a meaningful way. Access to case notes and administrative support should be provided by hospitals as needed.

### Assessment processes

- The system of interstate specialty assessments should be expanded.
- More local assessors from all specialties are required.
- The College and SA Health should acknowledge the time and efforts of assessors, by such means as
  - > Provision of appropriate CPD points for all assessors
  - > Remuneration for second-line assessors

### Clinical management

- Surgeons should actively identify those patients who are at high risk of death when they are admitted. This should be highlighted to junior staff.
- High risk patients need to be managed with a high level of consultant input on a regular basis. Avoidable delays and excessive investigations should be minimised.
- Surgical teams need to ensure that experienced staff are available to undertake procedures in a timely manner. Consultant involvement in high risk cases should be considered routine.
- Delays (diagnosis, transfer, investigation, treatment, theatre access) are regularly identified by assessors as

contributing factors in the clinical incidents. Hospital services need to review strategies to improve timely access to emergency theatres.

### ICU/HDU

- There is considerable demand for beds in ICU and HDU. Decisions regarding admission and discharge of surgical patients should be discussed with senior surgical, anaesthetic and ICU staff. These discussions need to take into account the level of care available on general wards, particularly at nights and on weekends.

### Post-mortem

- Post-mortem examinations are largely performed by the Coroner's pathologist. The process / procedure for accessing post mortem findings in a timely manner should be provided to treating clinicians.



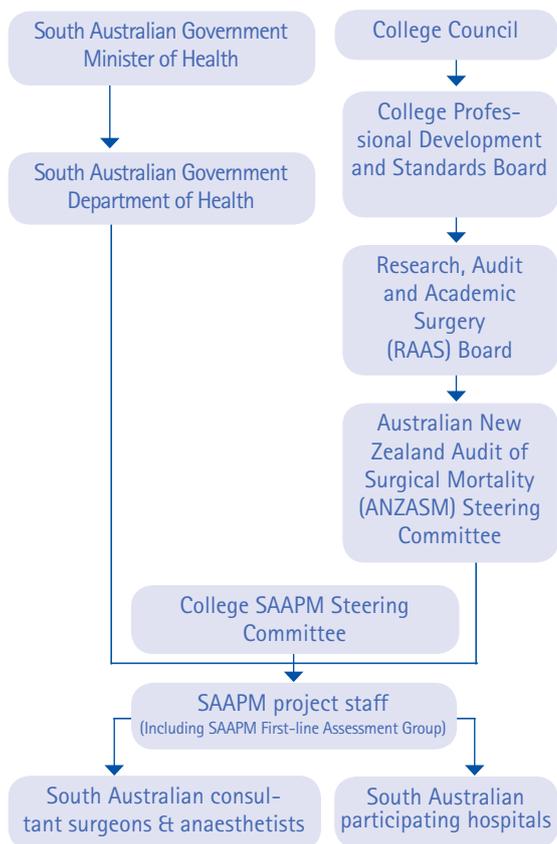
# 1. Introduction

## Background

The South Australian Audit of Perioperative Mortality (SAAPM) is a peer-review audit of surgically-related deaths in South Australia. The project is funded by the South Australian Department of Health (SA Health) and is administered by the Royal Australasian College of Surgeons (the College).

SAAPM commenced data collection on 1 July 2005 and falls under the governance of the Australian and New Zealand Audit of Surgical Mortality Steering Committee (ANZASM SC). The committee is an overarching body which ensures that mortality audits in Australia and New Zealand use standardised assessment protocols and collect a common dataset across regions to allow bi-national reporting of surgically-related deaths. The project governance structure is illustrated in Figure 1.1.

Figure 1.1 Project governance structure



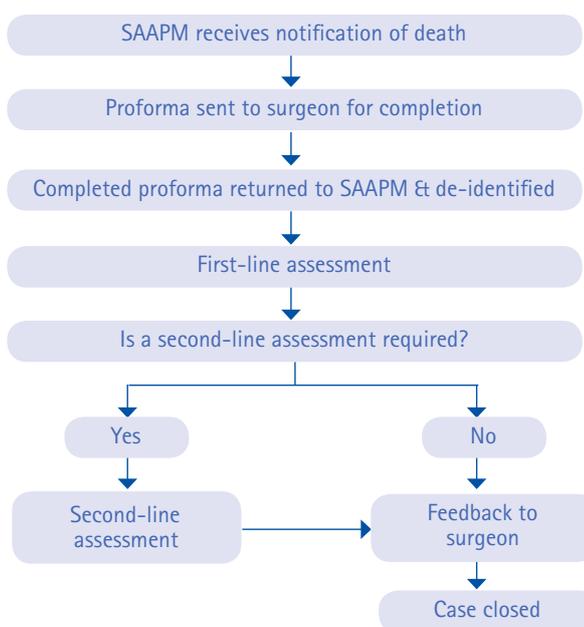
## Confidentiality

SAAPM is a confidential project with legislative protection at a state level under the Health Care Act 2008 under Part 7 (Quality improvement and research) and Part 8 (Analysis of adverse incidents), in addition to federal coverage under ANZASM through the Commonwealth Qualified Privilege Scheme, Part VC of the Health Insurance Act 1973 (gazetted 6 November 2006). This protection covers SAAPM staff as well as surgeons acting in the capacity of first- and second-line assessors.

## 1.1 The audit process and methodology

The audit process begins when the SAAPM office is notified of a surgically-related death by the medical record department or safety and quality unit of a hospital. A data collection form (surgical proforma) is sent to the consultant surgeon under whom the patient was admitted. Figure 1.2 indicates the various pathways a case may take through the assessment processes.

Figure 1.2 SAAPM audit process



### First-line assessment

The surgeon's completed proforma is received by the SAAPM Office, all identifiers are removed and the proforma is sent to a member of the SAAPM First-line Assessment Group. Proformas are assigned to First-line Assessment Group members according to the specialty of the surgeon who completed the proforma. The first-line assessor completes a surgical assessor's form, providing comments on the case management and level of care provided to the patient. If the first-line assessor considers that there is insufficient information on the proforma to come to a conclusion about the case, or if there appear to be factors that warrant further investigation, a second-line assessment is requested.

### Second-line assessment

A second-line assessment involves a detailed review of a patient's case notes. The SAAPM office will request case notes from the relevant hospital and these are forwarded with the proforma to a second-line assessor. Second-line assessors will assess cases relevant to their own specialty which have occurred in a hospital in which they do not practise. The case assessor provides a summary on the case management and the level of care provided to the patient.



## Feedback

A primary objective of SAAPM is education through feedback. Feedback is provided in a number of ways, upon completion of a first or second-line assessment, as well as publication of a selection of de-identified case note reviews for surgeons. In the broader sense, regular newsletters and this state-wide annual report containing analyses of the data and commentaries covering all of the specialties provide an overview of the project to the surgical and broader community.

## 1.2 Categories of deaths investigated

Deaths currently included in SAAPM are classified into two categories as follows:

- **Category 1: Operative deaths** A death that occurs when a patient is admitted under a surgeon, and has an operation/procedure during his or her last admission regardless of the length of stay in the hospital or medical facility.
- **Category 2: Non-operative deaths** A death that occurs when a patient is admitted under a surgeon, does not have an operation/procedure and dies during their last admission regardless of their length of stay in the hospital or medical facility.

Cases which fall under the care of specialists from the following colleges are excluded from assessment:

- The Royal Australasian College of Dental Surgeons (RACDS)
- The Royal Australian and New Zealand College of Obstetricians & Gynaecologists (RANZCOG)
- The Royal Australasian College of Physicians (RACP).

Deaths which are identified as terminal care on the surgical case form by the responsible surgeon are excluded from further assessment in the audit.

Terminal care cases are recorded but do not undergo the complete audit process. Terminal care is nominated by the surgeon on the surgical case form, and cannot be identified from the notification of death information.

## 1.3 Categorising clinical incidents

First and second-line assessors are responsible for categorising patient death into one of two categories:

- **Cases related to disease process:** In these cases patient death occurred due to the disease process despite appropriate care, and assessors found no issues with patient management.
- **Cases with clinical incidents:** In these cases clinical incidents were identified that may have impacted on patient management. These events are divided into one of three categories:

- > **Area of consideration:** This is an area of care that an assessor believes could have been improved or different but recognises that it may be an area for debate.
- > **Area of concern:** This is an area of care that the assessor believes should have been better managed.
- > **Adverse event:** An unintended injury caused by medical management rather than by disease, which is sufficiently serious to lead to prolonged hospitalisation or to temporary or permanent impairment or disability of the patient at the time of discharge, or which contributes to or causes death.

Assessors also evaluate the impact and preventability of the clinical incident as well as determining which associated clinical team may have been responsible. Overall the assessors must decide if the impact of the clinical incident either:

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

Assessors must also give their opinion as to whether the clinical incident was either:

- definitely preventable
- probably preventable
- probably not preventable
- definitely not preventable.

Assessors must also indicate who was primarily associated with the clinical incident:

- the audited surgical team
- another clinical team
- the hospital
- other.

It is important to note that the analyses contained in this report are based on the opinions subscribed to cases by either first or second-line assessors.

## 2. Audit participation

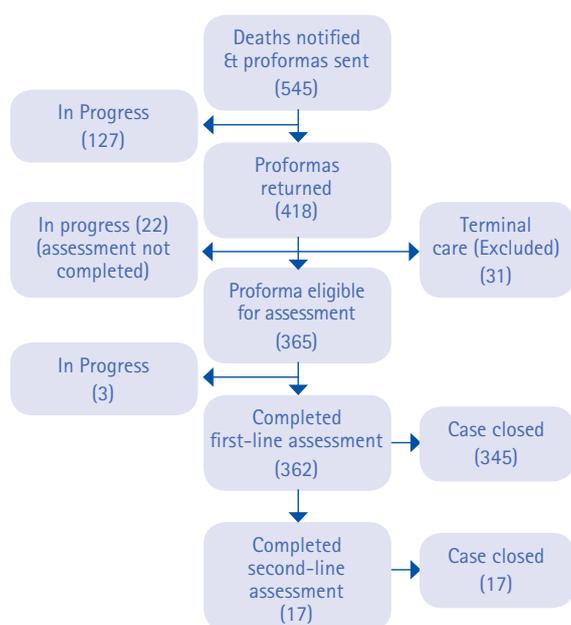
### 2.1 Overview of participation

Participation in SAAPM is directed at Fellows of the Royal Australasian College of Surgeons and is undertaken on a voluntary basis. Surgeons register to participate by signing a participation agreement form which the SAAPM project office sends to them. On notification from a hospital that a death has occurred, a case form is forwarded to the responsible surgeon unless the SAAPM project office has had specific notification of a surgeon's refusal to participate.

During this year, the audit has recruited public hospitals from the SA country region and more recently, some private metropolitan hospitals. Hospital participation requires timely notification of deaths and, where necessary, that case notes are made available.

Figure 2.1 describes the number of deaths and the proforma return and assessment rate, indicating the number of cases which have completed the audit cycle

**Figure 2.1 Deaths reported to SAAPM between 1 July 2007 and 30 June 2008**



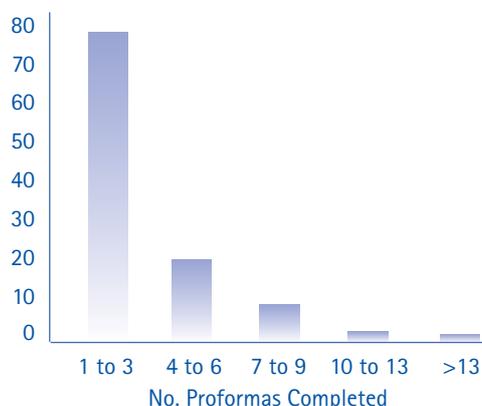
### 2.2 Surgeon participation

Participation in SAAPM is voluntary. Surgeons are defined as participating by either actively agreeing to participate through a signed consent form or having had a notifiable death for which they have completed and returned a proforma.

Mortality rates across specialties may vary due to the nature of patients treated; some specialties treat patients with complex medical conditions and multiple comorbidities increasing the risk of death, while other specialties may involve patients at lower risk.

In the 07/08 audit period, there were **545** deaths reported associated with **141** surgeons. Of these, **137** surgeons agreed to participate (97%). The number of surgeons completing one or more proformas is summarised in Figure 2.2.

**Figure 2.2 Number of surgeons completing one or more proformas**



### 2.3 Hospital participation

Table 2.1 reflects the location and hospital status of each of the participating hospitals. We are currently in negotiation with several private hospitals with the aim of including them in the audit.

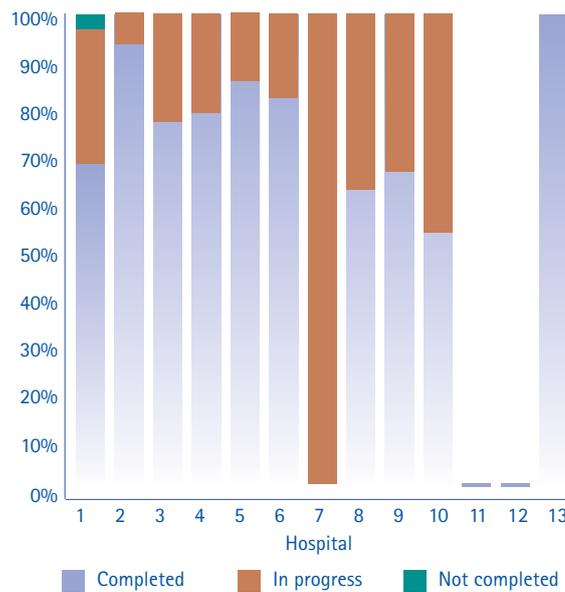
Figure 2.3 illustrates the distribution of proformas amongst participating hospitals and the status of cases. The most serious cases are generally transferred to a larger metropolitan teaching hospital for specialist care.

**Table 2.1 Hospital status and data collection initiation dates**

| Hospital number | Hospital status |         |       |          | Data collection initiated |
|-----------------|-----------------|---------|-------|----------|---------------------------|
|                 | Public          | Private | Metro | Regional |                           |
| 1               | Y               |         | Y     |          | 04-Jul-05                 |
| 2               | Y               |         | Y     |          | 11-Jul-05                 |
| 3               | Y               |         | Y     |          | 15-Jul-05                 |
| 4               | Y               |         | Y     |          | 01-Sep-05                 |
| 5               |                 | Y       | Y     |          | 08-Feb-06                 |
| 6               | Y               |         |       | Y        | 10-Apr-06                 |
| 7               | Y               |         |       | Y        | 19-Apr-06                 |
| 8               | Y               |         | Y     |          | 28-Aug-06                 |
| 9               | Y               |         |       | Y        | 27-Nov-06                 |
| 10              | Y               |         |       | Y        | 27-Nov-06                 |
| 11              | Y               |         |       | Y        | 15-Jan-07                 |
| 12              |                 | Y       | Y     |          | 20-Sep-07                 |
| 13              |                 | Y       | Y     |          | 18-Oct-07                 |



**Figure 2.3 Proportion of proformas completed by hospital**



Note - Not all hospitals reported eligible deaths in the 2007/2008 audit year. Hospital 7 had one reported case.

## 2.4 Proforma completion

During the period 1 July 2007 to 30 June 2008, **545** proformas were sent to surgeons. Of these, **418** (77%) were returned by the closure date for this reporting period for data analysis. This return rate is comparable to previous return rates of 74% and 81% respectively in the first two years of data collection.

Thirty one cases were excluded as these patients were admitted for terminal care and therefore did not proceed through the audit. There were **127** proformas outstanding at the time of report writing. In these cases either the surgeon had not completed the form, or the form completion was awaiting the retrieval of medical case notes from the Coroner's office. These proformas once returned will be included in subsequent annual reports.

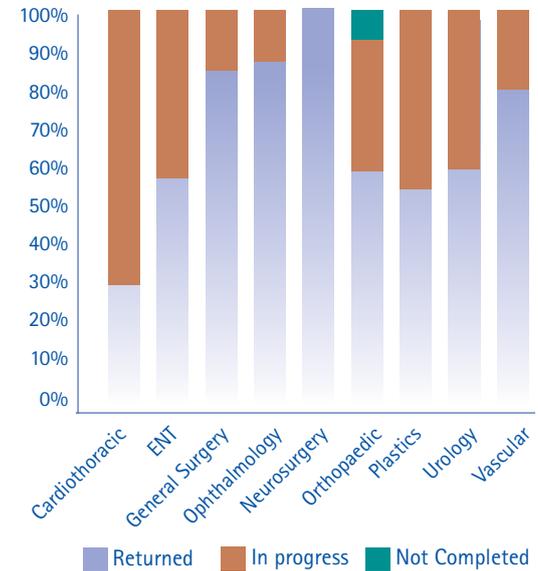
Table 2.2 provides data on the total number of proformas sent to surgeons by specialty during the audit period and records changes across the reporting periods.

**Table 2.2 Number of proformas sent out by specialty**

| Case specialty     | Numbers of cases |                  |                  |
|--------------------|------------------|------------------|------------------|
|                    | Jul 05 to Jul 06 | Jul 06 to Jul 07 | Jul 07 to Jul 08 |
| General surgery    | 181              | 229              | 276              |
| Neurosurgery       | 64               | 82               | 81               |
| Orthopaedics       | 82               | 80               | 67               |
| Vascular surgery   | 50               | 47               | 52               |
| Cardiothoracic     | 35               | 25               | 34               |
| Urology            | 10               | 7                | 14               |
| Plastic            | 11               | 8                | 11               |
| ENT                | 7                | 15               | 7                |
| Ophthalmology      | 0                | 0                | 1                |
| Oral/maxillofacial | 0                | 0                | 0                |

The proportion of proformas completed by specialty for the current audit year is illustrated in Fig 2.4. Where SAAPM has received a notification of a death under a surgeon who has chosen not to participate, the case is recorded as not completed.

**Figure 2.4 Proportion of proformas completed by specialty**



## 2.5 Assessments

All cases which fit the inclusion criteria of SAAPM are first-line peer reviewed by a surgeon in the relevant specialty at a different hospital. During the audit period, **362** of the **418** (87%) cases underwent first-line assessment. Of these **362** cases there were **17** cases (5%) that progressed to second-line assessment.

Table 2.3 provides data on cases which have undergone first- and second-line assessment.

**Table 3.0 Comparison of cases which have undergone assessment (2005- 2008)**

|                                    | Jul 2005 to Jun 2006 | Jul 2006 to Jun 2007 | Jul 2007 to Jun 2008 |
|------------------------------------|----------------------|----------------------|----------------------|
|                                    | n (%)                | n (%)                | n (%)                |
| Returned proformas                 | 328                  | 387                  | 418                  |
| First-line assessment completed    | 296 (90)             | 329 (85)             | 362 (87)             |
| Second-line assessment recommended | 37 (11)              | 26 (8)               | 17 (5)               |

Across the three years of data collection there has been a steady decline (from 11% then 8% to 5%) in the number of cases that require further scrutiny through second-line assessment.

Cases progress to second-line assessment if the first-line assessor has concerns about the patient's management and recommends that the case undergoes further review involving the medical case notes. Changes in the ANZASM policy have provided opportunities for interstate assessments to occur for those specialties that lack sufficient numbers of state assessors.

### 3. RESULTS

SAAPM has completed three years of data collection (1 July 2005 – 30 June 2008). In the current audit cycle (1 July 2007 – 30 June 2008) 418 proformas were returned and 365 were eligible for assessment. Thirty-one cases were considered to be terminal care by the reporting surgeons and therefore excluded from further audit assessment. Twenty-two cases were in the process of assessment at the time of data analysis.

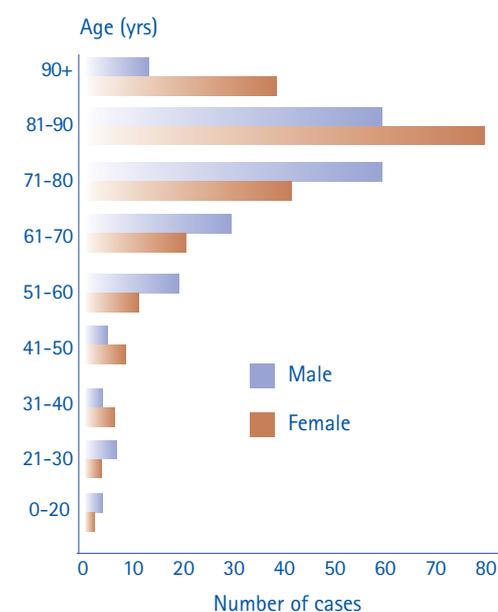
#### 3.1 Age and sex distribution

In the current reporting period, there were 545 reported deaths.

Figure 3.1 indicates the age and sex distribution of the reported cases. Patients between the ages of 71 and 90 years account for approximately 60% of all cases.

The 81-90 year age range remains the predominant group in the sample. In the 81-90 year age groups, females had the highest number of deaths (55%).

Figure 3.1 Age and sex distribution (07/08)\*



\* Age information available for 411 patients

#### 3.2 ASA grade

Figure 3.2 provides data on the ASA grade of patients since July 2006. The most frequently reported pre-operative ASA grade of cases audited over both years was grade 4. Patients assessed as ASA grade 4 are considered to have an incapacitating systemic disease that is a constant threat to life. The previous SAAPM report noted that patients with ASA grades of 3 and 4 show a statistically significant association with postoperative morbidity.

Figure 3.2 Comparison of ASA grade (06/07 – 07/08)

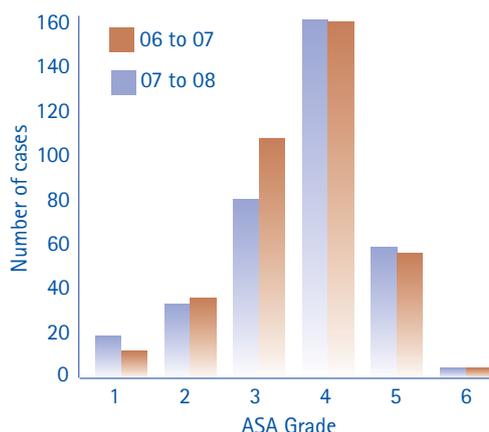


Table 3.0 ASA classification

| 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   |

#### 3.3 Surgical diagnosis

The main surgical diagnoses reported by surgeons are provided in Table 3.1. The 12 categories detailed, totalling 301 cases, represent 82% of all confirmed surgical diagnoses reported in the 365 returned surgical proforma. Fractured neck of femur was again the most frequent diagnosis, consistent with the data from our reports of 2005/06 and 2006/07.

Table 3.1 The most frequently reported surgical diagnosis

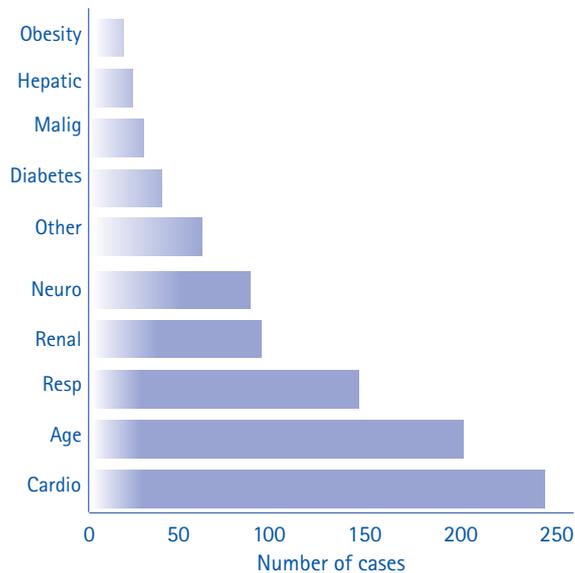
| Surgical diagnosis                       | n          | Percentage of total proformas returned (n =365) |
|--|------------|---|
| Fractured neck of femur                  | 65         | 18%   |
| Bowel obstruction                        | 38         | 10%   |
| Malignancy (GI 16, non GI 18)            | 34         | 9%  |
| Intracranial haemorrhage (ICH, SDH, SAH) | 29         | 8%  |
| Acute abdomen (peritonitis/perforation)  | 20         | 5%  |
| Ischaemic gut                            | 20         | 5%  |
| Biliary tract disease                    | 20         | 5%  |
| Abdominal aortic aneurysm (AAA)          | 19         | 5%  |
| Sepsis                                   | 18         | 5%  |
| Peripheral vascular disease              | 15         | 4%  |
| GI bleeding                              | 13         | 4%  |
| Pancreatitis                             | 10         | 3%  |
| <b>Total</b>                             | <b>301</b> |   |



### 3.4 Comorbidities

Comorbidities reported by surgeons are reflected in Figure 3.3. As was reported in the previous SAAPM report, cardiac problems, advanced age and respiratory disease remain the most frequently occurring factors.

Figure 3.3 Comorbidities in completed cases



As discussed in section 3.1, patients in the 71–90 year age group are the most frequently occurring in the 2007/2008 SAAPM dataset. In this age group, **53%** (133/250) of patients had at least three comorbidities. The data underlines the complexities of managing this high risk age group.

### 3.5 High dependency and intensive care units

Table 3.2 provides data of the views of the assessors' on the use of HDU and ICU. In the assessors' opinion there were no cases where ICU was not used when it should have been. There were **6 (2%)** cases in which the assessors indicated that HDU would have been beneficial but was not used. This represents a decrease from the **6%** reported last year. This is a very encouraging trend and indicates an increasing awareness by the treating surgeons of the necessity for high level multidisciplinary care in the management of these high risk patients.

In the context of an aging population there will always be a strong demand for ICU/HDU beds. These are invariably an expensive resource and must be utilised carefully. Surgeons should be involved in these management decisions in conjunction with senior anaesthetic and ICU staff.

Utilisation of ICU and HDU admission is an area which will continue to be monitored by SAAPM.

Table 3.2 Actual use and assessor opinion of use of HDU or ICU (2007–2008)

|                  |                        | n (%)            |
|------------------|------------------------|------------------|
| ICU not utilised | First-line assessor*   | 0 (0)            |
|                  | Second-line assessor** | 0 (0)            |
| HDU not utilised | First-line assessor*   | 4 (1)            |
|                  | Second-line assessor** | 2 (>1)           |
| <b>Total</b>     |                        | <b>6/362 (2)</b> |

*Assessors may have nominated that both ICU & HDU use would have been beneficial*

\*First-line assessments n = 362

\*\*Second-line assessments n = 17

### 3.6 Clinical incidents

Of the **362** cases which have undergone assessment, **84%** of deaths were related to the disease process, and there were no clinical incidents noted by the assessors.

There were 59 cases (16%) in which assessors reported a clinical incident categorised as an area of consideration, an area of concern or an adverse event. An incident rate of 19% was reported in the previous SAAPM 2007 report.

As indicated in the table below, 36 (10%) of cases in the current report were rated in the more serious categories as either areas of concern or adverse events. The Queensland Audit of Surgical Mortality (QASM) reports a comparable rate of 11% and the Tasmanian Audit of Surgical Mortality (TASM) reports 9%.

Of the 362 cases which have undergone assessment:

- 303 (84%) were related to the disease process
- 59 (16%) were cases with clinical incidents, of which:
  - > 23 (6%) cases were associated with areas for consideration
  - > 13 (4%) cases were associated with areas of concern
  - > 23 (6%) cases were associated with an adverse event.

Tables 3.3, 3.4 and 3.5 relate clinical incidents to patient outcome, preventability and the responsible clinical unit. The majority of incidents noted **36 (61%)** were not classified as adverse events. However, 23 incidents have been categorised as adverse events. Of these events, 3 have been assessed as having contributed to the patient's death while a further 18 were deemed to have caused a death in a patient expected to survive.

**Table 3.3 Patient outcome associated with areas of consideration, concern or adverse events reported by assessors**

| Clinical incident     | Made no difference to outcome | May have contributed to death | Caused the death of a patient who would otherwise be expected to survive | Missing data/No response | Total     |
|-----------------------|-------------------------------|-------------------------------|--|--------------------------|-----------|
| Area of consideration | 5                             | 13                            |  | 5                        | 23        |
| Area of concern       | 1                             | 7                             | 5  |                          | 13        |
| Adverse event         | 2                             | 3                             | 18   |                          | 23        |
| <b>Total</b>          | <b>8</b>                      | <b>23</b>                     | <b>23</b>  | <b>5</b>                 | <b>59</b> |

**Table 3.4 Preventability of event associated with areas of consideration, concern or adverse events reported by assessors**

| Clinical incident     | Preventability |           |              |                |                          | Total     |
|-----------------------|----------------|-----------|--------------|----------------|--------------------------|-----------|
|                       | Definitely     | Probably  | Probably not | Definitely not | Missing data/No response |           |
| Area of consideration | 2              | 3         | 10           | 2              | 6                        | 23        |
| Area of concern       | 5              | 8         |              |                |                          | 13        |
| Adverse event         | 2              | 10        | 11           |                |                          | 23        |
| <b>Total</b>          | <b>9</b>       | <b>21</b> | <b>21</b>    | <b>2</b>       | <b>6</b>                 | <b>59</b> |

**Table 3.5 Responsible unit associated with areas of consideration, concern or adverse events reported by assessors**

| Clinical Incident     | Associated with |               |          |          |                          | Total     |
|-----------------------|-----------------|---------------|----------|----------|--------------------------|-----------|
|                       | Surgical team   | Clinical team | Hospital | Other    | Missing data/No response |           |
| Area of consideration | 8               | 9             |          | 1        | 5                        | 23        |
| Area of concern       | 8               | 3             | 2        |          |                          | 13        |
| Adverse event         | 14              | 6             | 1        | 2        |                          | 23        |
| <b>Total</b>          | <b>30</b>       | <b>18</b>     | <b>3</b> | <b>3</b> | <b>5</b>                 | <b>59</b> |

Overall, reported clinical incident rates during the last three years of SAAPM have steadily declined from **20%** in 2005/06, to **19%** in 2006/07 and now to **16%** in the current report.

This report, however, shows an increase in adverse events, a total of 23 compared with 10 in the previous audit period. This is due to a change in the definition of an adverse event to include all postoperative anastomotic leaks. These have been included after discussion at the national ANZASM Steering Committee, to allow more accurate comparison of data across the various state-based audits.

#### Anastomotic leak

An anastomotic leak is an adverse event by definition, in that it is an unintended consequence of treatment, causes morbidity for the patient and may cause death. However, it must also be acknowledged that anastomotic leaks after intestinal surgery are a fact of life and are not entirely preventable. Even the most highly regarded surgical units worldwide report leak rates after all types of intra-abdominal procedures.

Obviously, experience and attention to detail are important factors in preventing leaks, but a low rate of problems will

still occur. The quality of care in a surgical unit is reflected in the way that these problems are diagnosed and managed when they arise. A high index of suspicion, appropriate early investigation and prompt intervention will maximise the patient's chances of survival.

In the current data we have reported four cases of fatal anastomotic leak after elective right hemicolectomy. This is an operation generally regarded as being less risky than a left colonic resection, but clearly the results do not support this. Surgeons and trainees involved with this type of operation should be aware of the audit data.

#### Delays in Treatment

The following three tables provide details regarding the areas of consideration, concern and adverse events as determined by the assessors.

It is notable that in 36 cases where there were areas of consideration or concern, there were 12 cases in which assessors recorded delays in definitive treatment. These cases involved a variety of factors including delays in diagnosis, access to radiology and timing of surgery.

Similar types of delays have been noted in previous annual reports and clinicians should remain alert to these issues.



**Table 3.6** The areas of consideration reported by assessors in emergency and elective cases

| Admission type                     | Areas of consideration                                     | Frequency |
|------------------------------------|--|-----------|
| Emergency                          | Decision to operate  |           |
|                                    | • Major surgery / elderly patient                          | 2         |
|                                    | • Surgery delayed by reliance on percutaneous drainage     | 1         |
|                                    | Timing   |           |
|                                    | • Earlier surgery preferable                               | 2         |
|                                    | Delayed diagnosis  |           |
|                                    | • Colon cancer   | 1         |
|                                    | • Perforated ulcer   | 1         |
|                                    | • Wound infection  | 1         |
|                                    | Surgeon involvement  |           |
|                                    | • Advanced trainee operating                               | 2         |
|                                    | Anaesthesia  |           |
|                                    | • Possible anaesthetic issues                              | 1         |
| Postoperative care                 | • Fluid management issues                                  | 2         |
|                                    | • Early discharge from ICU                                 | 1         |
|                                    | • Nasogastric tube / feeding issues                        | 2         |
| Medication                         | • Ceasing / restarting warfarin / anti-platelet medication | 3         |
|                                    | • Orthopaedic cement reaction                              | 1         |
|                                    | Patient factors  |           |
| • Patient refused transfusion      | 1  |           |
| Elective                           | Pre-operative  |           |
|                                    | • Earlier operation desirable                              | 1         |
| Operation                          |  |           |
| • Intra-operative fluid management | 1  |           |
| <b>Total</b>                       |  | <b>23</b> |

**Table 3.7** The areas of concern reported by assessors in emergency and elective cases

| Admission type   | Area of concern   | Frequency |
|--|---|-----------|
| Emergency  | Preoperative resuscitation inadequate                                   | 1         |
|  | Consultant supervision – Advanced trainee operating / high risk patient | 2         |
|  | Delay   |           |
|  | • Radiology delays  | 2         |
|  | • Diagnostic delays   |           |
|  | > ED staff  | 1         |
|  | > ICU staff   | 1         |
| > Junior surgical staff                                      | 1   |           |
| Advanced care directive misinterpreted, prolonging treatment | 1   |           |
| DVT prophylaxis inadequate                                   | 1   |           |
| Elective   | Patient not reviewed pre-operatively in high risk clinic                | 1         |
|  | Nasogastric tube dislodged early following total gastrectomy            | 1         |
|  | Postoperative vomiting – nasogastric tube not inserted                  | 1         |
| <b>Total</b>   |   | <b>13</b> |

**Table 3.8** The adverse events reported by assessors in emergency and elective cases

| Admission Type   | Adverse Event  | Frequency |
|--|--|-----------|
| Emergency  | PEG tube change causing gastric leak                     | 1         |
|  | ERCP (Medical unit) causing bile duct perforation        | 1         |
|  | Medical unit inpatient sustained burns on ward           | 1         |
|  | Large bowel obstruction delayed diagnosis in ED          | 1         |
|  | Missed injury in patient with multiple stab wounds       | 1         |
|  | Diabetes insipidus management in ICU                     | 1         |
|  | Duodenal ulcer – recurrent perforation after repair      | 2         |
|  | Small bowel resection – anastomotic leak                 | 1         |
|  | Abdominal wound dehiscence                               | 1         |
|  | Postoperative haemorrhage                                |           |
|  | • Groin haematoma  | 1         |
|  | • Intra-abdominal haematoma (no surgery required)        | 1         |
|  | • Post-operative haemorrhage with emergency re-operation | 1         |
| Elective   | Intra-operative liver injury causing haemorrhage         | 1         |
|  | Sepsis following liposuction                             | 1         |
|  | Anastomotic leakage                                      |           |
|  | • Right hemicolectomy                                    | 4         |
|  | • Pancreatic resection                                   | 1         |
|  | Aspiration pneumonia                                     | 1         |
|  | Haemorrhage  |           |
| • Post-operative haemorrhage requiring return to theatre | 2  |           |
| <b>Total</b>   |  | <b>23</b> |

### 3.7 Admission type

The admission status and how it related to clinical incidents is described in Table 3.9. Of the **346** cases with admission status available, **88%** were emergency admissions, of which **14%** (44/304) were associated with a clinical incident. Elective admissions made up **10%** (35/346) of all cases, of which **43%** (15/35) were associated with a clinical incident.

**Table 3.9** Clinical incident and admission status

| Clinical Incidents            |         |        |       |         |        |
|-------------------------------|---------|--------|-------|---------|--------|
| Admission Type                | Yes (n) | No (n) | Total | Yes (%) | No (%) |
| Emergency                     | 44      | 260    | 304   | 14      | 86     |
| Elective                      | 15      | 20     | 35    | 43      | 57     |
| Missing admission status data |         |        | 7     |         |        |
| <b>Total = 346</b>            |         |        |       |         |        |

### 3.8 Operative and non-operative data

From the data available from the **362** cases which completed assessment, **61%** (221/362) of cases underwent a surgical procedure and **39%** (141/362) did not.

The number of operative and non-operative cases by specialty is provided in Table 3.10. The General Surgical specialty accounted for **54%** (197/362) of all cases and **54%** (120/221) of all operative deaths.

**Table 3.10** Number of operative and non-operative cases by specialty

| Speciality     | Operation  |            |            |            | Total      |
|----------------|------------|------------|------------|------------|------------|
|                | Yes        | (%)        | No         | (%)        |            |
| General        | 120        | 61%        | 77         | 39%        | 197        |
| Neurosurgery   | 31         | 52%        | 29         | 48%        | 60         |
| Orthopaedics   | 27         | 71%        | 11         | 29%        | 38         |
| Vascular       | 22         | 54%        | 19         | 46%        | 41         |
| Cardiothoracic | 8          | 89%        | 1          | 11%        | 9          |
| Urology        | 6          | 86%        | 1          | 14%        | 7          |
| Plastic        | 3          | 50%        | 3          | 50%        | 6          |
| ENT            | 3          | 100%       | 0          | 0%         | 3          |
| Ophthalmology  | 1          | 100%       | 0          | 0%         | 1          |
| <b>Total</b>   | <b>221</b> | <b>61%</b> | <b>141</b> | <b>39%</b> | <b>362</b> |

Table 3.11 provides data on the reasons given by surgeons for no operation being performed. In some cases surgeons recorded more than one response. It is important to note that in almost **50%** of cases an active decision was made not to operate, or to limit treatment. These decisions are reached after discussion with the patient and/or their relatives. It is increasingly common for families to request limitation of treatment when the prognosis is poor, or if the patient has had a poor quality of life leading up to their admission.

**Table 3.11** Reasons for non-operation

| Reasons                                      | N          | %          |
|--|------------|------------|
| Not a surgical problem                       | 49         | 34         |
| Active decision not to operate               | 48         | 34         |
| Patient refused operation                    | 9          | 6          |
| Rapid death (related to the disease process) | 8          | 6          |
| Active decision to limit treatment           | 29         | 20         |
| <b>Total</b>                                 | <b>143</b> | <b>100</b> |

### 3.9 Grade of surgeon operating

Data from the current reporting period, provided in Figure 3.4, reveals that consultant surgeons were the primary surgeon in **51%** (108/210) of first procedures. The proportion of consultant surgeons operating where a subsequent procedure was necessary increased to **56%** (35/62) for the second procedure and **60%** (9/15) for the third procedure.

**Figure 3.4** Grade of surgeon operating



AST – Advanced Surgical Trainee

This increasing involvement of consultants in re-operations is pleasing to see. In the previous SAAPM report, the consultant involvement rates in first, second and third procedures was **43%**, **50%** and **58%** respectively. The steady improvement in this area suggests that the audit process is changing practice patterns.

SAAPM will continue to monitor this aspect of care. Good clinical governance would suggest that procedures in high risk patients should mandate a high level of consultant involvement at all stages.

### 3.10 DVT prophylaxis

Of the **362** cases that have been assessed, surgeons reported they had used a form of DVT prophylaxis in **237** (65%) of cases. This figure indicates a significant increase compared to the previous annual reports where the rate was **59%** (2006) and **57%** (2007). The reason for this steady increase is likely to be multifactorial, but SAAPM has clearly played a role in raising the profile of DVT management amongst surgeons.

Table 3.12 provides data on the specific type of DVT prophylaxis used.

**Table 3.12** Types of DVT prophylaxis used

|                        |     |
|------------------------|-----|
| Heparin/ LMWH          | 182 |
| Mechanical compression | 44  |
| Warfarin               | 7   |
| Anti-embolic stockings | 90  |
| Aspirin                | 13  |
| Other                  | 8   |

Note: Some surgeons indicated the use of two forms of prophylaxis i.e. mechanical and medication

In **35%** (128/362) of cases, surgeons reported they did not use DVT prophylaxis. As noted in previous reports, not all patients are suitable for anticoagulant prophylaxis,



depending on their clinical presentation. In some cases mechanical compression (TED stockings) may assist when chemical measures are not indicated.

Of the cases where the surgeon reported a reason for no DVT prophylaxis, 12% (15/128) of patients were being treated conservatively, 12% (15/128) were coagulopathic, and 11% (14/128) presented with a haemorrhage or had a rapid death on arrival at hospital. Table 3.13 provides data on the reasons given by surgeons for not using DVT prophylaxis.

The use of DVT prophylaxis was considered inappropriate by assessors in less than 1% (2/234) of cases. In 18 cases the question relating to DVT prophylaxis was not completed.

**Table 3.13 Reasons cited by surgeons for non use of DVT prophylaxis**

| Reason  | Number of cases |
|---|-----------------|
| Conservative/palliative treatment             | 15              |
| Elevated INR/liver comorbidity, coagulopathic | 15              |
| Presented with haemorrhage                    | 8               |
| Rapid death                                   | 6               |
| Mobilising                                    | 4               |
| Aggravate current condition                   | 4               |
| Already on heparin/aspirin                    | 1               |
| <b>Total</b>                                  | <b>53*</b>      |

\* Not all surgeons reported reasons for not using DVT prophylaxis

### 3.11 Fluid balance

Management of intravenous fluids in severely ill patients can be challenging and is an area of interest for SAAPM.

In the current reporting period there were 23 cases in which the treating surgeon felt that fluid management was an issue. First-line assessors were in agreement in 16 of these cases and a further 2 cases were highlighted by second-line assessors, giving a total of 25 cases. This represents 7% of the total cases assessed.

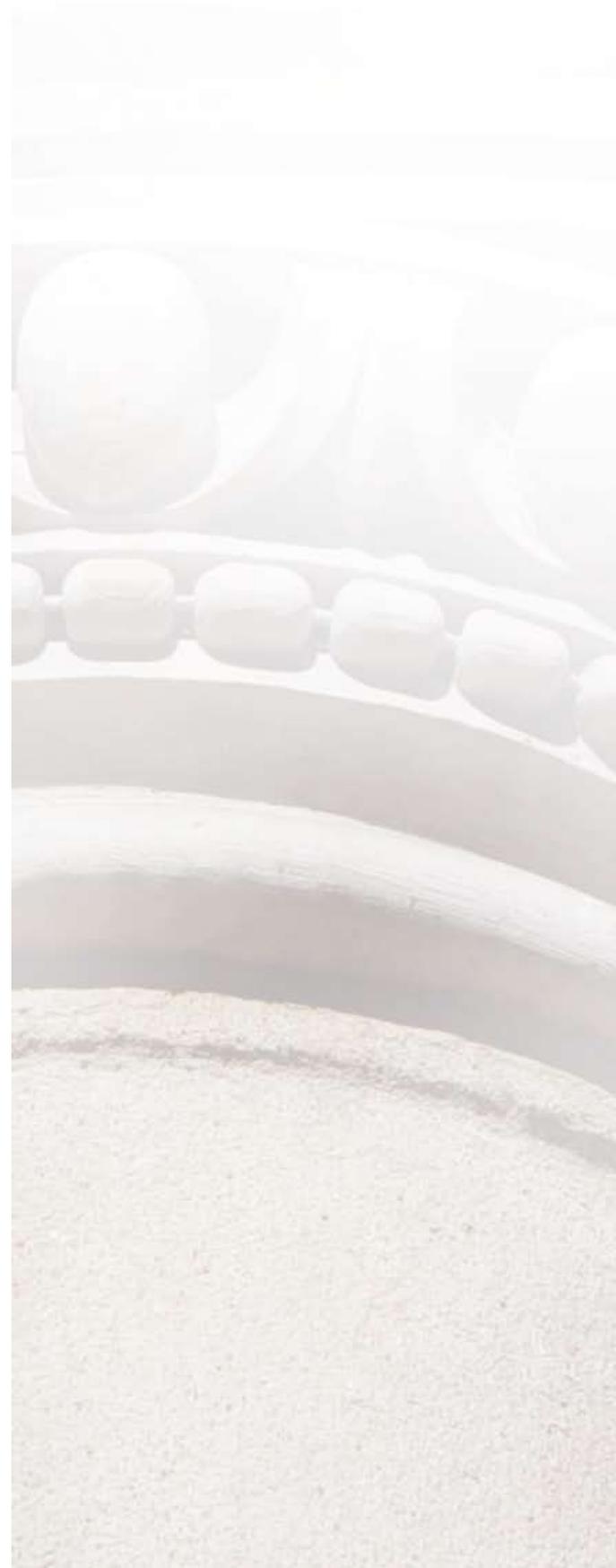
### 3.12 Post-mortem

The rate of post-mortem examination remains low, although the rate of **15%** for the current reporting period is an increase on the **12%** reported previously for 2006/07. The reasons for this low rate have been discussed in previous annual reports.

The majority of these examinations are carried out by the Coroner's office. There continues to be a delay in obtaining feedback to the treating clinicians, and this will be an area of continuing discussion with SA Health and the Coroner.

**Table 3.14 Post-mortem examinations**

| Post-mortem performed | Yes      |         | No  | Refused | Unknown |
|-----------------------|----------|---------|-----|---------|---------|
|                       | Hospital | Coroner |     |         |         |
|                       | 5        | 50      | 199 | 6       | 102     |



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