

Victorian Audit of Surgical Mortality



VASM

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ANNUAL REPORT

2012

July 2011 - June 2012

SUMMARY



Clinical Director's report

The death of a patient can be a learning experience.

This is the fifth annual report since data collection for the Victorian Audit of Surgical Mortality (VASM) commenced in 2007. Four case note review booklets have been disseminated which, together with the annual reports, have proven to be a popular tool with the surgical readership. In this report we present the outcomes of the review of 2,862 deaths.

It confirms the importance of addressing prominent failings in clinical management. This is consistent with our goal of education. We and other states have persistently identified delay in implementation of definitive care as an ongoing major issue. There is an increasing rate of participation in VASM by surgeons and it is encouraging to note a decreasing incidence of clinical management issues as progressive reports are published. This validates the value of the audit in overall patient care.

We have 100 percent public hospital participation and in the latter half of 2011 we commenced recruitment of the private hospital sector into the audit. We thank the 85 percent of private hospitals that have already come on board, and we have conducted a seminar to address the benefits of participation in VASM to hospitals and other stakeholders. Exciting developments in the audit include the inclusion of our Gynaecological colleagues into ANZASM and the slow but steady increase of private hospital participation, with a goal of 100 percent participation in the future. The anticipated increased uptake of the web-based electronic Fellow's Interface will facilitate and accelerate the VASM process.

There continues to be a decline in identified clinical issues, a finding which reinforces the benefit VASM confers to both surgeons and patients. When you read this report, I am sure that you will be amazed at the depth of valuable data that is obtained from the process which, although appearing fairly simple, amasses vast amounts of analysable information.

The success of VASM is dependent upon a highly efficient, motivated and hard-working team. Their attention to detail and adherence to protocol is the solid foundation on which the audit is built. With their help, and the support we receive from many others, I remain confident about the future of VASM, which has been so expertly nurtured from its embryonic state to the well-oiled machine it now is. This is due to the committed leadership of my predecessor, Associate Professor Colin Russell and the project manager, Claudia Retegan and her team. The support of the Victorian State Government, the Victorian Department of Health and the Victorian Surgical Consultative Council (VSCC) have enabled and facilitated VASM's inception and progress. The Royal Australasian College of Surgeons provides valuable support.

Mr Barry Beiles MB.BCh, FRACS(Vasc)

Clinical Director, VASM



Summary

The Victorian Audit of Surgical Mortality (VASM) commenced auditing surgical mortality in Victorian public hospitals in January 2008. This report represents data collected to the end of June 2012. The many rate-limiting steps in the audit process mean we have only completed the audit process in half of these cases.

Audit participation

There has been increasing participation in the Victorian Audit of Surgical Mortality (VASM) by Victorian Fellows. Intention to participate has risen from 60 percent in 2008 to 88 percent in 2012 (see Figure 1). This increase in intention to participate is supported by evidence of actual participation. The return of case record forms, a pivotal step in the audit process, varies between 85 percent and 90 percent. This appears to have reached a steady level and is similar to other regions. Compliance in completing all necessary data fields (data quality) has improved but is still less than satisfactory. The treating consultant, rather than a junior member of the team, has provided the information as outlined in section two of the report. This indicates an ongoing high level of personal involvement by participating surgeons.

All public hospitals with relevant surgical activity continue to participate and provide notifications of death associated with surgery. Funding has been increased to recruit the private sector to the audit. This is an important step to ensure that all surgical mortality undergoes peer review. Private hospital participation has reached 85 percent and continues to improve.

The majority of hospital deaths do occur in the public sector. This is not a reflection on the level of care provided in the public sector, but is a result of the less complex casemix generally receiving care in the private hospital sector.

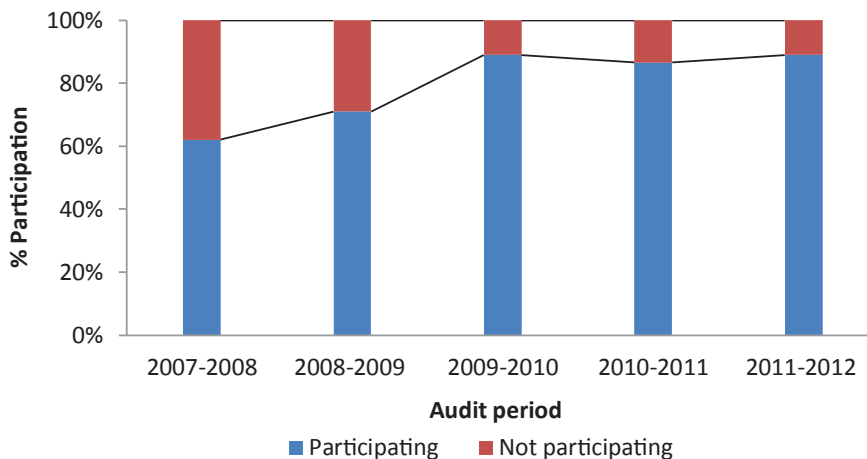
It is beneficial to put these deaths in some perspective by reviewing the number of surgical procedures performed in Victoria over this period. We interrogated the Victorian Admitted Episode Dataset (VAED) to establish that during the audit period a total of 2,400,542 patients underwent surgical procedures in Victoria.

VAED indicates that in a single year (1 July 2011 to 30 June 2012) 626,628 patients underwent surgical procedures in both the public and private sector. The number of deaths attributed to surgery as recorded by VAED was (1,995) is therefore a very small percentage (0.3) of the number of patients who actually underwent surgery over the same period and of these 1,367 were reported to VASM (0.2%). When the number of deaths reported to VASM in 2011-2012 is compared with the Victorian Admitted Episode Dataset (VAED) figures, VASM is capturing an increasing percentage of recorded state deaths (currently 69%).

Overall, 2,862 (51%) of the 5,585 deaths had completed the audit process by the census on 30 June 2012. The clinical information from these 2,862 cases forms the basis of this report. The remaining cases were not included in the audit for the following reasons: excluded due to admission for terminal care; inappropriately attributed to surgical care; treated by non-participating surgeons; or had not completed the audit process by the census date. This latter group should of course be available by the next census date.



Figure 1: Surgeon agreement to participate as percentage of eligible College Fellows in Victoria

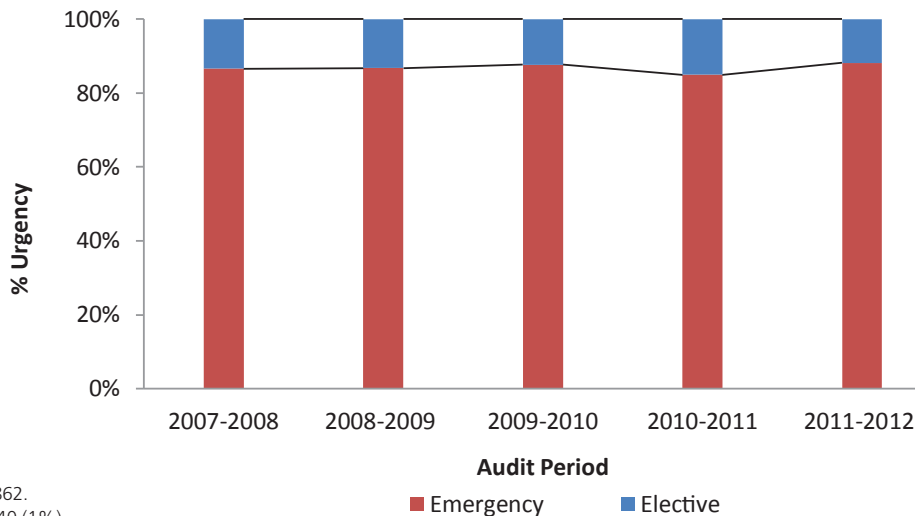


Note: Total n = 1,082.

Demographic and risk profile

Review of the demographic and risk profiles of all cases that had completed the audit process (2,862) confirms the trends described in previous reports. The majority of surgical deaths have occurred in elderly patients with underlying health problems, who have been admitted as an emergency (see Figure 2) with an acute life-threatening condition that often requires surgery. The actual cause of death was often linked to their pre-existing health status, in that the cause of death frequently mirrored the pre-existing illness. Death was most often adjudged to be not preventable, and to be a direct result of the disease processes involved rather than of the treatment provided. The most common causes of death reported are cardiac and respiratory failure. This is congruent with the most common comorbidities in this series of patients.

Figure 2: Urgency status of deceased over sequential audit periods



Note: Total n = 2,862.
Missing data: n = 40 (1%).



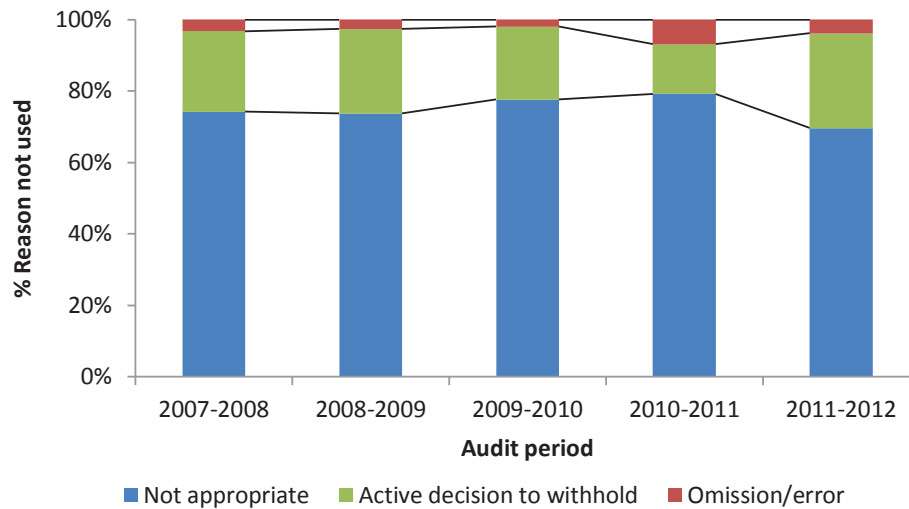
Risk management

Risk management strategies for this generally elderly, frail group of patients are especially important. The audit looks at three parameters: venous thromboembolism (VTE) prophylaxis to reduce the likelihood of pulmonary embolus, use of critical care facilities and fluid balance management.

- **VTE prophylaxis:** prophylaxis was provided in over two-thirds of audited deaths. A conscious decision to withhold prophylaxis was the reason given for non-provision for most of the remaining cases (see Figure 3). This was generally necessitated by some clinical contraindication to prophylaxis. Inadvertent omission of prophylaxis was rare, only occurring in two percent of audited cases.

When the appropriateness of withholding prophylaxis was reviewed, there was generally agreement by assessors that the decision was correct. However, in eight percent of cases where it was withheld, assessors felt the decision was questionable, although the decision did not affect the final outcome.

Figure 3: Reasons given by treating surgeon for not providing VTE prophylaxis



Note: Number of patients not receiving prophylaxis was 503 in a total of 2,273 operative cases (22%).
Missing data: n = 44 (2%).
VTE: venous thromboembolism.

- **Use of critical care facilities:** more than half of the patients in this audited series received critical care support during the course of their hospital stay. This is significantly higher than previous years. In only a small percentage of cases not receiving critical care (6%) did assessors feel that this may have been inappropriate.
- **Fluid balance during treatment:** there was a perception that this may have been an issue of management in only five percent of cases reviewed.



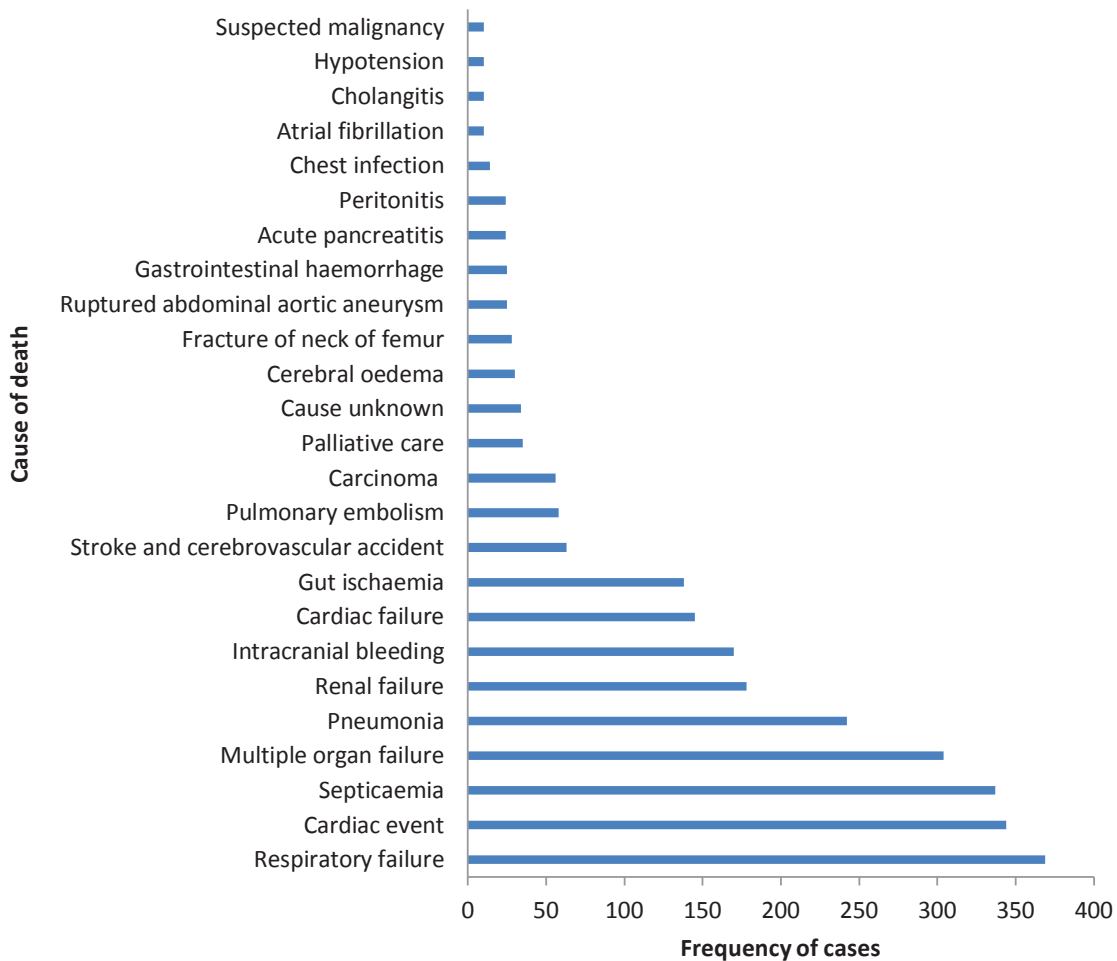
Cause of death

The treating surgeon records the probable cause of death as evidenced by the clinical features leading up to death.

A total of 2,683 conditions were perceived to be responsible for death in 2,273 cases.

The most frequently cited causes of death were respiratory failure (369, 14%), cardiac factors including heart failure, cerebrovascular incident, ischaemic heart disease, cardiorespiratory failure and cardiac event (344, 13%), septicaemia (337, 13%) and multiorgan failure (304, 11%) (see Figure 4). Death was attributed to these conditions in over half (1,354) of the 2,273 cases.

Figure 4: Frequency of reported causes of death



Note: Total n = 2,683 causes of death reported for n = 2,273 patients. Cause of death has been included in this graph if the total count was ≥10.



Operative profile

Twenty percent of the 2,862 patients had no operative intervention. This was most commonly an active decision not to proceed and usually occurred in patients admitted as an emergency for an irretrievable clinical problem. A total of 3,198 separate episodes of surgery occurred in 2,862 patients. In these surgical episodes, 2,273 operative procedures were recorded. The most frequent operative procedures described were for trauma or acute abdominal pathology. This reflects the high percentage of patients admitted as emergencies (82%) in this series. A consultant performed the surgery in 66 percent of instances and made the decision to proceed to surgery in 84 percent (see Figure 5).

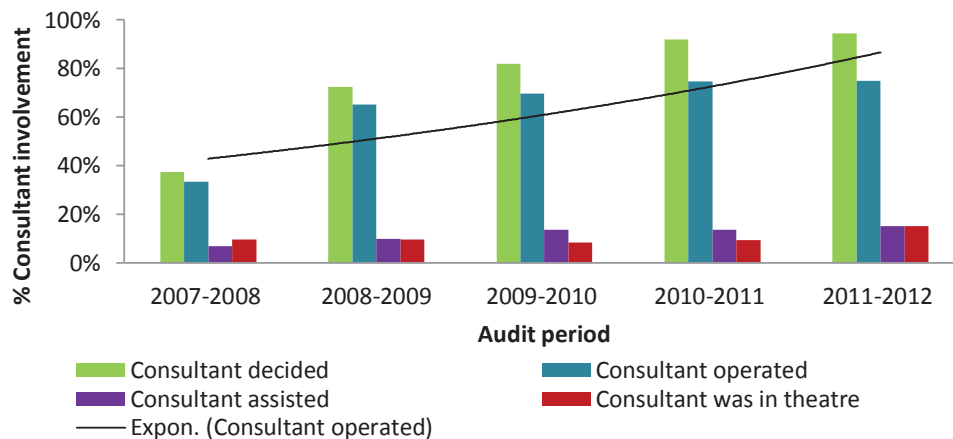
There was an unplanned return to the operating room (OR) in 348 (15%) of the 2,273 patients who underwent a surgical procedure.

Unplanned return to the OR is often, but not always, necessitated by a complication of the initial procedure and is associated with increased risk of death. Consultant involvement in such cases is highly desirable. Direct consultant involvement in such cases has risen from around 30 percent in 2007-08 to 75 percent in 2011-12. This recognition of the need for direct consultant involvement is to be commended.

The demand for time in the OR to manage emergency cases remains a significant problem for hospitals. The issue is well recognised in this and other countries.

There continues to be a low rate of postoperative complications as reported by treating surgeons.

Figure 5: Seniority of surgeons performing unplanned procedures



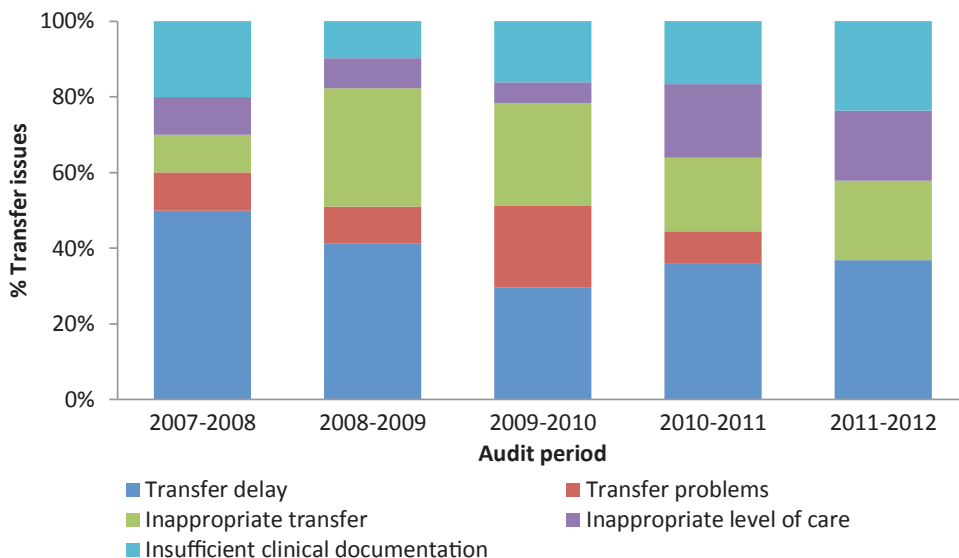
Note: Total n = 912.
 Missing data: n = 1 (0.1%).
 The consultant operated exponential trend line is curved which highlights considerable rise in consultant involvement.

Inter-hospital transfers

Twenty-three percent of cases in the audited series required inter-hospital transfer. Such transfers were usually necessitated by the need for higher levels of care. Issues of patient care related to transfer were raised in a third of these cases (see Figure 6). The most common criticism was that transfer occurred at an inappropriately late point in the course of the patient's illness.



Figure 6: Care of patient during transfer to another hospital



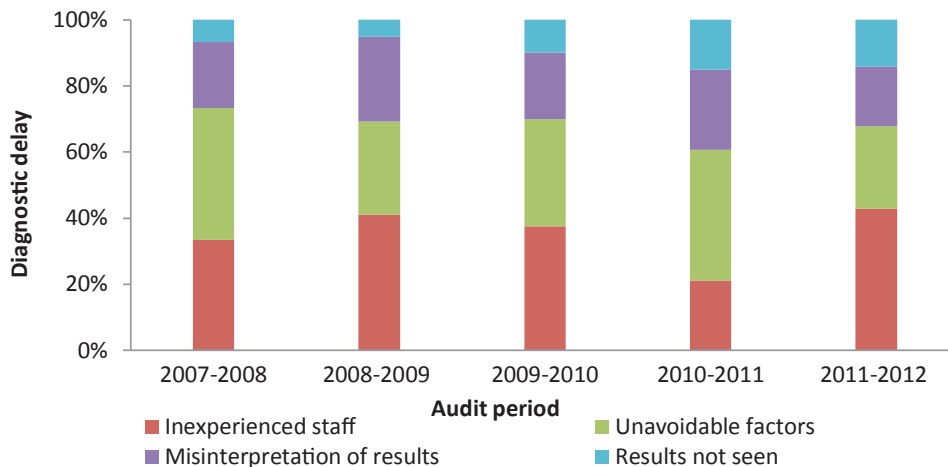
Note: Total n = 533 in 2,273 audited cases.
Missing data: n = 25 (5%).

Delay in diagnosis

The treating surgeons identified delays in establishing the diagnosis in 178 (6%) of the 2,862 audited cases. This rate has remained relatively constant over time.

When cases were submitted to first or second-line peer-review process, the incidence of delay in establishing a diagnosis was assessed as to 28 percent. Delay in establishing a diagnosis is one facet of the concerning rate of delay in implementing definitive treatment shown later. It is important to note that such delays are not always attributable to the surgical team. The reasons given for delay in diagnosis are provided in Figure 7.

Figure 7: Perceived delays in establishing a diagnosis



Note: Total n = 178 issues identified in 2,862 audited cases.



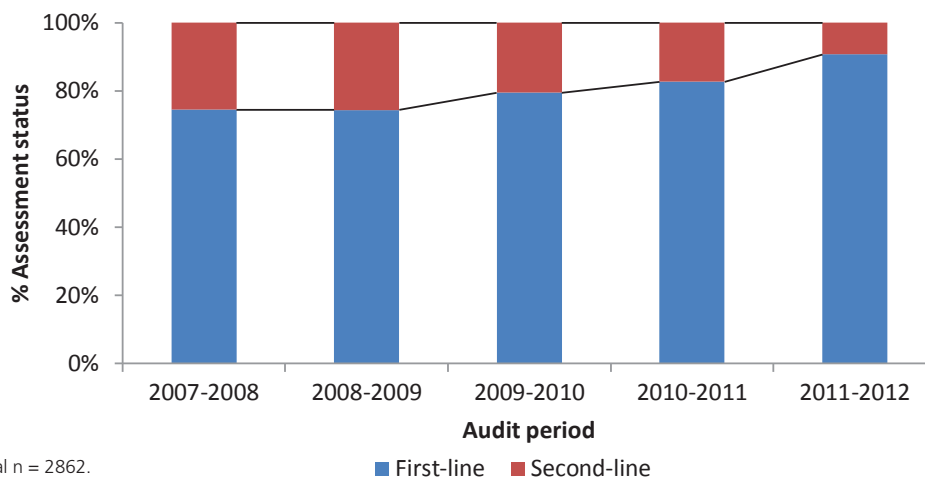
Peer review outcomes

First and second-line assessors review and appraise the appropriateness of the clinical care provided to each case reported to VASM. All cases undergo first line assessment (FLA) however certain cases will be referred for a second opinion as outlined in Figure 8.

- Second-line assessments (SLA):** the frequency of need for SLA could be seen as an indirect measure of quality of care. SLAs are requested for cases in which the clinical care needs to be looked at more closely or the treating surgeon did not provide sufficient information to reach a conclusion. Importantly, the rate of second line referral has decreased from 25 percent in 2007 to nine percent in 2012 (see Figure 8) and this rate is similar to other states.

It is disappointing that SLA was most commonly required because the clinical information provided by the treating surgeon was inadequate, occurring in 372 (67%) of the 555 instances. The need for SLA was similar among surgical specialties, and between metropolitan and rural hospitals.

Figure 8: Referral for second-line assessment



Note: Total n = 2862.
Missing data: n = 1 (<1%).

- Clinical management issues:** assessors use a standard spectrum of criticism to convey their perceptions of appropriateness of care. These are described in detail in section 3.2 of the full report.

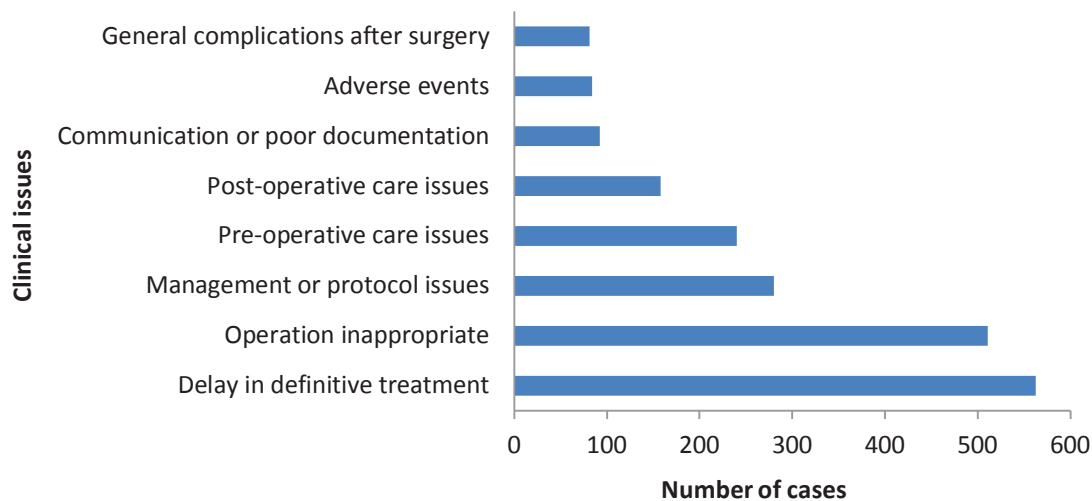
In 85 percent of audited deaths no, or only minor, issues of patient care were perceived. However, in 15 percent of cases more major issues of care were identified (areas of concern and adverse events). Over the audit period (2008-2012) there has been a significant decrease in the frequency with which assessors are identifying clinical management issues. The incidence of more major criticisms of clinical care is similar among the surgical specialties.

There is no clear evidence that specific hospitals or surgical specialties have attracted higher rates of criticism than others. It is important to remember that criticism of clinical care is not always attributable to the surgical team. A third of the issues identified were attributed to other specialty areas.



- **Perceived impact of identified issues on clinical outcome:** there was a perception that the clinical management might have been better in 27 percent of the 2,862 audited deaths. In only 146 patients (5% of audited series) the clinical management was deemed likely to have contributed to the adverse outcome. The perceived relationship of clinical management to outcome was less clear in the remaining cases.
- **Frequency of specific issues of clinical management:** the most common clinical issue among the 2,009 specific issues identified was delay in delivery of definitive treatment. (See Figure 9). This occurred at multiple levels in the care pathway. The underlying problem was usually delay in establishing the true diagnosis leading to late referral and delay in implementing definitive treatment. A similar pattern has been reported in the recent national report.

Figure 9: Frequency of specific clinical issues of management



Note: Total n = 2,009.

Data quality

Data quality is an essential component of this and other audits. We have looked at the frequency of missing data in this audit. There has been a slight improvement in some sections of the data collection forms. The volume of missing data is most prevalent in a few sections. We have recently reformatted two of these sections to make the audit forms more user-friendly.

We take this opportunity to emphasise the importance of accuracy and completeness of all clinical information provided to VASM.



Recommendations

Many of the recommendations made in previous years have been implemented. Collaboration between the Victorian Department of Health, Victorian Surgical Consultative Council (VSCC), Coroner's Office, hospitals and health services continues to facilitate our progress.

Objectives for the coming year are:

- Continue to improve the return rate of CRFs and increase surgeon participation.
- Continue to collaborate with VSCC and other agencies such as the Coroner's Office.
- Continue to disseminate important messages emanating from the audit.
- Enhance further the electronic interface to encourage Fellows to complete assessments online.
- Enhance analysis techniques.
- Facilitate communication and information sharing with other state mortality audits.
- Contribute to the national mortality audit report.
- Implement recommendations that resulted from the external evaluation of the audit program.
- Continue to coordinate and collaborate in educational seminars.

Conclusions

The audit process is designed to highlight system, process errors and identify trends in mortality associated with surgical care. A significant and positive trend in direct consultant involvement in patients with postoperative complications requiring unplanned return to the theatre has been demonstrated. This is reversal of a trend identified in earlier reports. There have been no adverse trends identified.



Acknowledgments

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- Participating Victorian hospitals
- Participating Victorian Fellows and IMGs
- Assessors, in particular the dedicated and specialty-specific first-line and second-line assessors
- Surgeons who have acted as assessors, for the time and effort providing detailed and valuable case note reviews
- Hospital Medical Records Departments
- Victorian Surgical Consultative Council
- Western Australian Audit of Surgical Mortality
- The Australian Central Territory Audit of Surgical Mortality
- The Northern Territory Audit of Surgical Mortality
- Tasmanian Audit of Surgical Mortality
- The National Coroners Information System
- South Australian Audit of Perioperative Mortality
- Queensland Audit of Surgical Mortality
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VASM Management Committee

Barry Beiles	Clinical Director, Victorian Audit of Surgical Mortality (VASM)
Peter Field, Chair	Victorian Surgical Consultative Council (VSCC)
Kate Gibson	Acting Manager, Clinical Councils Unit, Department of Health
Andrea Kattula	The Australian and New Zealand College of Anaesthetists (ANZCA)
Robert Stunden	Chair, Victorian Regional Committee
Rhondir Jithoo	Member, Victorian State Committee
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Keith Stokes	Australasian Association of Pediatric Surgery
Lee Gruner	President, The Royal Australasian College of Medical Administrators (RACMA)
Christos Kondogiannis	Australian Orthopaedic Association
Jocelyn Shand	Dental Practice Board
Patrick Lo	Neurosurgical Society of Australasia
Douglas Druitt	Urological Society of Australia and New Zealand
Gary Fell	Member Board in Vascular Surgery
Eldon Mah	The Australian Society of Plastic Surgeons
Ivan Kayne	Consumer Representative
Claudia Retegan	Project Manager, Victorian Audit of Surgical Mortality (VASM)
Wendy Babidge	Director, Research, Audit & Academic Surgery Division (RAAS)
Gordon Guy	ANZASM Manager, Research, Audit & Academic Surgery Division
Graeme Dennerstein	The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG)

VASM staff

Barry Beiles	Clinical Director
Claudia Retegan	Project Manager
Jessele Vinluan	Senior Project Officer
Karen Crowley	Project Officer
Mary Jane Sterry	Project Officer
Andrew Chen	Research Assistant
Sally-Anne Young	Administrative Assistant
Dylan Hansen	RMIT Placement Student

VASM biostatistical consultants

Nick Andrianopoulos	Senior Research Fellow, Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive Medicine, Monash University
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VASM spatial consultants

Graeme Martin	Spatial Software Consulting Services Manager, Spatial Vision
Ishara Kotiah	Spatial Software Development Manager, Spatial Vision



Contact details:

Victorian Audit of Surgical Mortality (VASM)
Royal Australasian College Of Surgeons
College of Surgeons' Gardens
250-290 Spring Street
East Melbourne VIC 3002
Australia

Web: www.surgeons.org/vasm
Email: vasm@surgeons.org
Telephone: +61 3 9249 1153
Facsimile: +61 3 9249 1130

Postal address:

Victorian Audit of Surgical Mortality (VASM)
GPO Box 2821
Melbourne VIC 3001 Australia

Collaborators:



The Victorian
Surgical Consultative Council

