When cancer surgery goes wrong

About the VASM audit

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Victorian Audit of Surgical Mortality (VASM)
Albury Convention Centre
11 October 2019

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS
RACS

Presentation outline

- Overview of the VASM and ANZASM audit process,
- Results and benefits from the audit,
- Tools to monitor patient safety,
- Case studies,
- Potential impact,
- Recommendations and
- Future directions.

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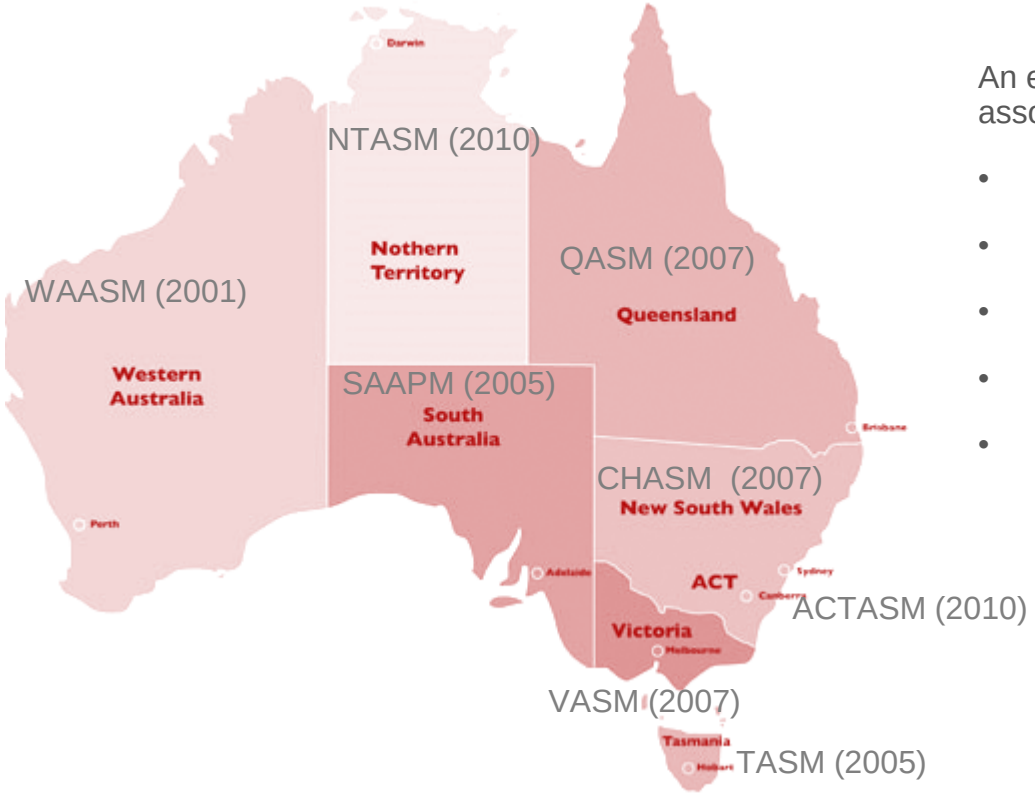
Origins



An external, peer-reviewed audit of the process of care associated with surgically related deaths.

- Modelled on the Scottish Audit of Surgical Mortality (1994).
- Protected by Qualified Privilege.
- National program management transferred to RACS (2005),
- All States and Territories under ANZASM (2010),
- CHASM administered by the Clinical Excellence Commission (CEC).

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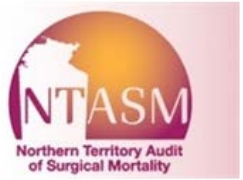
VASM Collaboration

192 Victorian surgical sites

2400 Victorian Fellows



National Safety and Quality Health Service Standards

National Safety and Quality Health Service Standards

Standard 1
Clinical Governance Standard

Standard 2
Partnering with Consumers Standard

Standard 3
Preventing and Controlling Healthcare-Associated Infection Standard

Standard 5
Comprehensive Care Standard

Standard 6
Communicating for Safety Standard

Standard 8
Recognising and Responding to Acute Deterioration Standard

VASM 2019 Key recommendations

Improved leadership in patient care

- Futile surgery and end of life care
- Infection control
- Improved perioperative management
- Improved awareness of surgical emergencies and sharing of care
- Improved communication
- In-house falls prevention
- Better documentation of care plans and clinical events
- Action on evidence of clinical deterioration

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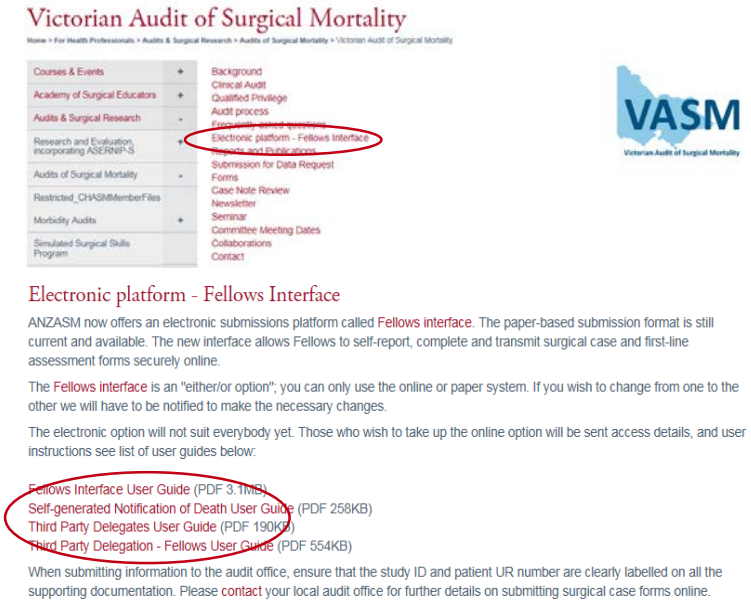
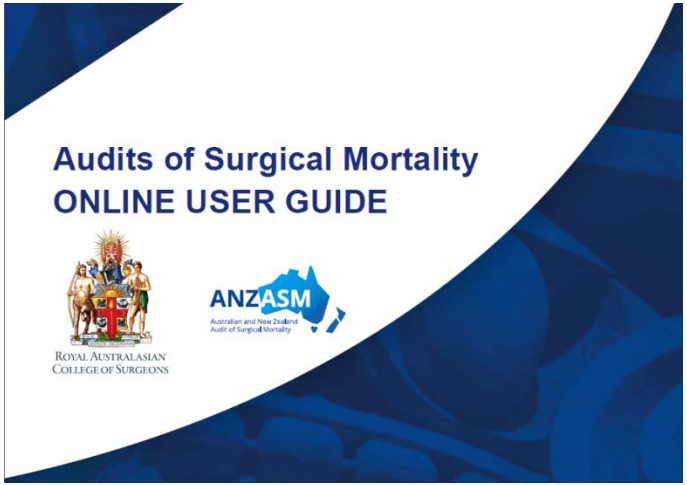
Fellows Interface – User Guide from the web

Type **www.surgeons.org/vasm**





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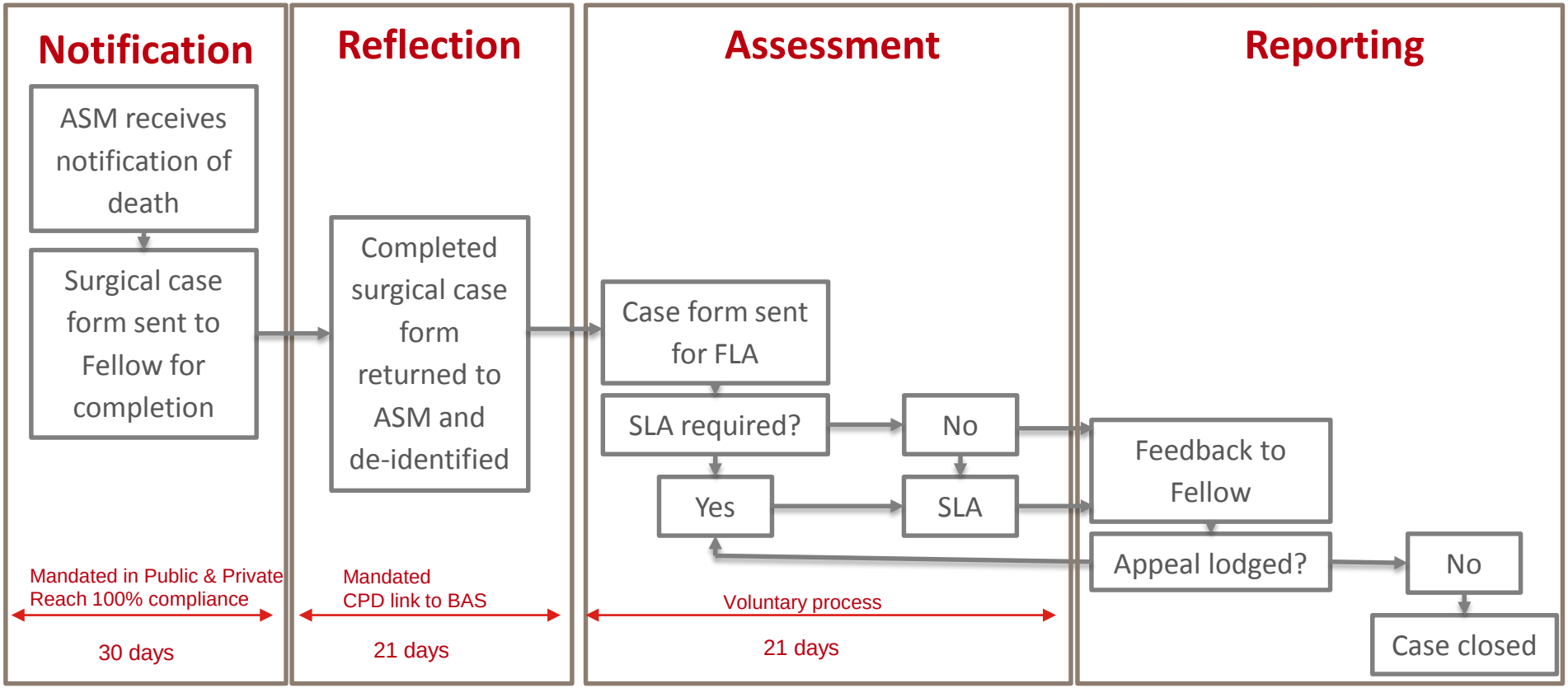
VASM Audit Flow



Management issues classification (ACONS)

- An area for CONSIDERATION is where the clinician believes areas of care COULD have been IMPROVED or DIFFERENT, but recognizes that it may be an area of debate.

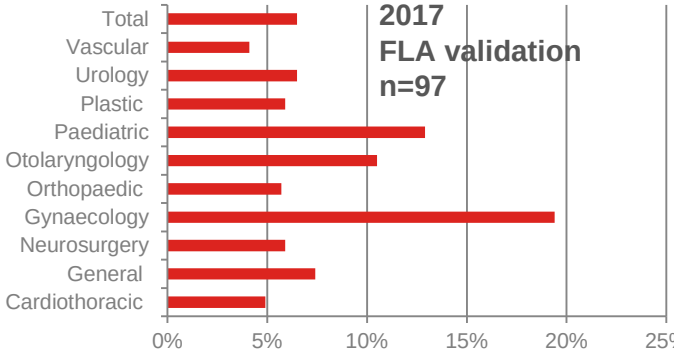
- An area of CONCERN is where the clinician believes that areas of care SHOULD have been better.

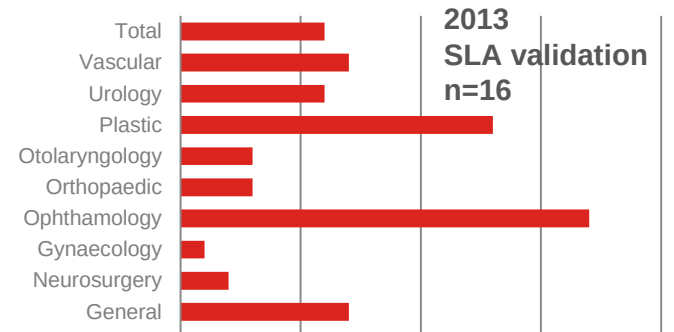
- An ADVERSE EVENT is an unintended injury caused by medical management rather than by disease process, which is sufficiently serious to lead to prolonged hospitalization or to temporary or permanent impairment or disability of the patient at the time of discharge, or which contributes to or causes death.

Concordance and validation

Concordant validity between treating surgeon and second-line assessor in 2012-2018

CONCORD AREA	N	CONCORD	GWET'S AC SCORE	95% CI	P VALUE
ICU care benefit if not received	173	87.28%	0.85	0.79 - 0.92	<0.001
HDU care benefit if not received	169	78.11%	0.71	0.61 - 0.81	<0.001
Fluid balance	1,002	83.93%	0.79	0.75 - 0.82	<0.001
Clinical management issues	1,219	55.70%	0.13	0.09 - 0.18	<0.001
Preoperative management/preparation	1,142	72.59%	0.58	0.54 - 0.63	<0.001
Decision to operate at all	1,151	78.45%	0.71	0.68 - 0.75	<0.001
Choice of operation	1,148	83.45%	0.80	0.77 - 0.83	<0.001
Timing of operation	1,146	82.81%	0.78	0.74 - 0.81	<0.001
Intraoperative/technical management	1,125	83.29%	0.79	0.75 - 0.82	<0.001
Grade/experience of surgeon deciding	1,130	96.55%	0.96	0.95 - 0.98	<0.001
Grade/experience of surgeon operating	1,132	96.02%	0.96	0.95 - 0.97	<0.001
Postoperative care	1,113	77.45%	0.68	0.64 - 0.72	<0.001





VASM Demographics and risk status

VICTORIAN SURGICAL STATISTICS FOR 2018

Hospital Participation

All Victorian public and private hospitals participate.

In 2018, the population of Victoria was approximately 6.4 million.

There were 703,530 hospital admissions involving surgical procedures; approximately 1,777 of which resulted in surgical deaths (0.25%).

Victorian population: 6.4 million
Surgical procedures: 703,530
Auditable mortalities: 1,777
Mortality rate: 0.25%
Elective surgeries: 18%
Emergency surgeries: 82%

Male: 56%
Female: 44%
Mean age: 73.4
Median age: 78.1

MOST COMMON COMORBID FACTORS LEADING TO SURGICAL COMPLICATIONS

Cardiovascular (e.g. heart problems, high blood pressure)

Advanced age (due to frailty delaying recovery)

Renal (e.g. diabetes, high blood pressure, kidney disease)

Respiratory (e.g. asthma, pulmonary disease, smoking)

Neurological (e.g. structural or biochemical abnormalities in the brain)

Australia has a good and safe healthcare system.

The Victorian Audit of Surgical Mortality (VASM) works to ensure that a high standard of surgical care is maintained in Victoria and that you, as a patient, receive the best care possible.

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS RACS

VASM Audit findings

Audit period	Total interventional procedures	VAED reported interventional mortalities	VASM reported surgical mortalities
2012-2013	630,713	1,882	1,558
2013-2014	663,762	1,924	1,613
2014-2015	672,957	1,966	1,700
2015-2016	679,676	2,009	1,720
2016-2017	693,970	2,018	1,764
2017-2018	703,530	2,041	1,777
Total	4,004,608	11,840	10,132

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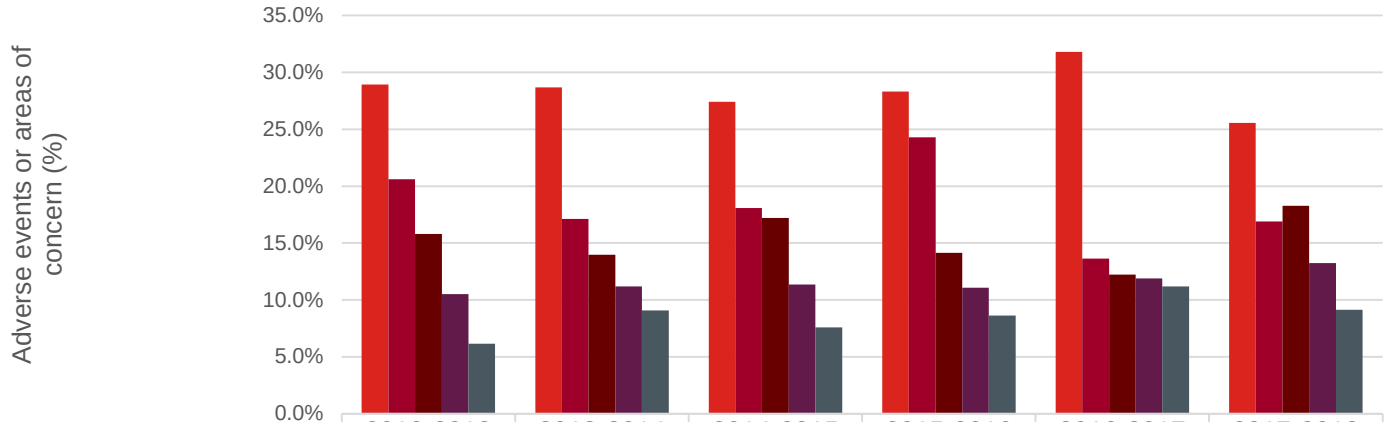
VASM Outcomes as assessed by assessors

Characteristics	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
No issues identified	71.0% (707/996)	67.6% (734/1,085)	69.6% (860/1,236)	69.6% (886/1,273)	71.8% (855/1,191)	73.7% (654/887)
Area of consideration	17.5% (174/996)	20.7% (225/1,085)	17.6% (218/1,236)	16.4% (209/1,273)	14.2% (169/1,191)	14.1% (125/887)
Area of concern	7.8% (78/996)	7.9% (86/1,085)	7.8% (97/1,236)	9.8% (125/1,273)	8.5% (101/1,191)	7.1% (63/887)
Area of adverse event	3.7% (37/996)	3.7% (40/1,085)	4.9% (61/1,236)	4.2% (53/1,273)	5.5% (66/1,191)	5.1% (45/887)
Preventable issues	13.6% (135/996)	14.8% (161/1,085)	12.9% (160/1,236)	13.6% (173/1,273)	12.9% (154/1,191)	11.3% (100/887)
Adverse event or concern that was preventable	8.2% (82/996)	7.9% (86/1,085)	7.4% (91/1,236)	9.4% (120/1,273)	8.8% (105/1,191)	7.1% (63/887)

Adverse Events	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Adverse event that was preventable and caused the outcome	1.8% (18/996)	2.4% (26/1,085)	2.0% (25/1,236)	2.4% (31/1,273)	2.9% (35/1,191)	1.9% (17/887)
Decision to operate at all	0.0% (0/996)	0.1% (1/1,085)	0.2% (2/1,236)	0.1% (1/1,273)	0.2% (2/1,191)	0.3% (3/887)
Pre-operative care	1.1% (11/996)	0.6% (6/1,085)	0.9% (11/1,236)	1.1% (14/1,273)	1.0% (12/1,191)	1.5% (13/887)
Operative care	1.0% (10/996)	1.0% (11/1,085)	1.0% (12/1,236)	1.1% (14/1,273)	1.7% (20/1,191)	1.0% (9/887)
Post-operative care	1.2% (12/996)	1.2% (13/1,085)	1.0% (12/1,236)	1.2% (15/1,273)	1.3% (16/1,191)	0.7% (6/887)

VASM Outcomes as assessed by assessors

Top clinical management issues all cases (CMI)



	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Operative management issues	28.9%	28.7%	27.4%	28.3%	31.8%	25.6%
Delay issues	20.6%	17.1%	18.1%	24.3%	13.6%	16.9%
Postoperative care issues	15.8%	14.0%	17.2%	14.2%	12.2%	18.3%
Preoperative care issues	10.5%	11.2%	11.4%	11.1%	11.9%	13.2%
Protocol issues	6.1%	9.1%	7.6%	8.6%	11.2%	9.1%

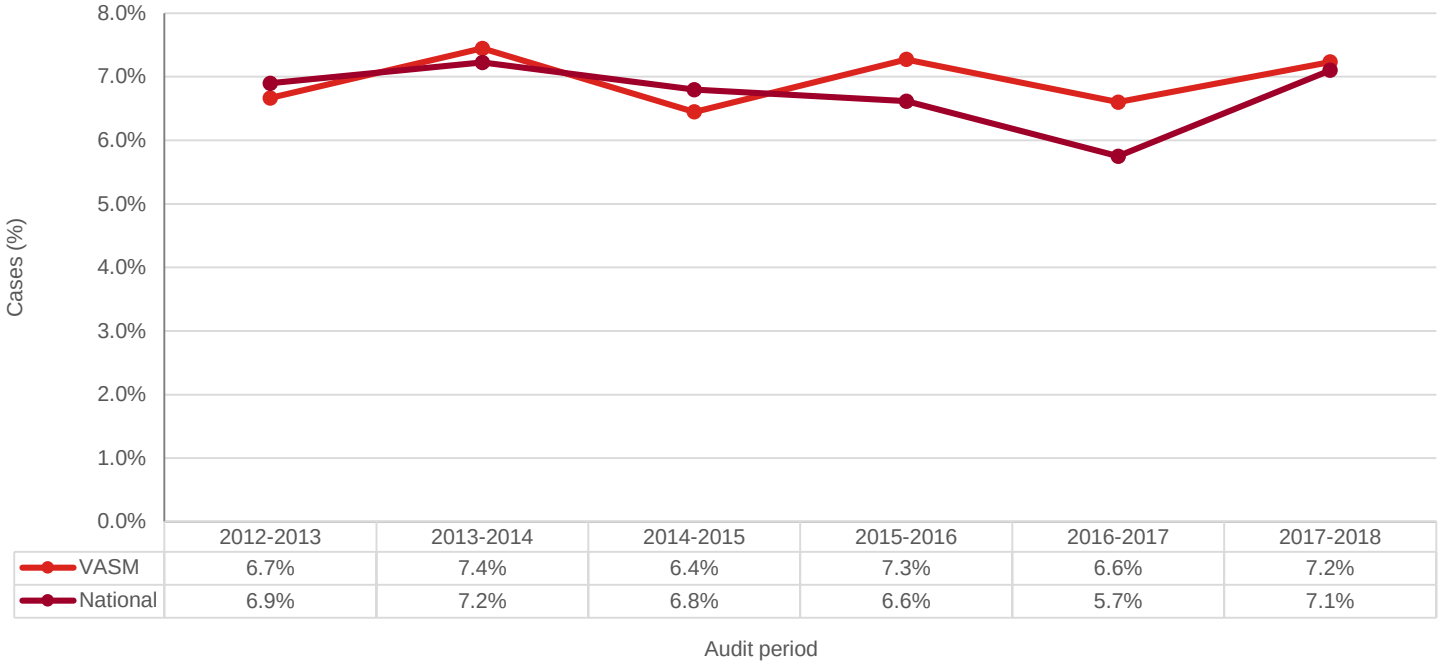
Audit period

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS RACS

Clinical management comparisons in 2012 to 2018

Variable	VASM	National	P value
Audited deaths with delay in surgical diagnosis	6.9% (463/6,680)	6.7% (1,346/20,053)	0.536
Audited deaths with delay in transfer	9.6% (134/1,403)	10.6% (504/4,767)	0.295
Audited deaths without use of intensive care (ICU) or high dependency unit (HDU)	**34.2% (2,293/6,700)**	**37.2% (7,484/20,120)**	**<0.001**
Inappropriate DVT prophylaxis treatment as viewed by the assessor	1.6% (103/6,540)	1.7% (337/19,328)	0.377
Proportion of elective admissions with elective surgery performed	86.9% (1,006/1,157)	87.2% (2,433/2,791)	0.876
Operation with the consultant surgeon present in theatre	**80.6% (6,992/8,672)**	**74.2% (16,875/22,756)**	**<0.001**
Audited operative deaths with postoperative complications	33.4% (2,041/6,105)	33.3% (5,334/16,022)	0.873
Audited operative deaths with unplanned return to theatre	15.3% (939/6,139)	16.0% (2,554/16,012)	0.240
Audited deaths with unplanned admission to intensive care (ICU)	18.6% (1,236/6,633)	18.2% (3,592/19,785)	0.388
Audited deaths with unplanned readmission	3.3% (221/6,614)	3% (591/19,729)	0.162
Audited deaths with fluid balance issues	8.3% (552/6,630)	8.3% (1,638/19,759)	0.938
Audited deaths with a clinically significant infection	32.9% (2,160/6,564)	34.2% (6,722/19,637)	0.050

Delay in surgical diagnosis



	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
VASM	6.7%	7.4%	6.4%	7.3%	6.6%	7.2%
National	6.9%	7.2%	6.8%	6.6%	5.7%	7.1%

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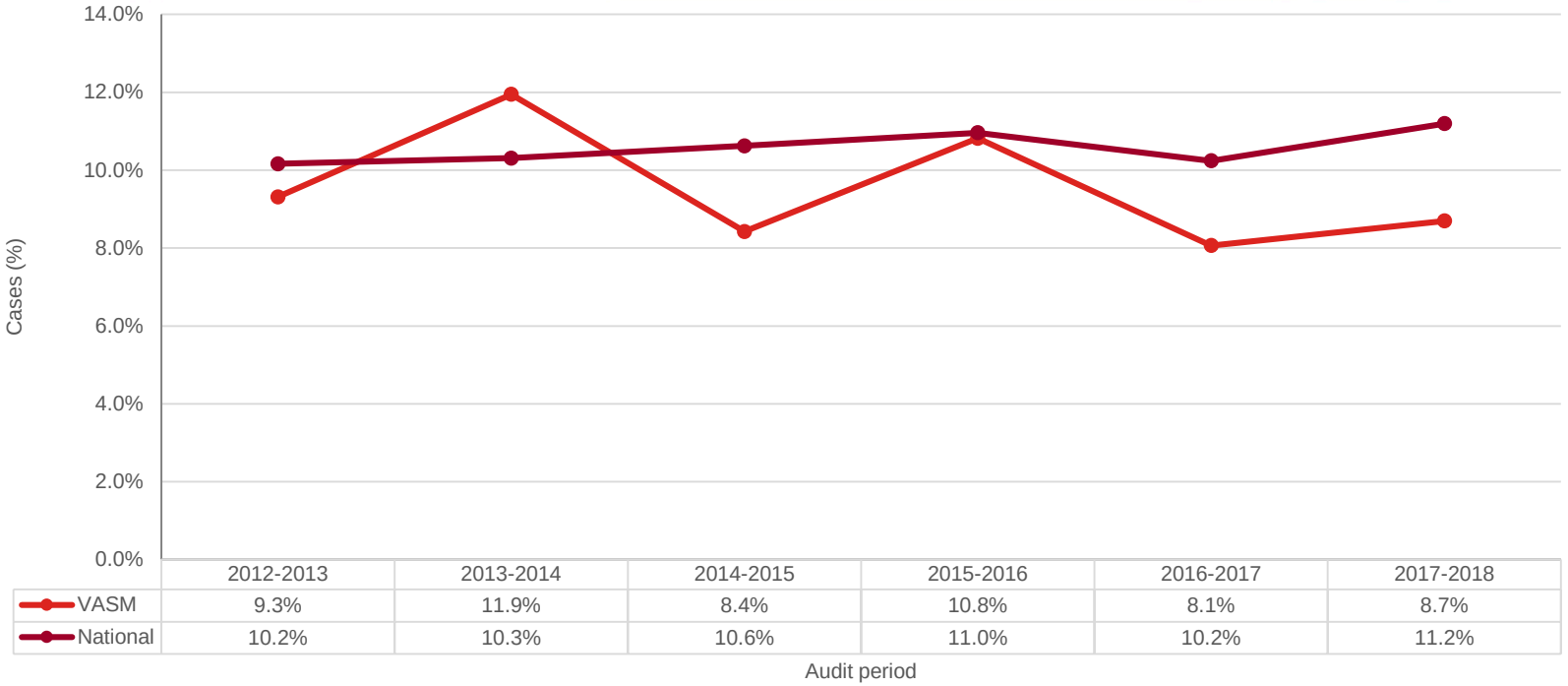
Delay in transfer to a hospital



	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
VASM	9.3%	11.9%	8.4%	10.8%	8.1%	8.7%
National	10.2%	10.3%	10.6%	11.0%	10.2%	11.2%

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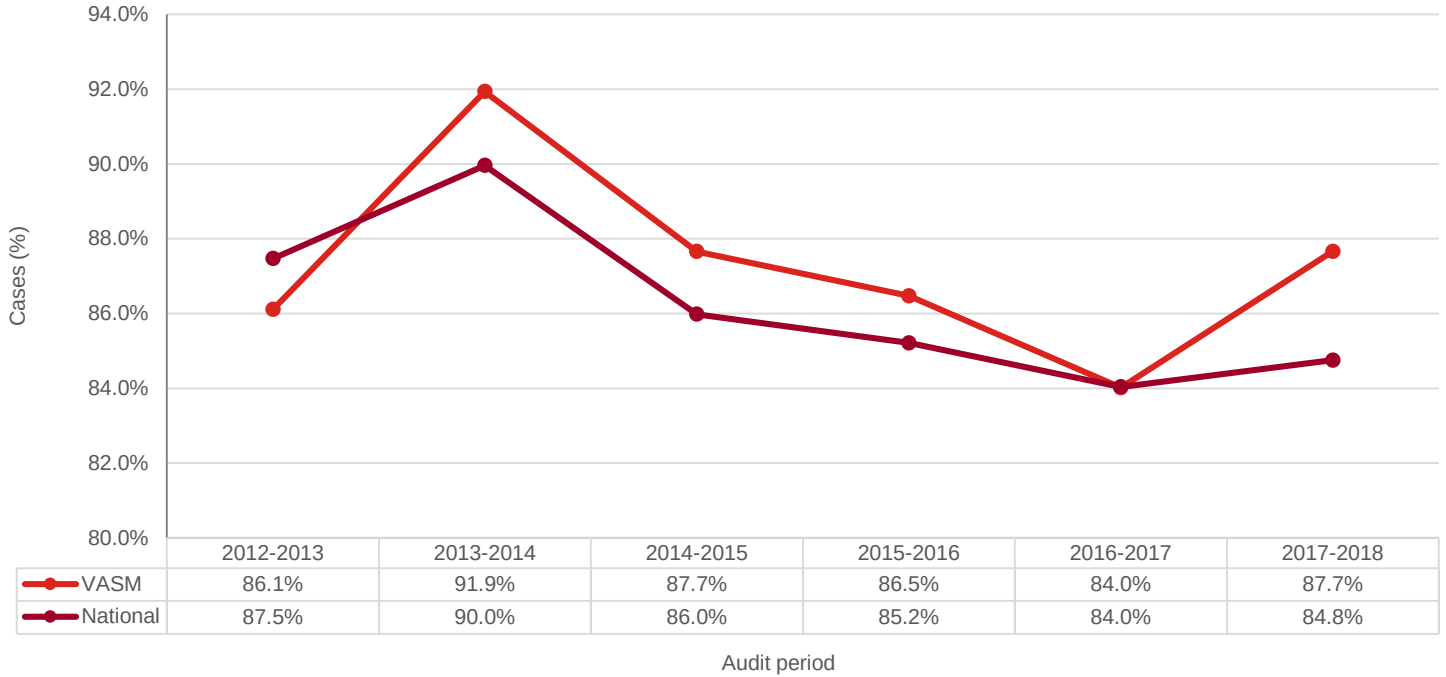
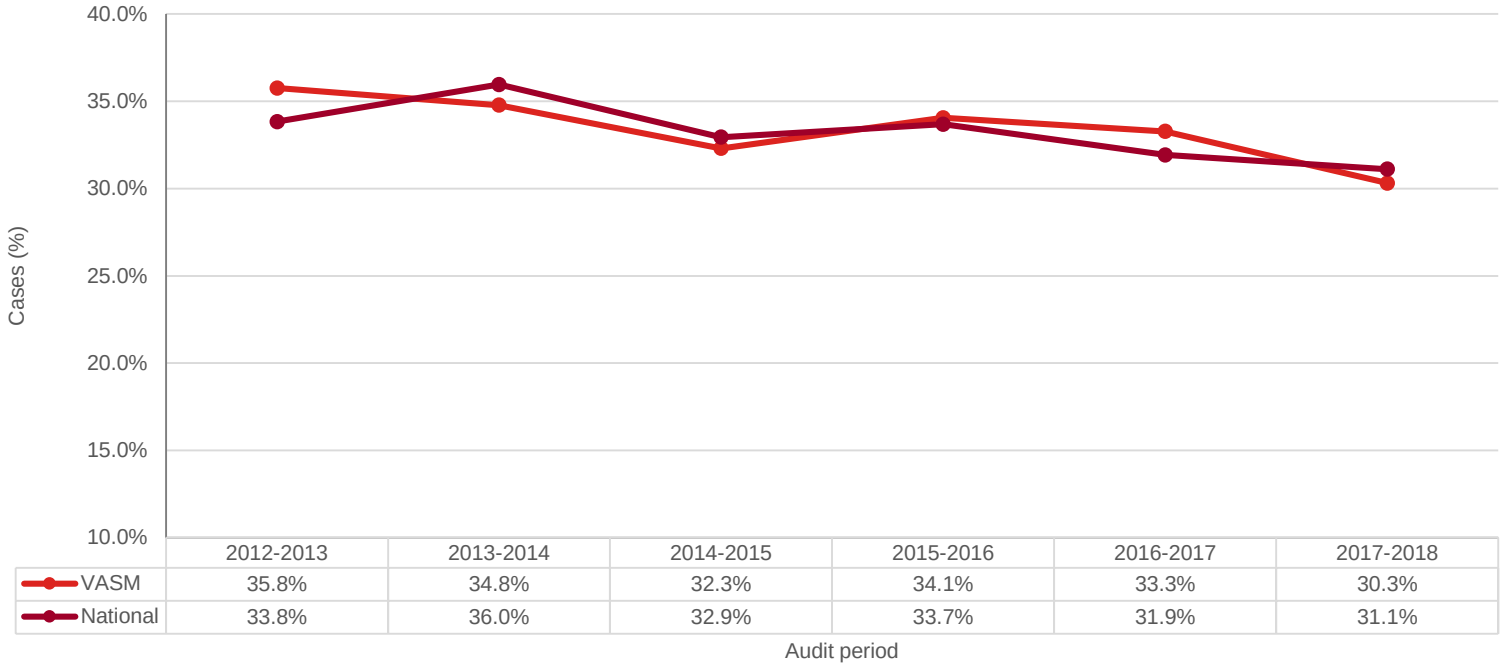
Elective surgery performed as planned



	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
VASM	86.1%	91.9%	87.7%	86.5%	84.0%	87.7%
National	87.5%	90.0%	86.0%	85.2%	84.0%	84.8%

COLLEGE OF SURGEONS RACS

Postoperative Complications



	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
VASM	35.8%	34.8%	32.3%	34.1%	33.3%	30.3%
National	33.8%	36.0%	32.9%	33.7%	31.9%	31.1%

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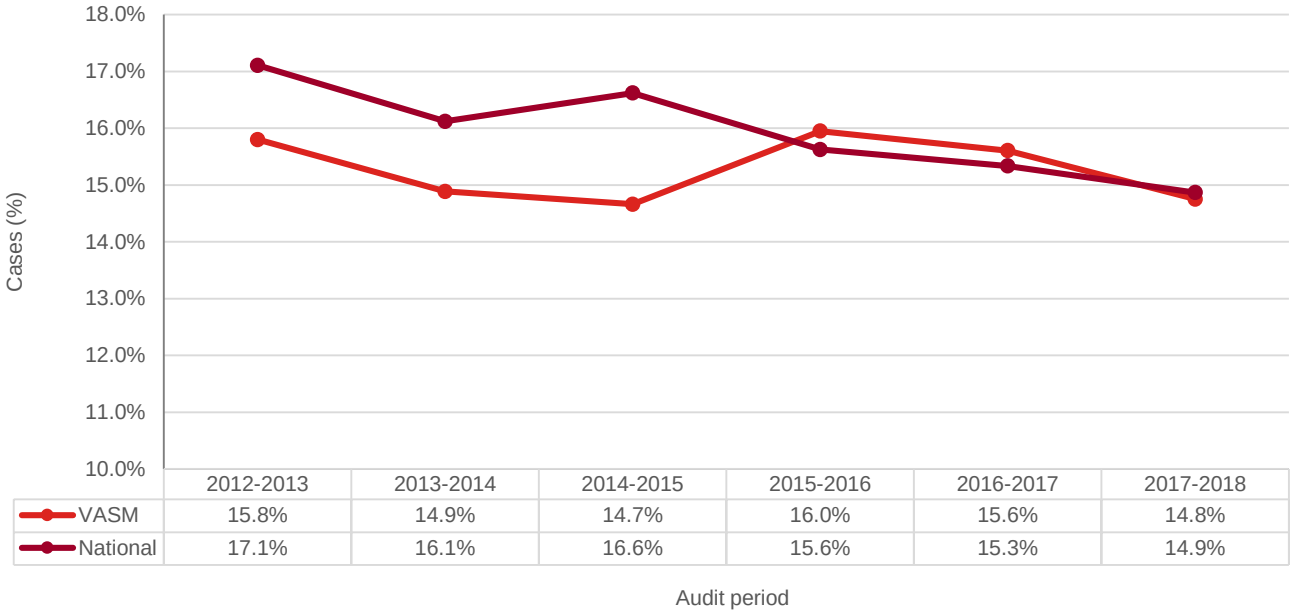
Unplanned Return to Theatre



	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
VASM	15.8%	14.9%	14.7%	16.0%	15.6%	14.8%
National	17.1%	16.1%	16.6%	15.6%	15.3%	14.9%

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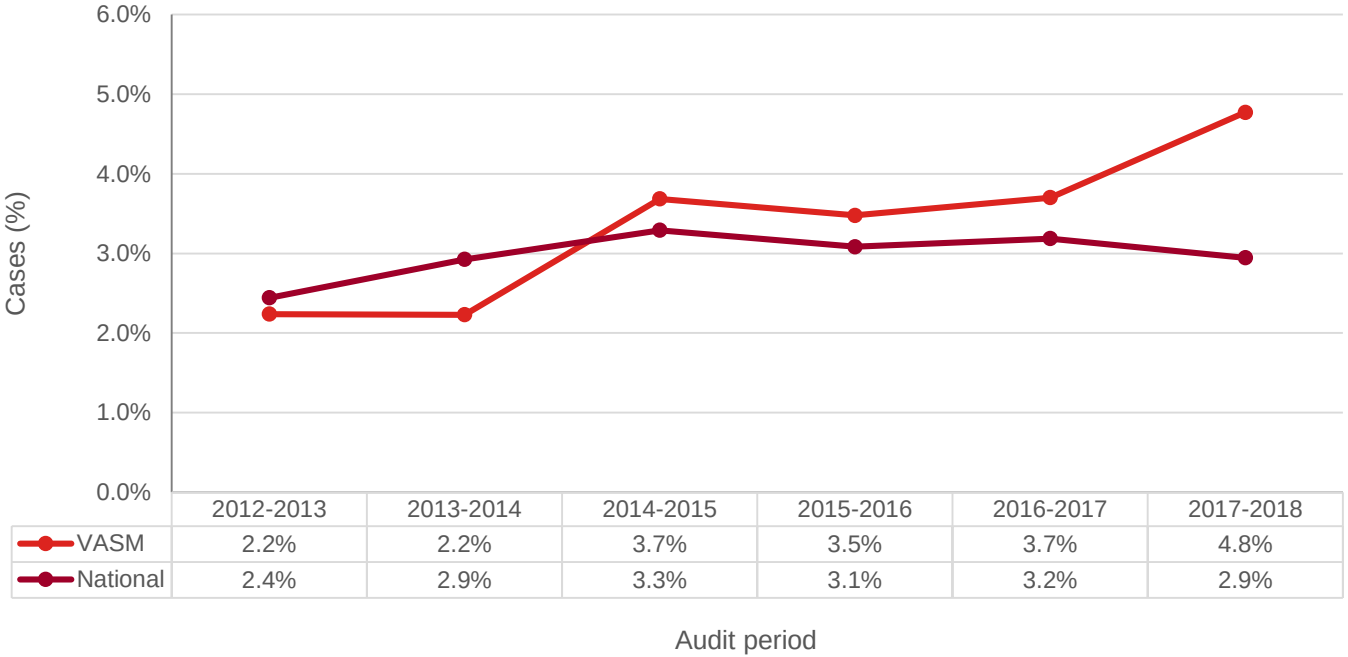
Unplanned Readmission



	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
VASM	2.2%	2.2%	3.7%	3.5%	3.7%	4.8%
National	2.4%	2.9%	3.3%	3.1%	3.2%	2.9%

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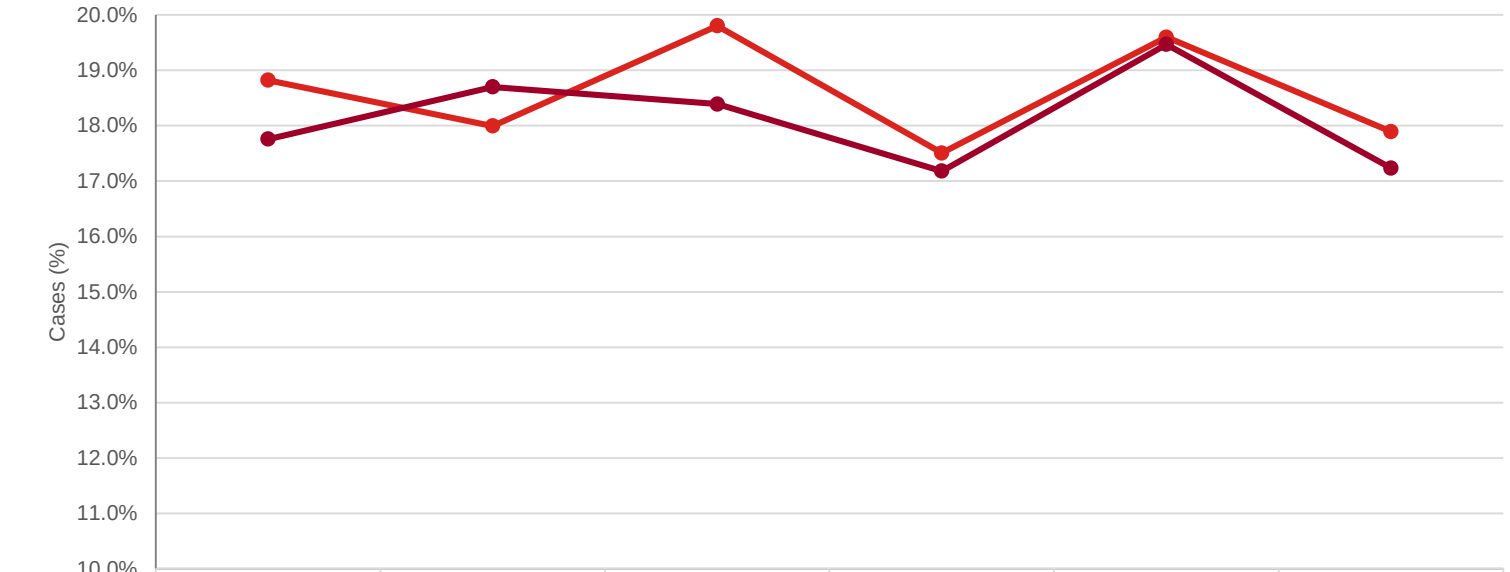
Unplanned Admission to Critical Care Unit



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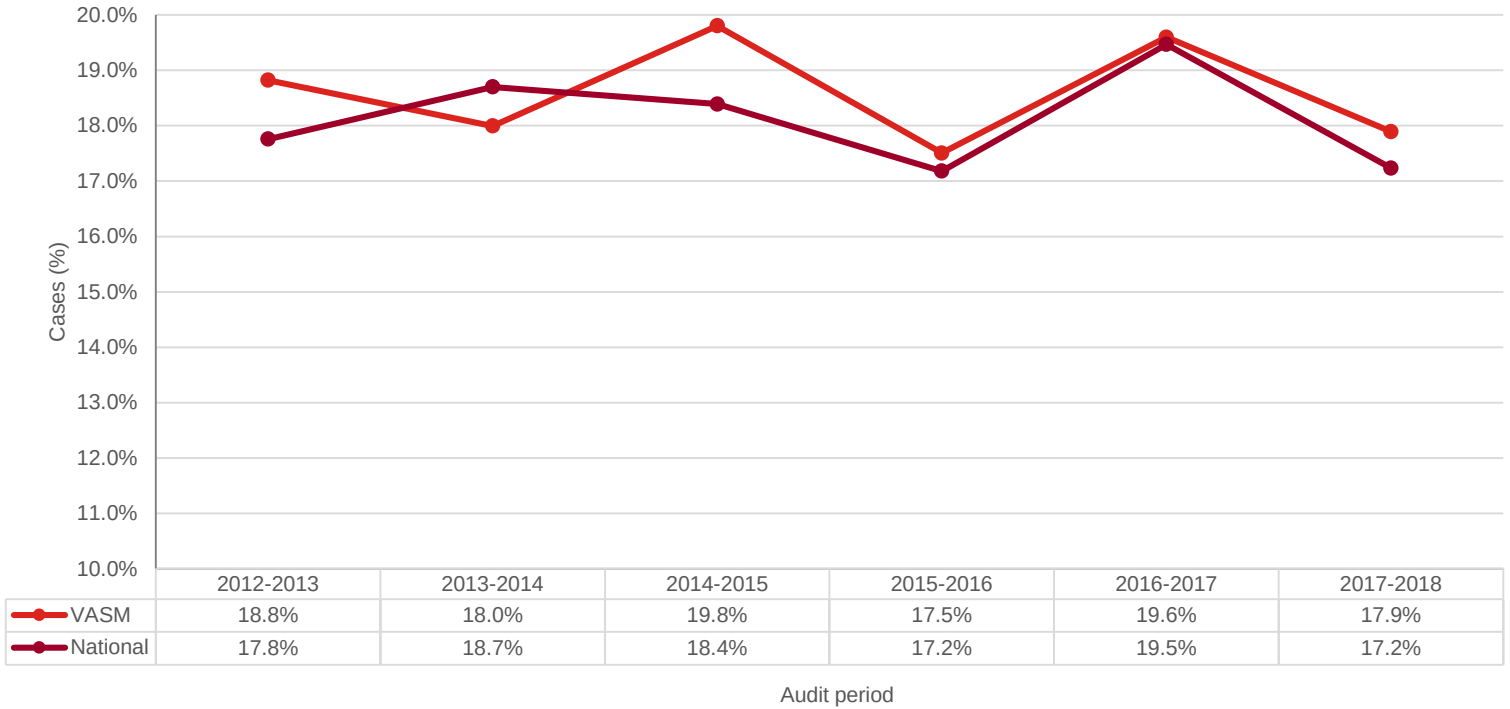
National	17.8%	18.7%	18.4%	17.2%	19.5%	17.2%

Audit period

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS RACS

Clinically significant infection



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ROYAL AUSTRALASIAN COLLEGE OF SURGEONS RACS

Case 1

Surgical decision-making for high-risk patients is complex and requires senior surgical leadership.

Elderly patient presented from home with a bleeding duodenal ulcer.

Underwent gastroscopy and endoscopic treatment for this ulcer.

Further bleeding

Not admitted to ICU - communication issues between teams

Patient expired from blood loss despite ongoing resuscitation.

Case 1

Assessor

case highlights complexities of shared decision-making between teams and importance of individuals understanding their roles ……surgical team was ultimately the treating team and made a treatment plan that did not have the support of other teams. Gastroscopy is a relatively low-morbidity procedure that may have saved this patient's life. Angio-embolisation of the gastroduodenal artery was another alternative, but availability and timeliness of this depends on the hospital. Laparotomy with underrunning of this vessel, should endoscopic control fail, carries much higher morbidity and a lower chance of the patient retaining an acceptable quality of life. The ICU physician and the anaesthetist questioned the benefits of this.

Anaesthetist decided that patient was unfit for any intervention. Patient was going to die without intervention, and full palliation should have been instituted once this decision was made, rather than wasting precious blood products in futile resuscitation.

When an elderly patient is admitted to an ICU, the limits of treatment in particular scenarios should be discussed between ICU and surgical staff. The decision for gastroscopy was the surgeon's call, as that was their expertise. The ICU physician may have reasonably refused to support the patient after a laparotomy, but the decision for laparotomy is again ultimately the surgeon's call. This highlights the need for a shared decision requirement among clinicians. While anaesthetists can advocate strongly about the futility of anaesthetising sick, elderly patients or preoperative patient optimisation, decisions about treatment interventions are the domain of the surgical team. In the situation of communication issues affecting timely treatment, the surgeon may have contacted the senior hospital officer for support. This is obviously more difficult in a time-critical situation overnight.

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Case 1

Surgical lessons:

Surgical decision making for high-risk patients is complex.

Senior surgical leadership is imperative in steering multidisciplinary teams towards an early consensus opinion

Communication to patients and their families.

Reference:

Glance LG, Osler TM, Neuman MD. Redesigning surgical decision making for high-risk patients. N Engl J Med. 2014;370(15):1379-81.

Case 2

Case Study: Decision to operate despite decision to palliate—futile surgery

Mid-80s, presented with blackouts

CT - large posterior fossa meningioma.

Craniotomy and attempted excision of the tumour.

Tumour heavily calcified - difficulty in excising it with the cavitational ultrasonic surgical aspirator (CUSA).

Significant dural bleeding.

Decision made to partially debulk tumour and,

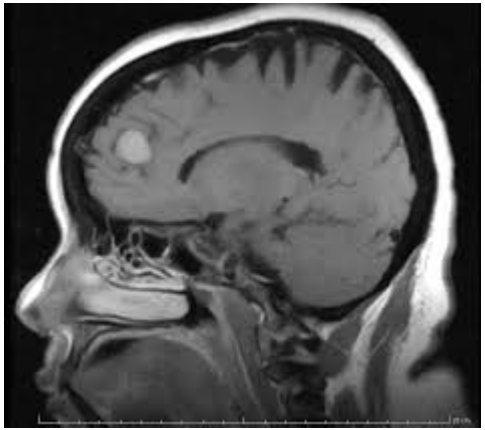
? return for further resection

Case 2

Assessor

With an ageing population the finding of more incidental abnormalities on imaging is an increasing problem.

Treating surgeons must be deliberate in their assessments and honest in their discussions with families regarding the futility of intervention in such cases to avoid such complicated scenarios from developing.



Case 2

Surgical lessons:

Duty of surgeon to inform patients and relatives as to the natural history of the disease, purpose of interventions, and need or otherwise for such interventions.

Importance of knowing when surgery should or should not be performed, irrespective of whether surgery can be performed. In some situations, as in this case, it is better to not operate than to operate in the first instance.

Vital that surgeons be aware of their individual limitations, skill level and experience, as well as the pitfalls and risks associated with the condition.

Adequate planning for difficult cases is vital.

As a surgeon, it should never be an issue to ask for assistance or advice.

Once a decision is made for palliation there may be a tendency for surgeons to persist in our approach: to 'complete' the procedure in the hope that something miraculous occurs.

"first do no harm" - it is the patient, not the disease, that is the priority.

Unnecessary procedures often lead to further pain and suffering along with emotional stresses to both patients and relatives.

Reference:

Royal Australasian College of Surgeons. End of life care, Melbourne: Royal Australasian College of Surgeons; 2017 [17 Jan 2017]. Available from: https://www.surgeons.org/media/24971463/2016-10-26_pos_fes-pst-057_end_of_life_care.pdf.

Case 3

Case Study: No apparent plan of management

Frail, elderly person with prior TCC bladder admitted with acute renal failure.
Comorbidities: COAD, diverticular disease, UTI
Recent cystoscopy - ? muscle invasive disease.
CT scan on admission demonstrated bilateral hydronephrosis with an obstructed left system due to a distal ureteric calculus and an obstructed right system, possibly related to TCC.
Attempt to access to both ureters failed due to technical reasons (? Grade of surgeon).
Bilateral nephrostomies and antegrade double-J (JJ) stents were inserted over the subsequent weeks
Patient died of multi-organ failure.

Case 3

Case Study: No apparent plan of management

Case 3

Assessor

More information would have been helpful.

Significant delays between recognising clinical issues and responding appropriately almost certainly contributed to the ultimate demise.

Examples:

48 hours delay until the first procedure was performed.

? nephrostomy tube in left rather than right kidney. No notes discussing rationale

48 hours for the medical staff to note that the nephrostomy not draining.

Nearly a week before antegrade stent inserted.

Most notes made by junior residents.

No clear evidence of consultant urologist input

When clinical deterioration occurred, no attempt to clear the left ureter until nearly three weeks after admission.

Case 3

Surgical lessons:

The quality of care was inadequate.

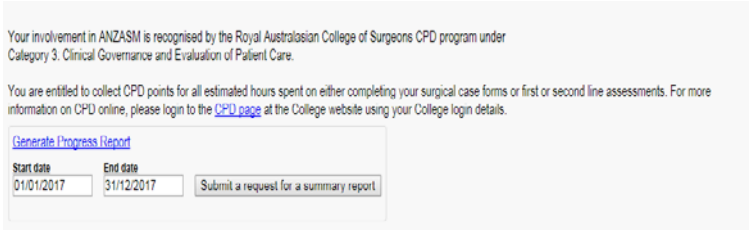
With considerable comorbidities there was a short window of opportunity to reverse processes.

It took over two weeks to clear both ureters by which time multi-organ failure was established and there was little chance of reversal.

No documented evidence of consultant urologist input.

These comments must be taken in the context of an elderly patient with multiple comorbidities and possibly an advanced malignancy.

Individual Surgeon's Report


Your involvement in ANZASM is recognised by the Royal Australasian College of Surgeons CPD program under Category 3. Clinical Governance and Evaluation of Patient Care.

You are entitled to collect CPD points for all estimated hours spent on either completing your surgical case forms or first or second line assessments. For more information on CPD online, please login to the CPD page at the College website using your College login details.

Generate Progress Report

Start date 01/01/2017 End date 31/12/2017 Submit a request for a summary report


Royal Australasian College of Surgeons

VASM

Individual Surgeons Report

The attached report contains a summary of the cases that have been reported to VASM under your name for the period 22 December 2006 to 27 January 2015. Your own data is compared with your peers - within your own specialty who participate in VASM and ANZASM. Note: there is time delay between generating the figures and sending the report; cases returned recently may not be included.

Deficiencies of care identified by the peer review assessors

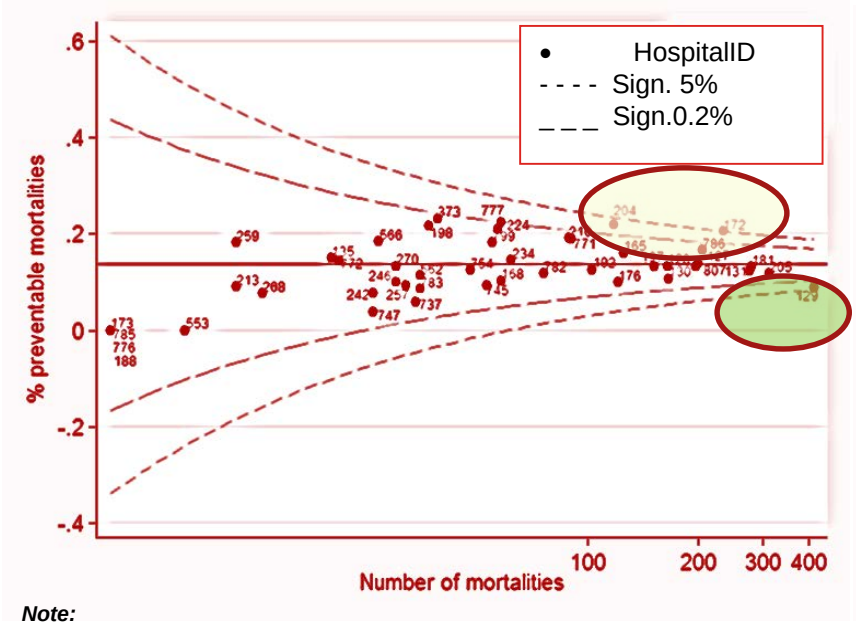
Clinical management issues	Your cases %	Cases in VIC %	Cases nationally %
Yes	50% (1/2)	43% (29/68)	40% (65/161)
No	0% (0/2)	41% (28/68)	47% (76/161)
Data not provided	50% (1/2)	16% (11/68)	12% (20/161)

Area	Events % of your patients	Events in VIC % of patients	Events nationally % of patients
Consideration	0% (0/2)	40% (27/68)	37% (59/161)
Concern	0% (0/2)	13% (9/68)	13% (21/161)
Adverse event	0% (0/2)	6% (4/68)	6% (9/161)
Data not provided	0% (0/2)	0% (0/68)	2% (3/161)

Preventable	Events % of your patients	Events in VIC % of patients	Events nationally % of patients
Definitely	0% (0/2)	6% (4/68)	5% (8/161)
Probably	0% (0/2)	28% (19/68)	29% (46/161)
Probably not	0% (0/2)	15% (10/68)	12% (20/161)
Definitely not	0% (0/2)	0% (0/68)	1% (2/161)
Data not provided	0% (0/2)	10% (7/68)	10% (16/161)

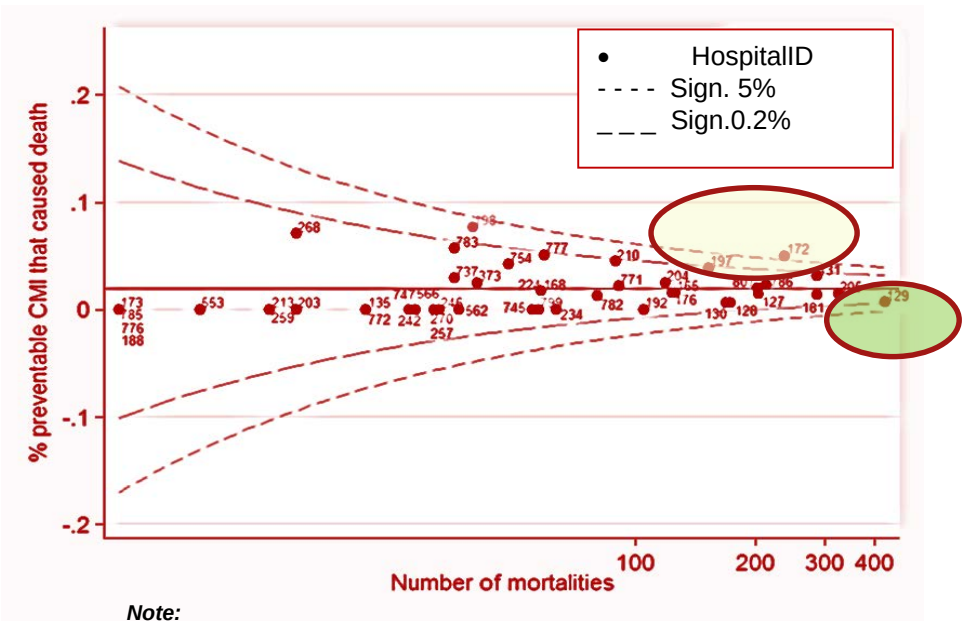
Hospital Surgical Performance Reports

Preventable mortalities



Note:
Sign: significant contour overlay
> 0.2% Sig = 204, 172 (negative outlier)
< -0.2 % Sig = 129 (positive outlier)

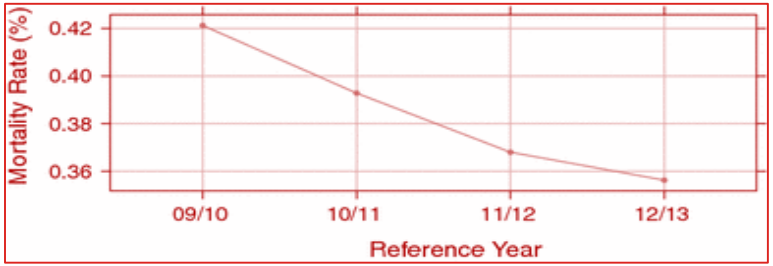
Preventable clinical management issues



Note:
Sign: significant contour overlay
> 5% Sig. = 172 (negative outlier)
> 0.2% Sig.= 197 (negative outlier)

Mortality rate

Victoria



National

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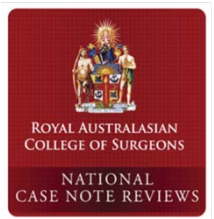
Educational impact at events

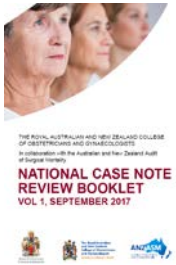
Barry Beiles (VASM), Barwon Health, Mortality and Morbidity Meeting, 4 March 2014.
Barry Beiles and Claudia Retegan (VASM), Epworth Health, Mortality and Morbidity Meeting, 5 March 2014.
Barry Beiles (VASM), RACS 'Revalidation' - 2014 Conjoint Medical Education Seminar, 14 March 2014.
Jessele Vinluan (VASM), Understanding the Literature and Preparing for Journal Submission, 1 May 2014.
Claudia Retegan (VASM), RACS staff meeting, 'Audit findings",1 July 2014.
Claudia Retegan (VASM), VMIA Risk managers', 'Audit process & findings" forum 12 July 2014.
Barry Beiles (VASM), RACS, 'Improved Health Outcomes in Victoria', 25 October 2014.
Barry Beiles and Claudia Retegan (VASM), 'The VASM Clinical Governance Program Roll out'- Clinical Governance Committee, 24 November 2014.
Claudia Retegan (VASM), Monash University, 'Value of Clinical Governance reports', 25 February 2015.
Barry Beiles (VASM), RACS 'Audit impacts practice, VASM & AVA' 14 March 2015.
Barry Beiles (VASM), RACS 'Complex – Decision Making Can audit be a tool - Decision-making', 25 March 2015.
Barry Beiles (VASM), Barwon Health, Mortality and Morbidity Meeting, 25 March 2015.
Barry Beiles (VASM), Barwon Health, Improving outcomes in the surgical patient, 23 February March 2016.
Claudia Retegan (VASM), RMIT Sci PAC meeting, Student placements in clinical audits, 17 June 2015.
Barry Beiles (VASM), RACS Trainee Starter Pack, VASM processes, 7 March 2016.
Nigel Broughton (VASM), Mortality following elective joint replacement, 8 March 2016.
Barry Beiles (VASM), Barwon Health, Mortality and Morbidity Meeting, 26 March 2016.
Barry Beiles (VASM), Epworth Health, Cardiac Surgery Meeting, 9 June 2016.
Claudia Retegan (VASM), Knox Health, Quality assurance meeting – VASM processes, 17 June 2016.
Claudia Retegan (VASM), Epworth Health, Medical records meeting – VASM processes, 20 June 2016.
Barry Beiles (VASM), Lessons learned from the VASM cases, 21 October 2016.
Nigel Broughton (VASM), Would you have changed the management of this patient's course to death, 23 August 2016.
Barry Beiles (VASM), Medical Student Conference, Surgical audit, why is it important, 27 June 2016
Claudia Retegan (VASM), RACS - Unity and Collaboration, 21 September 2016.
Andrew Chen (VASM), Audit finding suggests the need to limit futile surgeries, 16 November 2016.
Dylan Hansen (VASM), Comparison of the VASM with coronial cause of death, 20 November 2016.
Barry Beiles (VASM), Can registries and audits improve patient outcomes, 21 February 2017.
Claudia Retegan (VASM), Countdown to Zero - Safer Care in Victoria, 22 May 2017.
Claudia Retegan (VASM), Knowledge-based sharing in the health industry, 22 May 2017.
Nigel Broughton (VASM), How did we miss the diagnosis? Lessons learnt from the VASM audit. 25 May 2017.
David Watters (VASM), VASM audit – Barwon Mortality and Morbidity Meeting, 22 July 2017.
Philip McCahy and Claudia Retegan (VASM), The journey to Target Zero - tools to address critical areas that require improvement, 14 February 2018.
Philip McCahy , VASM-TASM Seminar - Unexpected death - What now ?, 12 July 2018.
Philip McCahy (VASM), Lessons learnt from the VASM audit held at the Royal Children's Hospitals, 19 October 2018.
Philip McCahy and Claudia Retegan (VASM), A regional perspective at Latrobe hospital, 5 September 2018.

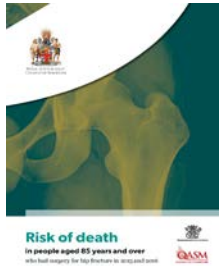
Educational tools via ANZASM App



Free App launched February '15 – deidentified case notes loaded onto app. Cases, where relevant, will have appropriate Hospital Standard applied (e.g. Standard 9 - Recognising and Responding to Clinical Deterioration).

Educational tools via specialty reports





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Educational impact via peer reviewed VASM publications

Cloney T, Jessele Vinluan J, Chen A, Retegan C, McCahy P. Stakeholder's perceived value of surgical audit data provided by the Victorian Audit of Surgical Mortality (VASM), HIMJ TBC 2019

Chen A, Vinluan J, Retegan C, McCahy P. Implementing error rate checks to improve the data quality in the VASM Computers in Biology and Medicine, January 2019

Ferrah N, Ibrahim J, Ranson D, Beiles B. Overview of surgical death investigations: could a dreaded experience be turned into an opportunity? ANZ Journal of Surgery, October 2017.

Hansen H, Hansen E, Retegan C, Morphet J and Beiles B. Validation of data submitted by the treating surgeon in the VASM ANZ Journal of Surgery, November 2018.

Overview of surgical death investigations: could a dreaded experience be turned into an opportunity? ANZ Journal of Surgery, October 2017.
Chen A, Retegan C, Vinluan J, Beiles CB. Potentially preventable deaths in the Victorian Audit of Surgical Mortality. ANZ J Surg. 2016 Oct 18.

Hansen D, Retegan C, Woodford N, Vinluan J, Beiles CB. Comparison of the Victorian Audit of Surgical Mortality with coronial cause of death. ANZJSurg. 2015 May 28 [cited 2015 Aug 1];86(6):432-33. DOI: 10.1111/ans.13185.

Vinluan J, Retegan C, Chen A, Beiles CB. Clinical management issues vary by specialty in the Victorian Audit of Surgical Mortality: a retrospective observational study. BMJ Open. 2014 Jun 30 [cited 2015 Aug 1];4(6). DOI: 10.1136/bmjopen-2014-005554.

Beiles CB, Retegan C, Maddern GJ. Victorian Audit of Surgical Mortality is associated with improved clinical outcomes. ANZJSurg. 2014 Jul 18 [cited 2015 Aug 1];85(11):803-7. DOI: 10.1111/ans.12787.

Retegan C, Russell C, Harris D, Andrianopoulos N, Beiles CB. Evaluating the value and impact of the Victorian Audit of Surgical Mortality, ANZJSurg. 2013 Oct [cited 2015 Aug 1];83(10):724-8. DOI: 10.1111/ans.12311. Epub 2013 Jul 16.

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Feedback from Fellows

1. *"More awareness of events leading to poor outcome."*
2. *"Enabled surgeons to have a common platform on which to discuss difficult cases."*
3. *"My Fellow colleagues and I learn from the adverse events in these critical situations and make every effort to avoid the complications encountered by others."*
4. *"Lead us to question why we are doing operations."*
5. *"Has promoted discussion between surgical staff and anaesthetic staff as to how to reduce unnecessary delays in surgery."*
6. *"Delays are what caused a lot of these problems. This is at all levels. The solution is not to audit but to act."*
7. *"It definitely makes us sit back and look at what we are doing, and ways to improve."*
8. *"Has provided a focus, in particular regarding appropriate types of surgery to be done at this hospital."*
9. *"Has contributed to better quality surgical audits in our health service."*
10. *"Has good ideas for improved care and outcomes."*
11. *"Tabled and discussed at medical advisory committee."*
12. *"…Reviewed by a committee which make appropriate adjustments to current policies and procedures to minimise mortality risks."*

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Independent review of VASM

Target Zero

- VASM has credible processes and can provide conclusive evidence of preventable harm.

Aspex

- Streamlined operational processes suggest the program has reached a degree of maturity,
- Secure processes are in place,
- Inter-assessor reliability demonstrates agreement in relation to clinical management issues identified,
- Surgeon and hospital participation in the audit is strong,
- Timely and good quality feedback and
- Hospital reports generated for internal quality improvement initiatives.

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Future directions

- Implement Aspex and target Zero recommendations
- Enhance current audit processes in collaboration with SCV, VPCC, RACS and surgical sites
- Maintain surgical trust and commitment in the audit,
- Continue to evaluate processes & outcomes,
- Develop active educational strategies, seminars and publications,
- Continue to identify innovative methods of analysis,
- Continue to provide relevant feedback to VASM stakeholders,
- Enhance current processes and
- Monitor the audit quality loop.

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Acknowledgments

- Collaborators,
- Participating Victorian hospitals,
- Participating Victorian Fellows and IMGs,
- Participating Victorian hospital stakeholders,
- Management committee,
- Safer Care Victoria (SCV),
- Australian Orthopaedic Association (AOA),
- The Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG),
- Royal Australasian College of Surgeons (RACS)
- VASM and ANZASM staff.

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