VASM and the Australasian Vascular Audit (AVA)

Have these 2 activities affected clinical outcomes?

Barry Beiles
Quality assurance project designed to highlight system and process errors associated with surgical mortality at State and National level.

Deaths in hospital after surgical procedure or under care of a surgeon.

Independent peer review of surgeons by surgeons.

Educational tool *not* punitive.

Compulsory for CPD requirements (RACS).
ASM receives notification of death

Surgical case form sent to surgeon for completion by paper or Fellows Interface

Completed paper or electronic surgical case form returned to ASM and de-identified

Surgical case form sent for first-line assessment by paper or Fellows Interface

Is a second-line assessment required?

Yes

Second-line assessment

Feedback to surgeon

No

Feedback to surgeon

Has an appeal been lodged on the second-line assessment?

Yes

No

Case closed
### Reported mortality by specialty

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General surgery</td>
<td>2,073 (40.0%)</td>
</tr>
<tr>
<td>Orthopaedic surgery</td>
<td>1,044 (20.1%)</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>617 (11.9%)</td>
</tr>
<tr>
<td>Cardiothoracic surgery</td>
<td>560 (10.8%)</td>
</tr>
<tr>
<td>Vascular surgery</td>
<td>449 (8.7%)</td>
</tr>
<tr>
<td>Urology</td>
<td>197 (3.8%)</td>
</tr>
<tr>
<td>Plastic surgery</td>
<td>124 (2.4%)</td>
</tr>
<tr>
<td>Otolaryngology head and neck surgery</td>
<td>56 (1.1%)</td>
</tr>
<tr>
<td>Pediatric surgery</td>
<td>49 (0.9%)</td>
</tr>
<tr>
<td>Obstetrics and gynaecology</td>
<td>9 (0.2%)</td>
</tr>
</tbody>
</table>
Postoperative mortality rate for operated cases - VAED
Preventable deaths in VASM 2011-2016

• VSCC question is unique to VASM

<table>
<thead>
<tr>
<th>Assessment Type</th>
<th>Preventable</th>
<th>Non-Preventable</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-Line Assessment</td>
<td>283</td>
<td>3907</td>
<td>6.8%</td>
</tr>
<tr>
<td>Second-Line Assessment</td>
<td>410</td>
<td>475</td>
<td>46.3%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>693</td>
<td>4382</td>
<td>13.7%</td>
</tr>
</tbody>
</table>
Recurring issues in 6,212 operative VASM cohort (85%) 2007-2016

• Operative management issues
• Delays
• Recognition and management of the deteriorating patient
• Communication and shared care
1. Operative management issues

- No op should have been performed-futile surgery, end of life care
- A different op should have been performed-seniority, choice by surgeon
- Technical issues in performance of surgery
2. Delays

• Delay in diagnosis – 8 %
• Delay in starting treatment - Surgeon identifies this in 2%, FLA 3%, SLA 13%
• Delay in transfer - 2%
3. The deteriorating patient

- Failure to recognize
- Failure to react
- Junior staff education NB.
- Timing (out of hours)
- Location
4. Communication

• NB in the deteriorating patient - reluctance to contact superiors
• Inter-specialty referral should be timely and response should be rapid
• Documentation poor - poor or illegible data entry by clinicians, especially lack of consultant record entry
Thus.......VASM

• Has achieved 100% hospital participation since 2012 with high compliance
• Is expanding- anaesthetic notification, gynaecology, orthopaedics, ?radiology
• Needs to improve the dissemination of the lessons learned as repeated issues are being reported every year
• Produces academic research output.......
Publications 2012-2017


3. The Victorian Audit of Surgical Mortality is associated with improved clinical outcomes. C. Barry Beiles, Claudia Retegan and Guy J. Maddern. *ANZ Journal of Surgery* 2015, 85; 803-807


AUSTRALIAN AND NEW ZEALAND SOCIETY FOR VASCULAR SURGERY
Structure of AVA

- “Compulsory” vascular audit ANZVS since 2010 (for membership of ANZSVS)
- Privacy and absolute confidentiality (like VASM)
- Web-based data entry
- Audit monitoring committee
- Data is validated
- Discharge outcomes of 4 index operations
Audit parameters (at discharge)

- Mortality after aortic surgery (open and EVAR)
- Stroke/death after Carotid Endarterectomy and Stents
- Graft occlusion and amputation rate after lower limb bypass
- Occlusion rate after AV Fistula creation
Usefulness of the AVA

• The only bi-national vascular surgical audit with risk-adjusted outcomes and a complete loop
• Allows real time comparison of outcomes with peer group
• Serves as the official logbook for trainees
• Produces reports that are used in unit audits
• Provides a dataset for research (on application)
• Issues a certificate for CPD compliance
• Has been used in medico legal defense
Detecting the outlier
Mortality after Open AAA

- Consultant
- Sign. 5%
- Sign. .2%

Graph showing mortality percentage against total.
AUDIT MONITORING COMMITTEE (AMC) IDENTIFIES A "VARIANT RESULT"

AMC notifies the member.

The member & AMC review the relevant cases. Data relevant to the review are collated & checked for accuracy.

The review demonstrates satisfactory results.

Continue audit.

The review demonstrates unsatisfactory results. De-identified data sent to the President of the ANZSVS for review. The surgeon is informed in writing of the outcome of the review and advised to stop performing the procedure(s).

Surgeon does not want to stop performing the procedure(s).

Chair of the ANZSVS notifies:
Head of the appropriate vascular unit.
Director of Medical Services at the hospital.
RACS via President of ANZSVS

Surgeon requests temporary halt, pending re-training and re-credentialing by Board of Vascular Surgery.

The member may appoint a surgical colleague to assist with review.

The surgeon may request review of the data by a member of the ANZSVS.
<table>
<thead>
<tr>
<th>Year</th>
<th>Operation</th>
<th>Consultant</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>IIB (Infrainguinal bypass)</td>
<td>x</td>
</tr>
<tr>
<td>2011</td>
<td>Aortic</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Aortic</td>
<td>x</td>
</tr>
<tr>
<td>2010-2012</td>
<td>Aortic</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>IIB</td>
<td>x</td>
</tr>
<tr>
<td>2013-nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010-2014</td>
<td>Aortic</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>AVF (AV fistula creation)</td>
<td>x</td>
</tr>
<tr>
<td>2015</td>
<td>IIB</td>
<td>x</td>
</tr>
</tbody>
</table>

Outliers detected in the AVA
## Open and endovascular AAA repair in Australia over 2 decades (AIHW data)

<table>
<thead>
<tr>
<th></th>
<th>Open repair n</th>
<th>Endovascular repair n</th>
<th>% Open</th>
<th>% Endovascular</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2000-2001</strong></td>
<td>2168</td>
<td>865</td>
<td>72%</td>
<td>28%</td>
</tr>
<tr>
<td><strong>2004-2005</strong></td>
<td>1734</td>
<td>1452</td>
<td>54%</td>
<td>46%</td>
</tr>
<tr>
<td><strong>2013-2014</strong></td>
<td>753</td>
<td>2405</td>
<td>24%</td>
<td>76%</td>
</tr>
</tbody>
</table>
Has decreased training exposure affected outcome of open AAA?

- AVA 2010-2014
- Group 1 – surgeons trained prior to 2006
- Group 2 – surgeons trained since 2006
- Univariate analysis of morphology and risk factors
- Risk-adjusted outcomes using multilevel logistic regression analysis
Multilevel risk-adjusted funnel plot for mortality – 10+ open AAA repairs
Infrainguinal bypass - Open vs Endo (AIHW data)
Has decreased training exposure affected outcome of IIb?

- AVA 2010-2014
- Group 1 – surgeons trained prior to 2006
- Group 2 – surgeons trained since 2006
- Univariate outcomes
- Risk-adjusted outcomes using multilevel logistic regression analysis
Multilevel risk-adjusted funnel plot for occlusion – 10+ IIB
Thus....... 

• There is no difference in outcomes for open AAA or IIB surgery between surgeons trained more recently (2006 and later) compared with those trained in an earlier era (prior to 2006) despite reduced exposure to open procedures in the AVA.

Conclusions

• Both the VASM and the AVA can be productively used for research activities
• Benefits to stakeholders can be demonstrated
• All audits take effort by surgeons to participate and the onus is on administrators to convince them that it is worthwhile
• Regulation to convince the recalcitrants is essential-achieved for VASM but \textit{not} for AVA
Conclusions (2)

• The VASM is associated with trend improvement in surgical mortality, preventable deaths but not in preventable CMI
• The AVA consistently shows good outcomes in all 4 audited procedures and outliers detected are followed up—they do not appear as repeat offenders
• Audit is beneficial in both endeavours