Can the VASM audit improve patient outcomes?

The Gippsland region perspective.

From sad to bad patient journeys,
VASM case studies

Mr Philip McCahy
Victorian Audit of Surgical Mortality (VASM)
Wednesday, 5th September 2018
Latrobe Regional Hospital
28 yo female
8 weeks pregnant. Right ear pain for ~1/52, saw GP. Likely ear infection prescribed amoxicillin.
Husband returned from getting antibiotic patient not verbally responsive.
AV - febrile 40C, sinus tachy 120, normotensive, increased RR. GCS initially 14 (E4, V4, M6) then 11 (E2 V4 M5).
ED - fever 39.4C, HR 90, BP 180/90. Lactate 3.6. GCS 10 (E4 V2, M4) WCC 16.6 , CRP>250. Antibiotics/DXM
CTB - diffuse cerebral oedema with effacement of the cerebral sulci, suprasellar cistern, ambient cistern and mild L uncal herniation. L and R mastoid air cell opacification very suspicious for oto-mastoiditis.
**Case study 51698**

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CTB - diffuse cerebral oedema with effacement of the cerebral sulci, suprasellar cistern, ambient cistern and mild L uncal herniation. L and R mastoid air cell opacification very suspicious for oto-mastoiditis.
Patient intubated - GCS 5 (E1, V2, M2) with abnormal extensor posturing noted
Transfer for further Neurosurgery, ENT and ID input
Both pupils became fixed and dilated - IV mannitol (extravasated into RUL).
ICU: mannitol, 3% normal saline, DXM + acyclovir. Unsuccessful EVD insertion, Cogmann inserted. Initial ICP 60 then 116mmHg.
Intra-Operative course:
•Neurosurgery: Bi-coronal craniotomy, bi-frontal craniectomy and duroplasty with insertion of right frontal subdural intracranial pressure monitor and subgaleal drain.
•ENT inserted bilateral grommets - finding of bilateral middle ear pus
•R forearm fasciotomy.

ICU - Pupils remained fixed and dilated. Consensus of nil meaningful neurological recovery. Brain dead testing.
Case study 44985

80 yo male

Flight into Australia (for TURP). Acute difficulty swallowing. Continued until presented to hospital 14 days after the flight.
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Flight into Australia (for TURP). Acute difficulty swallowing. Continued until presented to hospital 14 days after the flight.
Case study 44985

80 yo male

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Oesophagoscopy could not find the dental plate. CT - denture had eroded through the back wall of the laryngopharynx. Open approach to the retropharyngeal space successfully removed the dental plate.

Developed Cardiorespiratory issues with significant ST changes on ECG. Trans-thoracic echo which showed massive pulmonary embolism.

Likely developed DVT/PE flight over to Australia. Surgical removal of the plate was successful and ultimately it was not the main factor causing his death although it was an additional factor working against him along with his age.
Case study 50450

83 yo female

Passenger on multi-deck bus that rolled over. Patient trapped for 1 hour.

ED - bilateral femur fractures, open highly comminuted left tibia and fibula fractures with extensive soft tissue loss, open left mid foot fractures with extensive un-reconstructable soft tissue injury, closed right midfoot fractures. Required massive blood transfusion.
Case study 50450

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Passenger on multi-deck bus that rolled over. Patient trapped for 1 hour.

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Orthopaedic injuries fixed with external fixation.

Group opinion by orthopaedic unit that injuries would be unsurvivable without though knee amputation on the left lower limb and IM Nail Fixation or Lt femur fracture and Below knee amputation of Lt Lower Limb and IM Nail fixation of Rt femur.

Patient did not want to go through surgery. Transitioned to palliative care and died following day
Case study 48569

16-yo male
Sudden collapse and GCS of 3 with fixed dilated right pupil
CT brain - large right fronto-parietal ICH with 9mm of midline shift.
No vascular lesion visible on CTA.
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CT brain - large right fronto-parietal ICH with 9mm of midline shift.
No vascular lesion visible on CTA.

Surgery - urgent clot evacuation and decompression.
Deep seated basal ganglia AVM coagulated and resected.
ICP probe inserted with pressure readings of 4mm Hg.
Right pupil initially became smaller.
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Deep seated basal ganglia AVM coagulated and resected.
ICP probe inserted with pressure readings of 4mm Hg.
Right pupil initially became smaller.

Over the next days, intractable ICP increase despite maximum therapy. No re-bleed identified on CT but absent intracranial blood flow. Bilaterally dilated pupils and brain death diagnosis. Therapy ceased
93 yo male
Can walk 50-100 meters with a stick. Muscle invasive bladder cancer, obstructed left kidney (nephrostomy in place) and incontinent of urine.
Pre-anaesthetic Clinic - ASA 4 and a “very high risk”.
Radical cystoprostatectomy and ileal conduit.
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ICU - hypotensive. Ongoing bleeding
Return to theatre - widespread oozing, abdomen packed. 22 units of blood transfused.
Day 3 second look laparotomy with closure of the wound.
Day 9 the patient became febrile and developed an entero-cutaneous fistula - managed conservatively
Deterioration with sepsis, renal failure and pneumonia - palliation.
Day 19 - died
Case study 40606

78 yo female
Polymylagia rheumatica, osteoporosis. Long term steroids/MTX. Breast cancer. Previous LS laminectomy
Operation 1 - transforaminal interbody and posterolateral fusion/decompression in segments L4/5 and L5/S1
Discharged home with supportive brace
Day 18, readmitted with pain. Operation 2 – anterior approach partial corpectomy. ? L4 collapse following that
Day 36, operation 3 – open reduction spinal fracture, L4 corpectomy, titanium plate
Patient anaemic, 8kg wt loss and UTI
Boston brace but further hip and back pain
Day 55, operation 4 – anterior L3/4 corpectomy, posterior spinal fusion T12-L5
Deteriorated over next month died of multi-organ failure/chest infection.
Case study 40606

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Operation 1 - transforaminal interbody and posterolateral fusion/decompression in segments L4/5 and L5/S1
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Day 18, readmitted with pain. Operation 2 – anterior approach partial corpectomy. ? L4 collapse following that
Day 36, operation 3 – open reduction spinal fracture, L4 corpectomy, titanium plate
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Day 55, operation 4 – anterior L3/4 corpectomy, posterior spinal fusion T12-L5
Deteriorated over next month died of multi-organ failure/chest infection.

SLA: “anterior ….. operations were ill-conceived and likely to fail and should never have been done……..One wonders
whether the surgeon had undertaken the appropriate level of training for such major and extensive spinal surgery……. If
the patient had been managed in a decisive fashion with carefully managed analgesia, mobilization in an appropriate
brace, and ..... rehabilitation, she would not have died.”
Inclusion Gippsland region services

- Bairnsdale Regional Health Service,
- Bass Coast Regional Health,
- Central Gippsland Health Service,
- Gippsland Southern Health Service,
- Latrobe Regional Hospital,
- Maryvale Private Hospital,
- South Gippsland Hospital,
- West Gippsland Healthcare Group.

Combination of peer category:

- Private acute group D hospitals,
- Public acute group A hospitals,
- Public acute group B hospitals,
- Public acute group C hospitals.
**Surgeon compliance**

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospitals % of notified deaths with completed SCF</th>
<th>State % of notified deaths with completed SCF</th>
<th>National % of notified deaths with completed SCF</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2013</td>
<td>94.4% (34/36)</td>
<td>80.2% (405/505)</td>
<td>89.7% (1,088/1,213)</td>
</tr>
<tr>
<td>2013-2014</td>
<td>97.3% (36/37)</td>
<td>87.2% (441/506)</td>
<td>93.4% (1,129/1,209)</td>
</tr>
<tr>
<td>2014-2015</td>
<td>97.2% (35/36)</td>
<td>91.8% (458/499)</td>
<td>95.9% (1,147/1,196)</td>
</tr>
<tr>
<td>2015-2016</td>
<td>100% (42/42)</td>
<td>91.4% (459/502)</td>
<td>95.8% (1,116/1,165)</td>
</tr>
<tr>
<td>2016-2017</td>
<td>92.9% (39/42)</td>
<td>76.3% (428/561)</td>
<td>80.2% (923/1,151)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>96.4% (186/193)</strong></td>
<td><strong>85.2% (2,191/2,573)</strong></td>
<td><strong>91.1% (5,403/5,934)</strong></td>
</tr>
</tbody>
</table>

- Through the reporting period, **62.4% (116/186)** of notified deaths to VASM with returned SCF have completed the audit. The remainder of cases are still in progress.
Second-line inquest due to deficiency of care identified

- A second-line assessment was performed for **15.5% (18/116)** of patients overall.
- Lack of sufficient information in the surgical case form was cited as a reason for referral to second-line assessment in **55.6% (10/18)** of cases that underwent a second-line assessment.
### Delay in transfer

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospitals</th>
<th>Like state hospitals</th>
<th>Like national hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2013</td>
<td>33.3% (3/9)</td>
<td>11.7% (7/60)</td>
<td>10.2% (17/166)</td>
</tr>
<tr>
<td>2013-2014</td>
<td>16.7% (1/6)</td>
<td>18.2% (10/55)</td>
<td>15.3% (29/189)</td>
</tr>
<tr>
<td>2014-2015</td>
<td>33.3% (1/3)</td>
<td>9.7% (7/72)</td>
<td>9.5% (18/189)</td>
</tr>
<tr>
<td>2015-2016</td>
<td>50% (1/2)</td>
<td>15.8% (9/57)</td>
<td>16.1% (27/168)</td>
</tr>
<tr>
<td>2016-2017</td>
<td>20% (1/5)</td>
<td>8.9% (4/45)</td>
<td>13.9% (14/101)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>28% (7/25)</td>
<td>12.8% (37/289)</td>
<td>12.9% (105/813)</td>
</tr>
</tbody>
</table>

- From **1 July 2012** to **30 June 2017**, 25 audited deaths had been transferred to your hospital, and **28% (7/25)** of those were reported to have had delays in the transfer.
- There were **118** audited deaths involving a transfer from your hospital to another hospital, and **13.6%** of those were reported to have had delays in the transfer.
## Delay in diagnosis

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospitals</th>
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<th>Like national hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2013</td>
<td>14.8% (4/27)</td>
<td>8.5% (28/330)</td>
<td>9% (85/941)</td>
</tr>
<tr>
<td>2013-2014</td>
<td>11.5% (3/26)</td>
<td>6.8% (24/351)</td>
<td>8.1% (80/992)</td>
</tr>
<tr>
<td>2014-2015</td>
<td>11.8% (2/17)</td>
<td>5.9% (21/354)</td>
<td>7.2% (69/960)</td>
</tr>
<tr>
<td>2015-2016</td>
<td>4.3% (1/23)</td>
<td>10.8% (35/324)</td>
<td>9.4% (83/883)</td>
</tr>
<tr>
<td>2016-2017</td>
<td>4.5% (1/22)</td>
<td>8.3% (21/253)</td>
<td>6.5% (38/586)</td>
</tr>
<tr>
<td>Total</td>
<td>9.6% (11/115)</td>
<td>8% (129/1,612)</td>
<td>8.1% (355/4,362)</td>
</tr>
</tbody>
</table>

- From **1 July 2012** to **30 June 2017**, surgeons reported delay and/or error in the confirmation of surgical diagnosis in **9.6% (11/115)** of audited deaths at your hospital.
- From **12 March 2015** the data collection changed from gathering data on both delay and errors in surgical diagnosis to focus only on delay.
Inappropriate DVT prophylaxis

- Assessors considered the use or non-use of DVT prophylaxis inappropriate in 2.6% (3/115) of audited deaths at your hospital from 1 July 2012 to 30 June 2017.
- Assessors considered the DVT prophylaxis appropriate in 86.1% (99/115) of audited deaths at your hospital from 1 July 2012 to 30 June 2017.
- In 11.3% (13/115) of cases, the assessors could not comment on the appropriateness of DVT prophylaxis.
Operation with the consultant surgeon in theatre

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospitals</th>
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<th>Like national hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012-2013</td>
<td>72.7% (24/33)</td>
<td>78.5% (295/376)</td>
<td>72.1% (682/946)</td>
</tr>
<tr>
<td>2013-2014</td>
<td>76.9% (20/26)</td>
<td>80.7% (330/409)</td>
<td>76.8% (789/1,028)</td>
</tr>
<tr>
<td>2014-2015</td>
<td>81.8% (18/22)</td>
<td>76.8% (322/419)</td>
<td>73% (737/1,009)</td>
</tr>
<tr>
<td>2015-2016</td>
<td>72.4% (21/29)</td>
<td>81.6% (329/403)</td>
<td>76.5% (720/941)</td>
</tr>
<tr>
<td>2016-2017</td>
<td>83.3% (20/24)</td>
<td>81.5% (225/276)</td>
<td>76% (439/578)</td>
</tr>
<tr>
<td>Total</td>
<td>76.9% (103/134)</td>
<td>79.7% (1,501/1,883)</td>
<td>74.8% (3,367/4,502)</td>
</tr>
</tbody>
</table>

- The consultant surgeon was present in theatre, i.e. operating, assisting or supervising the operation in **76.9% (103/134)** of audited operations at your hospital from **1 July 2012** to **30 June 2017**.
Surgeons reported an unplanned return to theatre in **9.9% (11/109)** of audited operative deaths at your hospital from **1 July 2012** to **30 June 2017**.

<table>
<thead>
<tr>
<th>Year</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2012-2013</td>
<td>15.4% (4/26)</td>
<td>12% (33/276)</td>
<td>12.6% (85/676)</td>
</tr>
<tr>
<td>2013-2014</td>
<td>8.3% (2/24)</td>
<td>13.7% (40/291)</td>
<td>15% (110/735)</td>
</tr>
<tr>
<td>2014-2015</td>
<td>11.1% (2/18)</td>
<td>10.7% (34/319)</td>
<td>11.1% (84/754)</td>
</tr>
<tr>
<td>2015-2016</td>
<td>4.5% (1/22)</td>
<td>15.3% (45/294)</td>
<td>13.5% (96/711)</td>
</tr>
<tr>
<td>2016-2017</td>
<td>9.5% (2/21)</td>
<td>13.8% (31/224)</td>
<td>13.1% (59/452)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9.9% (11/111)</strong></td>
<td><strong>13% (183/1,404)</strong></td>
<td><strong>13% (434/3,328)</strong></td>
</tr>
</tbody>
</table>
Surgeons reported postoperative complications in **27% (30/111)** of audited operative deaths at your hospital from **1 July 2012** to **30 June 2017**.

Surgeons reported delay in recognising the postoperative complications in **17.9% (5/28)** of these deaths.

<table>
<thead>
<tr>
<th>Year</th>
<th>Hospitals</th>
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<tbody>
<tr>
<td>2012-2013</td>
<td>26.9% (7/26)</td>
<td>31.6% (86/272)</td>
<td>31.8% (218/685)</td>
</tr>
<tr>
<td>2013-2014</td>
<td>25% (6/24)</td>
<td>32.8% (95/290)</td>
<td>33.2% (246/740)</td>
</tr>
<tr>
<td>2014-2015</td>
<td>27.8% (5/18)</td>
<td>32.8% (104/317)</td>
<td>30.8% (232/754)</td>
</tr>
<tr>
<td>2015-2016</td>
<td>31.8% (7/22)</td>
<td>34.8% (102/293)</td>
<td>34.9% (247/708)</td>
</tr>
<tr>
<td>2016-2017</td>
<td>23.8% (5/21)</td>
<td>26.7% (59/221)</td>
<td>25% (112/448)</td>
</tr>
<tr>
<td>Total</td>
<td>27% (30/111)</td>
<td>32% (446/1,393)</td>
<td>31.6% (1,055/3,335)</td>
</tr>
</tbody>
</table>
Clinically significant infections

- Surgeons reported a clinically significant infection in **39.1% (43/110)** of audited operative deaths at your hospital from **1 July 2012 to 30 June 2017**.

<table>
<thead>
<tr>
<th>Year</th>
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</thead>
<tbody>
<tr>
<td>2012-2013</td>
<td>28% (7/25)</td>
<td>33.7% (91/270)</td>
<td>38% (242/637)</td>
</tr>
<tr>
<td>2013-2014</td>
<td>54.2% (13/24)</td>
<td>40.8% (118/289)</td>
<td>41.1% (303/737)</td>
</tr>
<tr>
<td>2014-2015</td>
<td>33.3% (6/18)</td>
<td>44% (140/318)</td>
<td>43.5% (327/752)</td>
</tr>
<tr>
<td>2015-2016</td>
<td>40.9% (9/22)</td>
<td>47.9% (140/292)</td>
<td>44.6% (314/704)</td>
</tr>
<tr>
<td>2016-2017</td>
<td>38.1% (8/21)</td>
<td>40.4% (90/223)</td>
<td>40.6% (181/446)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>39.1% (43/110)</strong></td>
<td><strong>41.6% (579/1,392)</strong></td>
<td><strong>41.7% (1,367/3,276)</strong></td>
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</table>
## Top deficiencies of care

### Regional

<table>
<thead>
<tr>
<th>Issue</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay in diagnosis</td>
<td>4</td>
</tr>
<tr>
<td>Pre-operative assessment inadequate</td>
<td>4</td>
</tr>
<tr>
<td>Delay to surgery</td>
<td>3</td>
</tr>
<tr>
<td>Better to have done different procedure</td>
<td>2</td>
</tr>
<tr>
<td>Delay in transfer to tertiary hospital</td>
<td>2</td>
</tr>
<tr>
<td>Delay starting DVT prophylaxis</td>
<td>2</td>
</tr>
<tr>
<td>Injury to organ</td>
<td>2</td>
</tr>
<tr>
<td>Unsatisfactory medical management</td>
<td>2</td>
</tr>
<tr>
<td>Failure to investigate patient fully</td>
<td>1</td>
</tr>
<tr>
<td>Anastomotic leak after open surgery</td>
<td>1</td>
</tr>
<tr>
<td>Delay in recognising a bleeding complication</td>
<td>1</td>
</tr>
<tr>
<td>Delay starting antibiotics</td>
<td>1</td>
</tr>
<tr>
<td>Protocol issues</td>
<td>1</td>
</tr>
<tr>
<td>Poor communication</td>
<td>1</td>
</tr>
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</table>

### Victoria

<table>
<thead>
<tr>
<th>Issue</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative management issues</td>
<td>218</td>
</tr>
<tr>
<td>Delay issues</td>
<td>158</td>
</tr>
<tr>
<td>Postoperative care issues</td>
<td>134</td>
</tr>
<tr>
<td>Preoperative care issues</td>
<td>99</td>
</tr>
<tr>
<td>Protocol issues</td>
<td>70</td>
</tr>
<tr>
<td>Poor communication</td>
<td>50</td>
</tr>
<tr>
<td>Adverse Events</td>
<td>48</td>
</tr>
<tr>
<td>Anaesthetic and Critical care issues</td>
<td>19</td>
</tr>
<tr>
<td>General complications of surgery</td>
<td>15</td>
</tr>
<tr>
<td>Septicaemia and wound</td>
<td>6</td>
</tr>
</tbody>
</table>

### National

<table>
<thead>
<tr>
<th>Issue</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay in definitive treatment</td>
<td>4462</td>
</tr>
<tr>
<td>Decision to operate</td>
<td>2934</td>
</tr>
<tr>
<td>Poor choice of operative procedure</td>
<td>2090</td>
</tr>
<tr>
<td>Poor documentation</td>
<td>1323</td>
</tr>
<tr>
<td>Postoperative care</td>
<td>1314</td>
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<tr>
<td>Diagnosis-related complications</td>
<td>1163</td>
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<tr>
<td>Management issues*</td>
<td>938</td>
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<tr>
<td>Communication issues</td>
<td>684</td>
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<tr>
<td>Preoperative assessment inadequate</td>
<td>608</td>
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<tr>
<td>Miscellaneous complications of treatment</td>
<td>589</td>
</tr>
<tr>
<td>Aspiration pneumonia</td>
<td>304</td>
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<tr>
<td>Fluid balance unsatisfactory</td>
<td>295</td>
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<tr>
<td>Surgeon too junior</td>
<td>234</td>
</tr>
<tr>
<td>Transfer should not have occurred</td>
<td>188</td>
</tr>
<tr>
<td>Failure to use DVT prophylaxis</td>
<td>177</td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>138</td>
</tr>
<tr>
<td>Anastomotic leak after open surgery</td>
<td>128</td>
</tr>
<tr>
<td>Injury caused by fall in hospital</td>
<td>125</td>
</tr>
<tr>
<td>Septicaemia</td>
<td>111</td>
</tr>
</tbody>
</table>

**VASM assessors identified for your region 27 issues in 15.5% (18) of 116 cases with potential deficiencies of care that were definitely, or probably preventable.**
Cases where the death was considered preventable

Cases originating from Gippsland region where the death was considered preventable flagged within 2-3 STD of the Victorian mean 13.4%.
Issues raised where the death was considered preventable

- Transfer with inadequate information
- Spigot of NGT for oral meds
- Perhaps the wrong operation
- Maybe early operation on re admission
- Lack of input from medical unit
- Pre-operative assessment issues
- Fluid management
- Failure to obtain medical input
- Early investigation and surgical intervention
- Dose of LMWH
- Delay to surgical diagnosis made by medical team x 2
- Decision to operate x 3
- Avoiding colonoscopy in this elderly high risk patient
- Anti-coagulation in bleeding patient
- Use of DVT prophylaxis if indeed patient had PE
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Decision to operate</td>
<td>234</td>
<td>82</td>
<td>38</td>
<td>354</td>
</tr>
<tr>
<td>Better to have done different operation or procedure</td>
<td>175</td>
<td>58</td>
<td>26</td>
<td>259</td>
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<tr>
<td>Delay to surgery (ie earlier operation desirable)</td>
<td>131</td>
<td>51</td>
<td>26</td>
<td>208</td>
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<tr>
<td>Delay in diagnosis</td>
<td>106</td>
<td>32</td>
<td>14</td>
<td>152</td>
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<tr>
<td>Unsatisfactory medical management</td>
<td>67</td>
<td>22</td>
<td>10</td>
<td>99</td>
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<tr>
<td>Pre-operative assessment inadequate</td>
<td>66</td>
<td>18</td>
<td>4</td>
<td>88</td>
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<tr>
<td>Poor documentation</td>
<td>52</td>
<td>16</td>
<td>10</td>
<td>78</td>
</tr>
<tr>
<td>Post-operative care unsatisfactory</td>
<td>52</td>
<td>12</td>
<td>7</td>
<td>71</td>
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<tr>
<td>Communication failures</td>
<td>39</td>
<td>13</td>
<td>11</td>
<td>63</td>
</tr>
<tr>
<td>Delay in transfer to surgical unit</td>
<td>41</td>
<td>15</td>
<td>3</td>
<td>59</td>
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</tbody>
</table>

- The report outlines the top ten preventable deficiencies of care identified nationally.
- VASM disseminates Case Note Review booklets, annual reports and publications to all sites.
Future directions

- Enhance current processes and collaboration with SCV
- Increase educational activities in regional Victoria
- Improve patient care and surgical experience
- Monitor the audit quality loop
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• Victorian Consultative Council on Anaesthetic Mortality and Morbidity (VCCAMM),
• 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.