Victorian Audit of Surgical Mortality
at the Royal Australasian College of Surgeons

Victorian Audit of Surgical Mortality (VASM)
Second-Line Assessment Validation Audit
2013 Report

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1. Introduction

1.1. Objectives

The objective of this audit was to examine the agreement between two independent assessors performing second-line assessments on the same case.

1.2. Scope

The validation audit was applicable to all VASM mortality cases submitted by January 2013 that had completed a second-line assessment during the original assessment phase, and were closed. Only the results of the second-line assessment were considered in the audit; the results of the original first-line assessment results were not considered[1].

1.3. Procedure

A 5% sample of closed cases was randomly selected for review. The requests to undertake the second-line validation audit was sent out in February 2013. The final validation assessment was completed and returned to VASM in June 2013.

The data from both the original and validation audits was entered into a Microsoft Access database which identified the VASM case ID and the fields where similarities and discrepancies were found.

At completion of the audit, a comparison was made of the recommendations from each assessment.

The Fellow who performed the original second-line assessment through the standard audit process is defined as the primary assessor. The second, or 'validation assessor', was an independent Fellow who conducted the second-line assessment without knowledge of it being a validation. Validation assessors were drawn from the relevant subspecialty and were unaware of the outcome from the original assessment. Both assessors had access to the same clinical material.

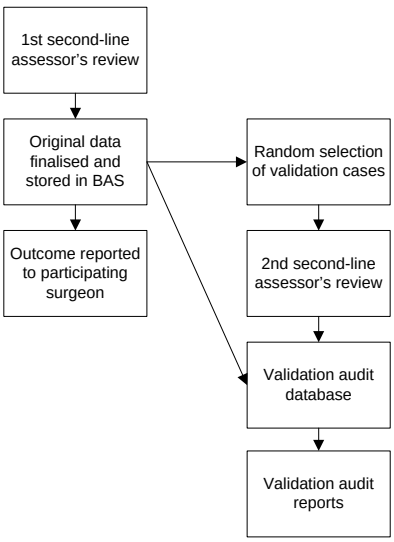
All the audit reports will be retained and stored securely for a period of 30 years, as per the personally-controlled electronic health record (PCEHR) legislation[2].

[1] A first-line assessment validation audit was conducted in 2013. For the results of this audit, please refer to: first-line validation report

[2] Williams, P. A. (2013). Does the PCEHR mean a new paradigm for information security? Implications for health information management. The HIM journal.

1.4. Audit Diagram

Black arrows indicated audit architecture checks.



1.5. Audit Case Selection

A total of 16 cases were selected to undergo a validation audit from a variety of specialties.

Table 1: Specialty distribution of cases selected for review

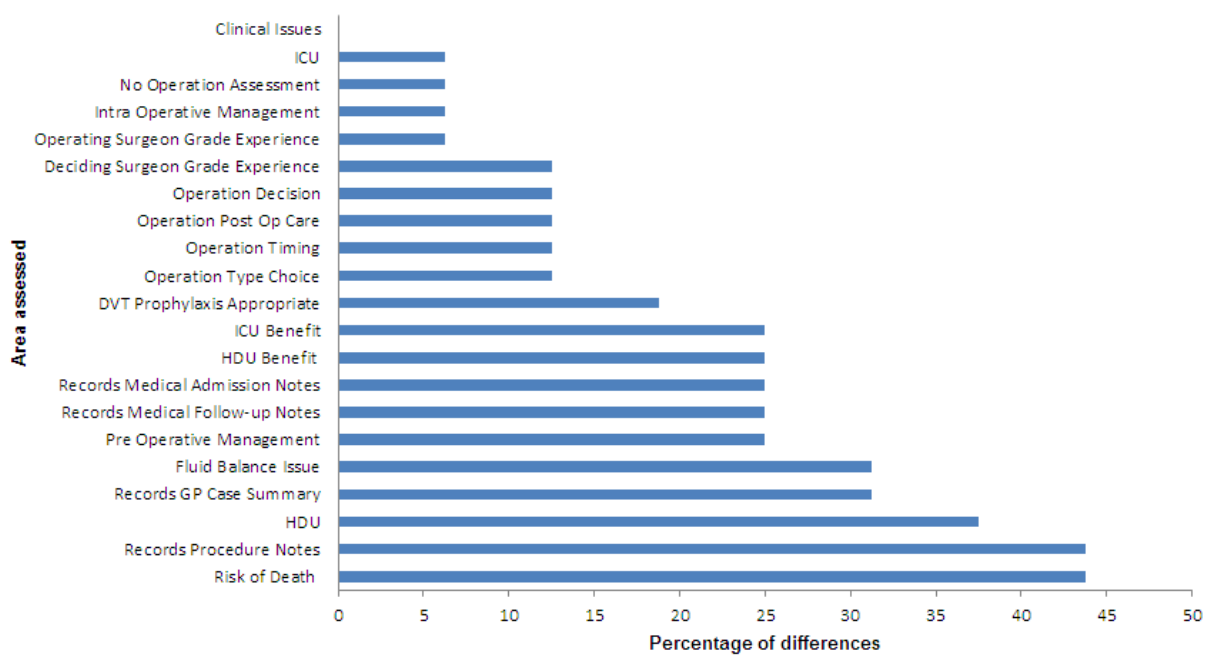
Speciality	**Second-line cases available for review**	**Cases selected n (%)**
Cardiothoracic	41	2 (5%)
General Surgery	167	3 (2%)
Neurosurgery	32	2 (6%)
Obs & Gynae	1	1 (100%)
Ophthalmology	1	1 (100%)
Orthopaedics	40	2 (5%)
Otolaryngology	5	1 (20%)
Plastic Surgery	1	1 (100%)
Urology	18	1 (6%)
Vascular	23	2 (9%)
Total	**329**	**16 (5%)**

2. Audit Report Results

The following section outlines the results of the validation audit. The original assessor's responses have been compared against the responses from the validation assessor.

The results of the validation have been summarised below. It shows the differences between the original and the validation second-line assessment.

Figure 1. Percentage summary of differences in areas assessed.



Note: DVT=Deep Vein Thrombosis, GP=General Practitioner, HDU=High Dependency Unit, ICU=Intensive Care Unit.

2.1. Record keeping

The assessor was asked to assess the quality of the record keeping in four key areas. These questions were relevant to all cases in the validation audit.

2.1.1. Medical admission notes

The original and validation assessors agreed with the quality of the medical admission notes in 12 (75%) of the 16 assessments. The four cases where there were inconsistencies in the response to this question, the original assessor thought the medical records were unsatisfactory while the validation assessor believed that they were satisfactory.

2.1.2. Medical follow-up notes

The original and validation assessors agreed on the quality of the medical follow-up in 12 (75%) of the 16 assessments. The four cases where there were inconsistencies in the response to this question, the original assessor thought the medical records were unsatisfactory while the validation assessor believed that they were satisfactory.

2.1.3. Procedure notes

The original and validation assessors agreed on the quality of the procedure notes in nine (56%) of the 16 assessments. In two of the cases where there were inconsistencies, the original assessor stated that the procedure notes were satisfactory while the validation assessor believed that the notes were either unsatisfactory or missing. In another case, the original assessor stated that the procedure notes were unsatisfactory while the validation assessor believed the procedure notes to be satisfactory. In two of

the discordant cases, the original assessor stated the procedure notes as missing, while the validation assessor did not complete the question. In the remaining two cases, the original assessor did not complete the question, while the validation assessor stated that the notes were missing.

2.1.4. Case summary letter to GP

The original assessor and validation assessor agreed on the quality of the summary letter to the General Practioner (GP) in 11 (69%) of the 16 assessments. In one of the cases where there was disagreement in response, the original assessor stated the summary letter to the GP was missing, while the validation assessor rated the letter as satisfactory. In two of the discordant cases, the original assessor did not complete the question, while the validation assessor rated the letter to the GP as satisfactory. In the remaining two cases, the original assessor did not complete the question, while the validation assessor stated that the letter was missing.

2.2. If NO operation was performed

If no operation was performed, the assessor was asked to assess *"should an operation be performed".* In this cross-section of 16 cases, there were six cases where no operation was performed.

From the six cases, there were four cases where the original assessor and the validation assessor agreed that no operation should have occurred. However, there was one case where the original assessor and validation assessor were in agreement that the patient should have been operated on. In the remaining case, the original and validation assessor did not agree whether an operation should have been performed. The original assessor stated that a specific procedure should have been performed, while the validation assessor thought that no operation was required. This highlighted the differences in treatment approaches utilised by the Fellows.

2.3. If an operation was performed

If an operation was performed, the assessor was asked whether there were any areas for consideration, of concern or adverse events in any of the following areas. This question was only relevant in the 10 cases where an operation was performed.

2.3.1. Pre-operative management/preparation

The original and validation assessor agreed in eight (80%) of the 10 cases when assessing whether there were any issues associated with the pre-operative management or preparation. For two of the responses that did not agree, the original assessor said there were areas for concern, while the validation assessor believed there were no areas for concern.

2.3.2. Decision to operate at all

The original and validation assessors agreed in eight (80%) of the 10 cases when assessing whether there were any issues regarding the decision to operate on the patient. For two of the responses that did not agree, the original assessor said there were no areas for concern, while the validation assessor believed there were areas for concern.

2.3.3. Choice of operation

The original and validation assessors agreed in eight (80%) of the 10 cases when assessing whether there were any issues regarding the choice of operation. For two of the discordant responses, the original assessor thought there were areas of concern, while the validation assessor believed there were no areas of concern.

2.3.4. Timing of operation (too late, too soon, wrong time of day)

The original and validation assessors agreed in eight (80%) of the 10 cases when assessing whether there were any issues regarding the timing of the operation. For two of the responses that did not agree, the original assessor said there were areas for concern, while the validation assessor believed there were no areas for concern.

2.3.5. Intra-operative/technical management of surgery

The original and validation assessors agreed in nine (90%) of the 10 cases when assessing whether there were any issues regarding the intra-operative/technical management of the surgery. For the disagreeing response, the original assessor said there were areas for concern, while the validation assessor believed there were no areas for concern.

2.3.6. Grade/experience of surgeon deciding

The original and validation assessors agreed in eight (80%) of the 10 cases when assessing whether there were any issues regarding the grade/experience of the surgeon deciding. For one of the responses that didn't agree, the original assessor thought there were no areas of concern, while the validation assessor believed there were areas of concern. For the remaining conflicting response, the original assessor thought there were areas of concern, while the validation assessor believed there were no areas of concern.

2.3.7. Grade/experience of surgeon operating

The original and validation assessors agreed in nine (90%) of the 10 cases when assessing whether there were any issues regarding the grade/experience of the surgeon operating. For the disagreeing response, the original assessor said there were areas for concern, while the validation assessor believed there were no areas for concern

2.3.8. Postoperative care

The original and validation assessors agreed in eight (80%) of the 10 cases when assessing whether there were any issues regarding the patient's post-operative care. For one of the responses that didn't agree, the original assessor thought there were no areas of concern, while the validation assessor believed there were areas of concern. For the remaining disagreement, the original assessor thought there were areas of concern, while the validation assessor believed there were no areas of concern.

2.4. Assessor's view (before any surgery) of overall risk of death

The assessor was asked to assess the patient's overall risk of death before any surgery on a five point Likert scale. This question was relevant to all 16 cases in this validation audit.

In 11 (69%) of the 16 cases, the original assessor agreed with the validation assessor on their view of the overall risk of death. In five discrepant answers, the responses only differed by one point on the scale. The remaining case differed by two points on the scale.

2.5. Critical care

The assessor was asked to assess whether or not the utilisation of critical care support would have benefited the patient.

With regards to the utilisation of the Intensive Care Unit (ICU), seven (44%) of the 16 cases were assessed where there was agreement that ICU support was not used in the patient's admission. In two (29%) of the seven cases, the original assessor agreed with the validation assessor that the patient would not have benefited from ICU support. In one of the discordant cases, the original assessor stated that ICU support would have benefited the patient while the validation assessor believed that ICU support would have made no difference. For the remaining two cases, the original assessor did not complete the question while the validation assessor believed that ICU support would have been beneficial for the patient. However, there was one case where the original assessor stated that ICU support was not used in the patient's admission while the validation assessor believed that ICU support was utilised. In this case, the original assessor also stated the ICU support would not have benefited the patient.

With regards to the utilisation of the High Dependency Unit (HDU), 10 (63%) of the 16 cases were assessed where there was agreement that HDU support was not used in the patient's admission. The original assessor and the validation assessor agreed in five (50%) of the 10 cases, that HDU support would not have benefited the patient. For the remaining five cases, there were two cases where the original assessor stated that the patient would have benefited from HDU support while the validation

assessor believed that HDU support would have made no difference. In one of the discordant cases, the original assessor stated that HDU support would not have been beneficial for the patient while the validation assessor believed that HDU support would have benefited the patient. The remainder two cases were not completed by the original assessor while the validation assessor believed that HDU support would have benefited the patient in one of these cases but not benefitting the patient in the other.

However, of the six cases where there was disagreement on whether or not HDU support would have benefited the patient, three were not completed by the original assessor while one was not completed by the validation assessor. All four of these cases resulted in HDU care not believed to be beneficial towards the patient. For the one of the remaining two cases, the original assessor stated that HDU support was used in the patient's admission while the validation assessor believed that HDU support was not utilised and it wouldn't have been beneficial for the patient. For the final discordant case, the original assessor believed that HDU support was not utilised while the validation assessor believed HDU support was used. This case resulted in the original assessor believing that HDU support would have been beneficial towards the patient's admission.

This section highlights that there is still need for further education on the processes in regards with critical care utilisation.

2.6. Was the decision on the use of DVT prophylaxis appropriate?

The assessor was asked to assess whether the decision on the use of Deep Vein Thrombosis (DVT) prophylaxis was appropriate in the management of the patient. This question was relevant to all cases in the validation audit.

The original and validation assessors agreed in 14 (86%) of the 16 cases when assessing whether the decision on the use of DVT prophylaxis was appropriate. For one of the assessments, the original assessor didn't complete the question. The remaining discordant case was due to the question not being completed by the validation assessor.

2.7. Was fluid balance an issue for this case?

The assessor was asked to assess whether fluid balance was an issue for the patient. This question was relevant to all cases in the validation audit.

The original and validation assessors agreed in 11 (69%) of the 16 cases when assessing whether fluid balance was an issue for the case. For three of the assessments where the response to the question differed between the original and validation assessor, the responses varied between 'yes', 'no' and 'don't know'. For one of the discordant cases, the original assessor did not answer the question. For the remaining discordant case, the validation assessor did not answer the question.

2.8. Were there any areas of consideration, concern or adverse event?

The assessor was asked to assess whether there were any areas for consideration, concern or adverse event in the management of the patient. This question was relevant to all cases in the validation audit.

The original and validation assessors agreed in all the cases when assessing whether there were areas of consideration, concern or adverse events in the management of the patient.

2.9. Actual incidence of areas of consideration, concern and adverse events identified

Table 2. Summary of clinical issues raised by the original and validation assessors, in both the second-line assessment form and the assessor's reports.

	Cardiothoracic (1)		Cardiothoracic (2)		General (1)		General (2)		General (3)		Neurosurgery (1)		Neurosurgery (2)		Gynaecology		Ophthalmology		Orthopaedic (1)		Orthopaedic (2)		Otolaryngology		Plastic		Urology		Vascular (1)		Vascular (2)		**TOTAL**	
	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation	Original	Validation
Adverse event	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
Concern	0	0	1	0	1	1	0	0	0	0	0	0	0	0	3	2	1	2	0	0	0	0	0	0	3	1	0	2	2	1	0	0	11	9
Consideration	2	1	0	1	0	1	2	1	3	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	2	2	2	0	0	2	3	14	13
TOTAL	2	1	2	1	1	2	2	1	3	2	0	0	0	0	4	3	3	2	0	0	0	0	0	0	4	3	2	4	2	1	2	3	27	23

2.10. Analysis of areas of consideration, concern or adverse event

An important aspect of the feedback given by assessors to treating surgeons is the free text section where assessors document perceived issues of management and make comments. This section of the feedback has been abstracted below. Both the original and validation assessors are compared.

Table 3. Analysis of areas of consideration, concern and adverse events.

Specialty	Assessment Type	Issues raised on SLA Form	Issues raised on SLA report
Cardiothoracic	Original	1. Protracted period time between presentation and coronary surgery 2. Anticoagulation management of patient awaiting coronary surgery	1. Anti-coagulant management in a patient who has had a recent acute coronary syndrome and stent insertion 2. Delay in taking this patient to the operation room after he presented with an acute coronary syndrome
	Validation	1. Clearer documentation by Cardio-Thoracic Surgery (CTS) team about timing of surgery	1. Cardiothoracic team could have been more proactive in operating sooner in an unstable patient
Cardiothoracic	Original	1. Aspiration pneumonia 2. Communication between medical teams	1. Communication between ICU/ Medical Emergency Team (MET) call staff and the surgeon 2. Hospital acquired pneumonia – patient developed Acquired Respiratory Distress Syndrome (ARDs) as a complication of their pneumonia 3. Protocols for ICU discharge also deserves special attention
	Validation	1. In hindsight, possible initial discharge for ICU too early? Coronary-Artery Bypass Grafting Surgery (CABG) x4 and Mitral Valve (MV) repair in 74yo man potential for adverse events	1. Patient developed respiratory compromise consistent with bilateral pneumonia and ARDs pattern. 2. Early discharge from ICU
General	Original	1. Missed diagnosis of Abdominal Aortic Aneurysm (AAA)	1. Missed diagnosis leading to missed opportunity for an emergency repair of the abdominal aneurysm
	Validation	1. Failure to consider ruptured AAA as possibility 2. Failure to perform CT scan on day 1 after admission	1. Investigations to confirm diagnosis

General	Original	1. Resuscitation and choice of ward admission 2. Timing of Endoscopic Retrogade Cannulation of Pancreatic (Duct) (ERCP)	1. Appropriate place of resuscitation – ward vs HDU 2. Timing of ERCP? Delayed by additional computed tomography (CT) scans 3. Senior surgical support or at least documentation of senior surgical support 4. Quality of surgical admission and progress notes
	Validation	1. The first MET call on patient should have prompted HDU admission in a patient with severe pancreatitis and pain	1. Patient should be managed in HDU – patient had a MET call for respiratory compromise and should have been a prompt for HDU admission
General	Original	1. Enteritis 2. Delay in ERCP 3. Missing images - Magnetic Resonance Cholangiopancreatography (MRCP)/CT/Ultrasound (US)	1. Further investigation of the patient's enteritis 2. Conflict of opinion as to the cause of the patient being on home oxygen 3. Units in tertiary hospitals in the city should be more supportive of country hospitals
	Validation	1. Communication 2. HDU/ICU resuscitation	1. Miscommunication between the hospitals 2. Patient was NFR (not for resuscitation) – shouldn't have attempted resuscitation
Neurosurgery	Original	None	None
	Validation	None	None
Neurosurgery	Original	None	None
	Validation	None	None

Gynaecology	Original	1. Vascular damage at laparoscopic entry 2. Use of the Verres needle vs. Hasson cannula 3. Seniority and availability of senior surgical staff 4. Method of vascular repair	1. Vascular damage at laparoscopic entry 2. Use of the Verres needle vs. Hasson cannula 3. Seniority and availability of senior surgical staff 4. Method of vascular repair
	Validation	1. Large vessel injury is lateral deviation of the needle or trocar at the time of insertion 2. Lack of immediate back up from more senior and experienced surgical staff 3. Attempted repair of the injured vessels before clamps were applied to prevent further major blood loss (e.g. aorta clamp)	1. Large vessel injury is lateral deviation of the needle or trocar at the time of insertion 2. Lack of immediate back up from more senior and experienced surgical staff 3. Attempted repair of the injured vessels before clamps were applied to prevent further major blood loss (e.g. aorta clamp)
Ophthalmology	Original	1. Patient had a Hypertrophic Obstructive Cardiomyopathy (HOCM) undiagnosed but underwent a general anaesthetic (GA) with ASA III-e, noted to be hypotensive on previous GA – but no evidence of Electrocardiogram (ECG) done 2. Junior resident not getting support from surgical /ENT/medical registrars regarding patient management on account of refusing to care for ophthalmic patients 3. CT orbit showed superior orbital mass and no fluid collection, operative notes are sketchy but operation did not target CT findings	1. Cause of death from undiagnosed hypertrophic obstructive cardiomyopathy and that the orbital mass was of a sebaceous cell carcinoma 2. Manner of surgery performed – no reference to any opinion from an orbital occuplastic consultant or neurosurgeon 3. ?Non-ophthalmic hospital where the surgical and Ears, Nose, Throat (ENT) registrar devolved themselves of responsibility to an “ophthalmic patient” when requested for advice by the night resident on call despite the fact there was no obvious covering ophthalmic registrar, leaving the resident and patient care in limbo
	Validation	1. Postoperative care of agitated patient 2. Initial diagnosis of orbital cellulitis	1. Failure to manage hydration in an agitated patient postoperatively 2. Incorrect initial diagnosis of orbital cellulitis 3. Senior staff should have been available for support and supervision of junior staff in such a difficult situation
Orthopaedic	Original	None	None

	Validation	None	None
Orthopaedic	Original	None	None
	Validation	None	None
Otolaryngology	Original	None	None
	Validation	None	None
Plastic	Original	1. Active myeloma 2. Anaemia 3. Motor neurone disease 4. Ulcers of left foot and calf	1. Delayed involvement of neurology and medical unit 2. Delay in diagnosis 3. Inadequate communication between all registrars and their consultants 4. Oncologist follow up inadequate
	Validation	1. Apparent disinterest by medical team on admission directing Mx/assessment of overall condition and underlying deterioration 2. Possibly helpful, competent but somewhat unexperienced registrar should have consulted surgeon regarding medical team's reluctance to take charge 3. Acute deterioration 1.5 hours after given small amount (1.5mg) morphine via peg (by palliative care) to decrease respiratory effect due to decreased GCS. Cause and effect unclear.	1. Medical team declining involvement with the patient when initially contacted by the emergency department 2. Inexperienced plastic surgery registrar assisting the patient on advice from the medical registrar

Urology	Original	1. Hyponatreaemia - timing of onset not known but could have been as early as day seven? Altered mental state 2. Decision not to do cystoscopy for continuing clot retention	1. A cystoscopy is often done prior to the commencement of Tranexamic acid but there is no comment as to why this was not done 2. Even junior members of the management team may have an observation which is pertinent to the overall management of the patient
	Validation	1. Late recognition of urosepsis 2. Late involvement of another physician 3. Focus of only one measure to control prostatic bed bleeding 4. Non-use of S/C heparin or clexane and fluid balance issues	1. Antibiotics should have been used during the re catheterisation attempts 2. Full blood examination was not recorded until towards the end of the second week when anaemia, hyponatraemia and sepsis were identified – should have been done earlier 3. Physician opinion should have been sought after earlier for a greater chance of identifying the complications
Vascular	Original	1. Preoperative investigation/imaging 2. Choice of operation based on lack of imaging	1. Adequate pre-operative angiography would have detected the severity of the proximal aorto iliac artery occlusive disease 2. Pre-operative decision making would have been improved with adequate assessment
	Validation	1. Inadequate preoperative information	1. More detailed investigations in such sick patient required
Vascular	Original	1. Palliation or operation 2. Ax-bifemoral instead of Ax-femoral	1. Initial decision to palliate may have been a better option 2. First operation as ax-bifemoral graft may have prevented second operation
	Validation	1. The patient was seen in ED the day before admission and there is a possibility that the diagnosis was missed 2. That the patient was 94 had renal failure and a very high CK consideration not to operation at all 3. The choice to revascularise one leg at the first operation rather than both	1. Delay in diagnosis 2. Decision to operate

3. Discussion

This validation audit was undertaken to give some perspective on inter-assessor variation between surgeons providing second-line assessments to VASM. In this study the numbers are small and there is of course no 'gold standard' and the assessment process itself involves some degree of subjectivity, 100% agreement between observers could therefore not be expected. Both groups of assessors are Fellows of the Royal Australasian College Of Surgeons or the Royal Australian and New Zealand College of Obstetricians and Gynaecologists and selected to assess cases relevant to their specialties.

A careful review of the outcomes in section 2 of the results shows there was frequent agreement between the original and validation assessor. There was no definite trend in the degree of criticism expressed by either.

When we look at the individual clinical issues raised by assessors and tabled in section 2.10, there is again no definite trend in degree of criticism expressed by original and validation assessors. When you study the actual comments provided by both groups of assessors the same clinical issues are often raised but in slightly different ways.

There would appear to be some trends in reporting of the incidence of areas of consideration, areas of concern and adverse event (Table 3). The validation assessors list 23 clinical issues under these categories as against 27 by the original assessors.

In this series of cases, the original assessors found two adverse events while the validation assessors only identified one adverse event. One of the adverse events were identified by both the original and validation assessor, while the other adverse event was identified by the original assessor but was mentioned in the validation assessor's report.

4. Conclusion

In this series of audited cases comparing second-line assessments provided by two comparable groups of clinical assessors we have found no reason to doubt the validity of the audit process with a high percentage (85%) of matches on the clinical issues, highlighting the value for such peer review processes in improving patient care in Victoria and nationally.

5. Recommendations

- Continue to support the current review process.
- Encourage assessors to utilise the VASM assessment guidelines.
- Make sure that all fields on the form have been completed and there are no blank fields (move towards compulsory electronic data submission).
- Carefully evaluate the questions related to use of critical care services and develop changes which can provide a more definite outcome.
- Develop assessor peer-review process workshop to assist in completing assessments.
- Repeat this review every two years.

Appendix 1 – Summary of differences between assessors

Table 4. Summary of differences between reviewers.

Question on form	Cardiothoracic (1)	Cardiothoracic (2)	General (1)	General (2)	General (3)	Neurosurgery (1)	Neurosurgery (2)	Gynaecology	Ophthalmology	Orthopaedic (1)	Orthopaedic (2)	Otolaryngology	Plastic	Urology	Vascular (1)	Vascular (2)	**Total**
Records Medical Admission Notes	*0*	*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	4
Records Medical Follow-up Notes	*0*	*1*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	4
Records Procedure Notes	*0*	*0*	*0*	*0*	*1*	*1*	*1*	*0*	*1*	*1*	*0*	*1*	*0*	*0*	*0*	*1*	7
Records GP Case Summary	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*1*	*0*	*1*	*0*	*0*	*1*	*0*	*1*	5
No Operation Assessment	-	-	*0*	-	*1*	*0*	*0*	-	-	*0*	-	*0*	-	-	-	-	1
Pre Operative Management	*1*	*0*	-	*0*	-	-	-	*0*	*1*	-	*0*	-	*1*	*0*	*0*	*1*	4
Operation Decision	*0*	*0*	-	*0*	-	-	-	*0*	*1*	-	*0*	-	*1*	*0*	*0*	*0*	2
Operation Type Choice	*0*	*0*	-	*0*	-	-	-	*0*	*1*	-	*0*	-	*1*	*0*	*0*	*0*	2
Operation Timing	*1*	*0*	-	*1*	-	-	-	*0*	*0*	-	*0*	-	*0*	*0*	*0*	*0*	2
Intra Operative Management	*0*	*0*	-	*0*	-	-	-	*0*	*1*	-	*0*	-	*0*	*0*	*0*	*0*	1
Deciding Surgeon Grade Experience	*0*	*0*	-	*0*	-	-	-	*0*	*1*	-	*0*	-	*1*	*0*	*0*	*0*	2
Operating Surgeon Grade Experience	*0*	*0*	-	*0*	-	-	-	*0*	*1*	-	*0*	-	*0*	*0*	*0*	*0*	1
Post Operative Care	*0*	*1*	-	*0*	-	-	-	*0*	*0*	-	*0*	-	*0*	*1*	*0*	*0*	2
Risk of Death	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*0*	*1*	*1*	*1*	*1*	*0*	7
ICU	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	1
ICU Benefit	-	-	*1*	-	*1*	-	-	-	*1*	-	*0*	-	*1*	-	-	-	4
HDU	*1*	*1*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*1*	*0*	*0*	*1*	*0*	6
HDU Benefit	-	-	*1*	-	*1*	*0*	*0*	*0*	*1*	-	*0*	-	*0*	*1*	-	*0*	4
DVT Prophylaxis Appropriate	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	3
Fluid Balance Issue	*0*	*1*	*0*	*0*	*1*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	5
Adverse Events	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	0
Total	4	4	2	4	8	1	2	0	12	3	1	3	9	4	2	8	**67**

Appendix 2 – Percentage values of differences between assessors

Table 5: Summary of differences between reviewers in percentages

Specialty	Cardiothoracic	General	Neurosurgery	Gynaecology	Ophthamology	Orthopaedic	Otolaryngology	Plastic	Urology	Vascular	**Totals**
Cases validated (n)	2	3	2	1	1	2	1	1	1	2	**16**
Fields checked (n)	140	210	140	70	70	140	70	70	70	140	**1120**
Differences (n)	8	14	3	0	12	4	3	9	4	10	**67**
Differences (%)	**6**	**7**	**2**	**0**	**17**	**3**	**4**	**13**	**6**	**7**	**6**

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