



Assessment Guidelines

INTRODUCTION

The Australian and New Zealand Audit of Surgical Mortality (ANZASM) evaluation process is an independent peer review of the death of a patient, focusing on surgical care during the course of admission. Independent peer review of adverse in-hospital events can help identify deficient processes and foster the implementation of evidence-based protocols that improve outcomes.¹⁻⁵

Evaluation of surgical mortality by ANZASM follows a structured approach of first- and second-line assessment. The guidelines that follow, address how these assessments should be conducted. They should be completed in the spirit of empathic enquiry and provide sufficient detail for a clear view of events. Critiques should be made in a detached manner and any opinions expressed should be objective and reasonable.

Assessors should consider whether the management of the case they are assessing adhered to a reasonable care pathway. If the assessor feels that the case was not reasonably managed, the assessor must consider whether the deviation from the accepted care pathway was significant and if there was sufficient justification for the deviation.

ANZASM assessments can take 2 forms:

First-line assessment involves reviewing the surgical case form submitted by a consultant surgeon, highlighting any queries or concerns (including recommending if any issues require more in-depth assessment), then providing brief feedback accordingly.

Second-line assessment involves the review of medical notes and the generation of a brief report summarising the clinical progression and highlighting any clinical management issues.

FIRST-LINE ASSESSMENT

All eligible cases require a first-line assessment. It is important that all sections of the assessment are completed. This will enable ANZASM staff to accurately code the case and reliably track state and national trends in mortality.

Potential challenges that may affect the quality of patient care include:

- inadequate communication between healthcare teams or between patients/families and healthcare providers
- inadequate use of critical care facilities
- delayed diagnosis and/or recognition of complications
- systemic issues that impede access and cause delays.

Assessors are asked to consider the following definitions when evaluating any potential clinical management issues that may have occurred during the course of patient care:

- *Area for Consideration*: the clinician believes an area of care could have been improved or different but recognises that this may be an area of debate.
- *Area of Concern*: the clinician believes that an area of care should have been better.



- *Adverse Event*: an unintended injury caused by intervention rather than by the disease process, which is sufficiently serious to lead to prolonged hospitalisation or to temporary or permanent disability of the patient, or which contributes to or causes death.

When to request second-line assessment:

- significant errors are thought to have been made during the pathway of care
- a case note review could usefully draw attention to lessons to be learned, either for clinicians involved in the case or as part of collated assessments for wider distribution
- an unexpected death has occurred (e.g. in theatre, during elective surgery for benign disease, during day-case surgery, young patient).

The first-line assessor must indicate on the assessment form why a second-line assessment is being requested.

A second-line assessment is unnecessary when obvious deficiencies of care, including adverse events, are identified from the surgical case form, or if the first-line assessor feels that no further useful information can be gained.

SECOND-LINE ASSESSMENT

A second-line assessment (case note review) is necessary to clarify issues of patient management identified or suspected in the first-line assessment.

Second-line assessors should consider the following key areas when writing their report:

- appropriate and timely diagnostic and therapeutic measures
- correct indication and timing of:
 - operations
 - interventions
 - intensive care
 - resuscitation orders
 - palliative care treatment orders
- consideration of and adherence to guidelines
- monitoring of the treatment process
- effective interdisciplinary cooperation
- accurate documentation of patient management and patient records
- appropriate use of deep vein thrombosis/pulmonary embolism (DVT/PE) prophylaxis before, during and after surgery.

The second-line assessment report should adhere to the following structure:

- succinct one-line title
- short history and factual account of clinical events (Case Summary)
- constructive comments on what could have been done differently (Discussion)
- suggested changes in practice that could be implemented to avoid repeat occurrences of deficient care, citing references if appropriate (Clinical Lessons)

Some example cases have been included for reference on the following pages.

REFERENCES

1. Crebbin W, Beasley S, Tobin S, Guest G, Duvivier R, Watters D. Judgement: clinical decision-making as a core surgical competency. *ANZ J Surg.* 2019;89(6):760-3.
2. Hut-Mossel L, Ahaus K, Welker G, Gans R. Understanding how and why audits work in improving the quality of hospital care: A systematic realist review. *PLoS One.* 2021;16(3):e0248677.
3. Krahwinkel W, Schuler E, Liebetrau M, Meier-Hellmann A, Zacher J, Kuhlen R, et al. The effect of peer review on mortality rates. *Int J Qual Health Care.* 2016;28(5):594-600.
4. Lui CW, Boyle FM, Wysocki AP, Baker P, D'Souza A, Faint S, et al. How participation in surgical mortality audit impacts surgical practice. *BMC Surg.* 2017;17(1):42.
5. Turner RC, Simpson S, Jr., Bhalerao M. Systemic predictors of adverse events in a national surgical mortality audit: analysis of peer-review data from Australia and New Zealand Audit of Surgical Mortality. *ANZ J Surg.* 2019;89(11):1398-403.

Example 1

Delay in recognition of gastric perforation after laparoscopic fundoplication

Case summary

A 5-year-old child with global developmental delay, autonomic dysfunction, congenital hypothyroidism, history of severe infantile spasm, chronic lung disease and diabetes insipidus underwent laparoscopic fundoplication with formation of a feeding gastrostomy.

The indication for fundoplication was not clear. The case notes indicated that the child had one ICU admission earlier in the year and two hospital admissions the previous year for aspiration pneumonia. Possible causes for the aspiration episodes included pharyngeal incoordination, pooling of saliva, or abnormal oesophageal peristalsis leading to poor oesophageal clearance. The child was on home oxygen for chronic lung disease with poor lung reserves.

On postoperative day 1, chest X-ray showed a complete whiteout on the left side requiring bilevel positive airway pressure. The patient became febrile (38.2°C) the next day, with scrotal wall oedema and discolouration. Ticarcillin and gentamycin were administered for collapse/consolidation of the right and left lower lobes. On postoperative day 3, the child was tolerating 30 ml/hour gastrostomy feeds.

In the early hours of postoperative day 4, the patient became unsettled and febrile and had a very distended abdomen, leading to increasing oxygen requirement. Gastrostomy feeds ceased at this stage. Over the course of the day, the patient became increasingly unwell, requiring intubation and ventilation with inotropic support to maintain blood pressure. This was complicated by a difficult intubation and cardiac arrest for 16 minutes requiring CPR and left-side pneumothorax. The clinical picture was consistent with that of septic shock. The abdominal distension accompanied by scanty bowel sounds and scrotal wall oedema/discolouration suggested an intra-abdominal source. The patient was considered to be too unwell to undergo any radiological investigations to rule this out.

On postoperative days 6 and 7 the patient was haemodynamically stable, but still on weaning doses of inotropes. Leakage of large volumes of yellowish-green fluid around the gastrostomy site was noted. Despite a request from the surgical team for a CT scan of the abdomen and pelvis, the patient did not have an abdominal ultrasound until postoperative day 12, which showed infrahepatic fluid collections. The surgical team opted to manage this conservatively. On postoperative day 14, ultrasound-guided aspiration of the intra-abdominal collections (500 ml) revealed purulent fluid. On postoperative day 15, methylene blue instilled via the gastrostomy tube leaked out via the abdominal drain, indicating a perforation in the stomach. The patient was taken for laparotomy on postoperative day 17, which revealed a perforation in the fundus of the stomach and complex pus collections in the abdomen. The patient continued to deteriorate.

A second laparotomy 6 days later showed a missed perforation on the posterior wall of the oesophagus. By this stage, the septic cascade had escalated to an irreversible point, with disseminated intravascular coagulation and abdominal compartment syndrome. Emergency laparostomy in the ICU was performed to relieve the abdominal pressure. Withdrawal of care commenced after extensive discussion with the parents and all treating teams.

Discussion

This child with significant comorbidities presented a difficult and challenging case in the event of deterioration. In any child deteriorating following an abdominal operation the first and foremost priority from the surgical team is to rule out any surgical complication.

There was significant delay in establishing the surgical complication clinically and radiologically. From postoperative day 4 onwards the patient's abdomen was the source of concern, according to the case notes. It is unclear why physical signs were missed regarding the ongoing concern of the abdomen. The delay in getting



any form of abdominal imaging to exclude intra-abdominal sepsis is not clear. A bedside ultrasound scan of the abdomen could have given some clue. Only by postoperative day 12 was an abdominal ultrasound done. The initial bilateral basal lung consolidation had diverted attention from the abdomen.

A less invasive procedure such as a gastrojejunal feeding tube via a percutaneous endoscopic gastrostomy would have been a better alternative, given this patient's significant comorbidities.

Clinical lessons

A very low threshold must be observed to rule out a surgical complication in a child who unexpectedly deteriorates in the immediate postoperative period. Appropriate and timely investigations can lead to a better outcome.

Example 2

Death of a patient from sepsis following complex spinal decompression

Case summary

A man in his 60s was admitted to the hospital palliative care unit by the urology team who had been treating him for prostate cancer (diagnosed 6 years earlier). He was admitted with significant signs of leg weakness, numbness and back pain, and signs of spinal cord compression consistent with a large metastatic lesion at T10 level. Other lesions throughout the skeleton were noted on bone scan, including pelvis, femora, left shoulder and spinal canal (multiple levels). The patient had deranged liver function. He was relatively malnourished, with advanced malignancy, and was on dexamethasone. A review by the spinal team identified impending paraplegia and incontinence. The team anticipated rapid deterioration.

After gaining informed consent, it was decided to perform a decompression surgery and fixation of the thoracic spinal column between T8 and T12. Decompression of the T9/10 level was included with debulking of the tumour. A dural tear occurred intraoperatively, with leaking of spinal fluid.

Five days later, the patient was returned to the operating theatre due to deteriorating neurological status (postoperative Medical Research Council grading of muscle power at least IV/V). His wound also demonstrated radiological signs of fluid collection. An MRI scan confirmed a large fluid collection likely to be blood and spinal fluid. Intraoperative findings included a dural tear, which was not directly repairable but patched with various agents. Over the following days, the patient developed signs of infection, sepsis and meningitis. This led to an overwhelming infection and the death of the patient.

Discussion

This case highlights the fragility of patients who have advanced metastatic disease. The patient presented in a severe situation with spinal cord compression and impending paraplegia. This prompted a difficult decision for the spinal team: Should a decompression be performed plus fixation of the spinal pathological fracture and metastatic lesion at the T10 level? Or should palliation be accepted at an earlier stage?

There appeared to be good communication between urology, palliative care and the spinal team, as well as appropriate informed consent for this patient and his relatives. In retrospect, however, it appears obvious that this patient was profoundly unwell with a deconditioned and malnourished state preoperatively. His impending paralysis would have advanced reasonably rapidly had it not been for the decompression surgery. This operation was complex, in relation to the advanced tumour bulk and the relatively poor condition of soft tissue typical of advanced metastatic cancer patients. The dural tear may have been avoidable; however, in the context of a complex operative field, soft and poor tissue quality, and the complexity of the procedure, it is not unreasonable to expect a relatively high chance of a dural tear.

The occurrence of a dural leak is not surprising. It was identified with subsequent imaging and required further surgical treatment. Intraoperative antibiotics were provided appropriately at the first surgery and specimens were collected at the second surgery. Consultation with the infectious diseases team included tailoring of the patient's antibiotics. He was also covered appropriately with deep vein thrombosis prophylaxis. Presumably, the wound haematoma and fluid collection became infected, and this extended to the meningeal space with meningitis becoming part of the diagnosis, leading to the patient's death in an overwhelmed septic state.

Clinical lessons

A patient with advanced metastatic prostate malignancy and impending spinal cord compression presents a difficult surgical decision. The correct answer and the correct treatment is not always obvious, even in retrospect. The complexity of such a spinal surgery is not to be underestimated and must be attended to by experienced personnel, as was the case in this situation.