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Foreword

This is the second collection of case studies for the Collaborating Hospitals’ Audit of Surgical Mortality (CHASM) in NSW. CHASM is a peer review process conducted by surgeons for surgeons and aims to improve the quality and safety of care throughout our public hospitals.

This year, fourteen cases have been selected from those submitted for a second line review – a thorough case history review by an independent surgeon from the same specialty but remote from the hospital from which the case we reported. It is noteworthy that, again, concerns about aspiration pneumonitis and venous thromboembolism are evident.

This volume also highlights the need for a great awareness of the patients’ situation which can dictate decision not to operate as well as when to operate. The use of technology, in particular radiology, to assist in diagnosis and early management is also highlighted as is the need to manage sepsis early and aggressively.

This volume should prompt the surgeon-reader to ask some questions:

• What would I have done in the same circumstance?
• What have I learned from this case?
• What practice changes will I implement on the basis of the information provided?

It is the answer to these three questions that will provide the stimulus for clinical practice improvement whatever the specialty and wherever the hospital.

Cliff Hughes, AO
Chief Executive Officer
Clinical Excellence Commission
Introduction

In this second CHASM casebook, we continue the theme of reflective learning as a means to improve surgical practice. We have collected 14 surgical cases where there are issues of interest to surgeons in general, surgical trainees and other clinical health professionals.

The theme of the collection is venous thromboembolism (VTE) prophylaxis with three illustrative cases and a narrative by Dr Mauro Vicaretti, Senior Lecturer, Vascular and Endovascular Surgery, Sydney Medical School and CHASM committee member. Mauro has included a comprehensive list of references.

Although aspiration pneumonitis remained a condition frequently associated with patient mortality in NSW public hospitals this year, other emerging themes were communication, clinical leadership, assessment and care of the deteriorating patient and support for junior medical staff. Also highlighted is the need for a Statewide teleradiology service from rural and remote areas to central hubs. Such a service would allow much greater efficiency and timeliness of clinical decision-making, often in emergency situations.

Sharing the learnings from cases such as these will benefit surgeons, trainees and ultimately our patients, enabling us to continue high quality surgical care in NSW. The vast majority of patients die with a heavy burden of illness and co-morbidity, many under emergency circumstances. Optimal care demands a thoughtful approach with consultation and communication as integral components in decision-making.

Again, we gratefully acknowledge and thank the contribution and participation of surgeons to the CHASM program. Without your support, there would be no audit and no cases for discussion and reflection. The committee hopes that you will find this case book useful and we welcome any feedback you may care to provide.

Michael Fearnside, AM
Chairman
CHASM Committee

Joseph Lizzio
Deputy Chairman, CHASM Committee
Chairman, NSW State Committee,
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Venous thromboembolic prophylaxis

Case 1

A patient in her seventies was admitted to hospital following a fall at home. She had dislocated her right elbow and fractured her left fibula at the ankle. She underwent a closed reduction of the dislocated elbow and application of a plaster cast to the left leg. It took some days for a walking cast to be applied to the left leg as the injury occurred during the Christmas period when there was reduced activity. She was assessed as being inappropriate to discharge and required further rehabilitation.

An episode of tachycardia and dyspnoea was recorded one evening but was not investigated. A similar episode occurred the next day. She was transferred to the high dependency unit for observation. The following day, she complained of pain in the right elbow and 2 days later was seen by a registrar who ordered an x-ray of the right elbow. When it was reviewed the next day, a recurrent dislocation was diagnosed. An open reduction and internal fixation was planned in 4 days time.

Immediately pre-operatively, it was realised that the patient was not receiving thromboprophylaxis and it was withheld because surgery was planned for the following day. The operation was uneventful. The day after surgery, an acute cardiorespiratory event occurred while the patient was transferring to a shower chair and a cardiac arrest occurred. Resuscitation was unsuccessful. A presumptive diagnosis of pulmonary embolism was made by the treating team. No autopsy was performed.

Surgical learnings:

- Multiple teams were involved in the care of an elderly patient who had limited mobility
- No venous thromboembolic (VTE) prophylaxis was given
- Episodes of tachycardia and dyspnoea merit further investigation.
- There was delayed access to the operating theatre for the surgical team. Optimal care would have been for earlier surgical treatment
- Hospital protocols should ensure that venous thromboprophylaxis is considered and documented in every patient.
Venous thromboembolic prophylaxis

Case 2

A male patient in his eighties was admitted for short stay elective treatment of bilateral inguinal hernias. There was a history of previous myocardial infarction 4 years earlier with recovery and good exercise tolerance with no cardiac symptoms.

The bilateral inguinal hernia repair was performed uneventfully.

The patient ceased taking aspirin 5 days prior to surgery and was given no thromboprophylaxis.

Post-operatively, after 4 days of being “unwell”, sudden death occurred. While the death may have been due to myocardial infarction, pulmonary embolism was a possibility. No autopsy was performed.

The assessor commented that despite day-only surgery, patients, particularly if elderly, are still less ambulant than normal when they are discharged. There is increasing evidence that calf pumps or stimulators, TED stockings and peri-operative subcutaneous heparin lessens the risk of peri-operative thrombotic disease even in minor procedures which prevent immediate return to normal activity.

Surgical learnings:

- Unless contraindicated, VTE prophylaxis should be considered for day-only and short stay patients undergoing operations.
- Although the incidence of VTE is low for day surgical cases, surgical and/or patient factors may increase the risk, necessitating VTE prophylaxis on the day of surgery and continuing post-operatively.
Venous thromboembolic prophylaxis

Case 3

A patient in his forties was admitted with abdominal pain due to acute appendicitis. Antibiotics were started and the next morning, an uneventful appendicectomy was performed. Elastic stockings were used during the surgery. The first dose of prophylactic heparin was given 12 hours post-operatively. The patient was discharged but readmitted 6 days later with a wound infection. Heparin was started the next morning. On the third day following the second admission, a cardiorespiratory arrest occurred. An autopsy confirmed that the cause of death was a pulmonary embolus.

There is no personal nor family history of vascular or particularly, venous disease.

Surgical learnings:

• VTE prophylaxis has been shown to decrease the incidence of VTE in medical and surgical patients although the reduced risk is not zero

• Unless contraindicated, prophylactic heparin should be started pre-operatively. When a diagnosis has been made and a treatment plan is being formulated in the emergency department, VTE prophylaxis should be considered in consultation with the surgical team, in anticipation of surgery
Prophylaxis for venous thromboembolism.

Venous thromboembolism (VTE) is a common disorder which remains a major cause of death in hospitals with a conservative incidence of 7%\(^1\). It accounts for more deaths than breast, lung, prostate or bowel cancer and is responsible for the long-term morbidity associated with the post-thrombotic syndrome or with pulmonary hypertension\(^1\).

In-hospital incidence of deep venous thrombosis (DVT) in those patients not receiving any form of thromboprophylaxis is approximately 10-40%. Following major orthopaedic procedures it rises to 40-60%, and in major trauma, spinal cord injuries and critical care patients, the incidence approaches 80%\(^2\).

Thromboprophylaxis for VTE has been shown to be effective in significantly reducing the incidence of DVT and fatal PE\(^3\). Despite this, VTE thromboprophylaxis in the surgical setting remains underutilised\(^4\).

There are 2 main arms to VTE prophylaxis, pharmacological (low-molecular weight heparin, unfractionated heparin sodium, fondaparinux, warfarin and the direct thrombin inhibitor dabigatran etexilate), and/or mechanical devices (graduated compression stockings and or intermittent pneumatic compression). For patients with complex conditions or co-morbidities, preoperative consultations with colleagues such as anaesthetists, vascular surgeons or physicians (haematologists, cardiologists) are appropriate.

Although the risk of VTE prophylaxis is generally reported as being low, therapy needs to be individualised to balance thromboembolic risk versus risk of therapy, either pharmacological, mechanical or a combination of both.

A number of international consensus statements\(^2,5\) are readily available which provide guidance for the surgeon on the appropriate use of thromboprophylaxis. These are detailed reviews of the current literature for all specialties of surgery. They have been summarised by the Australian and New Zealand Working Party on the Management and Prevention of Venous Thromboembolism\(^6\) and presented in a pocket book format, allowing easier reference for risk stratification and treatment options.
A VTE risk assessment should be undertaken on all patients utilising the following steps:

1. Assessment of the baseline risk of VTE, inherited and or acquired risks for thromboembolism
2. Assessment of the VTE risk related to hospitalization, underlying medical condition and surgery proposed
3. Assessment of potential bleeding risk during a specific surgical procedure (e.g. neurosurgical) and absolute (hypersensitivity, heparin induced thrombocytopaenia syndrome, inherited clotting disorder) or relative (renal or hepatic dysfunction) contraindication to VTE pharmacological therapy
4. Contraindication to mechanical prophylaxis (lower limb deformity, significant peripheral vascular disease)
5. Determine the overall risk
6. Implement appropriate thromboprophylaxis.

There may be a continued risk of VTE following discharge and it is recommended that non-pharmacological means of thromboprophylaxis are continued (graduated calf compression) until the patient is fully mobile. The risk of DVT for those undergoing day surgery is considered to be generally low and thus thromboprophylaxis is usually by mechanical means. Although the incidence is low it is imperative to recognise that the surgical procedure performed and potential patient VTE risk factors may increase the risk warranting pharmacological thromboprophylaxis. These increased factors should be accounted for on discharge to prevent the late presentation of VTE.

In a subset of the surgical population, thromboprophylaxis should be continued for 28-35 days following discharge. This includes those patients undergoing hip fracture or hip replacement surgery or patients after major abdominal or pelvic surgery for cancer, especially in patients who are obese, slow to mobilise or have a past history of VTE.

Thromboprophylaxis in the prevention of VTE “is not optional but is part of the duty of care obligation of surgeons.”

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References

1. Chong BH, Braithwaite J, Harris MF and Fletcher JP. Venous thromboembolism — a major health and financial burden: How can we do better to prevent this disease? MJA 2008; 189:134-5.


Unrecognised dislocation of hip prosthesis

Case 1

An elderly patient was transferred from Hospital A to Hospital B for investigations following surgery for a fractured neck of femur.

In Hospital A, the patient had a total hip replacement (THR) to treat a fracture of the neck of her right femur, following a fall. The THR was unstable and at least one reduction was required. At some stage, a decrease in haemoglobin was noted and a large retro-peritoneal and pelvic haematoma was identified. The patient was transferred to Hospital B for an angiogram, but no bleeding site was identified. She was then transferred back to Hospital A. The angiogram report stated that the right hip was dislocated. Throughout the admission, this was never acknowledged in the clinical record and the dislocation continued until the patient’s death 10 days later.

There were many co-morbidities, including emphysema. Complications included pneumonia, probably secondary to aspiration and a sacral pressure ulcer, hypokalaemia and impaired nutrition, causing peripheral oedema.

Although the patient died from respiratory failure, the second line assessor felt that a reduced hip may have improved mobility which, in turn, may have improved respiratory function. The other concern was that, other than for the patient’s period in ICU, there was no record in the notes that a consultant reviewed the patient in the last 10 days of her life.

Surgical learnings:

• A consultant must take primary responsibility for patient management.
• The doctor who orders the test has a responsibility to obtain and act on test results
• At handover, the doctor who ordered the test must inform the person taking over about the test
• It is desirable, where possible, that a geriatric consultation occurs for all elderly patients who have a fractured neck of femur.
CT scans and the acute abdomen

**Case 2**

An elderly male was admitted to a hospital on a Saturday night. The history was of increasing confusion for several days and abdominal pain and distension associated with vomitting for 2 days.

Examination revealed a distended but non-tender abdomen and an irreducible left inguinal hernia. An x-ray of the abdomen demonstrated a small bowel obstruction. He had tachycardia and tachypnoea.

The patient was seen by a surgical registrar and the next morning by the consultant. The management plan was for probable surgery following a CT scan. There was difficulty obtaining the CT scan, as it was a Sunday.

The patient became confused and tried to get out of bed. The intravenous line was pulled out and re-inserted. Urine output was low. A junior medical officer reviewed the patient early the next morning. His abdomen became tense and distended. No other members of the surgical team were informed of the deterioration in the patient’s condition.

At midday the patient collapsed after vomiting and was thought to have aspirated. A cardiorespiratory arrest occurred and resuscitation was unsuccessful. An autopsy revealed a small bowel obstruction, due to a mesenteric band from the liver to the caecum.

A nasogastric tube had not been inserted on admission or pre-operatively. Delay in obtaining a CT scan further delayed diagnosis and definitive treatment.

**Surgical learnings:**

- Aspiration remains a common cause of morbidity and mortality
- Where a CT scan is not readily available, surgical decision making should be based on clinical findings. Waiting to obtain a CT scan may not have been ideal management
- In all hospitals where surgical emergencies are treated and where a CT scan is available, 24-hour CT scan access is optimal
- Changes in a patient’s condition should be notified to a more senior member of the surgical team promptly.
Recognition of paralytic ileus

Case 3

A male in his middle 60s was admitted for an ultra-low anterior resection, with a colonic J pouch, a pouch anal anastomosis and loop ileostomy for the treatment of a low rectal cancer. His co-morbidities included hypertension, chronic obstructive airways diseases, sleep apnoea and carotid vascular disease.

The abdominal surgery was uneventful. Initially, his post-operative course gave no cause for concern. There was some early ileostomy action. Clear fluids orally were started. The urinary catheter was removed and a light diet started.

By post-operative day 3, it was noted that VTE prophylaxis had not started and subcutaneous heparin was given. On post-operative day 4, the patient became confused and agitated. He was suspected of suffering alcohol withdrawal and was treated with diazepam, thiamine and haloperidol. Sputum retention and bilateral pulmonary infiltrates were present on a chest x-ray and atrial fibrillation was diagnosed. Investigations excluded pulmonary embolism.

On post-operative day 5, the abdomen was reviewed by a CT scan which suggested paralytic ileus. Clear fluids were continued but abdominal distension persisted. In the early hours of post-operative day 7, an emergency call was made. Two hours later, a nasogastric tube was inserted and he was placed on nil by mouth, after he vomited 3 litres of faeculent fluid. A further 2.5 litres were aspirated. Pulmonary aspiration was recognised to have occurred. Despite resuscitation, his condition continued to deteriorate and death occurred a few hours later.

Surgical learnings:

- If the decision is made not to insert a nasogastric tube pre-operatively, junior surgical staff and nursing staff need to be aware of the physical signs and radiological features of post-operative ileus, which would permit recognition and management of the condition
- Earlier insertion of a nasogastric tube may have prevented vomiting and probable aspiration leading to death.
Palliative care or surgery?

Case 4

A patient in her early 50s with disseminated melanoma was admitted to hospital with a small bowel obstruction.

A diagnostic laparoscopy with sampling of the ascitic fluid was performed. No malignant peritoneal disease was identified. Two weeks later, a laparotomy was performed at which time metastatic melanoma causing small bowel obstruction in at least 2 sites was identified. Two de-functioning ileostomies were performed. Surgery was uneventful. Although the patient was managed in the intensive care unit (ICU) post-operatively, further active treatment was considered futile and the patient died.

The assessor commented that palliative surgical management was in such cases a major challenge and provided difficulties with decision making. Quality of remaining life was important to the patient and family. The surgeon needs to have the courage to do enough but the judgement not to do too much.

If the extent of the melanoma had been known following the laparoscopy, an alternative management plan might have been palliative and less active with a nasogastric tube, intravenous fluids and analgesia. The behavior of malignant melanoma is, however, unpredictable and unlike many other malignancies.

Surgeons face difficult decisions, such as in this case, frequently.

Surgical learnings:

• Where death is inevitable and surgery palliative, are less invasive management options preferable to surgery?
• Consultation with a palliative care physician should be considered in these circumstances and then an informed decision and plan agreed with the patient, family and medical team.
A complication of arterial puncture for coronary angiography

Case 5

An elderly patient presented to Hospital A with breathlessness and was admitted under a medical team. Co-morbidities included hypertrophic cardiomyopathy, hypotension, atrial fibrillation and hyperlipidemia. Two days after admission, he became hypotensive and developed chest pain. Clopidogrel and enoxaparin were started. One week later, the patient was transferred to Hospital B for coronary angiography which was performed via a puncture of the right femoral artery.

Following the procedure, bruising and tenderness were noted in the right groin. The patient was transferred back to Hospital A. The next day, the bruising and swelling in the right groin increased. There was no further clinical concern recorded until 5 days later when the patient complained of severe right groin pain. Examination revealed a large tense swelling in the upper right thigh. An ultrasound was performed. The formal results were not included in the notes although a provisional diagnosis of ruptured pseudoaneurysm was recorded.

Several hours later, the patient became hypotensive and unresponsive. A medical emergency call was made. There was a massive expanding haematoma in the right groin. Transfer to Hospital C for specialist vascular care took three hours during which time resuscitation started with blood products and coagulation factors.

A CT scan showed a large haematoma in the right groin, extending up the anterior abdominal wall. Nine hours after admission to the ICU in Hospital C, surgery was performed to stop the bleeding from the femoral artery. The pathology appeared to be a ruptured pseudoaneurysm. Following surgery, hypotension persisted despite inotropes and the patient died 20 hours later.

Surgical learnings:
- Pseudoaneurysm is a complication of angiography and is a surgical emergency.
- Applying pressure to the groin to control bleeding is an effective initial manoeuvre to control blood loss from an artery.
- Immediate surgery is required to control blood loss.
- Ultrasound is an effective diagnostic tool for pseudoaneurysm.
- This complication may be treated using endoluminal techniques which may be preferable to an open operation.
Endobronchial bleeding following tracheostomy

Case 6

A patient had an uncomplicated aortic valve replacement with post-operative bleeding requiring transfusion and reopening of the chest for haemostasis. Respiratory failure complicated the post-operative course and intubation was required. On post-operative day 9, an appropriate decision was made to insert a tracheostomy. Coagulation studies and platelet count were normal prior to the tracheostomy procedure.

Within 1 hour of the tracheostomy procedure, the patient had a PaCO₂ of 60mm Hg but adequate PaO₂. Chest x-ray revealed right upper lobe consolidation or collapse. Blood clot was found obstructing the trachea, 3 hours after completion of the tracheostomy when the patient could not be ventilated. A hypoxic cardiac arrest was followed by death.

Surgical learnings:

- While the common cause of respiratory obstruction following tracheostomy is a misplaced tube, bleeding within the tracheobronchial tree is a less frequent, but important, cause.
- Bleeding may not be external, around the tracheostomy incision.
- Regular tracheostomy suctioning should alert the staff to this complication.
- Fine-bore bronchoscopy through the tracheostomy tube would have provided both a diagnosis and definitive treatment.
Early treatment of obstructive urosepsis (1)

Case 7

An elderly male diabetic patient was admitted to hospital A with fever, impaired consciousness, hypotension, renal impairment and offensive urine. The provisional diagnosis was urosepsis but ultrasound imaging was not performed for 24 hours after admission and there was no initial surgical review. Thirty six hours after admission a urology registrar in Hospital B was contacted to request transfer. The plan was for a CT scan of the abdomen and probable nephrostomy. Sixty-three hours after admission the patient was transferred. Ureteric stents were finally inserted 81 hours after initial admission to Hospital A. Despite treatment in intensive care, deterioration continued and the patient died.

Surgical learnings:

- Urosepsis in the elderly requires urgent treatment. This is all the more so, if urinary obstruction is present
- Early surgical (urology) consultation is essential and once the diagnosis of an obstructed urinary system with infection is made, early transfer to an appropriate hospital is necessary.
Early treatment of early obstructive urosepsis (2)

Case 8

A patient in the 70s with diabetes mellitus, hypertension and cardiovascular disease presented to an emergency department with clinical signs suggestive of left ureteric colic. The patient was haemodynamically stable. Blood was present in the urine and traces of nitrites were found, suggesting infection. Eight hours after admission, the patient was noted to be febrile. A urology registrar reviewed the patient 15 hours after admission and the diagnosis of an obstructed kidney was made on a CT scan. Hypotension continued overnight and the medical emergency team call was made the next morning, when the blood pressure had fallen further and anuria was present. It was only at this time that the urology team was notified about the deterioration. Despite urgent and appropriate treatment by the urologists, multi-organ failure resulted in death.

Surgical learnings:
• Particularly in a diabetic patient with sepsis and an obstructed kidney, early intravenous antibiotic therapy is critical
• Recognition by junior medical staff of the deteriorating patient - hypotension and anuria are critical observations requiring communication with senior medical staff.
A statewide image transfer system for radiology

Case 9

A previously well patient in the late thirties was admitted to Hospital A, having been found unconscious at home. Endotracheal intubation was required. A CT scan of the head revealed a large intracerebral haematoma. The patient was transferred to Hospital B.

At Hospital B, the patient was managed in the intensive care unit. The provisional diagnosis was a hypertensive haemorrhage. A further CT scan of the brain and an intracranial CT angiogram, which were performed 12 hours after admission, demonstrated a middle cerebral artery aneurysm adjacent to the haematoma. The patient was transferred to Hospital C.

The transfer took 6 hours, following which, surgery was performed to evacuate the haematoma and clip the aneurysm. Despite intensive supportive treatment, the patient died 14 days after admission to Hospital C.

Surgical learnings:

- Definitive treatment was delayed because the initial diagnosis was a hypertensive haemorrhage. Hypertensive haemorrhage is an uncommon condition in the thirties and an intracranial aneurysm, or arteriovenous malformation (AVM), was much more likely to have caused the bleeding
- Delay in diagnosis would have been avoided had a neurosurgical consultant or neuroradiologist been able to see the initial CT scan images. A Statewide radiology image-transfer system would facilitate diagnosis and treatment in these conditions.
Would an acute surgical service have helped?

Case 10

A previously fit male patient in his mid fifties was admitted to hospital with a short history of abdominal pain and constipation. An abdominal CT scan, performed 6 hours after admission, showed free gas in the peritoneal cavity and signs of hepatic cirrhosis. Three weeks earlier, he had been admitted to the same hospital and underwent uncomplicated surgery for a strangulated umbilical hernia.

A surgical registrar saw the patient 4 hours after the CT scan. He underwent an operation 3 hours after being seen by the surgical team. At laparotomy, a tiny perforation was found in the small bowel, this being the only gut pathology. A macro-nodular cirrhotic liver and ascites were present. The consultant oversewed the perforation, and reinforced the repair with an omental patch. Post-operatively, ICU management involved treatment of the consequences of faecal peritonitis, septicemic shock and coagulopathy. Ten days after admission, the patient died from multi-organ failure.

Surgical learnings:

- When a patient presents with a perforated viscus and the comorbidity of hepatic cirrhosis, delay in operative management contributes to morbidity and mortality.
- There was significant delay before a surgical registrar saw the patient and a plan was formulated. Although this is a common problem in large public hospitals, it may be less of an issue if there is a consultant surgeon available to assess patients who have acute surgical conditions (acute surgical service). In this case, the availability of a senior consultant may have expedited treatment.
- It was unclear whether the perforation was a rare and spontaneous event, or whether it was a late complication of the earlier surgery.
Abdominal complications of pneumonia

Case 11

A patient in the thirties was submitted to Hospital A with fever and abdominal pain. A CT scan of the chest revealed pneumonia. Co-morbidities included alcoholic pancreatitis and cirrhosis with portal vein thrombosis. The patient was transferred to Hospital B, a teaching hospital, for intensive care management, but developed multi-organ failure, requiring cardiovascular support. When a tender abdomen was noticed, a CT scan showed an oedematous ileum and colon. The patient deteriorated further and an exploratory laparotomy (performed within 24 hours of transfer) did not identify any intra-abdominal source for the clinical deterioration. Subsequently, multi-organ failure progressed, further complicated by a wound dehiscence. The patient died on the fifth post-operative day.

Surgical learnings:

- Patients with conditions above the diaphragm may develop secondary abdominal symptoms
- Patients with multi-organ failure, requiring inotropic support, may develop radiological abnormalities affecting the gastro-intestinal tract
- Patients with multi-organ failure and deteriorating clinical parameters may require an exploratory laparotomy to determine the nature of the radiological abnormality. This is an appropriate method of investigation.
CHASM committee membership between July 2009 and June 2010

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Dr Joseph Lizzio, Deputy Chairman, Chairman, NSW State Committee, Royal Australasian College of Surgeons
Dr Allysan Armstrong-Brown, anaesthetist
Dr. Graham Beaumont, human factors safety specialist
Prof. Belinda Bennett, professor of health law
Dr Lewis Chan, urologist
Prof Stephen Deane, general and trauma surgeon
Dr Anthony Eyers, colorectal surgeon
Dr Charles Fisher, vascular surgeon
Dr Hamish Foster, general surgeon
Dr Kim Hill, Director, clinical governance
Prof John Hilton, forensic pathologist
Dr Charles Pain, Director, Health Systems Improvement
Prof Allan Spigelman, surgical oncologist
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Dr Shane Waddell, orthopaedic surgeon
A/Prof Peter Zelas, OAM, colorectal surgeon
Dr Michael King, general surgeon
Dr Hugh Martin, AM, paediatric surgeon
Executive and project staff based at the Clinical Excellence Commission

Professor Clifford Hughes, Chief Executive Officer
Dr Tony Burrell, Director, Patient Safety
Paula Cheng, Project Coordinator
Bruce Czerniec, Data Analyst
Adeline Nguyen, Project Officer
Lisa Huang, Project Officer (September 2009 to May 2010)
Ruth Murphy, Project Officer
Erin Gilmore, Project Assistant

Clinical Audit Managers based at area health services

Anne Barry, Hunter New England
Karenjit Kaur, Sydney West
Jean Cook, Sydney West (provided maternity relief in 2009)
Louise Robinson, Greater Western (to April 2010)
Angela Bannon/Jane Bowen-Jones, Greater Western (April to August 2010)
Nicole Smith, Greater Southern
Cynthia Redmond, South Eastern Sydney Illawara (to February 2010)
Wendy Bowker/Joseph Pendon, South Eastern Sydney Illawara (February to June 2010)
Honora Hewett, Sydney South West (Western Zone)
Belinda Irwin, Sydney South West (Eastern Zone) (from March 2010)
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