

From Death We Learn

*'We owe respect to the living;
to the dead we owe nothing but truth.'*
-Voltaire



The Office of Safety & Quality in Healthcare would welcome suggestions on how this publication series may be improved. Please forward your comments to:
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The patients and their families

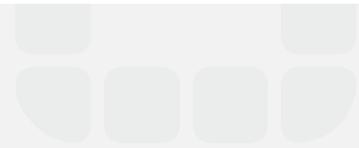


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Editorial

Investigations of unexpected or preventable deaths provide valuable insight into the way our health system works. Sharing the lessons we learn from investigations is as important as conducting the investigation itself.

The first (2006) and second (2007) editions of *From Death We Learn* emphasised lessons learned from deaths that proceeded to coronial inquest. In the 2007 edition, we also introduced articles from the health improvement environment including thromboembolism and mesenteric ischaemia.

The 2008 edition of *From Death We Learn* includes lessons learned from the quality improvement environment as well as summaries of coronial inquests findings that contain public health recommendations. The material has a case based structure as this has a high level of acceptance from clinicians.

The lead article this year summarises clinical improvements arising from the first full year of policy implementation from the Western Australian Review of Mortality (WARM). WARM has rapidly gained widespread acceptance in WA Health. High value information received from completed and reported investigations is used to identify trends of system deficiency in areas such as the timely and appropriate use of antibiotics; Emergency Department overcrowding; the supervision of junior doctors; communication; inpatient falls; and Medical Emergency Team function. At this stage these observations exclude surgical deaths as these are audited by the WA Audit of Surgical Mortality (WAASM) and reported elsewhere.

A health system should strive to minimise the occurrence of adverse events, and endeavour to optimise patient safety. We must continue to learn from the adverse events that occur in our health system, particularly those that precede death. All hospitals and health services are encouraged to use this document to raise awareness and educate health professionals in the lessons learned from unexpected or preventable deaths. In this way we respect the living by learning the truth from those who have died from preventable health care failures.



Anabelle May and Tom Hitchcock
Coronial Liaison Service
Office of Safety and Quality in Healthcare



Dorothy Jones
Director
Office of Safety and Quality in Healthcare

Learning from mortality review in Western Australia

The Western Australian Review of Mortality (WARM) Policy¹ arose from a commitment made in 2005 by the Western Australian Department of Health to ensure that all inpatient deaths were clinically reviewed. The policy became operational in January 2007 and applies to all inpatient deaths that occur in public hospitals and licensed privately managed hospitals providing services for public patients in Western Australia. Cases investigated by existing quality improvement systems (Western Australian Audit of Surgical Mortality (WAASM) and Sentinel Events), satisfy the requirements of the WARM Policy (2006).

The aim of WARM is to learn from and reduce the recurrence of preventable deaths. It provides a structural framework for classifying, reviewing and reporting deaths at a clinical level. When a patient dies, clinicians responsible for the care of the patient review the case with peers and classify the case to one of five Health Round Table² categories. If the patient is thought to have died as a result of medical intervention taken (category 5) or not taken (category 4), a detailed investigation with the purpose of making recommendations that reduce the risk of similar harm/injury to future patients follows. These recommendations are made to the Hospital/Health Service Executive and are then reported to the Department of Health together with data from the initial categorisation.

In this article we summarise the clinically important recommendations from deaths in 2007. This material excludes surgical deaths reported to WAASM as these are reported annually³.

1. Antibiotic use:

Several investigations demonstrated inappropriate antibiotic choice, dosage and delivery. Recommendations re-enforced the importance of using recognised and relevant antibiotic guidelines for antibiotic choice and correct dosage.

The Western Australian Therapeutics Advisory Group recommends that the contemporaneous version of Therapeutic Guidelines: Antibiotic Prophylaxis (currently Version 13)⁴ be adopted as the reference standard for the prescription of antibiotics in Western Australia. Exceptions may occur in individual circumstances where an alternative therapy is supported by an appropriate specialist or on specific clinical units that warrant local guidelines (eg renal, infectious diseases).

At least one copy of the Guidelines should be permanently available on each hospital ward for staff use. Note that the Guidelines are subject to regular audit and the most up to date version can be accessed via the Clinical Information Access Online web site.⁵

2. Emergency Department overcrowding:

Overcrowding of Emergency Departments was identified as having a negative impact on patient care. Recommendations were made that Emergency Departments develop and improve management systems for the clinical care of patients in situations of severe overcrowding. In particular, when waiting times for medical care in the Emergency Department exceed target times, patients should be re-assessed by nursing staff and have clinically relevant and regular observations recorded.

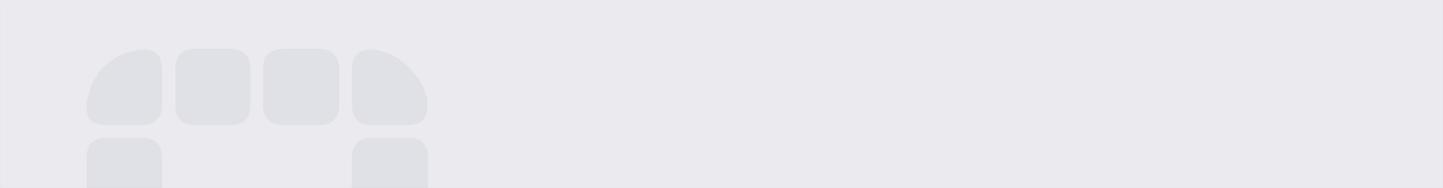
1 WA Review of Mortality Policy, 2006, Department of Health (WA)

2 Health Roundtable (2001), Health Roundtable insights: how to improve health care practices through Death Audits. Health Roundtable.

3 <http://www.surgeons.org/Content/NavigationMenu/Research/Audit/WAASM/default.htm>

4 http://www.watag.org.au/watag/docs/Surgery_Charts_2008.pdf

5 <http://www.ciao.health.wa.gov.au>



Investigations confirmed access to inpatient beds as the primary cause of Emergency Department overcrowding and recommended hospitals implement 'escalating overcrowding alerts' linked to bed management processes with the aim of improving access to inpatient beds.

3. Abnormal investigations:

Most clinicians utilise computer systems for accessing patient results. It is the responsibility of the managing medical team to check all normal and abnormal patient results. One investigation noted that there is an inevitable delay between the result being known to the laboratory staff and to the managing clinician. In the setting of an abnormal and possibly life threatening result, direct communication from the laboratory to the clinician can minimise delay and improve patient care. Laboratories should make direct contact with the managing clinician if there are abnormal life-threatening test results. A similar recommendation was made independently by the Coroner in a separate case reviewed in this issue (refer to Risks of anticoagulation and bone marrow biopsy, page 18).

4. Medical emergency teams and resuscitation:

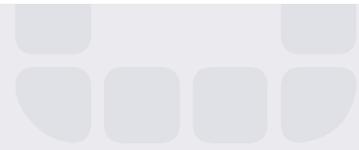
The function of Medical Emergency Teams (MET) and decisions about resuscitation were examined in many of these investigations. This is understandable as most of these patients became critically ill and required MET assessment prior to death. Recommendations relevant to MET function include:

- Full implementation as well as a pre-planned response to the MET criteria is needed.
- Once a MET team is called, the resuscitation of the patient is under the direction of the MET team leader. The role of the managing team is to attend and assist the MET team leader.
- All junior nursing staff should be trained in Basic Life Support and Cardio Pulmonary Resuscitation.
- MET teams should be orientated to suction systems, and CO₂ detection devices available on the wards.
- Ward based defibrillator monitor systems should be standardised to a single system.
- Palliative care decisions and 'do not resuscitate' orders should be clearly documented in the case notes and handed over from shift to shift by nursing staff.
- Ward staff should have access to debriefing after a critical incident has occurred.

5. Communication:

Deficiencies in communication and recommendations for improvement are frequent major findings in healthcare quality improvement investigations. Communication with the patient and between professional groups is fundamental to patient care and is easily eroded by factors such as increasing demand and workforce limitations. Hospitals and health services should maintain constant and eternal vigilance on communication and its risks within their organisation.

Several communication deficiencies during medical and nursing handovers were identified in the 2007 investigations. No clear solution has been identified beyond recommendations to develop an improved system of handover. It should be noted that Western Australia has been involved in piloting clinical handover protocols and Australia is leading international work on improving clinical handover in 2009.



In another investigation, patient care was compromised by communication difficulties between clinicians and patients whose primary language is not English. Recommendations to utilise the range of available interpreter services arose from this review.

6. Nursing staffing:

A number of investigations noted that clinical areas in both Emergency Department and inpatient units were not fully staffed at the time when incidents occurred. Local and state-wide shortage of nursing staff is acknowledged in these investigations with recommendations that health services develop strategies to alleviate the shortage of appropriately trained nurses, particularly in critical care areas.

7. Falls prevention:

Falls in hospital are commonly reported in quality improvement investigations. Inpatient falls frequently prolong hospital stays and contribute to patient morbidity and mortality. An investigation into a fall in this series recommended full implementation of the SQulRe fall prevention program⁶ in the hospital concerned.

8. Specific clinical situations:

Some reviews resulted in comprehensive recommendations about the management of specific clinical situations at their site. Examples of 2007 recommendations include:

- Head injury and coronary angioplasty: A recent head injury should be considered a contraindication to Coronary Angioplasty unless CT head demonstrates no intracranial pathology.
- Obesity: The hospital should have facilities including an appropriate bed and scales to manage obese patients.
- Sepsis: First dose antibiotics in patients with potential or actual sepsis should be prescribed and given in the Emergency Department without undue delay.
- Insulin dependant diabetes (IDD): Patients with IDD who have diarrhoea and vomiting require urinalysis and blood tests to assist in full assessment of their dehydration and possible ketoacidosis.
- Procedural sedation: High risk patients require secure intravenous (IV) access. In addition, if it is difficult to re-establish lost IV access in an emergency, then secondary IV access should be considered prior to starting the procedure.
- Haematemesis and Melaena: Specific guidelines are needed to assist doctors working in the Emergency Department with the management, consultation and referral of patients with gastrointestinal haemorrhage to Gastroenterology and emergent endoscopy services.
- Violence and aggression: Investigations into incidents in both Emergency Departments and inpatient units recommended the implementation of procedures to manage violence and aggression.

⁶ <http://www.safetyandquality.health.wa.gov.au/docs/squire/templates/Falls%20Workbook.pdf>



These system deficiencies and recommendations arise from the first full year of WARM. The information is clinically relevant and useful. It is an impressively rich harvest from a policy that was only implemented in January 2007 and much of the credit must go to nursing and medical clinicians who have engaged in mortality review and the ongoing care and advocacy of their patients.

Lessons from the quality improvement environment

Some of the following cases have been reported to, and investigated by the Office of the State Coroner as directed by the Medical Adviser to the Coroner. The Coronial Liaison Unit in the Office of Safety and Quality in Healthcare (OSQH), Department of Health has been granted access to the reports of the Medical Adviser to the Coroner within the limits placed by the Coroner's Ethics Committee. These limits are for the purpose of education and quality improvement only. The de-identified case information in this publication is approved by the State Coroner as being within the limits of the Coroner's Ethics Committee. Some of these cases may also have been reported to the Office of Safety and Quality in Healthcare as sentinel events. At the time of publication there has been no Coronial inquest into any of these cases.

Two cases of febrile neutropenia in the Emergency Department

Key messages:

- ***Patients at risk of febrile neutropenia presenting to Emergency Departments require identification and prioritised management even though many appear deceptively well.***
- ***These patients should all carry alert cards that identify their risk of neutropenia.***
- ***Triage nurses should identify patients at risk of febrile neutropenia on arrival and take baseline observations with the aim of isolating patients who report or have a fever.***
- ***Early medical assessment is required and if febrile neutropenia is suspected, administration of intravenous antibiotics should not be delayed pending full septic workup or laboratory results.***

Case 1

A man in his 50s receiving chemotherapy for cancer presented to his local hospital Emergency Department (ED) with chest pains and fever. Although he was assessed by the triage nurse as requiring medical assessment within 30 minutes (Australasian Triage Scale 3), the ED was very busy and a suitable isolation cubical was not available. He looked otherwise well and was placed in the waiting room where he remained for two hours until being called into the ED when a cubicle was vacant.

He was assessed and the risk of neutropenia documented. He was febrile but otherwise was stable and looked well. Blood cultures were collected and intravenous antibiotics prescribed however, these were withheld for two hours until a urine sample could be collected for culture. Antibiotics were then administered and he was admitted to the ward. Within hours he developed septicaemic shock that took a progressive deteriorating course. He died days later in ICU with multiple organ failure.

Review of this case identified that there were delays in the ED and in the administration of antibiotics. The review advised that patients who present with risk of febrile neutropenia should be isolated and that administration of antibiotics should not be delayed pending full septic work up.

Case 2

A patient receiving chemotherapy as an outpatient presented to an ED as instructed by her oncologist, complaining of nausea and diarrhoea. She looked well, no observations were recorded, and she was assessed as requiring medical assessment within one hour (Australasian Triage Scale 4). Two hours later she had not yet been seen and she left the ED.

The following day she re-presented by ambulance and a similar chain of events occurred. She looked well, and she was placed in the waiting room. Over two hours later, she once again left without waiting to be seen by a doctor.

On the third day she presented by ambulance in septicæmic shock. She died despite intravenous antibiotics and advanced resuscitation.

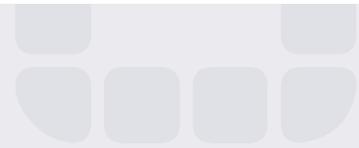
Review of this case identified that the risks of febrile neutropenia were not appreciated and that overcrowding contributed to assessment delays on the first two presentations. The review concluded that persons on chemotherapy should carry 'chemotherapy cards' to alert clinical staff to the dangers of neutropenia and that on presentation they should have a full set of observations including temperature.

Conclusion

These two cases demonstrate that patients at risk of febrile neutropenia presenting to EDs require identification and prioritised management even though they may appear deceptively well. These patients should now carry cards that identify the risk. Triage nurses should also recognise these risks and take baseline observations on presentation with the aim of isolating patients with ongoing fever or recent fever. Once inside the ED, early medical assessment is required and if febrile neutropenia is suspected, administration of intravenous antibiotics should not be delayed pending full septic workup or laboratory results.

	FREMANTLE HOSPITAL & HEALTH SERVICE HAEMATOLOGY & ONCOLOGY DEPARTMENT MEDICAL ALERT FEBRILE NEUTROPENIA
Patient Name	
Patient UMRN	
Consultant	
Because of the risk for neutropenic sepsis, if febrile or unwell please check FBC urgently . If neutropenic contact on-call consultant for patient's usual Hospital Immediately and commence Febrile Neutropenia Protocol . Broad spectrum antibiotics may be required.	
FREMANTLE HOSPITAL & HEALTH SERVICE HAEMATOLOGY & ONCOLOGY DEPARTMENT	
Oncology Clinic Monday - Friday 8.30am - 4.00pm Nurse9431 2846	
Haematology Clinic Monday - Friday: 8.30am - 4.00pm Nurse9431 2203 Office9431 2212	
B91 Dav Ward Monday - Friday: 8.30am - 5.00pm Nurse9431 2660	
Ward B9 North All Hours9431 3333	
Emergency Department All Hours9431 3333	

An example of a Medical Alert Febrile Neutropenia Card



Junior doctors and supervision in primary care settings

Key message:

- ***Health systems need to consider the level of supervision required of junior doctors who work in a primary care setting.***

Case 1

A woman in her 70s presented to an Emergency Department (ED) in the early morning hours with chest and epigastric pain radiating to the back. The ED was very busy and she was distressed and in pain. She was seen promptly by the first doctor available who was a resident (post graduation year 3). This doctor undertook a comprehensive medical assessment, reviewed the electrocardiogram, wrote clear and complete documentation, provided appropriate analgesia, and made a clinical diagnosis of pancreatitis.

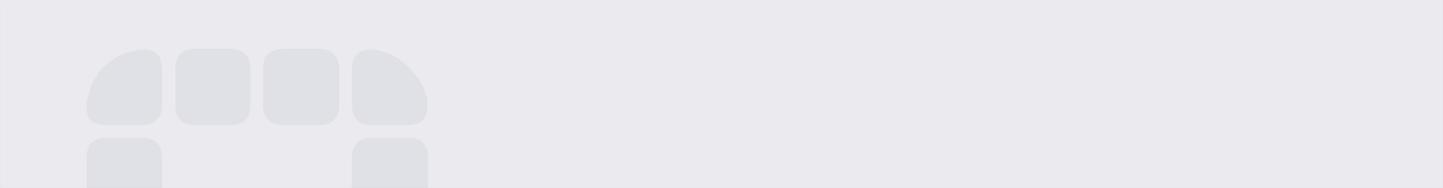
Investigations were requested to confirm the clinical diagnosis, however, they were not available until the following morning. These investigations failed to confirm the clinical diagnosis. This prompted review by a senior doctor approximately 10 hours after the original presentation. A CT scan of the chest was ordered on clinical suspicion of aortic dissection however the patient suffered a cardiorespiratory arrest and died soon after review by the senior doctor. Post mortem examination confirmed aortic dissection.

Review of this case identified the need for timely review of unwell patients managed by junior medical staff; it recommended that the hospital develop and implement a standard for supervision and timely case review of patients managed by resident grade staff working in the ED.

Case 2

An elderly woman presented to an ED with a scalp laceration after a mechanical fall with no loss of consciousness. She appeared well, her wound was sutured by a resident doctor and she was sent home for follow up and removal of sutures by her GP in 7 days. She represented by ambulance within 24 hours in a coma. A detailed history revealed that she was on anticoagulants for a previous medical condition. She required advanced airway and ventilator support prior to CT scan that showed an intracranial haemorrhage had progressed to the point that surgery was futile. She subsequently died of her injury.

Review of the case identified that in ideal circumstances resident grade doctors should be working under supervision. A recommendation was made that the hospital adopt a standard that all patients being discharged by junior doctors are reviewed by or discussed with a supervising registrar or consultant.



Case 3

This case was subject to Coronial inquest and was published with full commentary and recommendations in *From Death We Learn* 2007 (Robson inquest).

A teenage girl died in a regional town after 4 to 6 months of a progressive illness characterised by weight loss, lethargy, intermittent vomiting, and skin pigmentation. Post-mortem examination revealed that she had been suffering from undiagnosed Addison's disease. The focus of the inquest was to examine why this rare but treatable condition had gone undiagnosed in this patient.

The inquest revealed that the patient had been seen by a series of doctors in the setting of general practice during the 6 months prior to her death. Also about 10 days prior to her death she was treated in the local regional hospital by nursing staff acting on doctor's instruction. On her last three visits she had been managed entirely by an inexperienced resident grade doctor undertaking prevocational training.

A range of diagnoses were considered including depression, anorexia nervosa, and post-viral syndrome. No clear diagnosis was made despite documentation of progressive illness. Expert opinion at inquest was that the unexplained illness of the deceased required more intensive and expert assessment than was received.

The State Coroner's opinion was that the junior practitioner should have had adequate supervision by senior practitioners, and he recommended that pre-vocational doctors in general practice should have specified criteria for reference of very unwell patients to those responsible for supervising their work.

Conclusion:

These cases highlight the requirement for supervision of junior doctors working in the primary care setting. As a result of the review of these and other similar cases in the Quality Improvement and Coronial setting the following has occurred:

A standard of care has been developed and adopted by the hospitals concerned, whereby all junior doctors working in the Emergency Department are supervised by a registrar or consultant.

The Post Graduate Medical Council has developed and implemented guidelines for the supervision of junior doctors for all community placements.

The WA Country Health Service has:

- developed an educational package for prevocational general practitioners; and
- provided information to all GP surgeries outlining roles and responsibilities of general practitioners in relation to their medical status and informed consent

Rural Health West (formerly WA College of Rural and Remote Medicine) have developed a "Rural Generalist Pathway" program which involves junior doctor training in rural and remote Western Australia. Part of this program aims to ensure adequate supervision and support of junior doctors. The program is expected to commence in 2009.

Dialysis and dextrostix

Key message:

- ***Reliance on dextrostix can lead to falsely elevated blood sugar readings in patients using 7.5% Extraneal dialysis fluid. This can result in failure to recognise and treat hypoglycaemia or conclusions that diabetic control is poor in patients who are in fact normoglycaemic.***

A woman in her 70s on renal dialysis for many years was found collapsed on the floor. An ambulance was called and her blood sugar level at the time was found to be low. Ambulance paramedics administered glucagon to raise the blood sugar level (BSL) and her conscious state returned to normal.

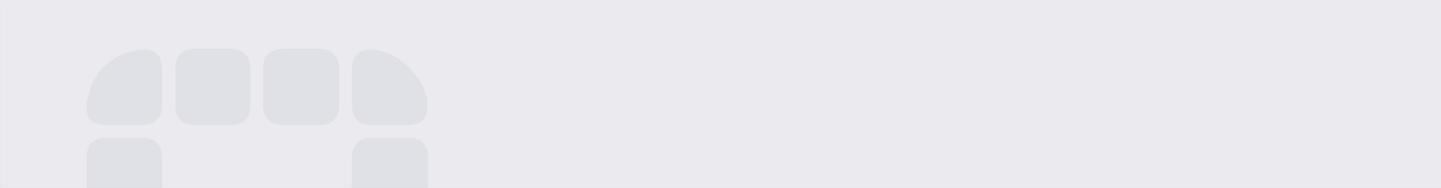
At the hospital a chest x-ray showed the presence of pneumonia. Bedside dextrostix were used to check the blood sugar and readings initially stayed within the normal range and she remained conscious. However, over a period of 3 hours she became unconscious and had a respiratory arrest requiring advanced resuscitation and admission to ICU.

In ICU, bedside dextrostix readings were in the 5-6 mmol/l range, Intravenous glucose was given and clinicians noted that dextrostix readings of blood glucose were consistently higher than the laboratory level. The patient's clinical state continued to deteriorate and she died despite intensive care.

Review of this case noted that the patient had been treated with a new dialysis solution that contained a maltose like sugar. This sugar has no nutritional value but is detected at a falsely elevated level by bedside dextrostix tests. The review concluded that hypoglycaemia played a role in progressing the patient's coma.

The concern is that patients who receive dialysis with 7.5% Extraneal bags may be at risk from an overestimation of the BSL by dextrostix leading to failure to recognise life-threatening hypoglycaemia.

All renal units have been made aware of the risks of falsely elevated BSL readings when using Extraneal bags for dialysing patients. Hospitals are advised to alert clinical staff to this issue, particularly those staff likely to be rostered into wards treating dialysis patients and agency staff that may be unaware of the risks.



Unrecognised diabetic ketoacidosis

Key messages:

- ***Diabetic ketoacidosis remains a recognised cause of death in young people.***
- ***Remember to perform urinalysis in patients who are acutely unwell.***

A young man became unwell with nausea, vomiting, headache and abdominal cramps. He attended a medical practitioner and was noted to be afebrile and well hydrated but there was no formal assessment or recording of pulse rate, blood pressure, respiratory rate, or urinalysis. A diagnosis of gastroenteritis was made and he was treated with intramuscular and oral antiemetics.

Follow up arrangements were made and he was advised to attend a hospital Emergency Department if the vomiting continued. He continued to vomit and overnight a second medical practitioner was called to the home. Pulse rate and blood pressure were recorded but no urinalysis was undertaken. The diagnosis of gastroenteritis was re-affirmed and intramuscular antiemetic prescribed and given.

Soon afterwards he became disorientated and short of breath. An ambulance was called and tests in hospital revealed severe diabetic ketoacidosis. Urine was positive for glucose and ketones. He died with multiple organ failure despite advanced resuscitation and management in intensive care. Post mortem examination also demonstrated multiple pulmonary emboli and cerebral oedema.

Review of the case observed that gastroenteritis was a reasonable working diagnosis made by medical practitioners prior to hospital admission. However, if urinalysis had been performed on any of these occasions it is likely that the correct diagnosis would have been made and progression of the illness possibly prevented.

Conclusion:

If bedside urinalysis had been undertaken the correct diagnosis would probably have been made.

Lessons from Coronial Inquest Findings

A very difficult airway

Key messages:

- *Paralysing patients with a compromised airway can result in death.*
- *Communication about anaesthetic difficulties experienced should occur on a systems level and also on an individual level to the patient and referring doctor.*
- *Doctors assisting courts with expert opinion should comply with relevant published guidelines.*

The case

A female patient in her 30s died as a result of failed anaesthetic induction for an elective procedure. She was administered a medium acting non-depolarising muscle relaxant (Atracurium) at induction, prior to securing airway and ventilation. Following muscle paralysis she could not be intubated or ventilated. She died despite appropriate resuscitation attempts.

The airway of the patient had obvious and known unique physical characteristics including poor mouth opening and fixed flexion deformity of the cervical spine. The potential for her to have 'a difficult airway' was noted pre-operatively by the surgeon and at a pre-anaesthetic clinic appointment with a junior doctor. Combined with this, anaesthetists had experienced airway and ventilation difficulties when providing general anaesthesia to this patient in the past.

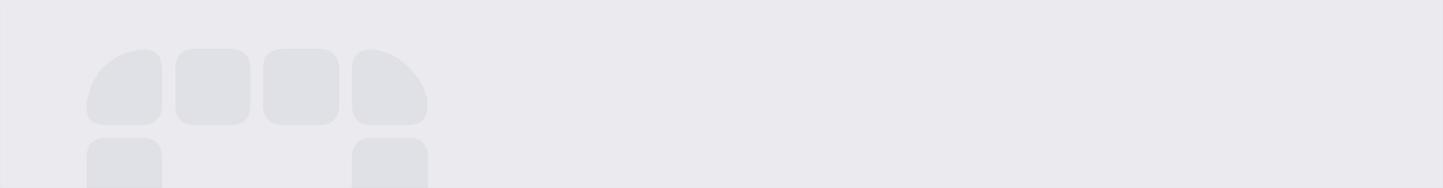
The patient and her general practitioner were unaware of these problems however there was a record on previous anaesthetic charts. In practice on the day of operation, this information was not accessible by the patient, the junior doctor in the pre-anaesthetic clinic, or the specialist anaesthetists.

The assessment by the specialist anaesthetist on the day of operation was limited. This resulted in the impression that the patient had good mouth opening, and the judgement that ventilation with a laryngeal mask would be possible despite the patient's physical characteristics. The specialist anaesthetist acknowledged this error in judgement during the inquest.

The inquest

The Coroner heard evidence from witnesses and a number of senior anaesthetists recognised as experts. He concluded that the patient died of cerebral anoxia resulting from paralysis and absent ventilation. He formed the view that given the patient's appearance it should have been obvious that she would present as an anaesthetic problem and considered that the decision to give the patient a medium term muscle relaxant before ensuring adequate ventilation resulted in her death. The Coroner found that death arose by way of misadventure and he referred the specialist anaesthetist to the Medical Board of Western Australia on the basis that the case should have been approached with greater care and caution.

The Coroner also commented on expert testimony heard at the inquest. In particular, the Coroner expressed the view that the opinions of one expert were not useful as they lacked objectivity and were 'essentially an effort to advocate' on behalf of a witness. He noted the court requirement for reports to be balanced and compliant with relevant published guidelines for expert witnesses appearing in court.



The recommendations emphasised the importance of communication about anaesthetic issues. The need to utilise state and national health system alerts was highlighted, as was the requirement of direct written communication between anaesthetists and referring doctors.

Since the release of the finding....

The Australian and New Zealand College of Anaesthetists (ANZCA) have published “form” letters on the Anaesthesia WA website to assist anaesthetists to communicate potential risk and anaesthetic difficulties to other health practitioners and patients. The use of these form letters is supported by the Department of Health as a strategy for managing risk related to anaesthetic care, as well as providing a tool to assist anaesthetists to comply with their duty of care.

Electronic copies of the forms and guidelines for managing patients with difficult airways may be accessed via the Anaesthesia WA website.⁷

The use of Medic Alert Bracelets by patients may also assist to promptly identify patients “at risk”. Refer to the Medic Alert website for more information.⁸

With regard to relevant expert witness guidelines, a general position statement for doctors is available from the Australian Medical Association (AMA) website.⁹ In addition to the AMA guidelines, clinicians asked to give an opinion or evidence in court may also consult their own professional organisations for statements and guidelines particular to their own area of expertise.

A recent publication by the General Medical Council (UK) *Acting as an Expert Witness*¹⁰ may also provide practitioners further guidance in this area.

***For further information pertaining to this case please refer to the Rasmussen Finding which can be found on the website of the Department of Health’s Office of Safety and Quality in Healthcare
http://www.safetyandquality.health.wa.gov.au/mortality/inquest_finding.cfm***

7 http://ctec.uwa.edu.au/anaesthesiawa/difficult_airway_letters.html

8 <http://www.medicalert.org/home/Homegradient.aspx>

9 <http://www.ama.com.au/web.nsf/doc/SHED-5FTUTX>

10 Acting as an Expert Witness www.gmc_uk.org

Sleep deprivation and Sudden and Unexpected Death in Epilepsy (SUDEP)

Key messages:

- *Patients with seizure disorders having a sleep deprived electroencephalogram should be informed that sleep deprivation may precipitate seizures.*
- *Patients should be advised to make appropriate arrangements during their period of sleep deprivation to manage the risk of seizure.*

The case

A woman in her 40s with epilepsy controlled on medication for many years consulted her GP about either ceasing or changing her medications because of perceived side effects. She was referred to the neurology department of a teaching hospital where a junior registrar assessed her and discussed her management with a senior consultant. A sleep deprived electroencephalogram (EEG) was ordered with the aim of identifying the patient's specific epileptiform activity as a guide to future therapy.

The patient planned to stay awake the night before her scheduled EEG. She was found dead in the morning. Post mortem revealed therapeutic medication levels. There was no obvious cause of death and the Forensic Pathologist concluded that death was consistent with epileptic seizure.

The inquest

The court focussed on the rationale for ordering a sleep deprived EEG and the causes of sudden unexpected death in epilepsy. Evidence was presented that epileptic patients have a mortality rate 2 – 5 times that of the general population. The court heard that the most common cause for epilepsy related death in the age group of the deceased was Sudden and Unexpected Death in Epilepsy (SUDEP). The mechanism for death in SUDEP is unknown, but it has not been found to be associated with sleep deprivation. Expert opinion was that the patient may have died of SUDEP coincident with sleep deprivation.

The Coroner concluded that the deceased suffered from an epileptic seizure and that her death was sudden and unexpected. He noted that even though the link between death and sleep deprivation could not be defined it was impossible to conclude that sleep deprivation was not a contributing factor.

The Coroner found that death arose by way of natural causes, and made recommendations in respect of public health and safety including:

- That a check-list designed to identify potential triggers for tonic-clonic seizures in patients undergoing EEG should be developed by Heads of Neurology at hospitals where EEGs are performed for use by inexperienced medical practitioners, such as junior registrars, to screen epileptic patients for likely triggers.
- That the Australian and New Zealand Association of Neurologists consider advising medical practitioners who order sleep deprived EEGs to inform patients that tiredness may be a trigger for seizures so that patients take this into account in making arrangements for the period when they are likely to be unusually tired as a result of sleep deprivation.



Since the release of the finding....

The Department of Health's Neurosciences and Senses Network have developed a suite of tools including a clinical checklist of epilepsy triggers to ensure that inexperienced practitioners examining epileptic patients do not inadvertently overlook any of these issues when treating their patients.

An information sheet for patients and clinical guidelines for inexperienced practitioners has been developed as part of a package to assist clinicians communicate with "at risk" patients. These tools are now being considered for statewide dissemination and use.

***For further information pertaining to this case please refer to the Moss Finding which can be found on the website of the Department of Health's Office of Safety and Quality in Healthcare
http://www.safetyandquality.health.wa.gov.au/mortality/inquest_finding.cfm***

Rural and regional ambulance tasking

Key message:

- ***Emergency calls to the ambulance service are received and managed by independent skilled operators.***
- ***Call-out decisions for the ambulance should be independent of local hospitals***

The case

A woman in her 60s with a history of chronic cardiac, respiratory, and hepatic illness required multiple admissions to her local rural hospital. She refused admission to a supervised care facility and chose to live at home with care from family members in a rural town. Within 24 hours of medical review and discharge from hospital she became acutely unwell in the early hours of the morning while being cared for by her two granddaughters.

An emergency call to the ambulance service was diverted to the local hospital. Here it was managed principally by nursing staff that were aware of the patient's recent medical review and discharge but were without experience in emergency medicine. On this advice, an ambulance was not sent to the patient's home and the granddaughters were advised to bring their grandmother to the hospital the following morning.

The patient died at home soon after wards, and a post mortem demonstrated acute pneumococcal bronchopneumonia in association with liver failure. The Deputy State Coroner found that death arose by way of natural causes.

The inquest

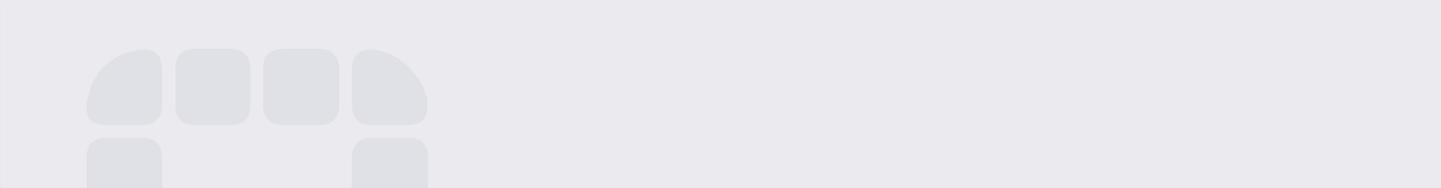
The main issue of concern were the circumstances that resulted in an ambulance not being sent following the urgent call for medical assistance. Evidence revealed that the ambulance service had changed its call-out procedures soon after the death of this patient. The ambulance service now ensures that all calls are received and assessed by trained operators in Perth. These operators are skilled in dealing with distressed, panicked and unqualified callers. In addition, this new system allows the limited number of nursing staff in small hospitals to focus on their nursing duties without being expected to receive and assess emergency calls for ambulance assistance.

The Deputy State Coroner was satisfied local hospitals no longer had any input to the call-out of an ambulance and that emergency calls to the ambulance service are received and managed by independent skilled operators.

Since the release of the finding...

The WA Country Health Service has confirmed that where there is an independent ambulance service country hospitals no longer have any input into the provision of ambulance services. However, Kimberley sites at Fitzroy Crossing, Halls Creek and Derby do not have independent ambulance services. These hospitals will respond to St John's Ambulance tasking and direct calls. Community members are encouraged to call 000 to access ambulance services.

For further information pertaining to this case please refer to the Chubby Finding which can be found on the website of the Department of Health's Office of Safety and Quality in Healthcare
http://www.safetyandquality.health.wa.gov.au/mortality/inquest_finding.cfm



Risks of anticoagulation when performing bone marrow biopsy

Key messages:

- ***Consider using imaging when performing bone marrow biopsy on high risk patients.***
- ***Hospitals need systems for notifying clinicians of abnormal results.***
- ***All observations relevant to a patient's care should be recorded and maintained with the patient's file.***

The case

A female patient in her 40s with a complex medical history was anticoagulated with warfarin due to her risk of stroke from atrial fibrillation and essential thrombocythosis. She required a bone marrow biopsy to exclude a haematological malignancy.

After a specialist team in haematology conducted a literature and case review, the risks and benefits of performing a bone marrow biopsy were discussed with the patient. A bone marrow biopsy under local anaesthetic without the aid of imaging was subsequently performed. Anticoagulation was not reversed for the procedure.

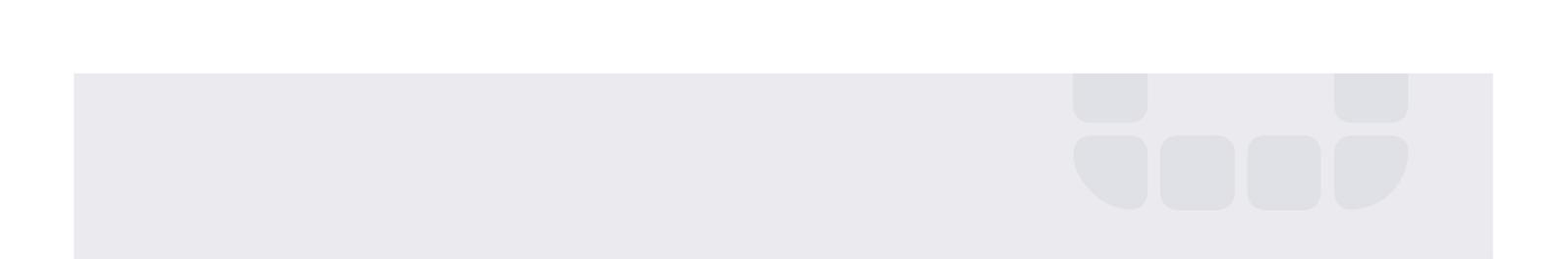
The patient suffered pain and leg irritation after the procedure and CT scan demonstrated a retroperitoneal haemorrhage. Her anticoagulation was reversed, her cardiovascular status was monitored, and she was treated with intravenous fluids and analgesia. The following day she suffered a sudden cardiorespiratory arrest. Advanced resuscitation and management included a laparotomy and attempts to embolise haemorrhaging however, she died the following day in the intensive care unit.

The inquest

It was demonstrated before the Deputy State Coroner that:

- The bone marrow biopsy was indicated, and that the practice of performing bone marrow biopsy without reversing anticoagulation is consistent with the majority of Australian and New Zealand Haematologists.
- The medical management of the patient following diagnosis of retroperitoneal haemorrhage was appropriate.
- It was also noted that no manual record of cardiovascular status was recorded for a period while the patient was on the ward, and there was a delay in clinical staff becoming aware of some abnormal investigation results.
- Post mortem examination revealed both pulmonary embolism and retroperitoneal haemorrhage.

The Deputy State Coroner formed the opinion that it was not possible to say the outcome would have been different once faced with the need to treat the retroperitoneal haemorrhage in a patient with the deceased's circumstances. She found that death arose by way of natural causes.



The Deputy State Coroner's recommended that:

- When bone marrow biopsy is to be carried out on patients at "high risk", clinicians should consider performing the procedure with the aid of imaging.
- Consideration should be given to developing an expedited method of notifying abnormal results to medical members of managing teams.
- All observations relevant to a patient's care be recorded and maintained on the patient's file.

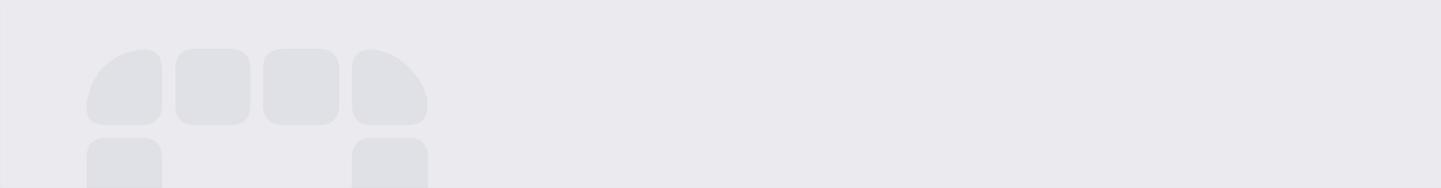
Since the release of the finding....

The Coroner's recommendations in the context of conducting bone marrow biopsies under imaging were considered. At this stage no changes to existing protocols for conducting bone marrow biopsies have been made. Biopsy under imaging could be considered for "high risk" patients such as the very obese and those patients on anticoagulation therapy.

To improve the management of abnormal results, the hospital concerned has developed a revised protocol for urgent notification of abnormal results. It is prudent that all hospitals develop protocols and improve communication for managing urgent notification of results.

PathWest, the central provider of laboratory services, has urged all sites to comply with its policy for promptly notifying clinicians of abnormal results.

***For further information pertaining to this case please refer to the Evans Finding which can be found on the website of the Department of Health's Office of Safety and Quality in Healthcare
http://www.safetyandquality.health.wa.gov.au/mortality/inquest_finding.cfm***



Suicide of a child

Key messages:

- ***Appropriate use of Selective Serotonin Re-uptake Inhibitors (SSRIs) and Selective Serotonin Nor-adrenaline Re-uptake Inhibitors (SSNRIs) has a risk of drug related behavioural change and suicide separate from the intrinsic risk of untreated depression***
- ***Clinicians prescribing these drugs should ensure patients or their parents or guardians, are fully informed of all pertinent facts and written Consumer Medication Information should be provided***
- ***Clinicians prescribing these drugs should ensure they physically review patients on a regular basis after prescribing the drug or upon any dosage change.***

The case

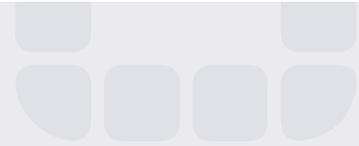
An adolescent in her early teens threatened her mother with a knife during an argument. The mother left the house and called her husband, the police, and her daughter's psychiatrist for help. During her absence the girl hung herself in the hallway of the family home.

The inquest

The inquest revealed a history of depressive mental illness treated initially with psychotherapy, then psychiatric treatment and medication. Variable compliance with Selective Serotonin Re-uptake Inhibitor (SSRI) and Selective Serotonin Nor-adrenaline Re-uptake Inhibitor (SSNRI) antidepressant medication was observed and documented. In addition, the adolescent had history of deliberate self harm, illicit drug use, and parental conflict.

The focus of the inquest was the use of antidepressant medication in children. The inquest heard that:

- There are currently no medications licensed in Australia for the treatment of depression for persons under the age of 18 years. This is partly due to difficulties in conducting research in children;
- Children and adolescents do experience depression. Medical practitioners who treat severe depression in this age group face a predicament as no drugs are registered and clinical trial data is limited;
- Medical practitioners can legally prescribe antidepressant medication "off label" to children;
- It is clinically appropriate and possibly life-saving to prescribe antidepressants to adolescents with severe depression where other forms of treatment have been unsuccessful. The preferred drugs are SSRIs and SSNRIs.
- Separate from the intrinsic risk of untreated depression, SSRIs and SSNRIs carry risks of drug related behavioural change and suicide.
- The use of SSRI and SSNRI antidepressant medication in severe cases of adolescent depression that have failed psychotherapy is accepted by national and state regulatory bodies.



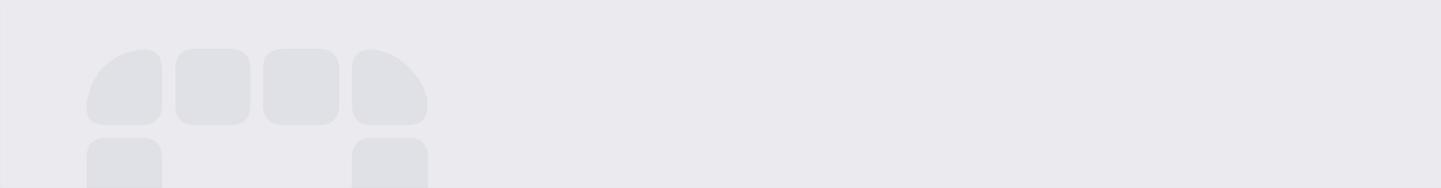
The Deputy State Coroner found that death of the adolescent occurred by way of suicide while in an unstable state of mind. She made the following recommendations:

- Clinicians prescribing SSRI and SSNRI should ensure that patients who will be taking the drugs, or their parents or guardians, are fully informed of all pertinent facts before prescribing them. Clinicians could emphasise this by providing up-to-date Consumer Medication Information (CMI) as written back-up.
- Clinicians prescribing SSRI and SSNRI should ensure that they physically review patients on a regular basis after prescribing the drug or upon any dosage change.
- Pharmacy registration /licensing procedures should be amended to ensure up-to-date CMIs be dispensed with medication and appropriate warning labels affixed to outside of boxes containing SSRI and SSNRI medications (including warning label 9 as recommended by Australian Pharmaceutical Formulary).

Since the release of the finding...

The recommendations related to the pharmacy registration and licensing procedures have been brought to the attention of the Therapeutic Goods Administration and the WA Psychotropic Drugs Committee to facilitate consideration of the Coroner's recommendation.

***For further information pertaining to this case please refer to the Tedeschi Finding which can be found on the website of the Department of Health's Office of Safety and Quality in Healthcare
http://www.safetyandquality.health.wa.gov.au/mortality/inquest_finding.cfm***



Grouped suicide deaths

During 2007 the Deputy State Coroner (DSC) released a document summarising common themes arising from a series of inquests into patient suicides with inquests held from 2003–2007.

The DSC observed that suicide is not uncommon in our community and, that carers and family members are secondary victims of suicide. This is occurring in our community where:

- There is increased demand for mental health services;
- There is consistent dissatisfaction with lack of appropriate resources, including funding, facilities and availability of qualified medical and nursing practitioners;
- In general, the practitioners available are providing services in extremely difficult conditions which affect their decision making;
- Inadequate support and communication exacerbates the significant care and responsibilities of carers and family members due to current conditions in the management of mental health in community settings; and
- Care of patients can be impacted by crises for unsupported carers and family members resulting in tragic outcomes.

The DSC concluded that although community mental health services have a responsibility for carer wellbeing, there is clear evidence that adequate facility and staff resources are lacking. In particular she noted that:

- Remote and regional areas pose a significant problem in relation to staff and facilities particularly in the North-West and the South-West.
- The Auditor General has identified concerning deficits in the implementation of the WA Health Department endorsed risk assessment guidelines, published jointly by the Australasian College for Emergency Medicine (ACEM) and Royal Australian and New Zealand College of Psychiatry (RANCP) including:
 - triage risk assessment
 - excessive Emergency Department waiting times
 - psychiatry assessments not being conducted
 - insufficient follow-up and post discharge services.

Further, the DSC identifies two significant areas with the highest risk requiring action:

1. Risk assessment and admission: The DSC stated her concerns that the standard of assessment and decision making was affected by bed availability. She concluded that all patients referred by a general practitioner or carer for admission should be assessed by a psychiatrist rather than a mental health nurse.
2. Discharge planning and communication: The DSC expressed concern that patients are vulnerable to suicide at discharge after assessment and discharge from hospital, particularly in adolescent patients. The provision of a written action plan for patients and carers was suggested as a solution. Action Plans would link patients and carers with community liaison mental health professionals to provide communication and resources.

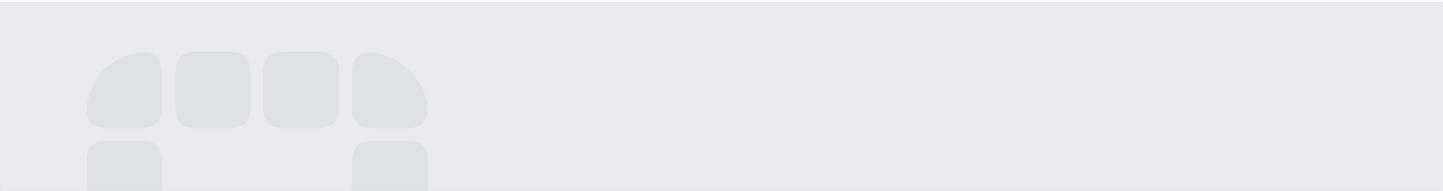
Recommendations from the DSC's grouped suicide review are reproduced:

Risk assessments

1. Risk assessments should always follow those guidelines published jointly by the ACEM and RANCP as subsequently endorsed by WA Health Department in 2001 as a minimum standard.
2. Where a person is referred to an authorised facility for admission by a medical practitioner, final risk assessment should be undertaken by a Psychiatrist, after triage and preliminary assessment by a Registered Mental Health Nurse (RMHN) if waiting time is a problem.
3. Where a person who has undergone prior admissions is taken to an Emergency Department by a carer experienced with that person, final risk assessment should be undertaken by a Psychiatrist, after triage and preliminary assessment by a Registered Mental Health Nurse (RMHN) if waiting time is a problem.
4. Where a person has undergone risk assessment in an Emergency Department and is not admitted to any facility but referred to Community Mental Health Services (CMHS), the person and their carer are to be provided with a written referral to their relevant CMHS, including contact numbers, their proposed management plan and relevant time frames.
5. The contact numbers provided should include 24hr emergency service numbers. People should be advised that these lines can be used by anyone at any time, and that they are operated by trained staff that are able to call out emergency teams if necessary. These should be a reality.

Community Mental Health Services (as a generic term)

6. Ultimately all Community Mental Health Services (CMHS) should be funded to respond holistically to crises. Patients and their families need support, especially when the patient is discharged into their care. Carers need to know the people involved in the care of their patient.
7. No person assessed for risk of suicide should leave an Emergency Department without being provided with written advice as to who to contact in case of crisis.
8. CMHS should make every attempt to provide their patients with concrete continuity. There should be written contact and established appointment dates, as well as the provision of numbers to contact in case of emergency between appointments and 24 hour numbers.
9. Every child or adolescent with mental health issues should be acquainted with a person acting as a community liaison officer. PMH should be included in all authorised facility guidelines and should be funded for community liaison officers to maintain contact with any child who has presented with mental health issues. This is regardless of whether the patient receives private or public sector treatment.
10. The role of the liaison officer is to be an accessible contact for the child in times of crisis. They should liaise with the Bentley Adolescent Unit if the child is admitted as a patient or the relevant Child and Adolescent Mental Health Service (CAMHS) where the child becomes a client of Community Mental Health Services (CMHS). Alternately, if private treatment is chosen, they should know who is treating the child. As a matter of community commitment to children and adolescents, the community liaison officer will ensure adequate access and provision of ongoing treatment for this age group.

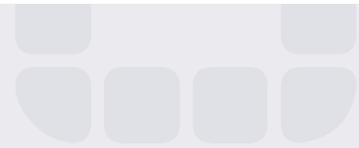
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11. Bentley Adolescent Unit should also have community liaison officers with a similar role and function to ensure children not passing through PMH are also provided with ongoing input.
 12. There is a very real need for day hospital transition units, as outlined by Professor Silburn, in additional locations throughout the metropolitan region and the rest of the State. These units would accommodate the difficult transition from discharge to admission to the community and as a community support for those dealing with mental health issues.
 13. There is a need for relevant facilities outside the metropolitan area for short term care of patients in crisis to avoid dislocation as an added stress. I don't know if the secure facility in Bunbury Regional Hospital is now adequate [Hilton] and there is nothing in the north of the State. I note the reference plan for a facility in Broome. This needs to become reality.
 14. Practitioners prescribing medication should ensure they comprehensively discuss compliance issues and discontinuation issues, as well as other relevant information associated with particular medication prescribed. I would prefer providers and dispensers to provide Therapeutics Goods Administration (TGA) approved CMLs to patients and/or carers as a written record.
 15. Those practitioners discussing discharge plans with patients and carers need to specifically consider the extent they discuss the potential for death as an outcome of self harming behaviour.
 16. The Office of the State Coroner review all suicides in 2009 to assess what, if any, contact the deceased persons had with State mental Health Services. This would assist in determining what progress has been made in the provision of improved Mental Health Services in the West Australian Community.

Since the release of the finding....

A Clinical Risk Assessment and Management policy (July 2008) has been launched by the Mental Health Division. Implementation of the policy and training of WA Mental Health Clinicians and Emergency Department Medical Officers will commence in due course.

Improved communication and discharge plans are being implemented to address the Coroner's recommendations.

***For further information pertaining to this case please refer to the Mental Health Finding which can be found on the website of the Department of Health's Office of Safety and Quality in Healthcare
http://www.safetyandquality.health.wa.gov.au/mortality/inquest_finding.cfm***



Appendix: References and useful websites

1. WA Review of Mortality Policy, 2006 , Department of Health (WA)
2. Health Roundtable (2001), Health Roundtable Insights: How to improve health care practices through Death Audits. Health Roundtable.
3. WA Audit of Surgical Mortality Annual report
<http://www.surgeons.org/Content/NavigationMenu/Research/Audit/WAASM/default.htm>
4. Western Australian Therapeutic Advisory Group Antibiotic Guidelines
http://www.watag.org.au/watag/docs/Surgery_Charts_2008.pdf
5. Clinical Information Access Online <http://www.ciao.health.wa.gov.au>
6. SQulRe Falls Program
<http://www.safetyandquality.health.wa.gov.au/docs/squire/templates/>
7. Anaesthesia WA
http://ctec.uwa.edu.au/anaesthesiawa/difficult_airway_letters.htm
8. Medic Alert
<http://www.medicalert.org/home/Homegradient.aspx>
9. Australian Medical Association
<http://www.ama.com.au/web.nsf/doc/SHED-5FTUTX>
10. General Medical Council (UK) Acting as an Expert Witness
www.gmc_uk.org
11. Coronial Inquest Findings (health related)
http://www.safetyandquality.health.wa.gov.au/mortality/inquest_finding.cfm



Office of Safety and Quality in Health Care
Western Australian Department of Health
189 Royal Street, East Perth Western Australia 6004
Tel: (08) 9222 4080 Fax: (08) 9222 4324
Email: safetyandquality@health.wa.gov.au/home/
Web: <http://www.health.wa.gov.au/safetyandquality/>



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