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The Office of Safety and Quality in Healthcare (OSQH) welcomes suggestions on how this publication series may be improved. Please forward your comments to safetyandquality@health.wa.gov.au

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From Death We Learn and coronial inquest finding documents identified in this text can be downloaded from the OSQH website: http://www.safetyandquality.health.wa.gov.au/mortality/coronal_liaison.cfm
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Coroner's foreword

It is commonly said that the most important role of coroners is to speak for the dead to protect the living. It is in this context that coroners make comments or recommendations following inquest hearings into reportable deaths with a view to preventing similar deaths happening in the future. These comments and recommendations in a medical setting often relate to issues bearing on public health and safety and standards of clinical care.

While only a small proportion of deaths investigated by a coroner proceed to a coronial inquest, which is a court hearing, all reportable deaths are investigated.

Families whose loved ones have died unexpectedly following medical treatment often struggle to come to terms with the circumstances surrounding the death. For these families it is often extremely important for them to have an expectation that the death of their loved one will result in changes which could prevent similar deaths occurring in the future.

When it appears that medical treatment could have been better or issues have been identified which if addressed could prevent similar deaths from occurring in future, it is important to ensure that the information is communicated to those who can use the information.

In this context the Office of Safety and Quality in Healthcare has taken the very positive step of providing short clinical summaries of inquest findings and de-identified summaries of other cases. These summaries highlight the clinical messages and lessons learned, allowing hospital and health professionals to benefit from the information which has been obtained.

All hospitals and health services are encouraged to use these summaries to raise awareness of important messages which have come from the investigation of these deaths so that lessons learned from investigating the circumstances of death can protect the living.

Mr Alastair Hope
WA State Coroner
Editorial

Investigation into deaths provides valuable insight into the way our health system works and it remains important to share lessons from unexpected or preventable events.

This is the fifth edition of From Death We Learn and includes an examination of the use of mortality data in improving patient safety, with the introduction of national benchmarking, and tools for the early detection of variation in clinical practice.

A number of cases from the Office of the State Coroner are reviewed with particular issues highlighted. This year we draw attention to the tragic effects of illicit drug use in the unfortunate deaths of two young people and the ongoing issue of preventable deaths in infants from co-sleeping.

All hospitals and health services are encouraged to use this document to raise awareness and educate health professionals.

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Using mortality data to improve safety and quality in health care

Those who work within our health system strive to provide the best quality patient care and to optimise patient safety. Where adverse events occur, there are opportunities to improve the care we provide. This includes not only learning from individual unexpected or preventable deaths, but also from monitoring deaths at a hospital or State-wide level.

There are several systems in Western Australia designed to ensure that deaths are systematically reviewed and recommendations for improvement arising from mortality review are implemented to advance patient safety, including the:

- Western Australian Audit of Surgical Mortality (WAASM, managed by the Royal Australasian College of Surgeons)
- Western Australian Review of Mortality (WARM) and the WA Sentinel Event Program (managed by WA Health)
- Office of the State Coroner.

These review processes all feature investigation of individual cases and give rise to recommendations for quality improvement.

The process of individual case review demonstrably drives quality improvement and in the past has led to the implementation of Medical Emergency Teams, the use of venous thromboembolism (VTE) risk assessment tools for surgical patients and improved staffing and equipment provision in rural hospitals.

Mortality rates can also provide important tools for quality improvement within the health system. An increase in mortality rate may indicate that preventable deaths may be occurring within a health care system, and thus be used as a screening tool for prompting safety and quality related investigation. Care must be taken with such indicators as an increased mortality rate may reflect a change in case-mix rather than a change in the quality of care provided. The individual cases contributing to these trends can then be identified for review.

Mortality rates are one measure that can also be used to compare the performance of one health care system to another, or to monitor improvement over time. In-hospital mortality is just one of a suite of quality indicators commissioned by the Australian Commission on Safety and Quality in Health Care (ACSQHC) to be used to monitor and improve the safety and quality of health care. Variations of rates of in-hospital mortality should be screening tools for prompting safety and quality related investigations.

The Hospital Standardised Mortality Ratio (HSMR) is one measure of in-hospital mortality. It is the ratio of the measured mortality rate compared to the expected mortality rate, derived from the Australian National Morbidity Database, using de-identified state data submitted annually. HSMRs can be used to compare the performance of different health care systems and may
stimulate quality improvement at individual sites in order to reduce mortality.

As the data is based on coding of patient notes at a hospital level, the use of HSMRs in isolation may result in driving the manipulation of coded data rather than achieving true improvements in health care quality and safety.

However, the introduction of national benchmarking with HSMRs, along with mechanisms for quality improvement and intervention at a clinical level, has the potential to improve care.

Mortality data can also be used for early detection of variation in clinical practice. Variable Life Adjusted Display (VLAD) charts are control charts that are timely and sensitive statistical monitoring tools that can be used with a variety of clinical indicators. They are risk adjusted and thus allow comparison across hospitals with variable case-mix. VLAD is effectively a screening tool and an early warning system. The control charts are used to identify trends in mortality in particular patient groups at different sites and to flag potential problem areas for further investigation. Limited resources for investigation and quality improvement activities can be focussed in the most problematic areas. Again, this is a form of monitoring that is most useful when used with quality improvement processes – to ensure changes in patient care are made. The VLAD methodology has been developed in Queensland and trials of run charts on five Diagnosis Related Groups (DRGs), national mortality indicators, have been conducted recently in WA. There will be increasing use of mortality data nationally in the next few years.

In summary, many different tools are available to identify areas for improvement and can be used to complement each other. Benchmarking indicators such as HSMR spur health services to improve their overall performance. Screening tools such as VLAD provide early identification of trends in mortality rates, flagging areas for closer scrutiny. Individual case review systems such as WARM result in system improvements within health care.
Introduction to the Coronial Liaison Unit

The Coronial Liaison Unit (CLU) is situated within the Office of Safety and Quality in Healthcare (OSQH) at the WA Department of Health. It consists of two Clinical Advisors (a Consultant and a Senior Registrar) and a Senior Policy Officer. It was established in 2005 as a health initiative to improve communication between WA Health and the Coroner’s Office. The CLU facilitates the allocation of health related findings from coronial inquests for implementation in hospitals and health services.

The CLU reviews all public inquests that have a medical aspect to them and places the recommendations via the Chief Medical Officer with the appropriate area within WA Health. Expert advice and comment on the recommendations and action taken to improve patient safety in response to the inquest findings are fed back to the State Coroner in a biannual report.

The CLU also receives non-inquested1 case reports from the Coronial Medical Advisors for the purpose of quality improvement. If there are aspects to these cases which are of concern, the CLU raises these issues with the appropriate clinical director from the relevant hospital/health service and seeks assurance that the death has been reviewed in a quality improvement environment.

For the purpose of quality improvement, the Coroner’s Ethics Committee allows the CLU access to provisional post mortem reports to assist clinicians to undertake mortality reviews. Where clinicians require post mortem findings to effectively review a death, an application for the preliminary results can be made via the CLU.

The CLU continues to work effectively with the Office of the State Coroner to share lessons learned from mortality review to improve future patient care.

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1 Deaths which are reportable to the Coroner, that do not require a public inquest, but may have an aspect which needs investigation or review by the health system.
Introduction to inquested cases

While under the *Coroner's Act (1996)* every regional magistrate is contemporaneously a coroner, the majority of inquests are held by the State Coroner Mr Alistair Hope and the Deputy State Coroner Ms Evelyn Vicker.

In Western Australia approximately 2,000 deaths are reported to the Office of the State Coroner each year. Approximately 600 deaths are subsequently dealt with by the treating doctor by issuing a death certificate recording the cause of death. These deaths are not accepted as coronial cases. The remainder become coronial cases and of these approximately 40 will be subject to public inquest.²

WA Health’s responses to coronial recommendations arising from public inquests have been included in this report where the timeframe has allowed a response to be formulated prior to publication.

These public inquests provide valuable lessons to be learnt from the dead to protect the living.

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² Law Reform Commission of Western Australia. Review of Coronial Practice in Western Australia: Background Paper. Project No 100. September 2010
Risks of complementary and alternative therapies

Key Messages:

- It is important for patients suffering from cancer to make informed decisions in relation to their treatment.
- Early medical intervention in many types of cancer has been shown to improve survival rate and lessen suffering.
- Complementary or alternative therapies have not been scientifically proven to treat or cure cancer. Some may improve quality of life and are best used to complement mainstream medicine, not replace it.

A 45 year old woman died from complications of metastatic rectal cancer nearly four years after the onset of her symptoms.

The woman had suffered from rectal bleeding for over a year before mentioning it to a medical practitioner. Instead, she had been visiting a homeopath, who attributed her symptoms to haemorrhoids.

Her GP referred her for a colonoscopy, which showed a rectal tumour. She was reviewed a few days later by a colorectal surgeon, who recommended chemotherapy, radiotherapy and surgery to remove the tumour. The adjuvant chemotherapy and radiotherapy would provide a better chance of survival, but almost undoubtedly lead to infertility. As the tumour appeared to be reasonably well contained within the pelvis, surgery could be seen as curative.

Despite being offered the best medical treatment available, the patient failed to attend follow-up medical appointments, choosing instead to undertake homeopathic treatment, which she had been assured would provide her with a complete cure.

Unfortunately she deteriorated over the following months, with marked weight loss, worsening pain and eventually developing a bowel obstruction. This would have been rapidly fatal, but she finally agreed to have orthodox medical treatment in hospital for what was now a locally invasive disease with metastases. Major pelvic surgery was undertaken, followed by chemotherapy and radiotherapy. However the cancer had spread so far that the treatment could only be palliative, not curative, and she passed away nearly two years later.

The inquest identified that:

The deceased had suffered symptoms of rectal cancer for over a year prior to seeking medical advice. During that time and the following year, her cancer developed and spread to the point that her chances of survival diminished from being very good to non-existent.

The deceased had received clear and reliable information from her mainstream general practitioner and treating surgeon. In addition, multiple attempts were made by her hospital practitioners to contact her when she failed to attend follow-up appointments, in order to reiterate their advice and concerns.
During the two year period from the onset of symptoms to the near-fatal episode of bowel obstruction, the deceased saw a homeopathy practitioner who was a member of the Australian Homeopathic Association and on the Australian Register of Homeopaths. This practitioner informed the deceased that homeopathic remedies would cure her cancer. The State Coroner noted that “by purporting to treat the deceased’s cancer (the homeopath) was not acting in accordance with the Australian Homeopathic Code of Professional Conduct”.

The homeopath advised that any other treatments, such as pain killers and even the emergency surgery for bowel obstruction would interfere with the success of homeopathic treatment and thus should not be part of the deceased’s management. The inquest identified that by relying on homeopathic remedies and refusing conventional medical treatment, the deceased experienced severe and unnecessary pain, as well as losing whatever chances of survival she might have had.

**The State Coroner concluded that:**

The deceased’s life might have been saved if she had made different choices.

He noted that “the choice for the deceased should have been a simple one between accepting the surgical option…or facing a painful death”, but that choice was made more difficult because of ‘mixed messages’ from a variety of sources. These included the homeopath, the deceased’s husband and two GPs who recommended other alternative therapies, both before and after her bowel obstruction.

The State Coroner also expressed concern over the apparent legitimisation of alternative medical regimes, with homeopathic medicines being sold in pharmacies and private health care companies allocating funds to non-science based alternative health practitioners.

The State Coroner concluded that the homeopath “was not a competent health professional” and was “giving dangerous advice on matters in respect of which she had no expertise.” He also commented that the deceased’s relationship with the homeopath was one of dependence and went beyond that expected of a health professional/patient relationship.

The State Coroner found that death arose by natural causes and recommended that the:

- Commonwealth and State Departments of Health review the legislative framework relating to complementary and alternative medicine practitioners and practices with a view to ensuring that there are no mixed messages provided to vulnerable patients and that science based medicine and alternative medicine are treated differently.

- Medical Board of Western Australia finalises its document Complementary Alternative and Unconventional Medicine if it has not already done so and take steps to ensure that the document is promulgated to the profession and complied with. This document provides guidance to medical practitioners in relation to when they may recommend unproved or experimental treatments.

As a consequence of the inquest, two general practitioners were referred to the Medical Board of Western Australia with concerns relating to their prescription of alternative medical therapies.

Reference: DINGLE inquest
Paediatric representations

Key Messages:
- Recurrent presentations to hospital should be considered a ‘red flag’ and prompt further investigation.
- Early signs of sepsis may be missed by inexperienced doctors.
- Early treatment of sepsis improves the chance of survival.

A one year old child died of staphylococcal pneumonia at a regional hospital shortly after transfer from a remote hospital via Royal Flying Doctor Service (RFDS). The child had been taken to the remote hospital twice in the week preceding her death, during which time her parents had requested further investigation and increased treatment. Eventually treatment was commenced and transfer to a regional centre organised, but intervention was too late to be successful.

The State Coroner noted that a series of errors were made in respect of the patient’s treatment including:
- the severity of the patient’s illness not being appreciated by the duty doctor at the remote hospital despite markedly abnormal observations reflecting respiratory failure and sepsis.
- failure to admit the patient.
- delays to the commencement of required treatment being intravenous antibiotics and intravenous fluid resuscitation.
- delays in transportation due to RFDS resource limitations.

The State Coroner found that death arose by way of misadventure and proposed to refer the duty doctor’s conduct to the Medical Board of Western Australia.

Reference: GORDON inquest
Medication reconciliation

Key Messages:

- The administration of Schedule 8 medications such as morphine should be documented clearly and consistently.

A frail 88 year old woman suffered multiple injuries and developed pneumonia as a result of a fall in an aged care facility. She was admitted to hospital for palliation and died several days later. Post mortem examination demonstrated pneumonia, multiple injuries and morphine toxicity.

The inquest revealed that:

- The decision to manage the patient palliatively was thought to be appropriate.
- The recording of morphine in the Register of Drugs book at the hospital and the patient’s medication chart demonstrated that significant quantities of morphine had been discarded without documentation.
- Certain boluses of morphine were shown to have been given from morphine infusions and effectively recorded twice.

The State Coroner found that death arose by way of accident and recommended that:

- When the Department of Health prints the Register of Drugs books for the purposes of the Poisons Act 1964 (Schedule 8) that consideration be given to including separate columns to record the discarding of Schedule 8 drugs and to allow for a signature to be placed in the book by the person who has discarded the drugs and by a witness to the discard. In the case of the books which have already been printed, the State Coroner recommends that nursing staff specifically record the fact that drugs have been discarded by making a short entry in one of the existing columns.
- The Department of Health adopts a uniform procedure throughout the state that unused Schedule 8 medications which are to be discarded be discarded into a sink and where this is not practicable due to the layout of the hospital, then into a sharps container.
- There be a review of the documentation used to record medications given to patients so that any bolus doses given from a quantity of a medication being provided by way of an infusion can be recorded as such.
WA Health action:

- WA Health is working towards amendment of the approved Drugs of Addiction Register for use in hospitals to include a discard column and implementation of regulations regarding the disposal of unused Schedule 8 medicines.

- Nursing documentation throughout the state has been modified to facilitate the recording of a bolus dose as a separate entry. This includes boluses given via patient controlled analgesia pump and patient controlled epidural analgesia pumps. There are also specific sections on recording epidural and intravenous opioid bolus doses. Nursing practice standards that have not been previously changed are now currently being adjusted to reflect the requirement to record the infusion bolus doses.

Reference: PARTINGTON inquest
The importance of clinical observations

Key messages:
- Observations should be attended to regularly and observation protocols standardised across the WA health system.
- Abnormal observations need to be responded to promptly.

A previously fit and healthy 17 year old male died unexpectedly after admission to hospital with tonsillitis.

After developing a sore throat, the deceased had seen his GP and started oral antibiotics. As he deteriorated the next day, he was taken to a regional hospital by his family where he was seen by nursing staff. The doctor on call that day was a busy GP who, at the time, was working at a GP practice and was unable to attend to review the patient for another five hours. However he provided nursing staff with a phone order for morphine to be delivered by means of a patient controlled analgesia device (PCA).

Later that evening the GP attended the hospital and reviewed the patient in person. Intravenous penicillin was commenced and the dose of morphine was increased. The patient went on to develop an itchy face, which was thought to be from the morphine and was given an antihistamine to settle the itch.

Overnight his condition deteriorated, with low levels of oxygen saturation noted by nursing staff but not acted upon. No further observations were made until he was found collapsed and lifeless some five hours later. Resuscitation attempts were unsuccessful.

The inquest revealed that:
- There was a possible history of undiagnosed obstructive sleep apnoea.
- There was a five hour delay in attendance by the duty doctor due to excessive workload.
- Delayed medical attention resulted in delayed intravenous antibiotic therapy.
- The use of PCA and associated observation regimen was non-standard.
- WA Health has no system-wide standard for PCA and associated observations.
- Observations on the ward by nursing staff were of inadequate frequency.
- The recording of observations on the ward by nursing staff was inadequate.
- There was an inappropriate response to hypoxia (SaO2 88%) when it was recorded by nursing staff.
- WA Health has no system-wide approach to the prescription of therapeutic oxygen.
The State Coroner noted that a number of factors appeared to have had a cumulative effect including the severe compromise of the upper airway which resulted from acute tonsillitis and very swollen tonsils. The patient was also receiving relatively high levels of morphine and as a result of his problems with breathing he may have suffered carbon dioxide retention.

The State Coroner concluded that death resulted from acute asphyxia and made several recommendations addressing:

- the availability of on-call medical staff and policies and guidelines regarding contacting these doctors by nursing staff.
- the management of the deteriorating patient, especially with regards to oxygen requirements.
- standardising the use of patient controlled analgesia systems throughout Western Australia.

**WA Health action:**

- WA Health has developed a state oxygen management policy currently open for consultation with nursing and medical stakeholders.
- WA Health is supporting the implementation of initiatives from the national Recognising and Responding to Clinical Deterioration Program, coordinated by the Australian Commission on Safety and Quality in Health Care, including the use of standardised observation charts in local hospitals and health services.

Reference: WATMORE inquest
The importance of documentation

Key Messages:
- Patient notes are a legal document and must be a true and contemporaneous record of events.

A 20 year old man was admitted to an open psychiatry ward at a public hospital for inpatient care and psychotherapy management of his mental state and risks of self harm. His history included psychosocial problems, temporal lobe pathology, possible child sexual abuse, recurrent episodes of self harm, the recent death of his partner, substance abuse and recurrent depression.

He absconded from the ward while on 30 minute observations, hanged himself with a garden hose and died in the grounds of the hospital.

At Inquest the State Coroner noted that:
- In the two days prior to his death the patient had deteriorated in his mental state and this was noted by two on-call medical practitioners. It was not considered appropriate to transfer him to a hospital with approved beds under the Mental Health Act as an involuntary patient on either of these occasions.
- On the morning of his death the deceased was placed on 30 minute observations due to concerns about his safety. However, while on the ward there was a period when 30 minute observations were not made and the deceased absconded from the ward.
- During the period when that patient was not being observed the medication chart was signed and observations were recorded by nursing staff at a time when the patient was already deceased.

The State Coroner found that death arose by way of suicide and made a number of recommendations.

With regard to medication charts and dispensing of medications the State Coroner recommended that:
- The Department of Health conducts a review of the process for providing medications to mental health patients to ensure that patients do receive medications at about the times ordered and the time of provision of medications is accurately recorded on the medication chart.

In relation to observations charts the State Coroner recommended that:
- The observations chart be altered so that the column does not contain pre-entered times, but that the nurse should enter the actual time when the patient has been observed.
An additional column is inserted in the observations chart to record actual observations made of the patient by the nurse conducting the observations.

A copy of the Nursing Guidelines to nursing observations charts is located where observations charts are located on the ward and that the nursing observations chart be amended by adding a brief reference to the importance of ensuring that on close observations the designated nurse must be able to satisfy himself or herself that the patient is safe.

In relation to the practical issue of observing patients the State Coroner recommended:

- The Department of Health reviews the practicalities associated with conducting high quality observations of at risk patients to ensure that there is consistency in nursing practice in that regard and to reduce unnecessary inconvenience in the conducting and recording of the observations.

In relation to the fact that the ward to which the deceased was admitted is not an authorised hospital for the purposes of the Mental Health Act 1996 the State Coroner recommended:

- That in all future plans for mental health units there be provision for authorised beds and the construction of the units should be such that staff are able to monitor all persons entering and leaving the ward.

Reference: HUDSON inquest
Deterioration of an obstetric patient

Key Messages:

- Clinical deterioration may be recognised early from changes in observations such as temperature and blood pressure and should be heeded even if the patient looks quite well.
- Puerperal sepsis, as with any sepsis, is best managed early with antibiotics as a key part of treatment.

A 38 year old woman died less than 30 hours after the birth of her fourth child as the result of untreated puerperal sepsis.

Following a straightforward, though short delivery with epidural, she developed fever and a headache in the early hours of the morning. Initially the midwife did not call for medical review, waiting until the deceased was vomiting and complaining of abdominal pain. A junior medical officer attended her at this point to prescribe analgesia and saw her again two hours later when she had a high fever again, severe headache and abdominal pains, along with a rapid heart rate. Whilst blood cultures were taken at this point, antibiotics were not commenced, with the resident preferring to wait one hour for the morning ward round with the consultant obstetrician.

At review on the morning round, it was felt that her headache was most likely related to the epidural, rather than a sign of the overwhelming sepsis she was developing. The diagnosis of post-epidural headache was supported by the on-call anaesthetist who reviewed her, but later considered to be unlikely by the anaesthetist who had performed the epidural.

The patient continued to suffer from headache and abdominal pains during the day, necessitating review by another junior medical officer. Later in the day her blood pressure dropped to 80/60, however the seriousness of this appears to have been overlooked by the midwife caring for her and the junior medical officers involved.

When the blood cultures returned positive, less than 12 hours after collection, this result was disregarded as the bottles had passed their expiry date. Despite being informed of the positive blood cultures, the registrar did not review the patient or order antibiotics be commenced.

The patient continued to have low blood pressure, worsening abdominal pain and poor urine output into the evening, when medical care was handed back over to the junior medical officer on night shift. As the only doctor present for the obstetric service at this hospital, he was also looking after several other very unwell patients.

It was not until the patient had an unmeasurable blood pressure some 27 hours post delivery that urgent action was taken. The on-call consultant was called in and the patient was transferred to a tertiary hospital but died following over an hour of resuscitation attempts.
At inquest, the State Coroner found that death had arisen by way of misadventure. Her death was identified as preventable, contributed to by a series of individual errors and system inadequacies.

Issues of concern identified by the State Coroner included:

- The poor level of staffing after hours at the hospital where the deceased was treated, with frequently only one junior medical officer with limited obstetric training present after hours.
- The apparent failure to recognise that the deceased was seriously unwell, with no ‘Code Blue’ being called at any stage, despite meeting criteria, has raised concerns over the adequacy of training of nursing and medical staff in this area.
- Attention is called to the communication between medical staff, with an over-reliance of senior staff on the verbal reports of inexperienced junior medical staff. The lack of adequate review of patients by senior staff may have contributed to the failure to prescribe antibiotics.
- Concern was also expressed over issues relating to the quality of documentation in the patient notes and the failure to perform frequent observations on a sick patient.

The State Coroner made the following recommendations that:

- Consideration be given to the appointment of obstetric registrars who would actually be on site so that at no stage would the most senior doctor present at the hospital be a resident.
- The Medical Emergency calling criteria be available on a laminated document placed at strategic points within the hospital.
- Training for both medical and nursing practitioners should provide greater focus on appreciation of the significance of vital sign observations and a proper understanding of the criteria which constitute a medical emergency.
- The hospital reviews its systems relating to the involvement of registrars to ensure that registrars take a close supervisory role in relation to inexperienced resident medical officers and involve themselves in the treatment of all unwell patients.
- There is a review of the puerperal pyrexia guidelines in place in the hospital to ensure that when an otherwise healthy mother gives birth to a baby and subsequently has an elevated temperature of 38°C or more on two occasions separated by a significant period of time, there is immediate introduction of appropriate antibiotics.
- The hospital reviews its protocols and procedures to ensure that there is an immediate response to concerning observations which reflect a significant deterioration in a patient’s condition.
- Training for both medical and nursing practitioners should provide greater focus on the importance of accurate and complete communication of significant changes in patients’ conditions to senior practitioners. In particular the State Coroner recommends that the training of resident medical officers should include a component focused on effective communication with registrars and consultants.
The Department of Health takes action to improve the training of nursing staff to ensure that there is consistency in the recording of both Integrated Progress Notes and Nursing Observations. In respect of Integrated Progress Notes, the State Coroner noted that it appeared that the common practice is that the time entered in the margin relates to the time of the making of the note. The State Coroner recommended that if this is the commonly used practice of nursing staff, then it should be mandated so that there is uniformity in that regard.

The Department of Health takes steps to ensure that nurses are alert to the importance of recording the actual time of the taking of observations in the date/time column of the documentation.

WA Health action:

WA public hospitals providing maternity care have undertaken the following actions in response to the findings of this inquest:

- Reviewed and updated clinical guidelines with respect to puerperal pyrexia.
- Developed observation charts with ‘early warning alert systems’.
- Reviewed ‘Code Blue’ response systems for occasions when deteriorating patients require emergency care.
- Revision of documentation standards.
- Staff education including obstetric emergency response training.
- The WA Clinical Handover Network and the WA Recognising and Responding to the Deteriorating Patient Network have been established to initiate state-wide coordinated action to reduce patient safety errors associated with clinical handover and patient deterioration.

Reference: McLEVIE inquest
The risks of co-sleeping

Key Messages:

- Co-sleeping is the practice of an adult carer and a baby both sleeping at the same time on the same bed surface.
- Co-sleeping is a risk factor for sudden unexpected death in infants.
- These deaths are likely due to asphyxiation and are potentially preventable.
- The term ‘cot death’ may be misleading, as some people may mistakenly believe the cot is what is responsible for the death.
- ‘Sudden unexpected death in infancy’ or SUDI is now the preferred term to describe all unexpected deaths in infancy, including Sudden Infant Death Syndrome (SIDS).

A four day old baby was discovered in bed unconscious under his sleeping mother’s breast at a regional hospital. He was resuscitated and transferred to Princess Margaret Hospital where he died at eight days of age from cerebral hypoxia.

His mother was a teenager with a history of substance abuse and was assessed to have a reduced ability to care for her child. In addition the baby was allowed to stay in bed with his sleeping mother after feeding (i.e. co-sleeping). Although the practice of co-sleeping was discouraged by some individual staff, it was common practice at the hospital at the time of this child’s death. The hospital had no policy or practice standards in place to reduce the known risk of suffocation.

The Deputy State Coroner found that death arose by way of accident and made the following recommendations:

- SIDS and Kids[^3] removes the current Safe Sleeping National Brochure from distribution and replace it with one more in line with contemporary medical knowledge with respect to the risks associated with co-sleeping.
- The regional hospital actively promotes its own policy based on the Department of Health Operational Directive and Clinical Guidelines with respect to safe sleeping practices by way of formal training and education of midwives/nurses to ensure implementation and consistency of education by example for its patients.
- Hospitals be required to show they have implemented the Department of Health Operational Directive (139/08), including that co-sleeping should be avoided “if the baby is under 11 weeks of age”, before they can be accredited as baby friendly.

[^3]: SIDS and Kids is a not-for-profit organisation that promotes the elimination of sudden and unexpected infant deaths during pregnancy, birth and childhood, supports bereaved families and funds research into stillbirth. [http://www.sidsandkids.org/about-us/]
Resources are provided to country hospitals in particular to encourage staff participation in education from either the Department of Health with respect to Operational Directive 0139/08 or SIDS and Kids as to safe sleeping practices for babies by way of funding for back-filling of staff attending such education.

Medical practitioners understand and use terms associated with the sudden and unexpected death of infants (SUDI) with care, to promote an understanding of the complexity of issues involved in unexpected baby deaths.

Health practitioners avoid the use of the term ‘cot death’ and show great care in using the term ‘SIDS’ in order to assist the public in understanding the complex issues involved in unexpected baby deaths.

Background:

In 2005 the Deputy State Coroner held a public inquest\(^4\) due to alarming numbers of infant deaths due to ‘overlay’\(^5\). It was hoped that publication of the risk factors associated with co-sleeping would help educate the community and reduce the number of deaths arising as the result of co-sleeping.

Prior to the inquest there had been neither policies, nor education available with respect to the risk of co-sleeping.

The following suspected risk factors associated with co-sleeping were outlined during the inquest:

- The developmental stage of the child, that is the more helpless the baby, the more risk there is likely to be.
- The extreme tiredness of the carer.
- The fact that the carer may be intoxicated with either drugs or alcohol or heavily sedated.
- Times when the baby is unwell and is experiencing depressed respiration and/or a high temperature.
- Any other factors which may inhibit the ability of the baby to breathe easily e.g. a closed, oxygen depleted, or carbon dioxide enhanced, environment.

Following the 2005 inquest, SIDS and Kids distributed information brochures regarding safe sleeping for infants.

\(^4\) VISSER inquest

\(^5\) “that is the baby being in close physical proximity to an adult in a restricted position and as a result being unable to breath effectively and probably asphyxiating.” VISSER inquest.
In 2008 the Department of Health released an Operational Directive implementing a State-wide co-sleeping / bed-sharing policy for WA Health hospitals and health services which aimed to ensure the safest possible sleeping environment for mothers and babies and reduce the risks of sudden unexpected infant death associated with co-sleeping/bed sharing.

The State-wide policy was based on the Women and Newborns Health Service clinical guidelines for co-sleeping/bed-sharing (December 2007) which aimed to educate and assist clinical staff to identify and respond to co-sleeping/bed-sharing in the hospital and health services.

During the recent inquest in 2010, the Deputy State Coroner noted that the Operational Directive and clinical guidelines provide clear and accurate guidance on co-sleeping.

The co-sleeping/bed-sharing situations the Operational Directive acknowledges as ‘high risk’ and to be avoided are:

- If the baby is under 11 weeks of age.
- If the baby is preterm or small for gestational age.
- If either the mother or father/partner is a smoker.
- If the mother smoked during pregnancy.
- If either the mother or father/partner have consumed alcohol or taken any medication or illicit drugs which may alter consciousness or cause drowsiness.
- If either the mother or father/partner has extreme tiredness to the point where they may/ would find it difficult to respond to the baby.
- Sleeping with the baby on any soft surface (i.e. a sofa, couch, waterbed, bean bag or sagging mattress).
- If there is excessive bedding on the bed.
- If the baby is sharing a sleep surface with other children or pets.

The Operational Directive also identifies that a varying level of supervision is required depending on the mother’s clinical condition for women choosing to breastfeed and/or settle their baby in bed. Any woman experiencing the following clinical conditions will require close supervision when feeding and or settling her baby in her own bed:

- inability to remain alert
- restricted movement
- severe difficulty with spatial awareness.

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In September 2010, the South Australian Coroner conducted an inquest into the death of five infants and found that all five children died while co-sleeping, either in a bed or on a couch with an adult. The South Australian Coroner concluded that the risk of sudden, unexpected death in infancy is greatly increased where a child sleeps in the same bed with one or more parents or other adults, whether the mechanism of death is asphyxia due to overlaying, bedding or otherwise.

Expert evidence was given by Professor Roger Byard, forensic pathologist with Forensic Science South Australia, co-author of Sudden Death in Infancy, Childhood and Adolescence, who stated that “co-sleeping in certain societies and cultures is common and for generations these cultures have not experienced any problems. However, in Western society the situation is different. This is a function of modern Western society in which bedding tends to be softer than some traditional Asian societies and parents tend to be heavily built, if not obese and often affected by alcohol or other drugs.”

WA Health action:

- WA public hospitals have undertaken the following actions in response to the findings of this inquest:
  - Ensured updated resources are available for parents on safe sleeping arrangements for infants.
  - Provided information on the risks of co-sleeping to parents at antenatal classes and following the birth of a baby.
  - Place safe sleeping information on baby cots.
  - Midwifery education on co-sleeping.
  - Continued implementation of the WA Health state-wide co-sleeping and bed-sharing policy.

Reference: WEST inquest

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The importance of patient education

**Key Messages:**
- Allergic reactions can be unpredictable in their severity.
- Early administration of intra-muscular (IM) adrenaline is important in the treatment of anaphylaxis and patients should always carry an adrenaline autoinjector with them.
- Education regarding food allergens should be widespread in the hospitality industry, and education about standardised treatment of anaphylaxis should be widespread in the health care system.

A 20 year old woman with a history of asthma and severe allergic reaction to peanuts died of anaphylaxis in a small seaside community after having dessert in a local café.

Following a roast dinner at a resort hotel, the deceased and her partner went to the café where she had sticky date pudding with Old English toffee ice-cream for dessert. About 15 minutes after she left the café the deceased started coughing. This did not improve with using a salbutamol inhaler and her partner called the on-call nurse at the nursing post for assistance.

The nurse arrived within five minutes of the call. She found the patient to be in severe respiratory distress, with audible wheeze, cyanosis and stridor.

Initial treatment consisted of oxygen, nebulised ipratropium, salbutamol and adrenaline, with IM (intramuscular) injections of adrenaline 0.5mg and promethazine.

The nurse contacted the on-call doctor at the local hospital in a nearby town for assistance and guidance.

The patient deteriorated with worsening hypoxia and a slow heart rate and was given further IM adrenaline. She initially improved, allowing the nurse some time to put in an intravenous (IV) cannula and give IV hydrocortisone. The patient then deteriorated again and was given IV adrenaline. The nurse attempted an emergency cricothyroidotomy, with guidance over the phone from the doctor, as the patient's breathing had become completely obstructed.

Unfortunately the patient did not improve and she died.

**The inquest revealed that:**
- The patient had her first documented allergic reaction to peanuts at age 15. Her most recent allergic reaction had been less than two months earlier and had required treatment at hospital.
- The patient had received minimal education regarding management of her allergy and whilst she had been prescribed an Epipen (adrenaline autoinjector), she did not usually carry it with her.
The patient and her partner had discussed the food they ordered at the café with the café staff, to satisfy themselves there were no peanuts in the food.

The sticky date pudding was visibly covered with pistachio nuts. It had been stored in a refrigerator on a shelf below a sealed container of peanuts.

The proprietor of the café had limited knowledge of the management of allergy and food allergens, but was aware of the chances of traces of nuts being found in food prepared by suppliers.

The Coroner noted that:
- there was the possibility of food cross-contamination at the café.
- the on-call nurse did a remarkable job and provided competent and appropriate care.
- ideally the second dose of IM adrenaline should have been ordered earlier, although it is recognised that this may not have changed the outcome.
- various guidelines concerning the treatment of anaphylaxis received by the Coroner were not consistent in their management regimes.
- although an individual must bear responsibility for their own health the deceased had not received the preventative education she should have done.

The Coroner found that death arose as a result of anaphylaxis and made a wide range of recommendations:
- Those at risk of life-threatening anaphylaxis should carry an Epipen with them at all times, and particularly when eating out and when travelling to remote places.
- The Department of Health should develop a Western Australian ‘model of care’ for anaphylaxis. This should incorporate service provision by immunology/allergy specialists, other specialists, general practitioners, pharmacists and other health professionals to provide care and evidence-based information in a timely manner. Adequate resources including a project officer should be provided. Minimum standards of care and service provision should be defined and adequately funded.
- The Department of Health should improve the education of health professionals about:
  a. acute management of anaphylaxis
  b. appropriate follow up of the patient at risk of future anaphylaxis.

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8 Susan Peta Richardson.
There needs to be the development of best practice guidelines in the diagnosis and management of anaphylaxis which are regularly updated. There should be easy access to the Australasian Society of Clinical Immunology and Allergy (ASCIA) action plans for anaphylaxis, access to adrenaline autoinjector trainers and patient education resources and access to adrenaline autoinjectors at the point of primary care after the initial episode of anaphylaxis.

Education of the food industry with regards to allergens and allergic customers needs to be improved. This should include training staff about allergens, allergic customers, accurate labelling, full and complete disclosure of food ingredients and possible routes of cross-contamination with allergens. This could be done by Environmental Health Officers who would need further training for this purpose.

PathWest Laboratory Medicine WA should retain blood samples, stomach contents and food samples in all cases of suspected anaphylaxis until after the Coroner has made findings.

The Department of Health should provide video link facilities and hands-free phone facilities (preferably with a head set) for remote nursing posts, such as Coral Bay, where a doctor is not resident and medical support in an emergency has to be provided by electronic means.

Medicare Australia, or other relevant body, should revise the Pharmaceutical Benefits Scheme (PBS) prescription criteria for the prescription of Epipens (or other adrenaline autoinjectors) to allow for:

a) prescription of more than one Epipen (or other adrenaline autoinjector) at a time
b) prescription of an Epipen (or other adrenaline autoinjector) following any anaphylactic reaction (and not only, as now, where adrenaline has been administered for that reaction or with the approval of an allergy specialist).

WA Health action:

- The WA Country Health Service is developing a network of audio (i.e. hands-free telephones) and video solutions for remote nursing posts.

Reference: LYNCH inquest
Risks associated with illicit drug use

Key Messages:

- Amphetamine based drugs (including methamphetamine and Ecstasy) can be fatal.
- There is effectively no antidote to a fatal overdose of amphetamine based drugs, but early supportive medical care may improve the outcome.
- Different levels of amphetamines can be fatal for different people.
- The illicit drug market does not guarantee consistent concentrations of drugs.

“Australians are the largest users of amphetamines in the world and the illicit use of amphetamines in the community as a recreational drug is common.” Of Australians aged 14 years or older, approximately one in forty has used meth/amphetamine for non-medical purposes with people aged 20-29 more likely than those in other age groups to have used these drugs. Of particular concern is that Western Australia leads the country in meth/amphetamine use.9 10

The following two cases from public inquests highlight some of the risks associated with illicit drug use.

Case One:

A 49 year old man died in police custody following the ingestion of a large amount of methamphetamines. The patient had a history of illicit drug use since he was a teenager with a related forensic history. In the six weeks before his death he had been using amphetamines heavily and was frequently noted to be acting strangely.

On the day of his death he was seen behaving in a bizarre fashion, continually stuffing what looked like bread into his mouth, running in and out of traffic and ‘shadow boxing’. Numerous calls were made to the police about his behaviour and the danger to himself and to others. He was caught by police and during a brief struggle was seen to place something in his mouth. One of the police officers removed some plastic from his mouth along with a piece of tomato and assumed that he had been chewing a sandwich or roll.


He was placed in the back of a police van and taken to the nearby police lock-up. When the van door was opened about 15 minutes later he had collapsed and was unconscious with shallow breathing and had a bluish tinge to his skin. CPR was commenced by the police and an ambulance called to take him to hospital. Unfortunately resuscitation was unsuccessful.

Post Mortem examination revealed a blood concentration of 17 mg/L of methylamphetamine, with 14 mg of methylamphetamine still present in the deceased’s stomach contents. A blood concentration greater than 2.5mg/L is considered to be a life threatening toxicity.

The opinion of the forensic pathologist was that a fatal cardiac arrhythmia was a likely mechanism of death. The Deputy State Coroner found that death rose by way of misadventure.

Case Two:

In the next case, a 21 year old woman, with a history of recreational drug use, died around five hours after taking three ecstasy tablets. She had taken ecstasy in the past, to enhance her enjoyment of social events and like many recreational drug users, had not realised that there could be adverse effects from this drug.

Whilst celebrating New Year’s Eve with friends, the deceased had consumed some caffeine, half an ecstasy tablet and a moderate amount of alcohol. Several hours later, following an argument with her boyfriend, she took three ecstasy tablets at once. Within an hour, she became alternately animated and lethargic, hot and cold. Her friends believed her condition to be part of normal intoxication, and tried to prevent her from injuring herself.

Her condition continued to deteriorate, and an ambulance was called when she became immobile and unresponsive. The paramedics described her as being rigid, with hot and clammy skin and dilated pupils. She was lying on her back and her airway was partially obstructed. She was taken to hospital where she had a seizure and was intubated, but subsequently developed a fatal cardiac arrhythmia.

The Deputy State Coroner concluded that ‘ecstasy was considered by these young people to be a “party drug”. The tragedy is, it is not. It can kill and when or why is a matter of chance.’

The effects of illicit drugs:11

Methamphetamines and amphetamine derivatives such as MDMA (ecstasy) cause sympathomimetic poisoning. The spectrum of toxicity ranges from mild agitation through to death. The clinical effect is largely dose-related but idiosyncratic toxicity can also occur. A wide range of systems in the body are affected.

Central nervous system effects include agitation, delirium, acute and chronic paranoid psychosis, aggression and seizures. Cardiovascular system effects include tachycardia, hypertension, cardiomyopathy and arrhythmias. These can be complicated by myocardial infarction, thoracic aortic dissection and intracerebral haemorrhages. Generalised muscle

11 Source: Dr Mark Monaghan, MBBS FACEM, Clinical Toxicologist.
rigidity can occur, causing hyperthermia, rhabdomyolysis, multi-organ failure and coagulopathy. MDMA can also cause a profound hyponatraemia, which can be exacerbated by the patient’s own water intake.

Management of patient’s affected by methamphetamines and amphetamine overdoses is essentially supportive, with intravenous hydration and the liberal use of benzodiazepines for symptomatic patients. Beta blockers should be avoided as their use results in unopposed alpha receptor stimulation, causing an increase in after load, cardiac work, hypertension and cardiac ischaemia.

Reference: CONWAY and POORE inquests [available upon request from the Office of Safety and Quality in Healthcare]
Lessons from the quality protection environment

All of the deaths that are reported to the Office of the State Coroner are investigated but not all go on to public inquest. The non-inquested cases may still yield useful information regarding opportunities for quality improvement in health care institutions across the State.

The Medical Adviser to the State Coroner has made a number of case reports available to the Coronial Liaison Unit within the Office of Safety and Quality in Healthcare for the purpose of education and quality improvement within the limits imposed by the Coroner’s Ethics Committee.

Deaths that occur within the WA health system that may have been possibly preventable are subject to mortality review processes via the WA Review of Mortality (WARM) Policy and investigation via the WA Sentinel Event Program, in addition to Coronial reporting requirements.

These deaths are investigated by the hospital/health service involved in the care of the patient under either State or Commonwealth qualified privilege, with the goal of systematically reviewing the case to develop recommendations for improvement to the health care system in order to avoid similar tragedies in the future.

The following cases demonstrate some examples of lessons learned in the past year from cases reviewed under qualified privilege. These are composite cases, based on non-inquested cases identified by the Office of the State Coroner and incorporate the emerging themes from investigations occurring under the WA Sentinel Event Program.

Identifying features of individual patients or staff have been removed and at the time of publication there has been no coronial inquest into any of these cases.
Missed subdural haemorrhage

Key Messages:

- The Canadian Head Computed Tomography (CT) Rules, a well-validated set of guidelines to aid in the assessment and management of patients with minor head injuries are used widely throughout Australia and many other countries.

- Minor head injury is defined as witnessed loss of consciousness, definite amnesia, or witnessed disorientation in patients with a Glasgow Coma Scale (GCS) score of 13–15.

- These guidelines do not apply to children, patients who have had a seizure, or those receiving anticoagulation.

- Patients who are taking anticoagulant medication are at a 10 fold increased risk of intracranial bleeding following minor head injury and should undergo further investigation, even when they present with only minimal symptoms.

An 84 year old woman who was taking warfarin was brought to an Emergency Department (ED) following a simple fall at home, which had resulted in a laceration to her forehead. She had not experienced any loss of consciousness, vomiting or visual disturbance and was able to walk. Following suturing of the laceration, she was discharged from the ED by a junior staff member without having had further investigations.

Three days later she was found unconscious at home by a relative. She was brought back to hospital, intubated and a CT scan of her head was performed. The CT scan unfortunately revealed a large subdural haematoma (collection of blood within the skull). Given her poor prognosis, her family requested that she not undergo surgery and instead be kept comfortable. She died later that same day with her family by her side.

The ED had guidelines for the assessment of patients with head injury, but these did not adequately cover patients on anti-coagulant therapy. These guidelines have subsequently been revised and now include specific reference to patients receiving anti-coagulant therapy. The revised guidelines have been made available to all staff and are included in education sessions for junior medical staff.

A shortage of senior medical staff did not allow for adequate supervision of junior medical staff and it was common practice for resident medical officers to discharge some patients without having discussed the matter with a more senior doctor. The issues of staffing levels and unsupervised work by junior doctors have been addressed by the hospital, with a policy to be implemented whereby junior staff must discuss all patients seen with a registrar or consultant.
The deteriorating patient

Key Messages:

- Medical Emergency Teams (MET) have been established in order to improve patient management in hospitals. However in some areas there continues to be a reluctance to use this service.

- When there is discrepancy between a patient’s apparent clinical condition and objective observations, care must be taken to investigate such incongruities rather than dismiss them.

A 70 year old man was admitted to a peripheral metropolitan hospital with bronchopneumonia. At the time of transfer to the ward, the patient was breathing at a rate of 40 breaths per minute and his oxygen saturations were in the low 80s despite treatment with high flow supplemental oxygen (12L/min via non-rebreather mask).

Such rapid breathing would normally require calling for the MET, however the nurse called for review by the on-call doctor, rather than initiating a full MET response.

The attending resident medical officer was of the opinion that the low oxygen saturation readings were inaccurate due to the patient’s cold hands and poor peripheral circulation rather than being a true reflection of the patient’s clinical condition, despite the rapid breathing rate. No changes to management or the orders for frequency of observations were made.

The patient’s condition continued to worsen, but was not reviewed by nursing staff again for some time. When observations were repeated four hours later, he was found to be only semi-conscious, with rapid shallow breathing and oxygen saturations in the low 70’s. A MET call was put out at this time, but unfortunately the patient arrested and was not able to be resuscitated.

During the review of this case, issues around MET criteria were examined. Whilst MET guidelines had been in place, there was found to be a culture where review by a junior medical doctor was regarded to be an acceptable and less disruptive substitute for MET review. Contributing to this was a tendency for admitting medical officers to admit patients to the wards in a condition that would meet the criteria for a MET call without specifically addressing this issue.

The review team recommended that the existing MET guidelines be adhered to more strictly and education of ward staff was undertaken regarding this. Medical staff were also educated regarding MET criteria, the MET response and the need to provide nursing staff with special instructions regarding amended MET criteria for specific patients. Planned medical review within a set time frame for patients with amended MET criteria was mandated. A new form for documenting amended MET criteria and planned time for review was successfully introduced.

Education for nursing and medical staff regarding clinical assessment of the deteriorating patient was undertaken. The need for further investigation of apparent incongruities between assessment and observations was highlighted, such as obtaining a blood gas sample to properly assess oxygenation.
Appendix 1: Quality protection

Quality improvement or quality assurance is a process of continually reviewing and evaluating patient care and patient outcomes using a variety of data sources to identify where care can be improved. The overall aim of quality improvement is to enhance the health care services provided to the community and reduce the risk of adverse events.

Quality improvement encompasses a wide range of activities and includes remedial action following activities such as morbidity and mortality audits, clinical audit, investigation of serious adverse events, and monitoring the rates of selected adverse events and comparing them against expected rates.

Effective quality improvement processes require open communication and acknowledgment of where care processes and outcomes can be improved. Some health care professionals may be reluctant to engage in this process because they fear that:

- the information gathered for critical review may be used to pursue legal proceedings against them; and,
- participation in the assessment and evaluation of services provided by other health care professionals may result in legal action being brought upon them by those individuals.

Legislation has been passed in Western Australia, other states and territories, and at the Commonwealth level, which seeks to encourage health care professionals to participate in quality improvement activities by providing for:

- confidentiality of some documents and proceedings of quality improvement committees;
- protection from these documents and proceedings being used in legal actions; and
- protection against legal liability for people who were acting in good faith in carrying out their responsibilities.

Western Australian qualified privilege scheme:

The *Health Services (Quality Improvement) Act 1994* encourages health professionals to participate in quality improvement processes aimed at improving the quality of health care. The Act prohibits the disclosure of information that identifies, either directly or by implication, individual health care providers and/or patients. Individuals who acquire information solely as a result of the performance of the committee's functions are protected from the compulsion to give evidence, and documents produced solely for the purpose of the committee activities are not admissible in legal proceedings. Source documents that are not created specifically for the purposes of the committee (medical records for example) are not protected by the provisions of the legislation.
Commonwealth qualified privilege scheme:
The Commonwealth qualified privilege scheme encourages health professionals to participate in quality improvement activities by providing two main areas of protection. It protects the confidentiality of information that identifies individuals known solely as the result of declared quality assurance activities, and the scheme offers protection from civil proceedings to people who participate in the declared quality assurance activity. For further information on the Commonwealth qualified privilege scheme please go to the Department of Health and Ageing website Programs and Initiatives section (www.health.gov.au). For State and Commonwealth qualified privilege information, please go to the Office of Safety and Quality in Healthcare website: http://www.safetyandquality.health.wa.gov.au/.

The investigation and analysis phase of the clinical incident management system (AIMS) is a quality assurance activity that is declared under the *Health Insurance Act 1973*. AIMS is in place in all public hospitals and health services across Western Australia. It covers reporting, investigation, analysis and monitoring of clinical incidents that occur as a result of health care or related systems, and predominately involves patients. The goal of AIMS is to improve health care delivery. Incident reporting enables staff to commence investigations to identify the factors and system errors that may have caused or contributed to the occurrence of the incident. Preventative measures can then be put in place to protect patients from similar events in the future.