

Upcoming seminar

Reviewing in-hospital mortality

About the seminar:

Review of in-hospital deaths is an integral part of good clinical practice. Audit provides the opportunity to learn about and improve practices and processes of care. Despite widespread recognition of its importance, there remains no 'gold standard' approach to doing mortality review.

In this seminar we will hear a range of views about how to undertake an effective mortality review. Importantly, a range of leaders from both acute health and forensic medicine will discuss how they use information derived from these reviews to improve practice and processes of care.

Our keynote speaker at the seminar is Dr Raj Behal via videolink from Rush University Medical Center in USA. Dr Behal has done considerable work on developing a data-driven framework for improving patient safety and clinical outcomes.

Who should attend:

This seminar will be of relevance to clinicians, quality and risk managers, and senior executive personnel working across all health sectors.

Venue: Ella Latham Lecture Theatre,
Royal Children's Hospital,
Flemington Road (cnr Gatehouse Street),
Parkville Vic 3010

Seminar date: Thursday 24th June, 2010

Seminar time: 9:30am - 4:30pm
(Registration opens at 9:00am)

Cost: \$165 per person (incl. of GST)

Further venue details, accommodation and parking information can be found on our website at: www.crepatientsafety.org.au.

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Centre of
Research Excellence
in Patient Safety

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The CRE in Patient Safety is funded by the Australian Commission on Safety and Quality in Health care and designated as a NHMRC Centre of Research Excellence. The CRE is based in the Department of Epidemiology & Preventive Medicine, Monash University, Alfred Hospital.

Collaborating institutions include: Bayside Health, University of Queensland, Melbourne Health, Southern Health, Wimmera Healthcare Group, ACT Health, ANU Centre for Health Stewardship, Victorian Institute of Forensic Medicine, CSIRO, Medical Defence Association of Victoria, Peninsula Health, Queensland Health, Australian Centre for Health Innovation, South Australian Department of Health, Western Australian Department of Health, Australian Institute for Health and Welfare (AIHW), Commonwealth Department of Health and Ageing, Australian Council for Healthcare Standards (ACHS), Victorian Department of Health, Monash University Department of General Practice, Clinical Excellence Commission, Melbourne Pathology, Peter MacCallum Cancer Centre, Princess Alexandra Hospital, Boston University (US), Veterans' Affairs (US), Imperial College School of Medicine (UK), Bergen University (Norway).

Do managed clinical networks improve quality of diabetes care?



Greene, A, Pagliari, C, Cunningham, S, et al, *Quality and Safety in Health Care*, 2009; 18: 456-461.

Systematic implementation of clinical guidelines for chronic disease management is difficult because of the need for coordination between different services. Managed clinical networks (MCNs) are a potential solution and this paper describes the evaluation of a local disease-specific (diabetes) MCN based in Scotland.

The paper summarises an independent evaluation carried out on the Tayside Diabetes MCN in 2004/05. Quality improvement strategies implemented incrementally by the MCN over a period of seven years were retrospectively reviewed through an analysis of documents and reports, and conclusions drawn from data extracted out of the regional diabetes register. Qualitative semi-structured interviews were also carried out with relevant staff and consumers. Patients with Type 1 diabetes were compared with patients with Type 2 diabetes. Patients mainly received their care in the community. Multiple interventions in the form of quality improvement activities and guideline implementation were examined. Process measures such as glycolated haemoglobin, and retinal screening were used as indicators.

Measuring blood pressure rapidly improved 26.5% ($p < 0.001$) throughout the study and most improvements were seen early in the MCN development. More complex processes (e.g. foot examination) showed slow improvement. Process measure for patients with Type 2 diabetes improved more than those with Type 1. Some of the process measures were benchmarked against national registers and the local outcomes were found to be much better. Rates for hospital referral for newly diagnosed patients with Type 2 diabetes fell 37.3% between 2002 and 2006.

The paper described three weaknesses in the initial setup of the MCN. Firstly, there was an over-emphasis on professional engagement, and more should have been done to increase consumer involvement. Secondly, more attention should have been paid to engaging National Health Service management. Finally, more focus should have been given to Type 1 diabetes.

There are several other limitations to this study which should be considered. The retrospective design and omission of a control group suggests that this paper is based on an independent evaluation of a local MCN. It is also based on a regional diabetes register, and the criteria used for patient selection is not obvious. The comparison with national data may not be significant. Audits in other regions are reported to be less complete and outcomes may be sensitive to case-mix variation, and influenced by incentives paid to general practices can be to carry out screening measures. Although the evaluation period was from 1998 to 2005, the paper reported selected outcomes according different time periods. This led to an uncertainty as to whether there was any bias in the presentation of results.

Take home message: MCNs facilitate the delivery of better care to whole populations across organisational and professional boundaries but require sustained work over long periods. Rather than just focusing on clinician engagement, MCNs must also improve engagement with patients and managers to support future redesign.

Effectiveness of acute medical units in hospitals: a systematic review

Scott, I, Vaughan, L, Bell, D, *International Journal for Quality in Health Care*, 2009; 21(6): 397-407.

Hospital bed occupancy and admission rates are increasing, leading to overcrowding and congestion in emergency departments. Hospitals around the world have implemented structural reforms, one of which is the establishment of acute medical units (AMUs) within acute hospitals. This paper is a systematic review of the available literature assessing the effectiveness of AMUs in hospitals.

Peer-reviewed journal articles reporting effects of the introduction of an AMU on mortality, length of stay, discharge disposition, readmissions, resource use and patient and/or staff satisfaction, were obtained from medical databases published between January 1990 and July 2008. Reports from non-peer-reviewed websites combined with a Google search were also obtained. Search criteria were adequately reported. Article selection and data extraction were performed by one author and confirmed by a second. Nine peer-reviewed articles were finally selected — none randomised or controlled. Two were prospective studies and seven retrospective before-after analysis. All studies were based in hospitals located in the UK or Ireland.

Due to the study heterogeneity, no formal meta-analysis was performed. Two studies (one of which was prospective), reported significant reductions in in-patient mortality between 0.6 and 5.6% following commencement of an AMU. Four studies reported significant reductions in the length of stay between 1.5 and 2.5 days. Waiting times for patients transferred from emergency departments to medical beds decreased by 30% in one study. In three studies, the proportion of medical patients discharged directly home from the AMU increased by 8 and 25%. Three studies noted no increase in 30-day readmission rates following unit commencement. Two studies described significant improvements in patient and staff satisfaction with care. Eight non-peer-reviewed reports relating to 48 units confirmed reductions in the length of stay. The paper also identifies several factors critical to the success of AMUs, and lists out issues that have proven to be problematic.

The evidence base around the efficacy of AMUs remains limited with the absence of controlled trials leading to the possibility of confounders or selection bias. As the paper noted, in one of the studies, a decrease in in-patient mortality may have also been due to a background decrease in mortality of the catchment population, changes in demographics of admitted patients, or a selection bias from referring doctors. None of the studies were based in Australia or New Zealand, and only seven AMUs in the UK and Ireland were reviewed out of a total of more than 300 AMUs currently in existence around the world.

The assumption is that the authors of the paper have used appropriate keywords to capture all the available peer- and

non-peer-reviewed evidence. The validity of the conclusions is basically limited by the strengths of the individual studies reviewed. However, the paper provides a useful summary of the current literature on AMUs. Controlled, prospective studies will be needed to confirm their efficacy. In the meantime, the limited observational data available suggest that AMUs improve patient outcomes and the satisfaction of patients and staff.

Take home message: The limited evidence available suggests that AMUs reduce in-patient mortality, length of stay, and emergency department access block without increasing readmission rates, and improve patient and staff satisfaction.

Postoperative risk of venous thromboembolism in middle aged women



Sweetland S, Green J, Liu B, et al. Duration and magnitude of the postoperative risk of venous thromboembolism in middle aged women: prospective cohort study. *BMJ*. 2009;339:b4583.

It is well known that the risk of venous thromboembolism (VTE) increases following surgery. However, there is limited information available as to how long the risk persists or the effect of surgery type on the risk of VTE. Using data from the UK 'Million Women Study' (www.millionwomenstudy.org), the authors aim to examine the duration and magnitude of the increased risk of VTE following different types of surgery. This well designed study broadens our previous understanding of the duration of risk and reinforces the importance of prophylaxis for both day and inpatient surgery.

This large population based prospective study recruited 947,454 women through the UK National Health Service (NHS) breast screening programme between 1996 and 2001. Participant data was linked to NHS inpatient and day surgery records, and central death, cancer and emigration registers. The investigators used ICD-10 codes to identify pulmonary embolism or deep vein thrombosis as a principal diagnosis, comorbidity or cause of death. Women were divided into two groups; those that had an operation during follow-up and those who did not. Both groups were similar for baseline characteristics, except the surgery group had a slightly higher proportion of women who used hormone replacement therapy. Women with more than one operation during follow up or those who had reported a history of blood clot, treatment for clotting problems, previous cancer or who had undergone an operation in the year prior to recruitment were excluded (n=415 840, 30.5%).

During follow-up 0.6% of study population (5,689 women) had their first thromboembolic event. Compared to women that did not have surgery, women who had surgery were 40 times more likely to develop VTE during the first week. This risk increased to 110 times more likely in the third postoperative week. The risk of VTE following day surgery is much lower than inpatient surgery. However, women having day surgery are 10 times more likely to develop VTE during the first six weeks following

surgery compared to women who do not have day surgery. The risk of VTE also varied by type of surgery, and is highest in the first six weeks following inpatient hip or knee replacement surgery, or surgery for cancer.

Despite making all attempts to adjust for variations in baseline characteristics between groups, the study is limited by the authors having no information on prophylaxis prior to inpatient or day surgery, which may have varied between patient and hospital.

Take home message: The postoperative risk of VTE is greatest in the first twelve weeks following surgery in women, peaking at postoperative week three. This raises the question as to whether thromboprophylaxis should be extended beyond the four week period currently recommended by the NICE guidelines. Women who have hip or knee replacement surgery or surgery for cancer are at greatest risk. Day surgery increases the risk of VTE to women, but not to the same magnitude as that seen following inpatient surgery.

Association of telemedicine for remote monitoring of intensive care patients with mortality, complications, and length of stay

Thomas EJ, Lucke JF, Wueste L, et al. *JAMA*. 2009;302(24):2671-2678.

As onsite staffing of intensivists has been associated with lower morbidity and mortality of ICU patients, the use of telemedicine technology is of interest for intensivists to provide remote care for patients where there is staffing shortages. The aim of this study was to determine whether telemedicine can improve care outcomes (mortality, complications and length of stay) for critically ill patients where on-site intensivists are not available.

This study was a prospective, observational study in six ICUs at 5 hospitals in the Gulf Coast region of the United States that implemented tele-ICU interventions systems. The systems were equipped with real-time vital signs; audiovisual connections to patients' rooms; early warning signals regarding abnormalities in a patient's status and access to laboratory values; imaging studies and the medication administration record. It was staffed by two intensivists from noon - 7 AM Monday through Friday and 24 hours a day on Saturday and Sunday. Measures were taken during a pre-intervention period (Jan 2003-August 2005) and post intervention period (July 2004-July 2006).

There were 2,034 patients enrolled during the pre-intervention period and 2,108 during the post-intervention. After adjustment for severity of illness, there were no significant differences associated with the telemedicine intervention for hospital mortality (RR, 0.85; 95% CI, 0.71 to 1.03) and ICU mortality (RR, 0.88; 95% CI, 0.71 to 1.08). There were no significant differences in complications, hospital length of stay or ICU length of stay.

An interesting finding was that there was an interaction between the tele-ICU intervention and severity of illness. The study found that the tele-ICU was associated with improved survival in sicker patients, however there was no improvement or worse outcomes in less sick patients. The authors noted that the sicker patients may have fared better because they were more likely to have required intervention in relation to sudden physiological changes detected by the system.

There are several factors which may have contributed to finding of no effect of the tele-ICU on mortality, complications and length of stay. The authors noted that low decisional authority was granted to the tele-ICU — almost two-thirds of the study patients had physicians who chose minimal delegation to the tele-ICU. It was also noted that the technologies were not well integrated in that

clinical notes and computerised physician order entries were not readily available within the tele-ICU unit.

The limitations of this study include that the degree of physician acceptance and quality of implementation were not assessed. As such, it could not be determined whether these were the reasons for the lack of effect. An assessment of the quality of implementation of such programs could also inform whether this is an issue in future studies. The increased surveillance of patients in the tele-ICU cohort may have also led to higher rates of complications detection which previously were going undiagnosed.

Take home message: This study identified no effect of a tele-ICU system for improving patient outcomes. However, the degree of integration of the system and physician acceptance may have played a role in its lack of benefits.

Bridging the communication gap between public and private radiology services

Chakera T, Nagree Y, Song S. et al. MJA 2009; 191(10):558-560.

This article describes the introduction of an electronic image transfer system between five public teaching hospitals and three large private practices with different picture archiving and communication systems in Perth. This pilot project was funded by the Western Australian Department of Health in 2008. The rationale for introducing the system was to reduce adverse patient outcomes attributable to delay of imaging when a patient moves between hospitals and between public and private systems. Use of different radiology information systems has been identified as a barrier to safe and timely patient management.

In June 2008, availability of a DICOM (Digital Imaging and Communications in Medicine) server enabled the sharing of health information including imaging data on 65 patients between public and private PACS (Picture Archiving and Communication System). One other study in the United States (Menschik, 2006) successfully exchanged digital images across various sites but this is the first study to take place and be reported on in Australia. Due to the success of the pilot, two additional private providers were connected in 2009 and a further two independent practices wish to join. Currently, approximately 150 radiological imaging studies are being transferred each week. Since implementation, there has been only one minor adverse event. This involved timely transfer but not review of images. The authors do not provide adverse event rates prior to implementation for comparison.

The major challenges reported by the authors were: (1) the resource-intensive nature of the transfer process (the DICOM was installed and configured for \$40,000 with an annual cost of \$4000); (2) the personal intervention required by staff in both the public and private systems to obtain written patient consent; and, (3) the time spent on telephone communication each time a patient presents for imaging.

Take home message: The public and private hospital systems in Australia rely on different technologies, processes, drivers and cultures. This study focused on a successful attempt to make information systems to transfer digital radiology images compatible and claimed benefits in the timely and safe management of patients. The trial will continue to grow across Western Australia. However, as with all attempts to implement technological solutions in complex socio-technical systems like healthcare, the consequent impact on workload for staff having to support and maintain the implementation may mean this is not sustainable.

Planned home and hospital births in South Australia, 1991-2006: differences in outcomes



Kennare RM, Keirse MJ, Tucker GR, Chan AC. MJA. 2010; 192(2):76-80.

Recently there has been much debate about the safety of planned home births both in the medical and lay literature in Australia and internationally. This population-based study aimed to examine differences in outcomes between planned home births, occurring at home or in hospital, and planned hospital births. Perinatal data on all births and perinatal deaths occurring in South Australia during the period 1991-2006 were included. Overall the study appeared well designed and of sound methodological rigor. A strength of the analysis was the use of risk adjustment in the outcome analyses.

The study found that planned home births accounted for 0.38% of 300,011 births in South Australia. The perinatal mortality rate for planned home births was found to be similar to that for planned hospital births (7.9 v 8.2 per 1000 births). However, the risk of intrapartum death was found to be sevenfold higher in the planned home births (95% CI, 1.53-35.87). In addition, the risk of death from intrapartum asphyxia was 27-fold higher for planned home births (95% CI, 8.02-88.83). Review of perinatal deaths in the planned home births group identified inappropriate inclusion of women with risk factors for home birth and inadequate fetal surveillance during labour. Low overall health as measured by Apgar scores, was more frequent among planned home births. However, the use of specialised neonatal care as well as rates of postpartum haemorrhage and severe perineal tears were lower among planned home births, but these differences were not statistically significant. Planned home births had lower caesarean section and instrumental delivery rates, and a seven times lower episiotomy rate than planned hospital births.

The authors note the limitations of the study — that like all observational studies the subjects self-select their group allocation. Therefore, although a number of covariates were included in the models to account for differences in patient characteristics, unmeasurable differences among patients that could affect the outcome may still have remained. In addition, despite including data from a 16 year period, the number of planned home births and subsequent adverse events were low. This resulted in wide confidence intervals for the point estimates suggesting a lack of precision.

Take home message: Perinatal safety of home births may be improved substantially by better adherence to risk assessment, timely transfer to hospital when needed, and closer fetal surveillance.

Reduced in-hospital mortality for heart failure with clinical pathways: the results of a cluster randomised controlled trial

Panella M, Marchisio S, Demarchi ML, Manzoli L, Di Stanislao F. *Qual Saf Health Care* 2009; 18: 369-373.

Chronic disease clinical practice guidelines are designed to support decision making based on summarised evidence for effectiveness of a number of interventions, in association with appropriate clinical judgment and patient preferences for treatment. However, the literature abounds with examples of 'failed' guidelines, and in many instances it is likely that suboptimal implementation is contributing to lack of measured effect. As the complex nature of change becomes better understood, implementation strategies to support effective implementation of guideline recommendations have been sought. Clinical Pathways (CP) are one such strategy, however the evidence for their effectiveness remains uncertain. This article, which summarises the results of a cluster randomised trial for management of in hospital heart failure (HF) with a clinical pathway, provides some encouragement for use of clinical pathways.

In the Experimental Prospective Study on the Effectiveness and Efficiency of Clinical Pathways, use of a CP was compared to usual care within a cluster randomised controlled trial including 14 of 18 interested Italian hospitals (the total potentially eligible number being 40). Patients treated by the pathway were admitted primarily for management of HF and those with acute coronary syndromes were excluded. The primary outcome measure was in-hospital mortality. The intervention consisted of a team based CP, where the CP considered care process in association with evidence for best practice and defined goals. Disappointingly, the methods, including randomisation and the intervention, were described in little detail and could not be easily replicated based on the article summary. As is often the case the authors point readers to previously published work. It is also not clear on which guidelines best evidence for care was based, nor the strength of evidence for elements of the CP, although a set of process and outcome indicators are tabulated, with some of these being Joint Commission on the Accreditation of Healthcare Organizations performance indicators. The statistical methods are appropriate for analysis of the study design and an intention to treat analysis was undertaken. It was not clear who performed the evaluation and if the evaluator/s were blinded to the purpose of the evaluation and group status.

Baseline characteristics including gender, severity of HF and comorbidity burden were similar in the two groups (CP n=214, control n=215), with age being a little higher in the intervention group (81.7yr v 79.7yr). There was reduced mortality rates in the CP group (5.6%, CI 2.5, 8.7) v control (15.4%, CI 10.5, 20.2), $p < 0.001$. For secondary outcomes, there was a trend towards improved HF severity, rate of unscheduled readmissions and reduced length of stay although these did not reach statistical significance. Patients in the CP group were more likely to have had LV assessment performed or planned, advice for cessation of smoking, written instructions provided for ongoing self-management but there was no difference in provision of ACE inhibitor therapy.

CP remained a strong determinant of reduce mortality in the multivariate analysis, where there was adjustment for age,

smoking, HF severity, hypertension and source of referral. There was no adjustment for length of stay (although the difference between groups was small) and no information about early discharge and post discharge deaths which may have influenced these results.

Take home message: Despite some limitations, this paper provides promising evidence of a direct relationship between redesign of care and improved in hospital patient health outcomes. The role of clinical pathways in non time dependant chronic conditions deserves further investigation.

Effects of socioeconomic position on 30-day mortality and wait for surgery after hip fracture

Barone A, Fusco D, Colais P, et al. *International Journal for Quality in Health Care* 2009; 21(6) 379-386.



This article reported on a retrospective cohort study of patients over the age of 65 who were admitted to an acute hospital in Rome with a hip fracture. The aim of the study was to investigate the effect of socioeconomic position on short-term mortality and waiting time for surgery after hip fracture. Overall, the study appeared well designed and of sound methodological rigor. A strength of the analysis was the use of risk adjustment in the outcome analyses. The study did however omit how many people were excluded from the analysis despite listing several exclusion criteria. This may affect the generalisability of the findings.

The socioeconomic position of each individual was obtained using a city-specific index of socioeconomic variables based on the individual's census tract of residence. The study found that low socioeconomic level was significantly associated with higher risk of mortality [adjusted relative risk (RR) 1.51; P, 0.05] and lower risk of early intervention (adjusted RR 0.32; P, 0.001). These estimates included adjustment for age and comorbidity. Socioeconomic level also had a negative effect on waiting times within 30 days.

A surprising finding of the study was that only 7.1% of surgical interventions were performed within 48 hours of admission. The authors highlight the Royal College of Physicians recommendation that surgical interventions should be performed within 24 hours of admission. Australian guidelines also recommend that surgery should be completed within 48 hours of admission.

There are some important limitations to this study which were acknowledged by the authors. Time to surgery was computed based on the date of hospital arrival and surgery and was not refined to the actual hour of surgery. In addition, although a number of covariates were included in the models to account for differences in patient characteristics, unmeasurable

differences among patients that affect the risk of 30-day mortality and intervention within 48 hours may still have remained. Not acknowledged by the authors is the measurement of hospital characteristics which may influence delays in surgery such as emergency department access block. A recent Australian study demonstrated that the number of access block patients at the time of arrival directly predicts delay to surgery (Richardson, Emergency Medicine Australasia 2009). Another potential limitation is that by attributing to each patient an aggregated indicator of socioeconomic position, the true association could be underestimated.

Take home message: This Italian study found that individuals living in disadvantaged census tracts had poorer prognoses and were less likely than more affluent people to be treated according to clinical guidelines despite universal healthcare coverage.

Bridging the gap between research and practice: review of a targeted hospital inpatient fall prevention programme

A Barker, J Kamar, A Morton, et al. Qual Saf Health Care 2009; 18: 467-472.

There has been an increasing focus on falls prevention across the care continuum over the last decade. Based on the recommendations of best practice guidelines, many hospitals have implemented falls prevention programs to try and minimise the patient harm arising from falls.

This study was a nine-year study of fall and fall injury rates at an Australian acute metropolitan hospital. Data for the project was collected three years prior to the implementation of falls reduction through to six years post implementation. Data were obtained by retrospective audit of hospital administrative data sets and the computer based incident reporting system. The falls prevention program implemented was locally derived and based on the best practice and peer-reviewed literature recommendations. It included risk assessment of all patients on high risk wards by nursing staff using a simple nine-item tool. The risk assessment was completed each shift. Nursing staff were then required to select, implement and document falls prevention intervention strategies each shift. They were given a list of six simple interventions from which to choose. Implementation of the program included staff training and audit of compliance with the falls prevention documentation.

During the nine-year observation of 271,095 patients, there were 2910 falls and 843 fall injuries. The study found that the rate of falls injuries decreased 41% after implementation of the program. This reduction was significant ($P < 0.001$) and was sustained for the six years. Despite this positive finding, the falls rate varied throughout the observation period, and no significant change in the rate from pre to post program implementation was observed.

The authors suggest that the finding of no reduction in falls during the observation period may be explained by improved reporting and/or a floor effect. They provided data on the number of all patient incidents reported and showed these increased eight-fold during the observation period. They therefore suggest that the number of falls may have reduced more substantially, but the reduction may have been masked by an increase in the reporting of non-injurious falls after the program implementation. Change to computer-based incident reporting, increased feedback of patient incident data to staff, increased staff awareness of the definition of a fall and that all falls must be reported and introduction of a coronial falls investigation standard in 2003 are factors that the authors listed as being potential facilitators

to improve post incident reporting. The authors also highlight that fall rates may have already been low at the hospital prior the program being implemented comparing their rates to those published by others.

A strength of the study is the demonstration of the programs acceptability and sustainability. The program appears to have been successfully integrated into daily nursing care and, as such, the reduction in falls injury rates have been sustained for several years. The authors cite these strengths as being where past programs have failed. Interestingly, the program was relatively simple and centred around interventions which could be considered as standard good practice nursing. For example: positioning a patients walking aid within reach, supervision of patients in the bathroom and use of a toileting schedule. The program included the use of high-low beds which can be lowered to floor level and bed/chair alarms which alert when a patient is attempting to move independently. The authors highlight that the use of high-low beds could have reduced fall injuries but not necessarily falls.

There are limitations to this study which must be acknowledged. The methodology used was not an RCT, and thus, some observed effects may have been because of factors other than the intervention. Further, there was no patient level analysis of interventions to determine which, if any, of the six interventions used are most effective at reducing fall injuries.

Take home message: A simple evidence based, targeted, multi-factorial falls prevention can reduce falls injuries in the acute hospital setting. Hospitals should seek to formally evaluate the impact of programs which they have implemented on falls and fall injuries using a similar methodology as reported in this study. However, further work is required using a randomised controlled design to validate the efficacy and generalisability of this particular program.

The impact of a clinical team assisting the Coroner's investigation of healthcare-related deaths

Joseph E. Ibrahim, Nicola Y. Cunningham, Adam J. O'Brien, Amanda J. Charles, Carmel M.F. Young, Legal Medicine 12 2010; 28-34.

The aim of this study was to describe the short term impact of implementing a Clinical Liaison Service (CLS) to assist Coroner's investigation of prevention of healthcare-related deaths. This paper was written by members of the CLS. The study highlights that in Australia, 4.9% of hospital admissions result in healthcare-related death and that half of these are considered to be preventable. The authors also highlight that traditionally, the relationship between the Coroner's Office and the healthcare sector has not been conducive to prevent patient deaths. They cite a lack of readily available clinical expertise, legalistic communication between the Coroners and healthcare professionals and limited clinician access to contemporaneous information from death investigations that could be used for practice improvement as factors contributing to the relationship breakdown.

This study employed a six-year internal observation design. The evaluation found the CLS developed and implemented:

- (1) a working model for a comprehensive and standardised clinical review;
- (2) a knowledge management strategy to enhance the healthcare sector access to information; and

(3) activities to improve communication channels between the Coroner's Office and the healthcare sector.

The implementation of the CLS appeared to improve the selection of appropriate cases for investigation; the nature and depth of the investigation and self-reported changes to clinicians practice. In addition, the authors stated use of the CLS clinically enhanced the investigation process and improved the credibility of the Coroner's death investigation. Other benefits reported were reduced apprehension in the healthcare sector about the purpose of the investigation and improved co-operation between involved parties. It was highlighted that a key feature of the service was the recognition of the differing needs of clinical and judicial sectors. These findings indicate that a team of practicing clinicians assisting the Coroner's investigation of healthcare-related deaths contributes towards improving patient safety.

The authors note that a barrier to the effectiveness of the CLS was its funding remaining constant over the six-year period. Therefore, the real costs increased each year resulting in reduced staffing which then impeded the service development. Importantly, they highlight that the CLS would only need to save one life every two years to offset the service running costs. This leads to an important limitation of the study — it did not provide any direct evidence that patient outcomes improved and that subsequent lives were saved as a result of the CLS implementation.

Other limitations of the study relate to the internal observational and retrospective design. The biases that this design creates are well known such as optimism inherent in self report. A prospective external validation would overcome these limitations. Also of note, the changes in patient safety to the CLS program requires a direct causal link and this is not possible in the absence of a control group. The authors suggest validation of their findings would best be achieved through a comprehensive external objective program evaluation including comparison with another jurisdiction operating without a clinical team.

Take home message: Use of a CLS appears to enhance the clinical aspects of the Coroner's investigation. It improves the use of existing information and facilitates strengthening collaborative partnerships. Future evaluations will also need to address sustainability of the service, and to explore what factors contribute to a functional CLS and whether the observed effects of the CLS are transferable. Successfully operating a CLS in other jurisdictions may depend on factors such as community and organisational readiness, clinical team composition and experience, expectations and attitudes of the judicial staff.

Use of colour-coded labels for intravenous high-risk medications and lines to improve patient safety

Porat N, Bitan Y, Shefi D, Donchin Y, Rozenbaum H. *Qual Saf Health Care* 2009; 18: 505-509.

This prospective interventional study was developed to assess whether the introduction of colour-coded labels on IV bags, syringes and lines reduced the time it took to identify the correct medication. The setting for the study was a simulated ICU in a hospital in Jerusalem. The study used a crossover design, whereby two groups of nurses (29 in one group and 31 in the other) each undertook six tasks on two mannequins.

The intervention group used labels which were designed in accordance with colour-coding specifications for drugs in anaesthesia. There were two types of labels; one with the name of the 46 drugs and the other with the name of the type of line (e.g. Epidural, pulmonary artery, ICD, CVP, PCA). There were various sizes to accommodate different devices. The control group used traditional standard printed adhesive paper with black print on a white background.

The two groups were compared to assess the time it took to

- (1) locate a syringe with a specific drug placed on a table
- (2) label the IV bag
- (3) change dosage on a syringe pump
- (4) find the peripheral vein line
- (5) identify and describe each line
- (6) identify a labeling error

A stopwatch was used to assess outcome by researchers who were not blinded to the intervention. A repeat measure analysis of variance was used to take into effect the crossover design of the study.

The intervention showed a statistically significant effect in regard to the time it took to perform all the tasks. However, in real terms this equated to a three second difference between the two groups. It took less time to label the IV bag and describe drugs and lines using the colour-coded system compared to the control, a difference of 13 seconds (1 min 7 sec vs 1 min 20 secs, $p > 0.002$ and 45 sec vs 50 sec). It took one second longer to identify the peripheral vein using the colour-coded system. An incorrectly labeled line was identified two seconds slower in the control group compared to the intervention (15 sec vs 17 secs).

Take home message: While the colour-coded system had a 'statistically significant effect' we should not lose focus on what this equated to in real terms and whether it really does improve patient safety, as the title of the article suggests. The colour-coded labels cost four to five times more than the standard labels used by the control group. This study has not demonstrated the effectiveness of a colour-coded system in reducing medication error. More research is required to investigate whether the increased costs associated with the intervention are justified by way of reducing adverse medication events and near misses.



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Harm from accidental falls in older Australians: has the situation improved?

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Interest in falls prevention has never been stronger both in Australia and internationally. This has been fuelled by the knowledge that falls pose a serious threat to the health and wellbeing of older people and contribute a substantial burden to the health care system. The demographics of ageing suggest that the burden of falls will escalate in coming decades¹. Falls are the leading cause of injury-related deaths² in older Australians and a significant factor contributing to a person's admission to a residential aged care facility³. The management of fall injuries in older Australians is estimated to cost in excess of \$565 million annually⁴. This is more than double the cost for motor vehicle accidents⁵. In light of this burden and with substantial state and federal expenditure on production and dissemination of best practice guidelines, the important question must be asked: Is fall related harm decreasing in Australia?

In Australia 2,881 people died as a result of a fall in the 2006 financial year—more than died from transport accidents, drowning, suicide or homicide². However, age adjusted fall mortality rates for persons aged 65+ years decreased 13% between 1999 and 2006². Age standardised fall related femoral fracture rates for this group also decreased in this time. Decreases were more modest in the range of 1-2%⁶. Conversely, the age standardised rate for fall related injuries in this group is estimated to be increasing by 1.1-2.5% each year⁶. Thus, it is evident that falls continue to be a significant problem for the Australian population and ongoing dedication of fiscal, research and clinical resources to prevention activities is required if the problem is to be stabilised or, more optimistically, reduced.

There is systematic review level evidence that exercise interventions are effective at reducing falls and risk of sustaining a fracture from a fall in older people living in the community⁷. While systematic review of evidence in the residential aged care setting indicates there is no clear benefit for exercise or multifactorial interventions. There is however some benefit with vitamin D supplementation for reducing falls⁸ in this setting. In hospitals, multi-factorial programs appear effective at reducing falls⁸. However, this result largely comes from studies in the sub-acute setting with no evidence of effect in the acute sector.

The apparent reduction in femoral fractures may represent improved osteoporosis screening and management, and effective use of fracture prevention devices such as hip protector pads and beds that can be lowered to floor level, particularly in the residential aged care setting. Large scale observational studies to support these hypotheses have however not yet been published. In 2006, more than one in five older people (65+ years) who presented to hospital with a fall related injury lived in residential aged care⁶. It is expected that this figure today would be higher given the number of Australians living in residential aged care has increased 10% over the last five years. With an absence of effective interventions in this setting, it is perhaps not surprising that the number of people presenting to hospital with a fall related injury is growing.

In summary, increased focus on falls prevention activity in Australia during the 1990's and 2000's has not reduced the magnitude of this major public health problem. This indicates that management of falls remains a priority injury prevention target in Australia. There is good evidence to support fall prevention interventions for older people living in the community and patients in sub-acute hospitals. Therefore, funding of these interventions should be a priority target for the Australian government. Unfortunately, there remains a lack of evidence to support falls prevention interventions in residential aged care and acute hospitals. Therefore, further investigation of interventions in these settings should be completed, creating a target for future research.

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