Australian Patient Safety Bulletin

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Upcoming seminars

Acute Medical Assessment Units: Improving Care and Flow for Medical Patients

The interface between hospital Emergency Departments and the inpatient medical wards presents many potential barriers to effective patient flow. In the context of increasing demands on hospital resources together with a reduction in the number of acute inpatient beds, many Australian and International hospitals have introduced Acute Medical Assessment Units or Medical Admission Planning Units to overcome these barriers. These units have been designed to enable rapid and effective assessment and planning for hospital admission.

But do Acute Medical Assessment Units improve patient safety? How should they be integrated into existing structures? What resources are required to get them up and going and what are the barriers to successful implementation?

This seminar has been designed to answer these questions from the perspective of clinicians and administrators. International and national leaders will provide their views on this emerging field of medicine.

Who should attend? This seminar will be of value to general physicians, ED physicians, nurses, geriatricians, administrators, Department of Human Services employees and other hospital staff.

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

Seminar date: Friday 24th April, 2009

Seminar time: 09.30am - 4.30pm
(Registration opens at 09.00am)

Cost: $165.00 per person (incl. of GST)

Further venue details, accommodation and parking information can be found on our website at:

www.crepatientsafety.org.au

Enquiries to Catherine Pound on 03 9903 0891 or catherine.pound@med.monash.edu.au.

Please put next seminar details in your diary. More details to follow.

Topic: Quality Indicators

Venue: Royal Prince Alfred Hospital, Sydney

Seminar date: Thursday 11 June, 2009

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 Human Services, 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).

A surgical safety checklist to reduce morbidity and mortality in a global population

Haynes, Weiser, Berry et al. A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. New England Journal of Medicine 2009; 360(5): 491-499.

Surgical complication rates in developed countries vary between 3 to 17%, with a peri-operative death rate between 0.4 to 0.8%. Higher rates are likely in developing countries. At least half of all surgical complications are estimated to be preventable, and studies on the effectiveness of preventive measures have shown significant reductions of such events.

This study evaluates the efficacy of a 19-item surgical checklist, based on the World Health Organisation's (WHO) Guidelines for Safe Surgery (2008). The aim of this checklist was to reduce complications and mortality associated with surgery.

A prospective before-and-after study at eight hospitals in the Safe Surgery Safe Lives program with a range of locations worldwide was performed (Canada, England, India, Jordan, New Zealand, Philippines, Tanzania, USA). The sites were coded. Hospital sizes and numbers of operation rooms (OR) varied between 371 to 1800 beds and 3 to 39 ORs. Most hospitals were urban public hospitals.

The 19-item checklist was then used at three critical junctures: before delivery of anaesthesia, immediately before incision and before patient leaves the OR. Data collection using standardized data sheets and patients were followed prospectively until discharge or for 30 days, for death and complications.

Outcomes that were measured included major complications arising after the operation, including death definitions for complications were based on the American College of Surgeons' National Surgical Quality Improvement Program. 19 major complications were monitored including ventilation for ≥ 48 hours, sepsis, infection, haemorrhage, cardiac arrest, coma and death.

To adjust for differences in patient numbers for each site, various end-point rates were standardised. Frequencies of performance of safety measures, major complications, and death at each site before and after implementation of the checklist were calculated. For each comparison, two-sided P-values using logistic regression were calculated, with site as a fixed effect. Additional analyses using case-mix, presence or absence of a data collector in OR and disaggregation of data to group into low, middle or high-income countries was performed.

The implementation of the checklist resulted in an overall decrease of surgical complications from 11% at baseline to 7%, whilst the death rate halved from 1.5% to 0.8%, and more patients were routinely screened after the implementation of the checklist.

The reduction in complications was maintained after adjustments for case-mix. However, the exact mechanism of improvement was not clear. Effects such as increased team interactions, reassessments and changes of current practices were considered factors in improving safety processes and team work, consistent with previous studies. Further, the Hawthorne effect may have had an effect on behaviour and processes due to the subjects' knowledge of being observed.

Take home message: The reduction in death and complication rates suggest a standardized surgical checklist could improve the safety of surgical patients in diverse clinical and economic environments.

Opportunities and challenges in improving surgical workflow

Xiao Y, Moss J, de Winter JCF, Venekamp D, Mackenzie CF, Seagull FJ, Perkins S. Opportunities and challenges in improving surgical workflow. Cogn Tech Work 2008; 10:313-21.

Surgical care is considered the principal component of care for most hospitals in terms of activity, resources and revenue. Efficiency in the operating room is dependent on systematic organizational processes throughout the hospital including extensive communication to ensure that the appropriate equipment, medical supplies, patients, surgical teams, support personnel, and accompanying documentation are presented at the required times. Hence the process of identifying factors that underpin potential obstruction to workflow is vital to facilitate optimal performance in the pre-, peri-, and post- operative environments.

This article synthesizes the findings of three different studies on the myriad of communications that occur in relation to the activities of operating theatres. In this way, it illustrates system design factors that can be incorporated to enhance workflow performance and safety.

The studies reported in this paper investigated a variety of external communication activities pertaining to operating room activity:

1. Communication patterns of coordinators – Close observation of charge nurses enabled comprehensive description of the elements of the face-to-face, telephone and intercom communications involved in managing the coordination of surgical activities in the operating suite;
2. Function of whiteboards as a communication aid - Description of utilization of whiteboards demonstrated their pivotal role as a consolidated visual communication aid that could keep all team members constantly updated of all current activities and requirements;
3. Clinical process evaluation - Analysis of reported problems, workflow delays and disruptions by team members, provided suggestions for proactive organizational change related to system design.

Verbal communication is a critical element; however coordination of equipment management and patient preparation can be synchronized with information technology solutions using passive sensors that electronically track status and location via the intranet; thereby reducing telephone communication significantly. Such performance monitoring has the additional benefit of raising awareness of real-time issues, which helps facilitate overall organizational learning.

Take home message: Surgical operations are reliant on stream-lined processes both outside and inside the operating theatre to promote optimal function in terms of efficiency and safety. Analysis of all communications pertaining to operating room activity enables identification of subtle system design issues impacting work flow and patient safety. Innovative techniques such as electronic tracking, have the potential to improve system performance and patient safety.

Interpreting process indicators in trauma care: construct validity vs confounding by indication

Willis C, Stoelwinder J, Cameron P. Interpreting process indicators in trauma care: Construct validity versus confounding by indication. International Journal for Quality in Health Care 2008; 20 (5): 331–338.

Various quality indicators are used in the area of trauma. The American College of Surgeons Committee on Trauma (ACSCOT) have developed a list of trauma indicators, most of which relate to processes of care that should be achieved within certain timeframes. These indicators were developed through expert consultation in the United States in 1987. However, the relationship of these indicators to poorer patient outcomes, including length of stay, in-hospital mortality and greater use of the intensive care unit remains unclear. The authors of this article sought to test the relationship of these processes, plus four additional Victorian State Trauma System (VSTS) indicators, to patient outcomes using Victorian data from the Victorian State Trauma Registry (VSTR).

Data from 5104 trauma cases recorded on the VSTR database between January 2001 to March 2006 were reviewed in this study. Patients had to be classified as blunt trauma, aged 16 years or more and with an Injury Severity Score of greater than 15 to be included. Ten ASCOT indicators and four VSTS indicators were examined for their relationship to the three outcomes listed above.

Three indicators were associated with higher rates of in-hospital mortality and three with increased length of stay. The greatest in-hospital mortality risk occurred in patients where blunt compound tibial fracture treatment occurred more than 8 hours after admission(odds ratio 7.8, p= 0.005) and patients not receiving fixation of femoral diaphyseal fractures (odds ratio 55.4, p= 0.002).

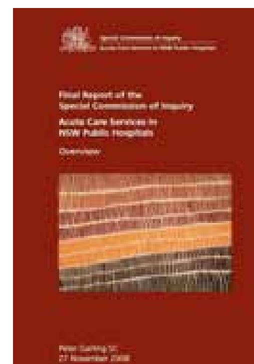
Interestingly, the authors found a counter-intuitive relationship between patient outcomes and nine of the indicators, such that patients receiving better care were found to have significantly poorer outcomes. For example, patients not receiving trauma team activation demonstrated reduced risk of lengths of stay greater than 29 days (odds ratio 0.3, P, 0.001) and reduced the risk of ICU stay more than 24 h (odds ratio 0.3, P, 0.001) as compared to those patients receiving team activation.

The limitations of this study relate to the use of existing data, which includes the potential for measurement error and being limited to the variables collected within the VSTR database. Both of these factors can limit the ability for robust risk-adjustment. The lack of association found for many of the indicators may also be that the outcomes examined in this study are not the best proxies for quality care within this population.

Take home message: The construct validity of the trauma indicators examined in this study remains unclear. The indicators were developed by expert consensus rather than through more rigorous research studies. The authors suggest that these indicators may be better used as treatment guidelines rather than definitive rules. It is important that appropriate and validated indicators of care be employed to improve quality of care.

In the wake of the Garling inquiry into NSW public hospitals: a change of culture?

Van Der Weyden MB. In the wake of the Garling inquiry into New South Wales public hospitals: a change of cultures? MJA. 190(2): 51-52.



Martin Van Der Weyden's MJA editorial is a critique of the Special Commission of Inquiry into Acute Care Services in NSW Public Hospitals or the 'Garling inquiry', which was published in November 2008.

The main criticisms surround its negative tone (echoing much of the media frenzy around a system "in turmoil") and the sheer volume of recommendations (a total of 139, many with extensive subclauses) that are raised without prioritisation or consideration of cost and implementation.

The author suggests such inquiry reports should be streamlined and emphasises the need for consultation with health professionals at the "coal face" if recommendations are to be evidence-based, reality-tested and rigorously debated so that they may actually be actionable and sustainable in terms of quality improvement.

Although dedicating resources to focus on this problem is important, it is also vital to undertake a thorough review of stakeholder opinions. The integral step in this process, as the author highlights, is the synthesis of relevant information to all interested and involved parties in a focused and prioritised manner prior to consultation. Once this has occurred the development of a list of achievable and realistic recommendations can be developed and instituted.

Van der Weyden concludes that the Garling Report offers little in the way of modifying community and hospital cultures that are trapped in the prevailing imbalance between community demands and expectations and the capacity of the hospital system to satisfy these demands. He stresses culture change is needed and wide consultation is vital.

Take home message: Special Commission Inquiries aim to increase the efficiency and effectiveness of the current healthcare system through recommendations directed at optimising prescriptive frameworks and practices. However, such recommendations will not be effective if those who are necessary to operationalise them are not consulted and supported.

Errors in patient specimen collection: application of statistical process control

Dzik W.S., Beckman N, Selleng K, Heddle N et al. Errors in patient specimen collection: application of statistical process control Transfusion 2008; 48(10): 2143-2151.

Accurate sample collection and labelling are critical steps in the process of blood transfusion. Errors in these steps in pretransfusion testing represents a leading cause of transfusion related patient morbidity and mortality. The process for safe pretransfusion testing is a complex one involving numerous hospital departments and staff, multiple steps, and hundreds of individuals. Therefore the process may drift out of control and reach an unstable or unsafe state as a result of many factors. Statistical process control (SPC) is a recognized method for monitoring a process over time. It can be used to document that a critical process is in control, and to signal an alert when the process wanders out of control. It is also useful to display the effects of process changes or to access the effects of new interventions and education.

The aim of this study was to determine the feasibility of SPC as a tool for monitoring quality in transfusion medicine. 10 hospitals in five countries who were members of the Biomedical Excellence for Safer Transfusion Collaborative (BEST) applied the SPC tool to data on sample errors. Sample errors were defined as mislabelled samples and miscollected samples. The SPC tool was used to generate control charts which were adapted to a spread sheet presentation to monitor process stability.

The participating hospitals found the SPC spreadsheet very useful to monitor sample errors in transfusion medicine. The hospitals applied SPC charts to suit their specific needs. One large hospital applied SPC directly to miscollected samples (or Wrong Blood In Tube, WBITs). Smaller hospitals used the SPC to track a combination of mislabelled samples and miscollected samples. Four smaller sized facilities, which used similar collection procedures, combined their data on WBIT into one control chart. One hospital used the control chart to monitor the effect of an educational intervention.

Take home message: This study describes a simple and inexpensive method which can monitor the sample collection and labelling process in any hospital. Statistical process control can help identify when a process is drifting out of control and the effects of education and prevention strategies on critical healthcare processes. The SPC tool may also be useful in the develop ment of national performance standards.

Interruptions and blood transfusion checks: lessons from the simulated operating room

Liu D, Grundgeiger T, Sanderson PM et al. Interruptions and Blood Transfusion Checks: Lessons from the Simulated Operating Room. Anesthesia & Analgesia 2009; 108: 219-222.

Safety surrounding many tasks in healthcare depends on the level of concentration of the staff involved and their ability to respond appropriately to interruptions. While interruptions may be beneficial, where they provide new information or prevent errors, they are often detrimental. Protocols are in place in most hospitals to guide the appropriate steps necessary for patient identification prior to administration of blood transfusions. Adverse event reports cite failure to perform appropriate checks as the most common error leading to incorrect blood transfusion. This study examined the ability of anaesthetists to supervise blood transfusion initiation in the operating theatre when simultaneously interrupted by the surgeon.

The study took place in a simulated operating theatre environment where the anaesthetist was engaged in organising and supervising a blood transfusion for the patient. As the unit of blood arrived, the anaesthetist was distracted by an instruction from the surgeon while the anaesthetic nurse initiated transfusion without completing requisite identification checks.

Video data recorded information on how the anaesthetist handled the interruption and whether the failure to perform ID checks was detected and corrected. The influence of head-mounted patient monitoring devices was also analysed.

The study showed that the anaesthetists who engaged with the surgeon's interruption failed to detect the error. Anaesthetists who multi-tasked (handled the interruption while continuing with the transfusion task), deferred (acknowledged the request, but completed the transfusion task before returning to the surgeon's request) or blocked (denied the surgeon's request) all detected and corrected the error in pre-transfusion identification check. Although numbers in the study were small, there was a significant correlation between strategy for handling the interruption and the likelihood of detection of the error.

Take home message: While interruptions are common in the busy environment of the operating theatre, the manner in which an anaesthetist deals with the interruptions, and completes or delegates tasks is vital in ensuring patient safety and attention to appropriate procedures.

Using simulation models to teach junior doctors how to insert chest tubes

Hutton I, Kenealy H and Wong, C. Using Simulation Models to Teach Junior Doctors How to Insert Chest Tubes: A Brief and Effective Teaching Module. Internal Medicine Journal 2008; 38: 887-891.

Across the field of medicine one of the problems educators face is how best to teach procedural skills. 'On the job' training is no longer seen as adequate. Artificial models and simulation techniques are proposed as an education tool to reduce the amount of incorrectly inserted chest tube which can cause serious complications for patients.

The study aimed to look at factors influencing competence in chest tube insertion and to test the effectiveness of using simulation models. A questionnaire was developed to assess confidence and skill level while inserting a chest tube. Small groups of junior doctors took part in a 2-hour teaching session using a simulation model to cover theoretical and practical chest tube insertion techniques. The doctors were administered a questionnaire and videotaped inserting a standard chest tube into the model before and (one month) after the teaching module. The tapes were blind marked by two independent assessors.

49 doctors completed all components of the study. Following the teaching module, a significant improvement in doctor's scores was found. It improved from a median score of 4 to a median score of 13. Doctors' self rated assessment measures also showed a statistically significant improvement from the pre-teaching median of 14 (maximum score 40) to post-teaching median of 28.

There was no correlation between self-rated assessment and formally measured chest tube competency, either before or after the teaching module. There were, however, some limitations to the study. A large number of participants had no previous experience inserting chest tubes and, therefore, their self assessed and video scores were lower than those with previous experience. Most of the participants had used the simulation model before this study and therefore improvements in technique could be explained by gaining familiarity with the equipment. Further study is needed to see if these improvements translate into improved performance in clinical practice.

Take home message: When reviewing teaching modules for procedural skills in medicine, artificial modules and simulation tools should be considered to ensure more effective practical training.

Impact of barcode medication administration technology on how nurses spend their time providing patient care

Poon EG, Keohane CA, Bane A. et al. Impact of barcode medication administration technology on how nurses spend their time providing patient care. Journal of Nursing Administration 2008; 38 (12): 541-549.

Medication errors can occur within the hospital setting during any stage of the medication use process, making them responsible for a large number of adverse outcomes. The use of bar-code medication administration (BCMA) systems can improve medication safety by verifying that the right drug is being administered to the right patient. In an environment of nurse shortages, increasing workloads, and time constraints, new technologies such as the BCMA can be perceived to slow users down and work-arounds may be created to bypass safety features.

Poon et al, implemented an internally developed BCMA that was designed to support communication between the pharmacy and nursing staff. This system would also organise workflows for nurses whilst verifying, by barcode scanning, every dose of medication and ensuring correct patient identification before administration to the patient.

The aim of the study was to measure the amount of time nurses spent on medication-related administration activities, to measure inefficient activities and to evaluate if a BCMA system would increase any inefficiencies. Poon et al. conducted a time-motion study at their hospital assessing both before and after implementation of the BCMA in order to measure the impact on nursing workflow. In total 232 hours were observed with sessions evenly split between before and after BMCA implementation and 182 nurses participated in the study with 23 being observed.

The results did not show statically significant changes in the amount of time spent on medication administration. Nevertheless, the implementation of BCMA did have several notable changes such as less time spent on managing physician orders and delivery of medication to the patient. There was a notable increase in time spent retrieving medication administration information but overall time spent on medication related activities did not change greatly.

Take home message: The authors showed that barcode technology did not increase the time that nurses spent on medication administration. They argue that, when well-designed, this type of technology could streamline nurses activities allowing them more time to spend on other, potentially patient-focused tasks.

CPOE - What are health professionals concerned about? A qualitative study in an Australian hospital

Georgiou A, Ampt A, Creswick N, Westbrook JI, Braithwaite J. Computerized Provider Order Entry (CPOE)-What are health professionals concerned about? A qualitative study in an Australian hospital. Int J Med Inf 2009; 78: 60-70.

The aim of this study was to identify the main concerns of a broad range of hospital personnel (e.g. doctors, nurses, managers, pharmacists and senior executives) prior to the implementation of an electronic medication management system. The system comprised prescribing and direct drug administration functionalities with an electronic medication chart and is known as Computerised Provider Order Entry or CPOE.

The study was conducted in a large Australian teaching hospital between January 2005 and February 2006 and involved semi-structured interviews (n=20) and focus groups (n=6) involving 50 participants in total. Participants ranged from those directly involved in implementation of the CPOE system to those who would ultimately be involved in or affected by it. Questions posed sought to gather concerns about the current paper based medication management and what changes participants thought the new computerised system would introduce.

Twenty recurrent themes related to nine areas of shared concern were identified. These included work practices, software / hardware, relationships / communication,

education / training, inexperienced staff and de-skilling. Higher level analysis identified four interrelated constructs that highlight what people were concerned about with the introduction of CPOE:

1. Will it help;
2. Will it work;
3. Will we cope; and,
4. Will it impair existing interaction.

Generalizing these research findings was limited by the sample size and the contextual circumstances of the hospital investigated.

The authors conclude that the study demonstrates that different groups within a hospital can have similar concerns. The research contributes to an understanding of pre-implementation concerns of staff which can have a significant effect on how technology is implemented and utilised.

Take home message: Understanding pre-conceptions and concerns and worries of staff towards changing technology can help to inform and strengthen implementation strategies.

Knowing - or not knowing - when to stop: cognitive decline in ageing doctors

Adler RG, Constantinou C. Knowing - or not knowing - when to stop: cognitive decline in ageing doctors MJA 2008; 189(11/12): 622-24.

This article discusses the issue of cognitive decline in an ageing medical workforce and the challenges this poses for Medical Boards. It provides a general overview using data from the Medical Practitioners Board of Victoria.

The key points are a significant portion of the medical workforce is over the age of 60 years, the prevalence of cognitive impairment increases with age and the nature of impairment leads to lack of insight and judgement. Therefore medical practitioners may be unwilling to accept they are impaired and this is compounded by their colleagues' reluctance to report concerns to the Medical Board. The article also highlights the lack of an evidence base to assist with decision-making when determining competence in ageing practitioners.

Take home message: This short article raises significant questions that will need to be addressed in the future about the medical workforce, performance evaluation and the need for evidence based models for decisions concerning competence.

Consumer - driven health care may not be what patients need - caveat emptor

Berenson RA, Cassel CK. Consumer-Driven Health Care May Not Be What Patients Need Caveat Emptor. JAMA 2009; 301(3): 321-323.

Consumer directed health care refers to tax advantaged health savings accounts, together with a high-deductible health plan. This approach has been broadly debated as a new means to organize the finance and delivery of health care services to be more efficient and effective. This can be achieved by applying the principles of market forces to health care.

The author suggests one area in this debate that has not received attention is the changing of the patient-physician relationship. Under consumer directed health care, physicians will act as the suppliers and patients as the consumers. This will place increased reliance on commercial ethics while eroding professional ethics as the guiding force for patient-physician interactions. Commercial competition requires the clinician to deliver desired products and services at competitive prices, grounded in the philosophy of caveat emptor – let the buyer beware. Professional ethics, in contrast puts the best interest of the patient and society above all else. Evidence suggests that the gravitational pull of market pressures that physicians operate in frequently outweighed physician's professional obligation to act in the best interests both of their patient and society.

The author argues that professionalism is important in health care. This is because consumers cannot be totally informed shoppers due to the vulnerability of the illness state and the complexity of the knowledge of health. In society it is assumed that patients can look to physicians and their professional values to fill in this gap of knowledge and act as their advocate. The complexity of this patient-physician relationship, coupled with the uncertainty of many medical outcomes, have lead to health market failure. The physician patient relationship is critical to overcome the market failures seen in the health care market.

Under consumer directed health care, physicians presumably would still be obligated to act in the best interest of the patient consistent with the same standard of care. Yet by intensifying the pull of competitive market force, consumer directed health care threatens to make it more difficult for physicians to be guided by professional ethics.

It has been argued that physician agency and trust can be maintained in line with commercial forces because patients value such a physician attitude and would seek it out; that is, there would be a market for ethical behaviour. The author points out that the problem is that trust in a physician is an inherently subjective quality, and varies with patient's beliefs and preferences. It will, therefore, be difficult to publicly report objective data on this attribute.

Take home message Consumer-directed health care will change the patient physician-relationship to market suppliers and customers. It is not acceptable to rally physicians and patients against one another with the aim to promote efficiency out of a competitive drive. Instead this patient physician- relationship should be strengthened to better serve both patients and society.

Trends in healthcare incident reporting and relationship to safety and quality data in acute hospitals: results from the National Reporting and Learning System

Trends in healthcare incident reporting and relationship to safety and quality data in acute hospitals: results from the National Reporting and Learning System. Hutchinson A, Young TA, Cooper KL, et al. Qual Saf Health Care. 2009;18:5-10.

Incident management systems have been established to capture adverse events and near misses in an effort to use this information to prevent reoccurrence. Data from the National Patient Safety Agency National Reporting and Learning System in the UK was interrogated to analyse patterns in reporting and to explore the link between reporting rates, hospitals characteristics and other quality and safety datasets.

Researchers analysed trends in reporting over an 18

month period from 2003 according to hospital and types of reports. They then assessed whether there was any association between reporting rates in the NRLS and:

1. the percentage of staff who gave positive responses to sections of the NHS Staff Survey relating to safety culture and incident reporting
2. MRSA bacteraemia rates
3. reports about medical devices lodged with the Medicines and Healthcare Products Regulatory Agency;
4. hospitals standardised mortality rates
5. numbers of deaths in low-risk Diagnostic Related Groups (DRG)
6. decubitus ulcer rates
7. risk management rating awarded by the NHS Litigation Authority
8. post operative sepsis.

This study showed that reporting rates increased over the research period. With regard to the types of incident reported, hospitals with higher overall reporting rates had a lower proportion of their reports in the "slips, trips and falls" category, suggesting that these hospitals were reporting higher numbers of other types of incident.

Hospitals with higher reporting rates were more likely to have positive data on safety culture and incident reporting from the NHS Staff Survey, and better risk management ratings from the NHS Litigation Authority.

There was no association between reporting rates and reported bacteraemia rates, reports to the medical device reporting system, hospital standardised mortality rates, death in low risk DRG, number of decubitus ulcers and post operative sepsis, hospital size, average patient age or length of stay.

Take home message: There seems to be a link between having a high reporting rate and having a positive perceived safety climate in regard to safety and reporting within hospitals. The association between institutions with a higher reporting rate and better risk management suggests that higher incident reporting rates indicate safer organisations. However, the inability to link higher reporting rates with outcome measures such as mortality and infection rates might reflect difficulty in establishing a link between process measures and outcomes or that no causal link exists between them.

Improving patient safety by increasing the uptake of proven safety measures in ICUs

W S Krimsky, I B Mroz, J K McIlwaine, S D Surgenor, D Christian, H L Corwin, D Houston, C Robison and N Malayaman A model for increasing patient safety in the intensive care unit: increasing the implementation rates of proven safety measures Qual. Saf. Health Care 2009;18;74-80.

Despite proven efficacy of some interventions to reduce patient harm, many are not implemented effectively in clinical settings. For example, some process measures demonstrated to reduce mortality and morbidity in patients treated in Intensive Care Units (ICU) include: providing prophylaxis against (1) venous thromboembolism; (2) ventilator-associated pneumonia and (3) stress ulcers. This study set out to improve uptake of evidence-based practice for these three measures in an ICU in the US.

A before / after study design was adopted. Researchers initially identified what steps were necessary to deliver optimal care. Baseline data was collected on adherence to prophylaxis for 40 consecutive patients admitted to the ICU.

Three strategies were identified to improve care coordination: (1) improving teamwork; (2) redesigning the system of care and (3) enhancing communication. The morning ward round was identified as the best time to build teamwork. A template for progress notes was developed which included a checklist to prompt for prophylaxis. This was integrated into the resident's notes. To enhance communication, real time data was collected and actual practice was reported against targets. This highlighted not only where it was being done well, but also when appropriate care was not delivered.

Observations were collected every 12 hours on adherence to prophylaxis and reported on statistical process control charts. For each variable being measured the proportion of patients who received best practice e.g. head of bed elevated 30 degrees was plotted and displayed. Prophylaxis for each of the three conditions being targeted improved during the study period.

Take home message: This study employed strategies which can be translated across all quality improvement exercises: engaging everyone involved in the process of getting it right; incorporating audit of practice in the normal workflow of a clinical area; and, reporting findings as close to real time as possible and to everyone involved.

Incidence and outcomes of major trauma assaults: a population-based study in Victoria

Phebe A O'Mullane, Antonia A Mikocka-Walus, Belinda J Gabbe and Peter A Cameron. Incidence and outcomes of major trauma assaults: a population-based study in Victoria; MJA 2009; 190 (3): 129-132.

The Australian Bureau of Statistics survey reported a drop in the number of assaults between 2002 and 2005, which contrasts with media reports that suggest an increase in violence. Subjective evidence based on presentations of injuries to the emergency department suggests an inverse. This study describes the incidence and outcomes of assaults resulting in serious injury in Victoria.

This study analysed population-based data from the Victorian State Trauma Registry for assaults between 1 July and 2001 and 30 June 2007. The main outcome measures were the overall trends in the rate of assault-related major trauma, in hospital mortality, and functional outcomes at 6 months after injury as measured by the Extended Glasgow Outcome scale.

Over the 6-year study period the rate of assault related major trauma rose significantly (Incidence Rate Ratio [IRR], 1.21 [95% CI, 1.16-1.26]). Of the 803 patients, 484 (60%) had blunt trauma and 319 (40%) had penetrating trauma. The rate of blunt trauma assaults rose significantly over the study period (IRR, 1.33 [95% CI, 1.26–1.41]), but the rate of penetrating trauma assaults did not increase significantly (IRR, 1.06 [95% CI, 0.99–1.13]). The majority of the patients were young men. 67% of assaults occurred in metropolitan Melbourne and 22% in

regional Victoria. Blunt injuries most often occurred on the streets while penetrating trauma mostly occurred at home. Assaults were more common during the late hours of the weekend.

Blunt trauma was associated with more severe injury compared with penetrating trauma; 967 patients (82%) with blunt trauma has serious head injuries, and 102 (24%) of these required inpatient rehabilitation. A higher percentage of patients with penetrating trauma died in hospital compared with those with blunt trauma (35% [IRR], vs. 23 [5%]; P = 0.01).

At 6 months follow-up only 19% of the patients (42) had completely recovered. Outcomes at 6 months were worse for those patients who had blunt trauma compared with penetrating trauma.

Take home message: This study demonstrates the value of population-based registries in targeting injury and disease prevention programs. The increase in incidence, the young age of the victims, and the potential for high burden of injury and poor outcome, combined with the preventable nature of the assault, highlights the need for more effective assault-prevention strategies.

What can the human factors concept of 'resilience' offer healthcare?

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In high-risk industries accidents happen. To err is human. We must accept that human fallibility is inevitable and systems are not perfect. But we can optimize the ways that people work and limit the number of accidents that occur. So-called 'High Reliability Industries' or HRO's[1]. have long been held up as an example for healthcare since they carry out similarly high consequence processes with very low levels of catastrophic failure. However, as it is increasingly being argued in the safety science literature, the complexity of healthcare - with its high level of variability, production pressure and professional autonomy, alongside comparatively low degrees of regulation and education around error, event reporting and safe culture – presents obstacles which may be insurmountable in terms of achieving such enviable standards of HRO "safe' practice.

Nonetheless, the scientific discipline of human factors, which draws together psychology, engineering and ergonomics (amongst others) to the study of interactions between people, technology and their work environments, can provide much benefit to those interested in tackling key patient safety concerns. A key human factors concept is 'resilience', which investigates how individuals, teams and organizations monitor, adapt to and act on failures in high-risk situations.[2] Although it is a new concept to healthcare, it is well accepted in other high-risk industries. Resilience moves the focus away from "What went wrong?" to "Why does it go right?", that is, it shifts emphasis from simplistic reactions to error making toward valuing a proactive focus on error recovery. Resilience is a better match for healthcare settings than the principles for high reliability because it more effectively addresses the unique complexities of health care and does not seek to standardize or simplify in the way that high reliability approaches often promote.

So, what exactly does resilience mean and how can we use it to help us build on successes and learn lessons about recovering from healthcare errors? Resilience has three interconnected levels: (1) the individual or cognitive / knowledge-based, e.g. speaking up about safety fears; (2) micro organisational or team / inter-group dynamics, e.g. clear supervision, leadership and feedback; and, (3) macro organisational or whole organization, e.g. corporate commitment to safety. This means that resilience can be described as a property of individuals and as well as teams within the workplace.

Resilience embodies a new philosophy relevant to healthcare because many errors are caught before they reach the patient yet we have little information on the system and process-related factors that help correct these errors.[3] Recent studies in healthcare demonstrate the merits of adopting a resilience-based strategy in this domain.[4]

One particular study demonstrated the effectiveness of asking critical care nurses to reflect on their role in preventing, intercepting and correcting errors. 44% of errors involving medication administration and 31% of procedural errors – both in the ICU over a 28 day period - were discovered by registered nurses, thus preventing harm to patients. These types of investigations, set within specific "problem" domains and related to high-risk processes, should help to pave the way for deeper examination of how such recovery is achieved, can be better supported and, even, trained for in real and simulated settings.

In summary, Resilience can benefit patient safety efforts because it represents a change in emphasis from a traditional, reactive focus on errors to seeing humans as a defense against failure. Translating this concept into practice requires identifying and testing mechanisms for measuring and building resilience within complex healthcare processes.[5]

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1 Weick KE, Sutcliffe KM. Managing the Unexpected: Assuring High Performance in an Age of Complexity. San Francisco, USA: Jossey-Bass; 2001.

2 Hollnagel E, Woods, Leveson NG. Resilience Engineering. Abingdon, UK: Ashgate; 2006.

3 Leape LL, Bates DW, Cullen DJ et al. Systems Analysis of Adverse Drug Events. ADE Prevention Study Group. Journal of the American Medical Association 1995; 274: 2314-6.

4 Rogers AE, Dean GE, Hwang W-T et al. Role of Registered Nurses in Error Prevention, Discovery and Correction. Quality and Safety in Health Care 2008; 17: 117-121.

5 Jeffcott SA, Ibrahim JI, Cameron PA. Resilience in Healthcare and Clinical Handover. Quality and Safety in Health Care 2009 (in press).