

Australian Patient Safety Bulletin

Newsletter of the NHMRC Centre of Research Excellence in Patient Safety

June 2009 Issue 12

Upcoming Seminar

Implementing Quality Indicators: Moving from Theory into Practice

About the seminar: A national priority area for improving safety and quality in health care is better use of data to identify, learn from and prevent errors and system failure. The Council of Australian Governments has recently endorsed collection and reporting of performance indicators in the National Healthcare Agreement.

Measurement is now an integral part of health-care delivery. Quality indicators should represent strategically placed probes into the health system to assess how well a service or an individual is performing. They should be regarded as tools to be used as part of an overall strategy to drive quality improvement: a means to an end and not an end in themselves.

This seminar will provide delegates with practical experiences from those who have implemented quality indicators in their institution or specialty area. It is designed to provide advice and guidance by sharing lessons learned from those who have used them to effectively introduce change and improve service delivery.

Who should attend? This seminar should be attended by people who have responsibility for implementing and evaluating care and service delivery at a clinical unit or institutional level.

It will be conducted by the NHMRC Centre of Research Excellence in Patient Safety (CRE-PS) in conjunction with the New South Wales Clinical Excellence Commission.

Venue: Kerry Packer Auditorium
Royal Prince Alfred Hospital
Missenden Road
Camperdown, NSW, 2050

Seminar date: Thursday 11th June, 2009

Seminar time: 09.00am - 4.40pm
(Registration opens at 08.30am)

Cost - \$220.00 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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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), Ambulance Victoria, Australian Red Cross.

Using quality indicators to improve hospital care

DeVoc M, Graafmans W, Kooistra M et al. *Using quality indicators to improve hospital care: a review of the literature.* *Int J Qual Health Care* 2009; 21(2) 119-129.

This systematic review summarises studies where quality indicators have been used either on their own or in combination with other strategies to improve quality of care in the hospital setting. In summarising the studies, the authors documented whether the implementation strategies using indicators had demonstrable impact on care processes and patient outcome.

Studies were included if they collected baseline and follow up data; included an intervention and control arm; clearly defined the outcome of the implementation strategy; and collected data from more than one site.

Articles were summarised according to how the quality indicators were being used;

1. in education meetings (where information was presented in conferences, seminars, lectures, workshops etc and discussion focussed on how to improve performance);
2. as educational outreach tools (information was provided back to health professionals/managers in their practice setting);
3. a part of an audit and feedback strategy where a report outlining performance was given;
4. as part of a quality improvement (QI) plan; and
5. to provide financial incentive by rewarding high performance.

Further to this, implementation strategies were categorised according to whether they; provided a feedback report, provided no feedback report, provided a feedback report in combination with other strategies e.g. with a QI plan, with incentives.

Study outcomes were categorised according to whether they were;

1. effective (more than half of outcomes measured improved significantly),
2. partly effective (approximately half of outcomes measured improved significantly) or
3. Ineffective (less than half of outcomes measured showed significant improvement).

Results: A total of 21 studies met the inclusion criteria. Nine were randomised controlled clinical trials, two were controlled clinical trials and 10 were controlled before-after studies. Seventeen (81%) were undertaken in US and one (5%) was an Australian-based study. Most (81%) were specific to one discipline and, of these, 67% were applied to cardiovascular care. Twenty studies evaluated the impact of quality indicators on processes of care while six evaluated their impact on patient outcomes. The most common use of the quality indicator was as an audit and feedback tool (n=12) followed by as part of a QI plan (n=10). Seven studies used the indicators for more than one purpose.

Five implementation strategies were effective in improving outcomes, seven were partly effective and nine were ineffective. Of the nine studies with Level 1 evidence, four showed the implementation to be ineffective. Of those that were effective, four reported that quality indicators were used in combination with another implementation strategy. Those strategies least likely to have any impact provided no feedback report. Seven studies reported barriers to changing practice. These included lack of resources e.g. time allocation and administrative support

(n=4), lack of support from management/physicians (n=2), lack of credible data (n=2) and unawareness of the implementation strategy (n=1).

Take home message: Few high quality studies have assessed the impact of using quality indicators on improving outcomes for patients. Those interventions that have been successful have generally provided feedback to clinicians in combination with other strategies. Those that have proven ineffective have provided no feedback to clinicians.

Hospital quality improvement strategies in Europe



Lombarts MJ, Rupp I, Vallejo P et al. *Application of quality improvement strategies in 389 European hospitals: results of the MARQuIS project.* *Qual Saf Health Care.* 2009;18 Suppl 1:i28-37.

This journal article reports one component of a larger project the 'Methods of Assessing Response to Quality Improvement Strategies' (MARQuIS). The project examined hospital care of patients in eight countries of the European Union. The project was developed to address perceived differences in quality in health care across Europe, resulting in patients crossing borders for better quality healthcare. This paper describes how hospitals in the European Union (EU) have applied seven quality improvement strategies. The strategies are: implementing organisational quality management programmes; systems for obtaining patients' views; patient safety systems; audit and internal assessment of clinical standards; clinical and practice guidelines; performance indicators; and external assessment.

The researchers used a web-based questionnaire survey that focused on hospital wide care and on three specific clinical conditions: acute myocardial infarction, acute appendicitis and child birth deliveries. The researchers validated the questionnaire data through site visits by independent external auditors in a selected sample of hospitals.

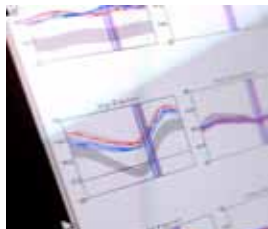
Results: A total 1396 hospitals were invited to participate, 483 accepted by accessing the web-based questionnaire of which 389 submitted a completed questionnaire (28% of invited hospitals). There was significant variation between countries, for example in the UK, 250 hospitals were approached, 41 accepted, and only 14 (6%) completed the questionnaire. In contrast in the Czech Republic 81 hospitals were approached, 53 accepted and 44 (54%) completed the questionnaire.

Of all the participating hospitals approximately 80% had organisational quality management programmes, 64.5% had systems for obtaining patients' views, 75% had patient safety systems, 75-90% had clinical guidelines, up to 70% had performance indicators or measures, up to 50% had an internal audit, assessment of clinical standards and up to 88% had some form of external assessment. Perhaps the most interesting finding was that patient involvement in quality improvement activities was lacking.

Take home message: Quality improvement strategies are widely used in Europe, and the most widely applied strategy is external assessment of hospitals. As expected, the study reports that there was considerable variability between countries. The reasons for the variability and how this impacts on patient outcomes requires further investigation.

Association between Safe Practices Scores and inpatient mortality

Kernisan LP, Lee SJ, Boscardin WJ et al. Association between hospital-reported Leapfrog Safe Practices Scores and inpatient mortality. JAMA. 2009; 301 (13):1341-8.



The Leapfrog group is a nonprofit business coalition in the US that provides information regarding hospital safety and quality to its members (large companies that purchase health care) and to consumers. Its primary method of evaluating hospitals is via voluntary participation in the Leapfrog Hospital Survey which includes the Safe Practices Survey which is endorsed by the National Quality Forum. The main measures of quality and safety as assessed by the survey are hospitals' self-report of structural and process measures such as: creating a safety culture, ensuring an adequate nursing workforce, providing patient care information and orders to all clinicians, preventing central venous line sepsis and requiring hand washing. Hospital performance on the Safe Practices Survey is ranked by quartiles and is available to the public on the website at <http://www.leapfroggroup.org>. This is important for consumers and suggests that hospitals in the highest quartile provide safer care than those in lower quartiles. The aim of this study was to determine the relationship between a hospital's Safe Practices Score and another measures of patient safety, the risk-adjusted inpatient mortality rate.

Results: A total of 1075 hospitals completed the Safe Practices survey in 2006 but discharge and mortality data was only available for 155 (14%) identified in the National Inpatient Sample which included a total of 1,772,064 discharges. Hierarchical logistic regression was used to determine the relationship between quartiles of Safe Practices Score and risk-adjusted inpatient mortality, after adjusting for hospital discharge volume and teaching status. Subgroup analyses were performed using data from patients older than 65 years and patients with 5% or greater expected mortality risk.

Raw observed mortality in the primary sample was 2.09%. Fully adjusted mortality rates by quartile of Safe Practices Score, from lowest to highest, were 1.97% (95% confidence interval [CI], 1.78%-2.18%), 2.04% (95% CI, 1.84%-2.25%), 1.96% (95% CI, 1.77%-2.16%), and 2.00% (95% CI, 1.80%-2.22%) (P=0.99 for linear trend). Results were similar in the subgroup analyses. It was determined that in this sample of hospitals that completed the 2006 Safe Practices Survey, survey scores were not significantly associated with risk-adjusted inpatient mortality.

Take home message: This analysis found no association between better performance on the Safe Practices Survey and lower risk adjusted mortality. It is possible that inviting hospitals to self-report on their patient safety practices and then assigning them to quartiles of score is not an effective way to assess hospital quality and safety. Future work should focus on establishing valid methods for assessing adherence to safe practices.

Improving data quality control in quality improvement projects

Needham DM, Sinopoli DJ, Dinglas VD et al. Improving data quality control in quality improvement projects. Int J Qual Health Care. 2009 ;21(2):145-50.

Even though data quality control methods are well accepted in clinical research their applicability to quality improvement (QI) projects is as yet uncertain. Clinical research is typically conducted with more resources compared with QI and this has the potential to impact on quality. In QI research most data collection occurs as part of routine patient care and without additional support. With an increasing number of QI projects being publicised, there is potential for them to have an important impact on health policy. If important decision making is becoming reliant on QI projects by hospitals, clinicians and policy makers, it is essential that results are accurate. This study examines the need for critical quality control methods to help ensure the accuracy of data collection, analysis and feasible data quality.

The authors describe a case study of improving patient safety in Michigan to demonstrate data quality control methods. This state-wide QI project aimed to improve compliance for catheter insertion and reduce the rate of central line associated blood stream infections and was performed in 103 intensive care units (ICU).

Results: Participating ICUs had a reduction in infections and by the 3 month period there was 66% overall reduction in infection rate. The authors reviewed the data quality control methods and stipulated where changes could be made to improve data quality.

The authors suggest that quality of data and consideration of resources limitations should be considered in all phases of the project starting at the design phase and inclusive of project aims. They stipulate that the data collection phase should include standardised data collection forms, comprehensive staff training and a well designed data entry system. Data collection should be audited and controlled for missing data with final analysis using appropriate statistical analysis addressing outliers, confounding and the effects of missing data.

Take home message: Quality improvement studies are playing an increasing important role in health policy and it is vital that data quality be a priority. Limitations such as resources need to be carefully considered from the design phase and throughout the project and have minimal impact on data quality. Improvement of data quality will allow important stakeholder's to base their decision making on accurate data.

Quality and safety indicators in anaesthesia

Haller G, Stoelwinder J, Myles PS, McNeil J. Quality and safety indicators in anaesthesia: a systematic review. Anesthesiology. 2009;110(5):1158-75.



Between 1987 and 1993 the anaesthesia care task force, which was assembled by the US Joint Commission on Accreditation of Healthcare Organisation, developed 14 anaesthesia-related indicators. Since that time, a number of private, government and healthcare organisations have used these throughout the US, Australia, United Kingdom and Canada. While safety indicators are important tools for measuring the quality of care, patient

mortality and morbidity outcomes are often insensitive tools for measuring the quality of anaesthetic care.

This study sought to systematically review the number of clinical indicators currently available to measure the quality and safety of anaesthetic care, including the evidence for each indicator's validity and recommended methods for their use. The authors conducted a literature review for all peer reviewed published journal articles in addition to published reports from government, private and professional organizations relating to the development and use of clinical indicators for anaesthesia. Expert opinion was also sought for unpublished indicators.

Results: A total of 834 articles were identified. From these, 22 articles and 26 web sites, manual or technical papers relating to indicator programs met the inclusion criteria. These publications resulted in the identification of 108 clinical indicators, half of which also measured surgical or postoperative ward care. Safety was the most common dimension measured by anesthetic clinical indicators (83%), followed by effectiveness (68%). More than half of the indicators (57%) were measures of outcome, and the remaining ones were process (42%) or structural indicators (1%). The most commonly recommended application of the indicators was external benchmarking and peer review, while a number were also considered adequate for report cards or pay for performance incentive schemes. Only 40% had been validated beyond expert opinion. The study identified a lack of standardised practices for measuring similar concepts, which makes it difficult to conduct external benchmarking. For example, perioperative anaesthesia-related mortality was being measured in three ways: death within 48 hours of receiving anaesthesia; death rate associated with procedures involving anaesthesia or death within 30 days of surgery.

Take home message: This study was the first systematic review of anaesthesia-related clinical indicators. Previous efforts to identify clinical indicators have focused primarily on published peer review literature, so this study represents a more thorough review of current practices. Further, this study has identified that more standardised and validation work are required to improve clinical indicators in this area.

Adverse outcomes of labour in hospitals in Australia

Robson SJ, Laws P, Sullivan EA. Adverse outcomes of labour in public and private hospitals in Australia: a population-based descriptive study. *Med J Aust.* 2009;190(9):474-7.

The aim of this study was to compare the rate of serious adverse perinatal outcomes between private and public maternity hospitals for all births in a four year period (Jan 2001 to Dec 2004) using the National Perinatal Data Collection (NDPC) database. Only singleton term births (37-41 weeks gestation) were included in the study. The main outcome measures were perineal injury, need for high level of neonatal resuscitation, Apgar score < 7 at 5 minutes, admission to neonatal intensive care unit or special care nursery, and perinatal death.

Results: A total of 789,240 term singleton births were recorded in Australia, of which 247,489 (31.4%) occurred in private maternity hospitals. With regards to maternal characteristics, women delivering in private hospitals had a higher mean age and were more likely to be having their first baby than women who delivered in the public system. There were higher rates of indigenous mothers, adolescent mothers, self reported smokers and women with diabetes and/ or hypertension in the public system as compared to the private system. Logistic regression was used to adjust for maternal age, Indigenous status, parity, smoking status, diabetes, hypertension, remoteness of usual

residence, and method of birth when comparing the main outcomes.

There was a higher rate of intervention (i.e. assisted vaginal births and caesarean sections) in private hospitals than in the public system. However, the rates of all adverse outcomes studied were higher for births in public hospitals than for those in private hospitals. For women, the adjusted odds ratio (AOR) for third- or fourth-degree perineal injury was 2.28 (95% CI, 2.16–2.40). For babies, the odds of a high level of resuscitation (AOR, 2.37; 95% CI, 2.17–2.59), low Apgar score (AOR, 1.75; 95% CI, 1.65–1.84), intensive care requirement (AOR, 1.48; 95% CI, 1.45–1.51) and perinatal death (AOR, 2.02; 95% CI, 1.78–2.29) were all higher in public hospitals.

Some of the limitations of the study were that it was not possible to measure the proportions of women in each group with important comorbidities such as obesity, which increases the risk of adverse outcomes, or to accurately measure socio-economic status, which also has important influences on pregnancy outcome. A potential confounder for this analysis is that obstetricians may refer more complex patients of higher risk to care in the public system, however, this may have been partially adjusted for by excluding prematurity and multiple pregnancy data from the study. Because of the nature of the data collection there was no analysis of important maternal outcomes such as postpartum haemorrhage, postpartum depression, and severe maternal morbidity. With the establishment of such registries as the Australian Maternity Outcomes Surveillance System (AMOSS) such outcomes may be more easily studied in the future.

Take home message: For women delivering a single baby at term in Australia, the prevalence of adverse perinatal outcomes is higher in public hospitals than in private hospitals. There are higher rates of intervention (i.e. assisted vaginal delivery and caesarean section) in the private system, however, this is not associated with increased rates of perinatal morbidity and mortality or third and fourth degree perineal tears.

Emergency department overcrowding and hospital access block

Richardson DB & Mountain D. Myths versus facts in emergency department overcrowding and hospital access block. *MJA* 2009;190(7):369-74.

Optimal management of emergencies is dependent on efficient flow through the emergency department (ED). If the number of patients either needing or receiving treatment exceeds the physical or staffing capacity of the ED, the result is congestion or overcrowding. Overcrowding creates a serious problem for patient safety, with its potential to hinder access to acute health care at a time most needed.

This summary paper attributes access block as the principal cause of overcrowding, which occurs when patients spend more than 8 hours in the ED due to a limited availability of inpatient beds for those requiring admission. Predictive modelling enables identification of seasonal and weekly patterns; however these are only useful in managing the problem if there is a global hospital commitment and capacity to intervene.

Results: The authors emphasize several points about ED overcrowding, including:

- Although patient presentations to EDs have increased, the delay in receiving treatment are related to admitted patients using ED resources whilst awaiting an inpatient bed
- Solutions at an ED level such as increasing ED capacity, introducing telephone advice lines, or opening additional co-located General Practice service have no effect

- Overcrowding is associated with adverse effects on quality of care, patient safety and patient outcomes.

Details of associated adverse outcomes from the international literature supports the authors' premise that increasing the size of EDs in the absence of increasing hospital beds will only serve to further increases in overcrowding and access block.

Take home message: Emergency Department overcrowding and access block are related to systemic problems with patient flow arising from through the acute health sector. Posing a preventable threat to patient safety, with an associated 20% to 30% excess mortality annually in Australia, the solutions need to be addressed by the health system as a whole.

A hospital discharge program to decrease rehospitalization

Jack BW, Chetty VK, Anthony D et al. A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. *Ann Intern Med.* 2009 3;150(3):178-87.

There is currently no standard procedure for hospital discharge. Approximately 20% of hospital inpatient visits are accompanied by post-discharge adverse events that lead to readmission. This randomised control trial aimed to evaluate the clinical effectiveness of a new package of services implemented at hospital discharge which they named reengineered discharge (RED).

The trial was conducted at the Boston Medical Centre, Boston, Massachusetts. Nurse discharge advocates were trained in the RED intervention by using a manual (www.bu.edu/fammed/projectred/) that contained detailed scripts, observation of relevant clinical interactions and simulated practise sessions. All eligible patients were approached about the study and a total of 738 participants agreed to participate.

Results: A total of 368 participants were randomised to the usual care group and 370 to the intervention group. In the usual care group, normal discharge practices applied and no further action was taken. In the intervention group, discharge advocates provided patients with an after hospital care plan which contained medical provider contact information, appointment calendar, a colour-coded medication schedule, discharge diagnosis and information about what to do if a problem arises. On the day of discharge, the after hospital care plan and the discharge summary were faxed to the primary care provider (or GP). Participants were phoned by a clinical pharmacist 2 to 4 days after discharge to reinforce the discharge plan and go over any medication related problems, and this information was passed onto the discharge advocate and GP. The primary outcomes measured were emergency department visits and rehospitalisation within 30 days of discharge. Secondary outcomes were patient reported preparedness for discharge and frequency of GP follow-up within 30 days of discharge.

Intervention participants had a lower rate of hospital utilisation than usual care participants (incidence rate ratio, 0.695 [95% CI, 0.515 – 0.937]; $P = 0.009$) and intervention participants reported a higher GP follow-up rate than usual care participants (62% vs. 44%; $P = 0.001$). These early results show a clear decrease in hospital utilisation within 30 days of discharge for the intervention group who received the reengineered discharge program. A multicentre study is needed to quantify the decrease in hospital readmissions through intervention and the possible cost savings to the health system.

Take home message: Hospital discharge requires procedures to ensure patients and primary care providers understand what is required of their follow-up care. Investment in properly prepared discharge planning can pay off in the longer term by reducing readmission rates.

Intensive versus conventional glucose control in critically ill patients



NICE-SUGAR Study Investigators, Finfer S, Chittock DR et al. Intensive versus conventional glucose control in critically ill patients. *N Engl J Med.* 2009;360(13):1283-97.

Hyperglycemia is common in critically ill patients and the occurrence of severe hyperglycemia is associated with increased morbidity and mortality. However the optimal target range for blood glucose in critically ill patients remains unclear. Trials examining the effects of tighter glucose control have had conflicting results and systematic reviews and meta-analyses have also led to differing conclusions. Nevertheless, many professional organisations recommend tight glucose control for patients treated in intensive care units. This international parallel group randomized controlled trial tests the hypothesis that intensive glucose control reduces mortality at 90 days.

Results: A total of 6104 adults admitted into intensive care units of participating institutions in Australia, New Zealand and Canada and who were expected to require treatment in the ICU on 3 or more consecutive days were randomly assigned to undergo either intensive glucose control, with a target blood glucose range of 4.5 to 6.0 mmol per liter, or conventional glucose control, with a target of 10.0 mmol or less per liter. The primary outcome was death from any cause within 90 days after randomization. Data with regard to the primary outcome were available for 6022 patients, or 98.7% of the patients randomized. The two groups had similar characteristics at baseline. A total of 829 patients (27.5%) in the intensive-control group and 751 (24.9%) in the conventional-control group died (odds ratio for intensive control, 1.14; 95% confidence interval, 1.02 to 1.28; $P=0.02$). The treatment effect did not differ significantly between operative (surgical) patients and nonoperative (medical) patients (odds ratio for death in the intensive-control group, 1.31 and 1.07, respectively; $P=0.10$). Severe hypoglycemia (blood glucose level, ≤ 2.2 mmol per liter) was reported in 206 of 3016 patients (6.8%) in the intensive-control group and 15 of 3014 (0.5%) in the conventional-control group ($P<0.001$). There was no significant difference between the two treatment groups in the other outcomes such as median number of days in the ICU or hospital or the median number of days of mechanical ventilation or renal-replacement therapy.

Take home message: In this large, international, randomized trial, the investigators found that intensive glucose control as compared with conventional glucose control, increased the absolute risk of mortality among adults in the ICU. On the basis of these results they do not recommend use of the lower target in critically ill adults.

Teaching a structured tool to improve clinical communication

Marshall S, Harrison J, Flanagan B. *The teaching of a structured tool improves the clarity and content of interprofessional clinical communication. Qual Saf Health Care. 2009;18(2):137-40.*

Suboptimal communication between health professionals has been recognised as a significant causative factor in incidents compromising patient safety and is estimated to be a major factor in 60–70% of serious incidents. The aim of this study was to determine if the teaching of a communication tool, ISBAR (Identify, Situation, Background, Assessment, and Recommendation) improved the transfer of information in a simulated clinical environment conducted in real time.

Eighteen teams of final year medical students were approached and seventeen teams consented to participate in the study. These teams (10-12 students per team) were randomised into two groups. The intervention group received a 40 minute education sessions on the ISBAR communication tool. The control group received no education sessions. Both the intervention and control group participated in a standardised simulated clinical scenario using a patient simulator in a replicated medical environment 2-4 hours after the education session. For each group, five students (range 4–6) actively participated in the study scenario while the remainder observed the scenario. During each scenario one student made a telephone referral to a senior college seeking advice.

The telephone calls were audio recorded and scored by a blinded reviewer on content and clarity after inter-coder reliability checks were undertaken. A 20-item scoring sheet was used to identify the presence or absence of important aspects of content of the students' telephone communication and the clarity. Items included whether the student stated the purpose of call early, clearly conveyed urgency, stated the vital signs without prompting, offered a differential diagnoses and reasoned balance of likelihood. A global rating for the communication was also given, using a five-point scale. Primary outcomes were the number of items mentioned on the 20-point list, and global rating scores. Inter-rater reliabilities for each item and the global rating score were analysed using Cohen kappa statistics.

Results: Students in the intervention groups scored significantly higher on the 20 point list (mean score 17.4) than students in the control groups (mean score 10.2) ($p < 0.001$). Likewise global rating score of the delivery of information on a five point scale was also higher in the intervention group ($p = 0.903$, $p < 0.001$).

Take home message: This study demonstrates the positive effect of teaching the ISBAR tool on the content and clarity of communication during telephone referrals in a simulated clinical environment. However this positive outcome cannot be translated in to a real life clinical environment. Further observational studies in a real life environment need to be conducted to verify the tool's effectiveness in improving communication.



The effects of aviation-style non-technical performance and outcome in the operating theatre

McCulloch P, Mishra A, Handa A et al. *The effects of aviation-style non-technical performance and outcome in the operating theatre. Quality and Safety in Health Care 2009; 18: 109-115.*

Aviation has a long tradition in non-technical skills training, which focus on human factors issues, such as communication, decision making and leadership, within teams. Many have advocated this training be applied in healthcare but its benefits for patient safety must first be proven if the necessary investment of time, money and resources are to be justifiable. McCulloch and colleagues observed those personnel performing laparoscopic cholecystectomy (LC) and carotid endarterectomy (CEA) procedures, to investigate the impact of a non-technical skills course (based on aviation "Crew Resource Management", CRM) on:

1. attitudes, as measured by the Safety Attitudes Questionnaire (SAQ) which elicits caregiver attitudes through the six factor analytically derived climate scales
2. teamwork, as measured by the Oxford Non-Technical Skills method which classifies non-technical skills into four key dimensions
3. operative technical errors, as measured by the Observation Clinical Human Reliability Assessment (OCHRA) which recognizes nine key tasks
4. non-operative procedural errors, as measured by a taxonomy developed in previous studies and including items like absence or malfunction of essential equipment and inability to use or set up equipment
5. complications, operating time, and length of hospital stay (LOS), as measured routinely for hospital records.

The non-technical skills training consisted of a 9 hour classroom session, followed twice-weekly coaching from CRM experts over a three-month period. All personnel regularly involved in LC or CEA were invited to the sessions and 54 (65%) attended. Subsequently, at least two members of a surgical team had to have undergone the CRM training to make the case eligible for study. A total of 48 (26 LC operations and 22 CEA procedures) were studied before the intervention, and 55 (32 LC and 23 CEAs) afterwards.

Results: Overall, non-technical skills training improved technical performance in theatre. Non-technical skills (increase 37.0 to 38.7, $t = 2.35$, $p = 0.021$) and attitudes (SAQ increase 64.1 to 69.2, $t = -2.95$, $p = 0.007$) improved after training. Operative technical errors declined from 1.73 to 0.98 ($u = 1071$, $p = 0.009$) and Non-operative errors from 8.48 to 5.16 per operation ($t = 4.383$, $p < 0.001$). However, the effects varied between procedures and were stronger in the LC group than in the CEA group.

Take home message: This is the first study to show improved technical outcomes after an intervention to improve non-technical skills. In this setting it appears that teaching interpersonal skills and having good mentorship/leadership has resulted in demonstrable improvement in clinical performance. What is not known is whether this, in turn, improves patient outcomes.

An online tool to facilitate guideline implementation

Hill KM, Lator EE. How useful is an online tool to facilitate guideline implementation? Feasibility study of using eGLIA by stroke Clinicians in Australia. *Qual. Saf. Health Care* 2009;18;157-159.

Clinical practice guidelines (CPG) are tools designed to support decision making at the point of care in order to reduce variation in practice and improve patient health outcomes. The difficulties in implementing CPGs have been well documented. In order to improve guidelines and enhance implementation, guidelines for development of CPG have been published by NHMRC and a guideline quality assessment tool the AGREE tool is also available. In this paper the authors test the feasibility of using a further tool, the Guideline Implementability Appraisal Tool (GLIA) which has been specifically designed to improve implementation attributes of guidelines.

The study invited 1000 clinicians working within stroke networks to participate in the study, of whom 65 (6.5%) expressed an interest and 40 (4%) completed the study. There was an imbalance in background of participants with 40% being speech pathologists and 3% being medical. The guidelines recommendations were extracted from the Clinical Guidelines for Acute Stroke Management but no additional information was provided about these guidelines nor the reasons and methods of selecting only 58 of the 148 recommendations within these CPG. Participants could self select at least 2 recommendations and were asked to specifically comment on another recommendation provided by the project team. For each recommendation the participants were asked to rate the utility of the eGLIA tool for assessing implementability on a 5 point Likert scale.

Results: The study reported overall positivity for the tool with 94% of participants agreeing or strongly agreeing that eGLIA was useful, while 77% indicated they would use the tool again. Only 72% agreed that the tool allowed them to clearly identify potential barriers to implementation. There was considerable variation in response to the eGLIA tool when assessing the set recommendations. It is possible that this may introduce bias where 'implementability' may be one of the reasons why recommendations were chosen. Overall it was felt the eGLIA focused on internal guideline attributes more than other external factors such as organisational capability for change and infrastructure requirement.

Take home message: There are significant methodological limitations to this study that do not support over-enthusiastic endorsement of the eGLIA tool. However, it provides another way of considering guideline quality that may add value to existing tools and deserves further study.

Guideline based computerised decision support for decision making in multidisciplinary teams

Goud R, de Keizer NF, ter Riet G et al. Effect of guideline based computerised decision support on decision making of multidisciplinary teams: cluster randomised trial in cardiac rehabilitation. *BMJ*. 2009;338:b1440.

Rehabilitation after a cardiac event or intervention is a crucial part of patient recovery and prevention of further cardiac complications. Rehabilitation programs are usually developed for each patient by a multidisciplinary team incorporating four areas: exercise, education, relaxation and lifestyle changes. Cardiac rehabilitation practice is often poorly standardised and does not follow scientific evidence and clinical guidelines. To

address this poor concordance with guidelines, an electronic patient record system with computerised decision support functionalities called CARDASS (cardiac rehabilitation decision support system) was developed. This program allows patient clinical data and assessments to be entered into the software and a rehabilitation plan is developed for each patient. This study determines the extent to which computerised decision support can improve concordance of multidisciplinary teams with therapeutic decisions recommended by guidelines.

A multicentre cluster randomised control trial was designed to evaluate the effectiveness of CARDASS in Dutch cardiac rehabilitation centres. As outpatient centres had only one multidisciplinary cardiac rehabilitation team, entire outpatient centres were the unit of randomisation. Participating centres worked with either of two versions of CARDASS: an intervention version (which had full functionality) or the control version (which comprised all the information management services, but did not provide therapeutic recommendations). Therefore, rehabilitation programs were developed by either the multidisciplinary teams own judgement (control arm) or by basing their decisions on recommendations by CARDASS (intervention arm).

Results: A total of 40 centres were invited to participate in the trial and 31 were randomised (16 in intervention and 15 in the control). All multidisciplinary cardiac teams received a standardised training course during which the control and intervention versions were demonstrated. The trial continued over a period of 6 months.

Data from 21 centres, including 2787 patients, were available for analysis. Computerised decision support significantly increased concordance with guideline recommended therapeutic decisions for exercise therapy by 7.9%, for education therapy by 25.7%, and for relaxation therapy by 25.5%. The concordance for lifestyle change therapy increased by 3.2% but this was not a significant change. One limitation to this study was the high attrition rate with only 21 centres of the total 31 randomised providing data, making it impossible to perform a genuine intention to treat analysis. This infers that implementation of this new system may be difficult.

Take home message: Computerised decision making support was shown to improve the concordance to recommended guidelines for exercise, education and relaxation, but did not improve concordance for lifestyle change therapy.

Toward a 21st-century health care system

Arrow K, Auerbach A, Bertko J et al. Toward a 21st-century health care system: recommendations for health care reform. *Ann Intern Med*. 2009; 150(7):493-5.

The FRESH-Thinking Project began in June 2006 with the aim of developing critical analyses to inform health care reform proposals in the US. For this publication, the project leaders brought together a diverse group of multidisciplinary scholars to provide direction for the 'essential foundations' of fundamental health care reform in the US health system. From a series of workshops, the FRESH-Thinking group proposed that significant changes were needed in the way US health care is financed as well as the delivery structures in place to provide care to all Americans. In doing so, the group agreed upon the eight following recommendations to reform US health care:

1. Replace the existing fee-for-service payment structure with payments based on innovation and efficient delivery of high quality care. Payments to providers need to be based on care that is demonstrated to improve patient outcomes, decrease racial and other inequalities, increase efficiency and moderate financial costs of healthcare. In doing so, greater attention needs to be placed on the development of valid and reliable outcome measures

2. Invest in an independently funded agency that sponsors research on the effectiveness, cost-effectiveness and comparative effectiveness of therapeutics, diagnostics and processes of care. Such an agency should be co-funded from public and private sources
3. Streamline federal and state laws governing health care provision. States should continue enforcing licensure and credentials of providers and protecting consumers
4. Invest in readily accessible health information technology with nation-wide 'interoperability' standards. This promotes systematic collection of health data and provides a national vehicle for information exchange
5. Establish a national health database contributed to by all involved in health systems, including payers, providers and other owners of health data
6. Insure all Americans through identifying sources of revenue, including savings from capping tax exclusions of employer insurance schemes and taxing tobacco
7. Provide a 'standard benefits package' to all Americans through state or regional insurance exchanges. These exchanges would be able to pool risk, allowing those without

access to employer based insurance funds to access a standard package

8. Institute a health coverage board with the role of updating the products included in the standard benefits packages. All individuals should retain the right to purchase packages with additional coverage

Coverage, cost and quality of care are the chief concerns facing the US health system. Reforms of funding and health care delivery systems are therefore required to generate comprehensive and sustainable changes in health system performance.

Take home message: While directed toward US health reform, many of the above initiatives are also relevant for Australia. This paper has demonstrated that a large, multidisciplinary group of leading health experts can reach consensus on the changes needed for fundamental health reform. A greater challenge may be in finding practical solutions that address each reform goal.

Composite measures for measuring quality of care

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Multiple measurement strategies have been used to quantify quality of care, resulting in a wealth and diversity of information.¹ The difficulties of synthesising this information into readily interpretable and meaningful information at the level of the organisation have led to advanced measurement methods, including composite indices. These indices have become popular in combining the results of multiple indicators into one or more summary scores.¹

In 2006, the US Institute of Medicine (IOM) defined composite scores "as the bundling of measures for specific conditions to determine whether all critical aspects of care for a given condition have been achieved".² Composite measures aggregate results from individual indicators into an interpretable and meaningful score, which may be used for inter-provider comparisons (e.g. hospital, system or national level), quality improvement efforts, benchmarking and to assist in consumer decision making. As part of their commitment to composite measure development, the IOM has called for greater research into the reliability and validity of composite measures in healthcare.²

For such 'global' measures of quality, a means of combining information from multiple sources has several advantages. Composite measures are able to simplify often complex information to support decision making; provide a more easily interpretable score for identifying trends; assist in streamlining data reporting; present the 'big-picture' of the issues on the healthcare agenda; and, provide a useful summary of overall performance allowing comparison of similar systems and organisations, which may assist in reinforcing accountability to stakeholders.^{1,3,4}

Despite these advantages, some have questioned the value of composite indices in healthcare settings. Of primary concern is the potential loss of detailed information by combining multiple indicators into a single measure, which may obscure where specific quality issues are most problematic and thus where quality improvement may be of greatest benefit.^{4,5} Downstream, misuse of composites to simplify policy decisions may result from poorly constructed, non-validated metrics.³ The need for a clearly defined approach to composite index construction and validation is of prime importance in ensuring a metric that is informative to multiple stakeholders and useful in comparing and contrasting provider performance.³

While composite measures are not the only means of measuring 'quality of care', they do offer a potentially useful and interesting option to a number of key healthcare stakeholders. Future efforts at exploring different methodological approaches to composite measures and where these tools may fit within a broader performance measurement agenda are therefore required.

1 Jacobs R, Goddard M, Smith P. How robust are hospital ranks based on composite performance measures? *Medical care* 2005;43:1177-1184

2 Institute of Medicine. *Performance Measurement: Accelerating Improvement*. Washington D.C.: The National Academies Press; 2006

3 Nardo M, Saisana M, Saltelli A, et al. *Handbook on Constructing Composite Indicators: Methodology and User Guide*. Paris: OECD; 2005

4 Zaslavsky AM, Shaul JA, Zaborski LB, et al. Combining health plan performance indicators into simpler composite measures. *Health Care Financ Rev* 2002;23:101-115

5 Reilly M, Johnstone P. Composite indicators may not be helpful in comparing health authorities. *BMJ* 2000;320:252