



Center of Excellence for Patient Safety Research and Practice



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Safety of Patients Isolated for Infection Control

Henry Thomas Stelfox et al recently published a study in the *Journal of the American Medical Association* that examined the quality of medical care received by patients isolated for infection control.

Infection control policies are intended to prevent the nosocomial transmission of infectious diseases in hospitals. Airborn, droplet, and contact precautions are routine protocols that protect against the spreading of these infectious pathogens. Stelfox (2003) notes that although the specific transmission-based precaution depends on the type of pathogen, typically infection control precautions consist of placing infected patients in private rooms, restricting their activity outside of their rooms, and requiring all visitors to wear protective clothing (e.g. gloves, gowns, and masks) when in their presence.

Isolation tactics have proven effective for controlling contagious pathogens, however, questions have been

raised whether isolated patients are treated the same as other patients. For example, Stelfox cites studies where isolated patients were found to have half as many hourly contacts with clinicians and were also less likely than other patients to be examined during physician rounds. While these results cannot comment directly on the quality of care being administered, they do make room for the possibility that inadvertent system failures may lead to patient neglect and medical errors in isolated patients. (Stelfox et al, 2003).



To test whether the quality of care was compromised among isolated patients, Stelfox et al conducted a study of hospitalized patients at a Canadian and a Boston hospital. At Sunnybrook and Women's College Health Sciences Center (Toronto, Ontario), eligible patients were isolated because of colonization or infection with methicillin-resistant *Staphylococcus aureus* (MRSA). Control subjects were matched by hospital bed and included the 2 patients who both immediately preceded and followed the isolated patient's admission. At Brigham & Women's Hospital (Boston, MA), eligible patients were admitted with a primary diagnosis of congestive heart failure and were isolated for

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MRSA colonization. The 2 heart failure patients admitted immediately before and after the isolated patient served as the matched controls.

Although no differences were observed in hospital mortality between the isolated and control groups, other significant discrepancies were found. Compared to control patients, isolated patients were more likely to have their vital signs recorded inaccurately, to have days where provider progress notes were not documented, and to express dissatisfaction with their care. Furthermore, isolated patients were more likely to experience adverse events. Two physicians identified adverse events from a summary of each patient's hospitalization. Summaries were prepared by a trained medical record analyst. Reviewing physicians were blinded to patients' isolation statuses. 161 adverse events were observed among 121 patients. Among these, isolated patients were twice as likely than control patients to experience preventable adverse events and were eight times more likely to experience supportive care failures (i.e. falls, pressure ulcers, and electrolyte and fluid disorders) (Stelfox et al, 2003).

Discrepancies in quality of care were found between isolated and control patients

in this study. The authors note that while it is important to control the spread of infectious pathogens, the infection control system places additional barriers between patients and clinicians that can inadvertently lead to adverse events and a lower quality of patient care.

References:

Stelfox, HT; Bates, DW; Redelmeier, DA. "Safety of Patients Isolated for Infection Control. *JAMA*, 2003; vol;290(14); p:1899-1905.

Julian and Martha Soshnick present generous gift to Dr. David Bates and The Center of Excellence for Patient Safety Research and Practice

The Center of Excellence for Patient Safety Research and Practice under the direction of David Bates, recently received a generous gift of 300,000 dollars from Mr. and Mrs. Julian Soshnick.

This donation will be used to establish the Center of Excellence as an ongoing entity in its efforts to continue to fund research aimed at reducing medical error and improving patient safety.

The Critical Care Safety Study: The Incidence and Nature of Medical Errors

Investigators at Brigham and Women's Hospital have been working to identify the types, causes and incidence of medical errors in critically ill patients. Under the direction of Principal Investigator, Dr. Charles Czeisler MD, PhD, a multi-disciplinary team of researchers is collaborating in efforts to assess the effects of intern fatigue on patient safety.

This research study is a collaboration between researchers from the error community and the highly regarded sleep group. It will extend over several years and includes leading researchers such as Jeffrey M.

Rothschild, MD, MPH, David W. Bates, MD, MSc, Rainu Kaushal, MD, MPH, and Lisa Burdick, MS, from the Division of General Medicine; Christopher P. Landrigan, MD, MPH, John W. Cronin, MD, Charles A. Czeisler PhD, MD, and Steven Lockley PhD, from the Division of Sleep Medicine; Craig M. Lilly, MD from the Division of Pulmonary and Critical Care Medicine; Peter H. Stone, MD from the Division of Cardiology, and Joel T. Katz, MD from the Division of Infectious Disease at

Brigham and Women's Hospital.

In part one of this study, investigators conducted a prospective observational study in the medical ICU and coronary intensive care units (CCU). Incidents were collected using direct 24/7 observations of on-call interns, simulated nursing staff reports chart reviews and a computerized pharmacy surveillance system. Trained physician observers and research nurses provided incident case descriptions that were independently rated by 2 physicians. Medical errors that resulted in harm were classified as preventable AEs (PrevAEs). Medical errors with the potential for harm were classified as potential AEs (pAEs). Potential AEs included intercepted and non-intercepted MEs that did not result in harm. Serious MEs are non-intercepted pAEs and PrevAEs. Inter-rater reliability (IRR) was assessed using the Kappa (k) statistic.

Preliminary findings of part one of the *Critical Care Safety Study*, reveal that "preventable and potential AEs are frequent in critically ill patients and often have severe sequelae." (Rothschild et al) The authors further state that efforts aimed at decreasing these types of medical errors are needed.

In part two of the *Critical Care Safety Study*, this group

of researchers further rated medical errors (pAEs and PrevAEs) according to various aspects of the patient care intervention (s); the type of care, the cognitive stage and behavioral performance class. The investigators point out that each ME may be associated with several responses. (total % \geq 100). "The types of care associated with MEs were procedure or treatment related; systems-related i.e. transport, equipment, scheduling, diagnostic, and prevention. The cognitive stages for MEs were execution planning, surveillance and unknown. The behavioral performance classes judged responsible for MEs were slips and lapses, knowledge-based deficiencies, incorrect use of rules, and unknown. Investigators noted several common themes such as failures with communication, training, inexperience, delays, standardization, knowledge and protocol compliance.

The authors further conclude that "the diversity of types of MEs and AEs supports a systems approach to analyzing safety issues in critical care. Data such as these should be helpful in designing effective interventions, and suggest that procedure and treatment-related issues and human factors are attractive targets."

Data will continue to be analyzed and the results of

this study, will be presented at the Society of Critical Care Medicine's Annual Symposium in February, 2004.

Children's Hospital, Boston, forms new Patient Safety Research Group

In response to the vast amount of ongoing patient safety research at Children's Hospital, a team of leading researchers has come together to form a new Patient Safety Research Group.

This newly formed group will facilitate interaction between all investigators and help to ensure that findings from different studies are translated into measurable improvements in health care at Children's Hospital Boston and elsewhere.

Members of this Patient Safety Research Group include: Jenifer R. Lightdale, MD, Christopher P. Landrigan, MD, MPH, Michael S.D. Agus, MD, Jeffrey Burns, MD, MPH, Jeff Cardini, MS, RN, Elizabeth Fortescue, MD, Alexander Garden, MB, ChB, Rainu Kaushal, MD, MPH, Sarah McBride, MD, Kshitij Mistry, MD, Stephen Porter, MD, MPH, Liana Stanley, MEd, Robert Ursprung, MD, Connie Crowley-Ganser, MS, RNC, Lisa Horowitz, PhD,

Garerth Parry, PhD, Patricia Hickey, RN, and Donald A. Goldmann, MD.

Patient Safety Research Initiatives at Children's Hospital aimed at **Understanding the Epidemiology of Error** include:

Pediatric Medication Errors

Dr. Kaushal led a study at two tertiary care medical centers of the incidence of medication errors in pediatric inpatient care using a multi-disciplinary case review methodology.

Kaushal R, Bates DW, Landrigan C, McKenna KJ, Clapp MD, Federico F, Goldmann DA. Medication Errors and Adverse Drug Events in Pediatric Inpatients. JAMA 2001; 285; 2114-2120.

Adverse Events and Errors in the Care of Bronchiolitis

Drs. McBride, Landrigan, and Goldmann have recently completed a study of adverse events and near-misses in the care of hospitalized patients with bronchiolitis.

Patient Safety Strategies

Drs. Fortescue, Kaushal, Bates, and colleagues recently conducted a study evaluating prevention strategies for medication errors in inpatient pediatrics

Fortescue EB, Kaushal R, Landrigan CP, McKenna KJ,

Clapp MD, Federico F, Goldmann DA, Bates DW. Prioritizing Strategies for Preventing Medication Errors and Adverse Drug Events in Pediatric Inpatients. Pediatrics 2003; 111: 722-729

Errors in Post-Operative ICU Communication

Dr. Mistry and colleagues are studying errors during "hand offs" of patient care. Specifically, he is leading an assessment of the prevalence of communication errors during post-operative patient admissions to the pediatric intensive care unit, and the downstream consequences these miscommunications have on patient care.

Patient Safety Research aimed at **Identifying Risk Factors and Developing Improvement Strategies** are:

The Simulator Program at Children's Hospital Boston

The Simulator Program at Children's Hospital Boston (co-directors Patricia Hickey and Dr. Jeffrey Burns) has been created to enhance patient safety and promote professional development. Curricula has been developed to enhance crisis resource management training for clinicians, specifically the Code Team, ECMO Team, Transport Team, Critical Care Nurses, Cardiac Cath Lab teams, and Anesthesia-airway response.

Informative Technology Linking Parents and Providers.

Dr. Stephen Porter has developed a patient-centered technology that fosters collection of relevant medical data directly from parents arriving for acute care.

A Double-blind Randomized Controlled Trial of Capnography for Increasing the Safety of Children Undergoing Procedures with Conscious Sedation

Dr. Lightdale has completed a pilot study of capnography in children undergoing gastrointestinal endoscopy

Variation in Resident's Patient Safety Education

Dr. Parry is leading a study that will examine national variation in the roles of Chief Residents in educating physicians in patient safety. He is particularly interested in studying how programs prioritize patient safety issues.

Patient Safety Research focused on **Testing Interventions** include:

Ward-Based Clinical Pharmacists

Dr. Kaushal led a study of the effect on serious medical error rates of introducing ward-based clinical pharmacists into ward and ICU settings. The pre-intervention serious medication error rate per 1000 patient days was 29 for

the intensive care ward, 8 for the general medical ward, and 7 for the general surgical ward. Post implementation of ward-based clinical pharmacists, the serious medication error rate dropped approximately five fold to 6 in the intensive care ward (p 0.002), but remained essentially the same at 9 in the general medical ward (p 0.82) and 9 in the general surgical ward (p 0.66).

Use of Random Audit Checklists

Dr. Ursprung is leading a study of the effect of random safety audits on process errors, an idea adapted from industry. Daily, 2 items chosen randomly from a 20-item safety checklist are assessed for every patient in the NICU during rounds. Dr. Ursprung and colleagues will see if introduction of these audits decreases error rates.

Effects of the ACGME duty hour standards on Patient Safety, Housestaff Safety, Sleep, and Education

Dr. Landrigan is leading a three-center study (TCHMCB, Lucille-Packard Children's in Stanford, Children's National in DC) of the effects of the ACGME duty hour standards introduced in July 2003.

Safety of an Intermediate Care Unit

Drs. Agus, Landrigan, and McBride are conducting a prospective observational

study designed to evaluate the effect of the creation a Pediatric Intermediate Care Unit (InCU) on patient safety in a Pediatric Hospital.

Frontline: Patient Safety Publications, Research Projects, and Presentations

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[Interview] *Medical Economics.* 80(15):29-30, 33-4, 2003 Aug 8.

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Gardner, Roxane, MD, MPH, presented “**Enriching Obstetrical Care Through Medical Simulation**”, at The Annual Women and Newborn Health Conference, Norwood, MA, Nov. 2003.

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