ACTION PLAN TO ADDRESS: MEDICAL ERRORS IN THE ADMINISTRATION OF DRUG INFUSIONS

The Performance Gap

Medical errors are defined as a preventable adverse event or effect of care and are a leading cause of death in the United States. Healthcare leadership is largely unaware of significant improvement in quality and safety of healthcare as well as cost savings that can be realized by actively addressing medication errors.

Deaths from medical errors exceed deaths attributable to motor vehicle accidents, breast cancer, and heart failure. They include inaccurate or incomplete diagnosis or treatment, as well as when an appropriate method of care is executed incorrectly. Human error has been implicated in nearly 80 percent of adverse events that occur in complex healthcare systems. The vast majority of medical errors result from faulty systems and poorly designed processes versus poor practices or incompetent practitioners.

First credited with initiating an industry-wide call to improve patient safety, a 2000 Institute of Medicine (IOM) report, "To Err is Human: Building a Safer Health System," estimated that medical errors result in between 44,000 and 98,000 preventable deaths and 1,000,000 excess injuries each year in U.S. hospitals. Most of the errors cited in the IOM report were due to problems in the health care system rather than individual failures.

A 2006 follow-up to the IOM study found that medication errors are among the most common medical mistakes, harming at least 1.5 million people every year. In 2000 alone, the extra medical costs incurred by preventable drug related injuries approximated $887 million—and the study looked only at injuries sustained by Medicare recipients, a subset of clinic visitors.

In the United States, reporting medical errors in hospitals is a condition of payment by Medicare. However, an investigation by the Office of Inspector General, Department of Health and Human Services released January 6, 2012, found that most errors are not reported and even in the case of errors that are reported and investigated changes are seldom made which would prevent them in the future.

Infusion pump errors related to programming and use are common and may be associated with catastrophic complications. The pumps are complex to program and the user interface results in programming errors. Patients on infusions are often critically ill and on multiple medications which further increase the probability of error. A variety of approaches that are available immediately for hospitals committed to reducing medical errors and patient harm, including automated infusion technologies, integration of electronic medical records, continuous patient monitoring, infusion pumps, predictive algorithms, checklists, and process of care advances.

Closing the performance gap will require hospitals and healthcare systems to commit to action in the form of specific leadership, practice, and technology plans.

Leadership Plan

- The plan should include fundamentals of change outlined in the National Quality Foundation safe practices, including awareness, accountability, ability, and action.
- Hospital governance and senior administrative leadership must commit to become aware this major performance gap in their own healthcare system.
- Hospital governance, senior administrative leadership, and clinical/safety leadership must close their own performance gap by implementing a comprehensive approach to addressing the performance gap.
• A goal date should be set to implement the plan to address the gap with measurable quality indicators.
  - “Some is not a number. Soon is not a time.”
• Specific budget allocations for the plan should be evaluated by governance boards and senior administrative leaders.
• Clinical/safety leadership should endorse the plan and drive implementation across all providers and systems.

**Practice and Technology Plan**

*Suggested practices and technologies are limited to those proven to show benefit or are the only known technologies with a particular capability. Other technology options may exist, please send information on any additional technologies, along with appropriate evidence, to info@patientsafetysummit.org.*

**Multidisciplinary team**

• Include nursing, information technology, pharmacy, and physicians

**Technology**

• Implement Computerized Provider Order Entry (CPOE)
  o End-to-end infusion pump programming (such as Epic® and Cerner®).
  o Implement electronic Medication Administration (most E.H.R. companies).
  o Implement Barcode Medication Administration Technology (most E.H.R. companies).
• Implement drug libraries (such as Alaris®, Baxter®, Hospira®, Fresenius®, B.Braun® I.V. pumps or comparable systems).
• Implement Pharmacy Workflow Manager (such as Doseedge® from Baxter Healthcare®).
• Implement infusion pumps that wirelessly communicate data back to the electronic Medication administration record (such as Alaris®, Baxter®, Hospira®, Fresenius®, B.Braun® I.V. pumps).
• Implement quality assurance reports to audit compliance with safe drug administration.
• Implement Point of Care Medication Error reporting systems (such as Institute for Safe Medical Practice’s Medication Error Reporting Program).
• Implement pharmacy robots to reduce safety problems associated with providers drawing up their own medications and risk associated with contamination from outsourced compounders (such as BAXA® Intellifill® Robot).
• Implement labels with a bar code that directly documents drug administration into anesthesia information systems and monitoring to make sure the syringe has not been used before on any other patient (such as Codonics® Safety Labeling System).
Appendix: Future Considerations – Health IT and Patient Safety

After implementation of leadership, practice, and technology changes, there are additional and future considerations to make with Health IT and Patient Safety. Hospitals should be aware of these changes when implementing.

The Institute of Medicine (IOM) recently released their report on future considerations and recommendations, which are noted below and in the process of implementation.11 The IOM noted: “A constant, ongoing commitment to safety—from acquisition to implementation and maintenance—is needed to achieve safer, more effective care.”

Recommendation 1: The Secretary of Health and Human Services (HHS) should publish an action and surveillance plan within 12 months that includes a schedule for working with the private sector to assess the impact of health IT on patient safety and minimizing the risk of its implementation and use. The plan should specify:
   a. The Agency for Healthcare Research and Quality (AHRQ) and the National Library of Medicine (NLM) should expand their funding of research, training, and education of safe practices as appropriate, including measures specifically related to the design, implementation, usability, and safe use of health IT by all users, including patients.
   b. The Office of the National Coordinator for Health IT (ONC) should expand its funding of processes that promote safety that should be followed in the development of health IT products, including standardized testing procedures to be used by manufacturers and health care organizations to assess the safety of health IT products.
   c. ONC and AHRQ should work with health IT vendors and health care organizations to promote postdeployment safety testing of EHRs for high-prevalence, high-impact EHR-related patient safety risks.
   d. Health care accrediting organizations should adopt criteria relating to EHR safety.
   e. AHRQ should fund the development of new methods

Recommendation 2: The Secretary of HHS should ensure insofar as possible that health IT vendors support the free exchange of information about health IT experiences and issues and not prohibit sharing of such information, including details (e.g., screenshots) relating to patient safety.

Recommendation 3: ONC should work with the private and public sectors to make comparative user experiences across vendors publicly available.

Recommendation 4: The Secretary of HHS should fund a new Health IT Safety Council to evaluate criteria for assessing and monitoring the safe use of health IT and the use of health IT to enhance safety. This council should operate within an existing voluntary consensus standards organization.

Recommendation 5: All health IT vendors should be required to publicly register and list their products with ONC, initially beginning with EHRs certified for the meaningful use program.

Recommendation 6: The Secretary of HHS should specify the quality and risk management process requirements that health IT vendors must adopt, with a particular focus on human factors, safety culture, and usability.

Recommendation 7: The Secretary of HHS should establish a mechanism for both vendors and users to report health IT–related deaths, serious injuries, or unsafe conditions.
   a. Reporting of health IT–related adverse events should be mandatory for vendors.
   b. Reporting of health IT–related adverse events by users should be voluntary, confidential, and nonpunitive.
   c. Efforts to encourage reporting should be developed, such as removing the perceptual, cultural, contractual, legal, and logistical barriers to reporting.

Recommendation 8: The Secretary of HHS should recommend that Congress establish an independent federal entity for investigating patient safety deaths, serious injuries, or potentially unsafe conditions associated with health IT. This entity should also monitor and analyze data and publicly report results of these activities.

Recommendation 9a: The Secretary of HHS should monitor and publicly report on the progress of health IT safety annually beginning in 2012. If progress toward safety and reliability is not sufficient as determined by the Secretary, the Secretary should direct the FDA to exercise all available authority to regulate EHRs, health information exchanges, and PHRs.

Recommendation 9b: The Secretary should immediately direct the FDA to begin developing the necessary framework for regulation. Such a framework should be in place if and when the Secretary decides the state of health IT safety requires FDA regulation as stipulated in Recommendation 9a above.

Recommendation 10: HHS, in collaboration with other research groups, should support cross-disciplinary research toward the use of health IT as part of a learning health care system. Products of this research should be used to inform the design, testing, and use of health IT. Specific areas of research include:
   a. User-centered design and human factors applied to health IT,
   b. Safe implementation and use of health IT by all users,
   c. Sociotechnical systems associated with health IT, and
   d. Impact of policy decisions on health IT use in clinical practice.
References

10. Overview of the 100,000 Lives Campaign. Institute for Healthcare Improvement.