

ECRI Institute PSO Deep Dive Analyzes Medication Events

This article has been excerpted from the September/October issue of Patient Safety and Quality Healthcare.

Medication mishaps are the most common errors in health care. In 2011, ECRI Institute PSO spearheaded a unique collaborative for health care organizations to learn from medication errors, which represent the most frequently reported events submitted to ECRI Institute PSO — comprising about 25 percent of all events.

ECRI Institute PSO asked participating health care organizations to submit at least 10 medication events — either actual errors or close calls (near misses) — over a specified five-week period so that the PSO could identify patterns and trends from the aggregated, de-identified data and share the findings, as well as recommendations. Participating organizations submitted 695 medication events during the five-week period starting April 15, 2011, and ending May 20, 2011. Eighty health care organizations — including general acute care and pediatric hospitals and long-term care facilities — joined the initiative; the majority of events were submitted by acute-care hospitals.

Most events occurred during the medication administration stage or “node” of the medication-use process. Although errors can occur in any phase of the medication process, participating facilities indicated that most events specific to one node (473) occurred during administration of the medication (67.7%), followed by

dispensing (16.1%), prescribing (8.5%), and monitoring (7.8%).

ECRI Institute PSO’s analysis looked at the medication administration events by route of delivery and found that of the 320 reports for administration-only errors, IV-related errors were the most frequently occurring events, representing 36.9% of administration-only events, followed by oral administration events (18.1%) and subcutaneous injection (7.8%). The analysis dove deeper into these events to understand the reasons and prevention strategies for each type of medication administration error.

Intravenous administration

The frequency of IV administration errors may be due partly to the frequency of IV use and the complex, error-prone aspects of infusion pump programming. Many IV infusions involve high-alert drugs, such as insulin, anticoagulants, and chemotherapeutic agents. The Institute for Safe Medication Practices (ISMP), which publishes a list of high-alert medications, defines them as drugs that bear a heightened risk of causing significant harm when they are used in error.

Of the 118 IV-related administration errors, 55 (46.6%) involved a high-alert medication, and nine of the events, according to the reports, resulted in patient harm, including two deaths. Significantly, these two fatal events were the only two medication errors reported that may have contributed to or resulted in patient deaths; both occurred during administration of IV infusions, and both events involved high-alert medications.

ECRI Institute PSO also found that among the 118 IV-related medication

errors, the most commonly reported types were for the following reasons:

- Drug not given (22.9% of IV-related errors)
- Wrong pump rate (20.3%)
- Wrong drug (16.9%)
- Wrong dose (13.6%)

Oral administration

Events occurring with medications delivered by mouth sometimes involved similar errors as those found among the IV events. The following reasons were given for the 58 events involving oral medications:

- Wrong dose (29.3%)
- Drug not given (20.7%)
- Wrong drug (15.5%)

Though there were wrong-patient errors for events involving both IV and oral administration of drugs, the wrong-patient errors represented a larger share of events for medications taken orally — 10.3% for oral administration events versus about 6% for IV-related events.

As with IV events, a large share of oral administration events involved high-alert medications (39.6%). The largest number of events with high-alert medications, 12 or 52.2% of the events, occurred with opioids, and another 5 events (21.7%) arose with anticoagulants.

Injections

Of the 25 events occurring with a subcutaneous injection of a drug, wrong-dose errors represented 36%, followed by wrong-drug errors (20%) and drug-not-given events and delays in administering an injection (both categories represented 12% of events involving subcutaneous injections). Significantly, 88% of the events entailed a high-alert medication — either insulin or anticoagulants, such as heparin and low-molecular-weight heparin.

Reference

Huber C, Rebold B, Wallace C, Zimmer KP. 2012 ECRI Institute PSO Deep Dive™ Analyzes Medication Events. *Patient Safety and Quality Healthcare*. 2012;9(5):28–34.

Save the Date: CHPSO Annual Meeting

Getting to Zero: Innovate, Collaborate, Accelerate is the theme for CHPSO's Second Annual Meeting April 8–9, 2013, at the Hyatt Regency Sacramento. Based on feedback from this year's Annual Meeting, next year's program will be extended a half day to include breakout sessions. Special thanks to the planning committee for working to put together an informative and inspiring program.

The planning committee welcomes additional input on topics and speakers. Please send suggestions to Frances Sutz Brown, CHPSO's director of Operations and Communications, fsutzbrown@chpso.org or 916.552.7598.

The Value of Proactively Addressing Systemic Risks

Part one of a two-part series

Systematic investigations into the root causes of actual and potential medical errors are necessary in order to design, and continually redesign, safer health care systems. Numerous quality improvement tools are available to assist clinicians towards this goal. The Joint Commission's standard LD.04.04.03 requires accredited health care agencies to ensure new or modified services are well designed, incorporating knowledge gained from performance improvement activities, sentinel event experiences and evidence-based practices. The Joint Commission therefore recommends proactive risk assessments (PRA) to evaluate prospectively process failures, understand their consequences, and identify causal factors that need improvement.(1)

Recognizing the value of prospective health care risk assessments, the Agency for Healthcare Research and Quality (AHRQ) launched a grant program to fund a variety of PRAs to identify hazards inherent in health care systems.(2) AHRQ encouraged health care agencies to collaborate with experts outside of health care in conducting comprehensive PRA research projects. There are multiple forms of PRAs.(3)

Failure Mode and Effects Analysis

The Failure Mode and Effects Analysis (FMEA) process is likely the most common PRA in health care and has

been used to evaluate high-risk patient processes such as medication administration, blood transfusions, MRI safety and barcode medication administration, to name just a few.

FMEA, first developed in the 1940s by the US military, was designed to assess the relative impact of failures inherent in a process and to identify and address those risks with the greatest potential for harm. FMEAs may be performed on a new procedure or equipment prior to implementation, or on an existing system. The FMEA process begins by listing the steps in a process, then brainstorming to identify the failure modes (what could go wrong), their causes and the potential severity of their effects (termed "hazard scores").

The failure modes of greatest severity and frequency are then addressed through action plans designed to eliminate or mitigate the potential for harm. FMEAs are most efficient and effective when they are armed with a clearly stated objective; conducted by a small multidisciplinary team of experts with working knowledge of the process under examination; and led by a facilitator well versed in the FMEA process.(4) Many FMEA templates exist. Online FMEA tools are available as well, both private and public, such as the one located on the Institute for Healthcare Improvement's website.

Case Study

Online FMEA Tool used to address risks of patients using own insulin pumps at St. Joseph's Medical Center, Stockton.

Subscription service: www.chpso.org/lists/

Questions or comments: Rory Jaffe, MD, MBA rjaffe@chpso.org

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CHPSO has collaborated with a company called QI Path, which offers an online FMEA tool that is in the final stages of refinement. In the role of risk manager for St. Joseph's Medical Center in Stockton, California, a Dignity Health member, I agreed to participate in a CHPSO trial of QI Path. Our FMEA objective was to address the risks inherent in allowing patients to manage their own insulin pumps during inpatient admissions. The topic was deemed urgent due to the increasing number of diabetic patients admitted with their own insulin pumps; these patients were demanding they be allowed to manage their own pumps because of the distinct advantages insulin pumps offer in maintaining desirable blood sugar ranges.

FMEA team

The FMEA team for the project consisted of pharmacists, nurses and nurse managers. A dietician, information technology nurse and hospital executives were consulted for the action plan phase. We were fortunate to have two nurses on our core FMEA team who were themselves insulin pump users and had been admitted to our hospital on multiple occasions, providing unique firsthand insight into the challenges of the process both from the clinician and patient perspectives. We intentionally limited the size of the team to six members. The online features of QI Path allowed us to work asynchronously, either singly or in pairs, thus reducing the amount of face-to-face meeting time required. In addition, the program provided an organized structure to the process and instantly sorted failure modes and effects by their hazard scores.

Failures identified

The failure modes with highest hazard scores included failure to identify that the patient has an insulin pump; failure

to adequately screen that a patient is able to safely manage his or her own insulin pump; lack of nursing proficiency with insulin pumps; and lack of a method to record a patient's activities with the pump. The team developed action plans that included a documentation cue on admission to ask all diabetics whether they have their own insulin pump; a patient's own insulin pump order set that includes criteria to determine a patient's eligibility to manage the pump; a form for the patient to record daily management activities with the insulin pump, documenting his or her blood sugars and carbohydrate counts which the nurse verifies and that becomes part of the patient's medical record; and mandatory nursing staff education on the entire process, including a hands-on introduction to insulin pumps and how they operate.

Part 2 next month: socio-technical probabilistic risk assessment.

— Susan White, Director of Clinical Risk Management, Shands at the University of Florida

References

1. Joint Commission. *Comprehensive Accreditation Manual 2010*. Joint Commission Resources; 2009.
2. Battles J, Kanki B. The use of socio-technical probabilistic risk assessment at AHRQ and NASA. In: Spitzer C, Schmocker U, Dang V, eds. *Probabilistic Safety Assessment and Management*. Berlin, Germany: Springer-Verlag; 2004:2212–7.
3. Coles G, Fuller B, Nordquist K, et al. Three kinds of proactive risk analyses for health care. *Joint Commission Journal on Quality and Patient Safety*. 2010;36(8):365–75.

4. Ashley L, Armitage G, Neary M, Hollingsworth G. A practical guide to failure mode and effects analysis in health care: making the most of the team and its meetings. *Joint Commission Journal on Quality and Patient Safety*. 2010;36(8):351–8.

RCA Webinar Recording Available

On September 24, CHPSO and ECRI presented the webinar: *Event management and the RCA critique*. The [webinar recording and handouts](#) are now available on the members-only CHPSO/ECRI portal. Contact CHPSO or ECRI if you have any problems logging in.

As part of CHPSO membership, ECRI provides complimentary written critiques of a hospital's RCA document, including assessment of thoroughness, identification of root causes and effectiveness of the action plan. This thorough evaluation is based upon ECRI's expertise in reviewing more than two million events to date. CHPSO member hospitals can submit up to six RCAs per year to ECRI through a secure CHPSO/ECRI portal.

The evaluation reviews the RCA's

- systems analysis process,
- root causes identified by hospital compared to those identified by ECRI,
- strength of recommendations in response to the identified root causes, including scope, timing, potential extent of risk reduction, administrative implementation, and measures of effectiveness, and
- system analysis methods used.

CHPSO Calendar Notes

Unless noted, all events are for CHPSO members only. Members will receive an email a few days before each event with information on how to participate.

October

8: CHPSO: Members Call. Q&A on Member Benefits. Learn about the many complimentary member benefits and opportunities CHPSO offers: Support for connecting to CHPSO's data reporting systems; educational programs; custom research reports; RCA critiques; work groups; and safe table discussions. 10–11 AM

15: CHPSO/ECRI: Discharge Orders: Piecing the Care Transitions Puzzle Together. Share ideas and discuss gaps in transition of care from the inpatient to the outpatient setting that contribute to readmissions. 11:30 AM–12:30 PM

November

12: CHPSO: Members Call. 10–11 AM

19: CHPSO/ECRI: User Group Meeting. Topic TBD. 11:30 AM–12:30 PM

December

10: CHPSO: Members Call. 10–11 AM

TBD: CHPSO/ECRI: Radiology Patient Safety. Web seminar time TBD.

For further information on these events:

info@chpso.org, 916.552.7651

Hospital Council Calendar Notes

November 13 — BEACON Fall Exchange, South San Francisco Conference Center, 9 AM–4 PM

Join peers from hospitals throughout Northern and Central California for a day of networking, knowledge exchange and sharing of best practices to improve patient safety. Renew your spirit, your commitment and get inspired to try new ideas. Keynote presenters and topics include Kathleen Bartholomew on Leading a Patient Safety Culture: Beyond the Statistics; J. Bryan Sexton on Caregiver Resilience and Quality Improvement: A Double Edged Sword; and Richard Davies DeBronkart, Jr. on Discovering the e-Patient Movement: How Patient Engagement Can Improve Safety and Quality. For more information go to www.hospitalcouncil.net/post/beacon-fall-exchange.

HASD&IC Calendar Notes

October 17 — Perinatal Safety Council Meeting: Ending Elective Deliveries Before 39 Weeks Gestation, Rady Children's Hospital, 3–5:30 PM

October 17–21 — IDWeek, Advancing Science, Improving Care, San Diego Convention Center

This week-long program features the latest science and bench-to-bedside approaches in prevention, diagnosis, treatment, and epidemiology of infectious diseases, including HIV. The region's Patient Safety First collaborative is offering up to \$700 reimbursement per hospital for sending its infection preventionist and/or Antimicrobial Stewardship Program representative to the event. For more

information, contact Alicia Muñoz at amunoz@hasdic.org or 858.614.1541.

About This Newsletter

CHPSO Patient Safety News provides lessons learned from reviews of patient-safety events and news of patient-safety activities in this state. We hope you will find it useful in your efforts to improve patient outcomes. This newsletter may be freely distributed in its original form. Copies of each newsletter are archived on the CHPSO website (www.chpso.org).

Prospective authors may submit articles to Frances Sutz Brown: fsutzbrown@chpso.org, 916.552.7598. Typical articles will be brief — between 200 and 600 words. A completed [publication agreement form](#) must be submitted prior to publication.

Call for Speakers

CHPSO is looking for Annual Meeting speakers to present innovative strategies, concepts and ideas on several patient safety topics. Speakers will represent a variety of hospitals, from small rural facilities to large systems. If you have expertise in the following areas and would like to be considered as a speaker, please contact Frances Sutz Brown, fsutzbrown@chpso.org, 916.552.7598.

- Best ideas in patient safety: case studies
- Surgical safety
- Medication safety
- Technology safety
- Critical process solutions: e.g., patient identification
- Performance measurement