PENNSYLVANIA PATIENT SAFETY ADVISORY

Produced by ECRI Institute and ISMP under contract to the Pennsylvania Patient Safety Authority

Vol. 10, No. 4

December 2013

REVIEWS & ANALYSES

117 **Falls Prevention: Pennsylvania Hospitals Implementing Best Practices**
Pennsylvania Patient Safety Authority analysts evaluated survey responses from hospitals participating in the falls prevention collaboration and identified 35 practices or program elements that were associated with lower rates of falls with injury. Assessing best practices, auditing for compliance, and analyzing results in relation to rates of falls with injury can help organizations effectively focus their improvement efforts.

125 **Breakdowns in the Medication Reconciliation Process**
Breakdowns in medication reconciliation during admission, transfer, or discharge introduce potential risk to the patient. Over one year, 501 events involving these breakdowns were reported to the Authority. Implementing strategies to limit these errors and ensure accurate medication histories can help foster safe transitions from one level of care to the next.

FOCUS ON INFECTION PREVENTION

137 **Update: Are Influenza, Pneumonia, and Vaccination Rates Improving in Nursing Home Residents?**
Since 2009, the rates of influenza and lower respiratory tract infection in Pennsylvania nursing homes have remained steady. In addition, while resident influenza and pneumococcal vaccination has increased in the commonwealth, these rates are still below the all-state average. One important improvement strategy is to increase vaccine uptake among healthcare workers in nursing homes.

FROM THE DATABASE

140 **Data Snapshot: Pediatric Laboratory Events**

UPDATE

142 **Quarterly Update on Wrong-Site Surgery: Areas to Focus Attention**

OTHER FEATURES

146 **A Decade of Dedication to Improvement**

150 **Continuing Success through Collaboration**

152 **Authority Welcomes New Board Members and Recognizes Former Members for Their Contributions**

155 **Postoperative Voiding**

CORRECTIONS

156

OBJECTIVE

The *Pennsylvania Patient Safety Advisory* provides timely original scientific evidence and reviews of scientific evidence that can be used by healthcare systems and providers to improve healthcare delivery systems and educate providers about safe healthcare practices. The emphasis is on problems reported to the Pennsylvania Patient Safety Authority, especially those associated with a high combination of frequency, severity, and possibility of solution; novel problems and solutions; and problems in which urgent communication of information could have a significant impact on patient outcomes.

PUBLISHING INFORMATION

The *Pennsylvania Patient Safety Advisory* (ISSN 1941-7144) is published quarterly, with periodic supplements, by the Pennsylvania Patient Safety Authority. This publication is produced by ECRI Institute and the Institute for Safe Medication Practices under contract to the Authority.

COPYRIGHT 2013 BY THE PENNSYLVANIA PATIENT SAFETY AUTHORITY

This publication may be reprinted and distributed without restriction, provided it is printed or distributed in its entirety and without alteration. Individual articles may be reprinted in their entirety and without alteration, provided the source is clearly attributed.

Current and previous issues are available online at http://www.patientsafetyauthority.org.

SUBSCRIPTION INFORMATION

This publication is disseminated by e-mail at no cost to the subscriber. To subscribe, go to http://visitor.constantcontact.com/d.jsp?m=1103390819542&p=oi.

INDEX INFORMATION

The *Pennsylvania Patient Safety Advisory* is indexed in NLM Catalog (http://www.ncbi.nlm.nih.gov/nlmcatalog), a service of the US National Library of Medicine and National Institutes of Health.

The *Advisory* is also indexed in the CINAHL® Plus and CINAHL Plus with Full Text databases.

CONTINUING EDUCATION

The Pennsylvania Patient Safety Authority works with the Pennsylvania Medical Society to offer AMA PRA Category 1 Credits™ for selected portions of the *Pennsylvania Patient Safety Advisory* through the online publication *Studies in Patient Safety*. Go to http://www.pamedsoc.org to find out more about patient safety continuing medical education opportunities.

The Authority also works with the Pennsylvania State Nurses Association to offer nursing continuing education credits for selected portions of the *Advisory*. Go to https://psna.hostingharrisburg.com to view the course catalog.

CONSIDERATION OF SUBMITTED MANUSCRIPTS

Manuscripts consistent with the objectives of the *Pennsylvania Patient Safety Advisory* are welcome. For information and guidance about submission and instructions for authors, please contact the editor.

Scan this code with your mobile device's QR reader to subscribe to receive the Advisory for free.

PATIENT SAFETY AUTHORITY

Board of Directors

Carrie DeLone, MD, *Chair*
Radheshyam M. Agrawal, MD
Jan Boswinkel, MD
John Bulger, DO, MBA
Joan M. Garzarelli, MSN, RN
Daniel Glunk, MD
Lorina Marshall-Blake
Gary A. Merica, RPh, MBA/HCM
Cliff Rieders, Esq.
Stanton Smullens, MD
Eric H. Weitz, Esq.

Staff

Michael Doering, MBA, *Executive Director*
Laurene Baker, MA, *Director of Communications*
Franchesca J. Charney, RN, MS, CPSO, CPPS, CPHRM, CPHQ, DFASHRM, *Director of Educational Programs*
Denise Barger, BA, CPHRM, CPHQ, CPPS, HEM, *Patient Safety Liaison*
Michelle Bell, RN, BSN, FISMP, CPPS, *Patient Safety Liaison*
Jeffrey Bomboy, RN, *Patient Safety Liaison*
Regina M. Hoffman, RN, CPHRM, CPPS, *Patient Safety Liaison*
Christina Hunt, MSN, MBA, HCM, RN, CPPS, *Senior Patient Safety Liaison*
Richard Kundravi, BS, *Patient Safety Liaison*
Megan Shetterly, RN, MS, *Senior Patient Safety Liaison*
Robert Yonash, RN, *Patient Safety Liaison*
Howard Newstadt, JD, MBA, *Finance Director/CIO*
Teresa Plesce, *Office Manager*
Denise D. Conder, *Administrative Specialist*
Karen McKinnon-Lipsett, *Administrative Specialist*

Contact Information

333 Market Street, Lobby Level
Harrisburg, PA 17120
Telephone: 717-346-0469
Fax: 717-346-1090
Website: http://www.patientsafetyauthority.org
E-mail: patientsafetyauthority@pa.gov

PENNSYLVANIA PATIENT SAFETY ADVISORY

Karen P. Zimmer, MD, MPH, FAAP, *Acting Editor*
John R. Clarke, MD, *Editor Emeritus*
William M. Marella, MBA, *Program Director*

Analysts

Theresa V. Arnold, DPM, *Manager, Clinical Analysis*
Sharon Bradley, RN, CIC
James Davis, MSN, RN, CCRN, CIC
Michelle Feil, MSN, RN
Edward Finley, BS
Lea Anne Gardner, PhD, RN
Michael J. Gaunt, PharmD
Matthew Grissinger, RPh, FISMP, FASCP
Mary C. Magee, MSN, RN, CPHQ
Christina Michalek, BSc Pharm, RPh
Susan C. Wallace, MPH, CPHRM

Advisors

Michael Cohen, RPh, MS, ScD, *President, ISMP*
Ronni Solomon, JD, *Executive Vice President and General Counsel, ECRI Institute*
Allen Vaida, PharmD, *Executive Vice President, ISMP*

Production Staff

Jesse Munn, BA, *Managing Editor*
Michael Baccam, MFA
Susan Lafferty
Miranda R. Minetti, BS
John Hall, *Manager, Printing Services*
Tara Kolb, BFA, *Manager, Media Services*
Kristin Finger, BS
Suzanne R. Gehris
Marlene P. Hartzell
Benjamin Pauldine, MS

Contact Information

Mailing address: PO Box 706
Plymouth Meeting, PA 19462-0706
Telephone: 866-316-1070
Fax: 610-567-1114
E-mail: support_papsrs@pa.gov

Editorial Advisory Board

Mary Blanco, RN, MSN, CPHQ, *Brandywine Hospital*
Lawrence M. Borland, MD, *Children's Hospital of Pittsburgh of UPMC*
Dorothy Borton, RN, BSN, CIC, *Albert Einstein Medical Center*
Albert Bothe Jr., MD, *Geisinger Health System*
Mark E. Bruley, BS, CCE, *ECRI Institute*
Vincent Cowell, MD, *Temple University*
Monica M. Davis, CRNP, MSN, MBA, *The Children's Hospital of Philadelphia*
Frank M. Ferrara, MD, MBA, *Wills Eye Surgery Center-Plymouth*
Caprice C. Greenberg, MD, MPH, *University of Wisconsin*
Daniel Haimowitz, MD, FACP, CMD
Richard J. Hamilton, MD, *Drexel University*
Mary T. Hofmann, MD, *Abington Memorial Hospital*
Norman A. Johanson, MD, *Drexel University*
Janet Johnston, RN, MSN, JD
Harold S. Kaplan, MD, *Mount Sinai School of Medicine*
Michael L. Kay, MD, *Wills Eye Hospital, Thomas Jefferson University Hospital, Pennsylvania Hospital*
John J. Kelly, MD, FACP, *Abington Memorial Hospital*
Curtis P. Langlotz, MD, PhD, *University of Pennsylvania*
Michael Leonard, MD, *Kaiser Permanente, Institute for Healthcare Improvement*
Steven C. Marcus, PhD, *University of Pennsylvania*
James B. McClurken, MD, FACC, FCCP, FACS, *Temple University*
Patrick J. McDonnell, PharmD, *Temple University School of Pharmacy*
Francine Miranda, RN, BSN, FASHRM, *Lehigh Valley Hospital*
Dona Molyneaux, PhD, RN, *Gwynedd-Mercy College*
Steve D. Osborn, Vice President, *Saint Vincent Health Center*
Christopher M. Pezzi, MD, FACS, *Abington Memorial Hospital*
Hyagriv N. Simhan, MD, MSCR, *University of Pittsburgh*
Dean Sittig, PhD, *University of Texas*
Donald C. Tyler, MD, MBA, *The Children's Hospital of Philadelphia*
Donald P. Underwood, DO, *Drexel University*
Nielufar Varjavand, MD, *Drexel University*
Debra J. Verne, MPA, RN, CPHRM, *Penn State Milton S. Hershey Medical Center*
Linda Waddell, MSN, RN, CEN, *Donald D. Wolff, Jr., Center for Quality Improvement and Innovation at UPMC*
Harold C. Wiesenfeld, MD, *University of Pittsburgh*
Zane R. Wolf, PhD, RN, FAAN, *LaSalle University School of Nursing and Health Sciences*

ACKNOWLEDGMENTS

The following individuals reviewed selected articles for Vol. 10, No. 4:
Kathleen Fowler, MSN, RN, CMSRN, *UPMC St. Margaret*
Russell H. Jenkins, MD, *Institute for Safe Medication Practices*
Dona Molyneaux, PhD, RN, *Gwynedd-Mercy College*
Henry Trumbo, PharmD, *St. Mary Medical Center*

©2013 Pennsylvania Patient Safety Authority

Falls Prevention: Pennsylvania Hospitals Implementing Best Practices

Michelle Feil, MSN, RN
Senior Patient Safety Analyst
Pennsylvania Patient Safety Authority

ABSTRACT

The Pennsylvania Patient Safety Authority provided 83 hospitals participating in the Pennsylvania Hospital Engagement Network (HEN) Falls Reduction and Prevention Collaboration with two tools to evaluate their falls prevention programs: a self-assessment survey and a process measures audit. The survey results revealed two categories of best practices with high levels of full implementation: event reporting and postfall assessment. The three categories of best practices with the lowest levels of full implementation were medication review, communication, and use of sitters. Comparing survey responses with the audit results revealed a noticeable gap between levels of full implementation of best practices reported on the survey and compliance with falls prevention practices observed during the audit. Analyses of survey results and hospital rates of falls with injury identified 35 individual falls prevention practices and/or specific program elements that were associated with lower rates of falls with injury. Assessing level of implementation of best practices in falls prevention, auditing for compliance, and analyzing results in relation to rates of falls with injury can identify significant strengths and weaknesses in current hospital falls prevention programs. (Pa Patient Saf Advis 2013 Dec;10[4]:117-24.)

Scan this code with your mobile device's QR reader to access the Authority's falls prevention toolkit.

INTRODUCTION*

In December 2011, the Pennsylvania Patient Safety Authority partnered with the Hospital and Healthsystem Association of Pennsylvania to lead the Pennsylvania Hospital Engagement Network (HEN) Falls Reduction and Prevention Collaboration. This collaboration is funded by the Partnership for Patients initiative established by the Center for Medicare and Medicaid Innovation (also known as the Innovation Center). Between January and May 2012, 83 hospitals from across the commonwealth joined the collaboration and enrolled in the Pennsylvania Patient Safety Reporting System (PA-PSRS) Falls Reporting Program.

A major focus of the collaboration continues to be to ensure that hospitals are implementing evidence-based practices in falls prevention. Education provided to hospitals in the collaboration has included a review of what is currently established as best practice based on individual, high-quality research studies and systematic reviews, as well as evidence-based falls prevention guidelines.[1-9]

The Authority developed two tools for hospitals in the collaboration to use in evaluating their falls prevention programs: the Hospital Engagement Network Falls Reduction and Prevention Collaboration Self-Assessment Tool (SAT) survey and the Falls Prevention Process Measures Audit Tool. As a result of facilities using these tools and sharing their findings, the Authority has been able to (1) identify which best practices in falls prevention are being included in participating hospital falls prevention programs, (2) measure compliance with implementation of best practices, and (3) identify specific falls prevention best practices associated with higher or lower rates of falls with injury. The falls SAT survey and the Falls Prevention Process Measures Audit Tool can be accessed at http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/falls/Pages/home.aspx.

METHODS

Falls SAT Survey

The falls SAT survey was adapted from an existing questionnaire[10] and was designed to evaluate the current structure and content of hospital falls prevention programs compared with evidence-based best-practice guidelines. The intent of the SAT survey was to assist hospitals in creating action plans targeted to the best-practice elements that were identified as missing or in need of improvement in their current falls prevention programs.

Falls Prevention Process Measures Audit Tool

The Falls Prevention Process Measures Audit Tool is a point prevalence data collection tool used to assess compliance with falls prevention practices most commonly included as part of hospital falls prevention programs. Hospitals were asked to complete quarterly audits on the unit or units where they were piloting small tests of change as part of the HEN collaboration. The audit consisted of documentation review (e.g., "Was falls prevention plan documented?") and observation of patients and the environment (e.g., "Does patient have risk identifiers?").

* The analyses upon which this publication is based were in part funded and performed under contract number HHSM-500-2012-00022C, entitled "Hospital Engagement Contractor for Partnership for Patients Initiative."

©2013 Pennsylvania Patient Safety Authority

Falls-with-Injury Rates and Falls SAT Survey Responses

Rates of falls with injury per 1,000 patient-days were calculated for January through June 2012 using falls with harm as reported through PA-PSRS (i.e., any fall requiring more than first-aid care[11]) and total facility patient-days as reported to the Pennsylvania Health Care Cost Containment Council (PHC4).[12] Complete data was available for 75 of the 80 hospitals that responded to the falls SAT survey. For 18 hospitals reporting zero falls with injury during this period, an event count of 0.01 falls was used in order to permit inclusion in the meta-analysis. Rates of falls with injury in these 75 hospitals were analyzed alongside falls SAT survey responses to assess any association between specific falls prevention best practices and falls-with-injury rates.

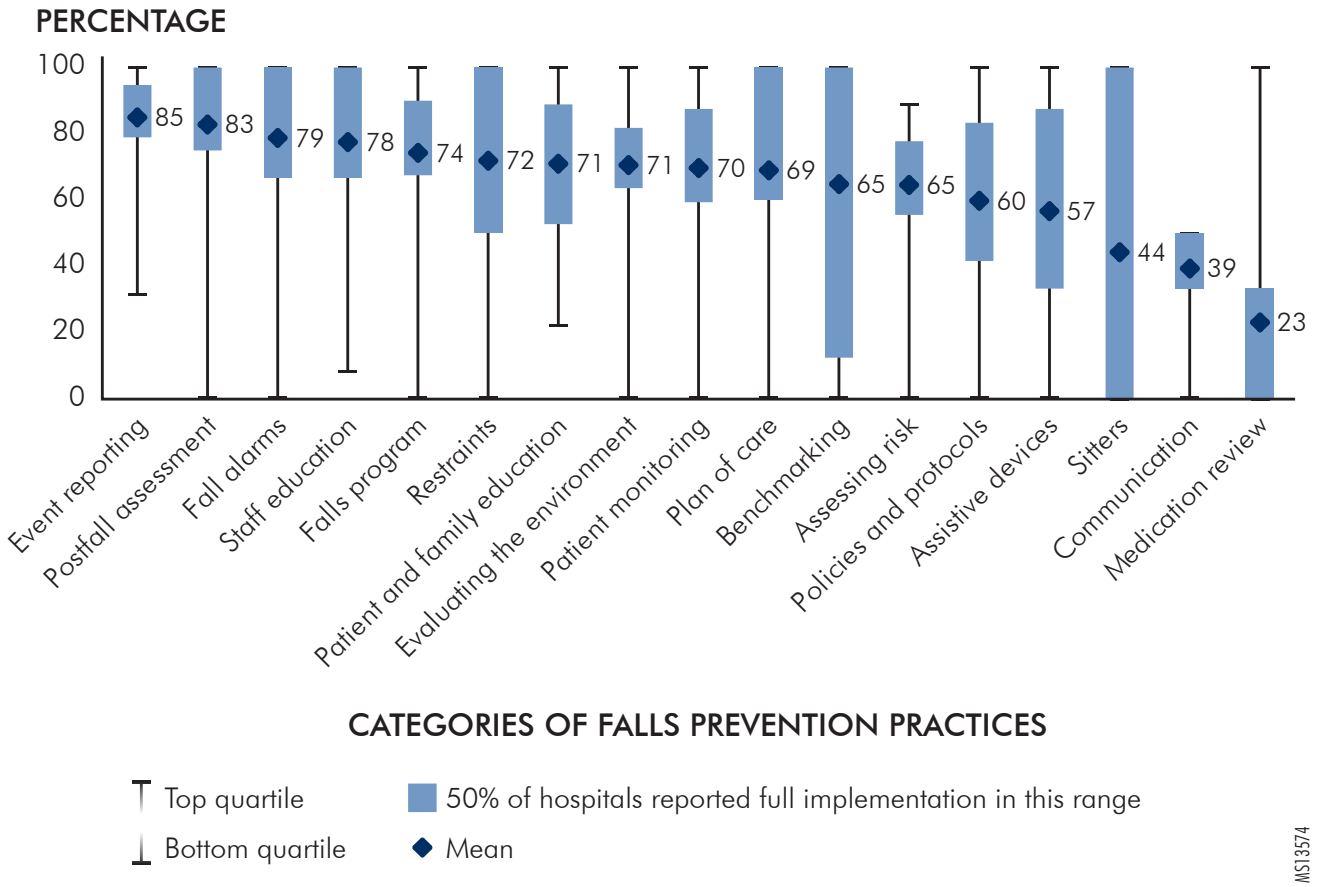
First, a DerSimonian and Laird random-effects meta-analysis of the logit-transformed rates per patient-day at each facility was performed. Hospitals with more patient-days were weighted more heavily in this analysis than hospitals with fewer patient-days because they provide more statistically reliable information about the rates of falls with injury. Subsequently, random-effects meta-regressions were performed to measure the associations between rates of falls with injury and both categories of prevention practices, as well as between rates of falls with injury and individual falls prevention program elements.

RESULTS

Falls SAT Survey

Eighty hospitals completed the falls SAT survey between July 5 and August 31, 2012. The majority of hospitals reported full implementation for the majority of best practices in falls prevention. Hospitals reported full implementation of an average of 71% of best practices (range of 22% to 93%). Figure 1 displays the average percentage of full implementation of best practices reported by hospitals, organized by category. The range of responses in

Figure 1. Percentage of Falls Prevention Best Practices with Full Implementation, by Category



Note: **As reported by 80 facilities in the Hospital Engagement Network.**

©2013 Pennsylvania Patient Safety Authority

all these categories reveals the variation present across all 80 HEN hospitals that completed the falls SAT survey.

Falls prevention practices with high levels of full implementation. Two categories of falls prevention best practices within the falls SAT survey scored highest in terms of full implementation: event reporting and postfall assessment. Fifteen hospitals reported all best practices in the event reporting category as fully implemented. The only two questions that all 80 hospitals scored as "Yes" were also in this category: "Does your facility use a standardized patient safety event report for internal purposes to document and report fall hazards, falls, and falls with harm?" and "Does it [the report] require staff to include the date and time of the fall?"

Falls prevention practices with low levels of full implementation. Medication review was the lowest-scoring category of the falls SAT survey in terms of level of full implementation of best practices. This category included six best practices, four of which the majority of hospitals reported as not having implemented (see Table 1).

The second lowest scoring category was communication. This category consisted of six best practices, three of which were reported to have an average full implementation of 75% or less: (1) "When the patient is transferred for testing, therapy, or to another unit, is there a process in place for communicating the individual's risk of falling directly to the transporter and to the receiving party?"; (2) "Are indicators promptly removed once a patient is transferred or discharged?"; and (3) "Do visible indicators of a patient's risk for falling display on the nurse call system workstation?" The last question was one of the lowest-scoring questions of the survey, with only four hospitals responding "Yes." As shown in Figure 1, this is also the only category of falls prevention practices for which no hospitals reported more than 50% of best practices to be fully implemented.

The third lowest scoring category was sitters, or one-to-one observation. Of the 48 hospitals that reported having sitter programs, only 21 reported full implementation of all six best practices (i.e., the sitter program includes patient eligibility criteria, a process for requesting and discontinuing sitters, criteria for sitter qualifications, a sitter job description with expectations for sitter behavior and responsibilities, a training program for sitters, and a pool of sitters).

Also of note is that only 47 hospitals (59%) reported full implementation of a multidisciplinary falls team with participants from all sectors of the facility (e.g., clinical personnel, nonclinical personnel, senior managers). The majority of hospital teams included nurses, but many were lacking pharmacists and physical therapists, and even more did not include physicians or nonclinical personnel.

Table 1. Levels of Full Implementation of Falls Prevention Best Practices in the Category of Medication Review

FALLS SELF-ASSESSMENT TOOL SURVEY QUESTION	YES* (%)	P/I† (%)	NO‡ (%)	NO RESPONSE (%)
Do pharmacists review patient medication regimens for potential falls risks when filling medication orders?	26.25	15.00	56.25	2.50
Is there a requirement that the pharmacist inform the prescriber and the nursing staff if prescribed medications increase the risk of falling?	10.00	6.25	81.25	2.50
Does the pharmacist recommend alternative medications to reduce the patient's risk of falling if the prescribed medications increase the risk of falling?	12.50	12.50	72.50	2.50
Does the facility's pharmacy and therapeutics committee periodically review formulary medications to identify those that increase falls risk and make recommendations about those medications?	13.75	12.50	71.25	2.50
Are physicians encouraged to modify or eliminate prescribed medications that increase the risk of falling?	36.25	16.25	46.25	1.25
Do nurses have access to a list of medications that increase an individual's risk of falling that is used when assessing patients for falls risks?	40.00	15.00	42.50	2.50

Note: As reported by 80 facilities in the Hospital Engagement Network. Shaded areas indicate the percentage of hospitals with no response or reporting no implementation for each best-practice question.

* YES = full implementation
† P/I = partial implementation/needs improvement
‡ NO = no implementation

©2013 Pennsylvania Patient Safety Authority

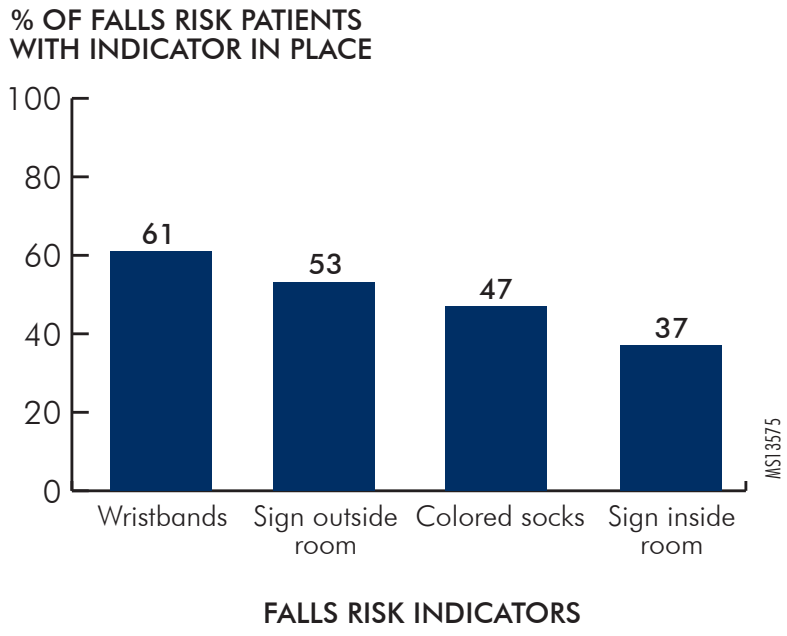
Falls Prevention Process Measures Audit Tool

Sixty-three hospitals submitted baseline point prevalence audits between July 1 and September 30, 2012. A total of 1,894 patients were audited, of which 1,847 (98%) had completed falls risk assessments and 1,292 (68%) were identified as being at risk to fall. Of the patients identified as being at risk to fall, most had a call bell within reach (91%), documentation of a falls prevention plan (88%), two siderails in the up position (81%), and nonskid socks or slippers (76%). Falls risk identifiers, specialty equipment, and alarms were found to have lower levels of implementation. Table 2 (available exclusively with this article online at http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Dec;10(4)/Pages/home.aspx) details the percentage of patients at risk to fall that were found to have each falls prevention practice in place.

These audits were considered a baseline assessment of compliance with falls prevention practices for the hospitals participating in the collaboration.

Comparison of falls SAT survey responses to audit results revealed a noticeable gap between levels of full implementation of best practices reported on the falls SAT survey and compliance with falls prevention practices observed during the audit process (see Figure 2). For instance, in facilities reporting full implementation of wristbands used to communicate falls risk, only 61% of patients at risk to fall were found to have falls risk wristbands in place.

Figure 2. Compliance with Use of Falls Risk Indicators in Hospitals Reporting Full Implementation on the Falls Self-Assessment Tool Survey, July through September 2012



Falls-with-Injury Rates and Falls SAT Survey Responses

Seventy-five hospitals that had completed the falls SAT survey had complete data available to calculate rates of falls with injury for the period of January through June 2012. The overall estimated rate of falls with injury per 1,000 patient-days for this group was 0.21 (95% CI: 0.17 to 0.26), with large variability among hospitals. The top quartile of hospitals had rates ranging from 0.26 to 2.50 falls with injury per 1,000 patient-days.

Of 139 individual falls prevention best practices included in the falls SAT survey, meta-regression analyses were completed for 136 practices. The other three were excluded because they were reported as fully implemented at all 75 hospitals. These three were assessment and documentation of a patient's risk for falling in the patient's medical record on admission; use of a standardized patient safety event report for internal purposes to document and report fall hazards, falls, and falls with harm; and requiring staff to include the date and time of the fall in the event report.

Falls prevention practices associated with lower rates of falls with injury. Meta-regression analyses revealed 5 of 17 categories of falls prevention practices with statistically reliable associations ($p < 0.05$) with lower rates of falls with injury: (1) falls prevention program design, (2) benchmarking, (3) policies and protocols, (4) assessing risk, and (5) post-fall assessment.

Further analyses identified 35 individual falls prevention practices and/or specific program elements that were also associated with lower rates of falls with injury ($p < 0.05$). See "Falls Prevention Practices and Program Elements Associated with Lower Rates of Falls with Injury." Also of note is that while use of a specific color to communicate falls risk was found to be associated with lower rates of falls with injury, no one color was found to be associated with reductions or increases in rates of falls with harm.

Falls prevention practices associated with higher rates of falls with injury. No category of falls prevention practices was found to have a statistically reliable association with higher rates of falls with injury. However, hospitals reporting higher levels of full implementation of practices in the falls alarms category

(continued on page 122)

©2013 Pennsylvania Patient Safety Authority

FALLS PREVENTION PRACTICES AND PROGRAM ELEMENTS ASSOCIATED WITH LOWER RATES OF FALLS WITH INJURY

Falls-with-injury rates were calculated for the time period of January through June 2012 for 75 facilities that completed the falls self-assessment tool survey in July and August 2012. The following individual falls prevention practices and specific falls prevention program elements were found to have statistically significant associations with lower rates of falls with injury in these 75 facilities ($p < 0.05$).

Falls Prevention Program Design

- Formation of a falls prevention team that includes the following roles:
  - Physicians
  - Transportation managers or representatives
- Design and implementation of a falls prevention program that does the following:
  - Defines the goals of the falls team and responsibilities of each member
  - Performs ongoing assessment of the program's effectiveness (at least annually)
  - Develops and revises protocols and policies when necessary to support the goal of preventing falls

Benchmarking

- Use of an external benchmark to compare facility falls rates

Policies and Protocols

- Development of a facility falls prevention policy that includes the following:
  - A requirement for when an individual should be reassessed for risk
  - A description of appropriate responses to falls, including protocols for postfall investigation
  - A process for revising assessment and intervention strategies based on data
  - A plan to promote awareness of falls risks and prevention

Assessing Risk

- Assessment of falls risks for both inpatients and outpatients
- Requirement of routine reassessment of patients for their falls risks
- Periodic facility review of the effectiveness of falls risk assessment tools
- Use of the Hendrich II Fall Risk Model
- Use of the General Risk Assessment for Pediatric Inpatient Falls tools

Evaluating the Environment

- Requirement for patients to wear slip-proof socks or shoes

Medication Review

- Periodic review by the facility's pharmacy and therapeutics committee to identify formulary medications that increase falls risk and to make recommendations about those medications
- Encouragement of physicians to modify or eliminate prescribed medications that increase the risk of falling

Patient Monitoring and Sitters (One-to-One Observation)

- Performance of hourly rounds
- Requirement for staff to stay with patients who are identified as being at risk to fall while in the bathroom
- Use of sitter programs
- Design of sitter programs to include the following:
  - Criteria for sitter qualifications
  - A training program for sitters
  - A pool of sitters

Staff Education

- Provision of falls prevention education to staff that
  - occurs at orientation and periodically thereafter or as needed,
  - addresses the roles and responsibilities of staff as part of the falls prevention education program, and
  - includes education for intrinsic (clinical) and extrinsic (environmental) causes of falls for staff members involved in direct patient care, as appropriate for the staff members' roles and responsibilities

Patient and Family Education

- Provision of direct education to patients and their family members regarding the causes of falls and the interventions used to prevent falls

Communicating Patient Risk

- Use of a specific color to identify patients as being at risk to fall
- Use of falls risk wristbands

Postfall Assessment and Event Reporting

- Implementation of a policy on how to respond to patient falls
- Educating and requiring staff to do the following:
  - Document the fall in the patient's medical record
  - Request a postevent systems analysis or postfall investigation
- Reassessment of patients following a fall for falls risk and communication of findings to staff who interact with the patient
- Use of a standardized patient safety event report for internal purposes, requiring staff to include extrinsic (environmental) factors

©2013 Pennsylvania Patient Safety Authority

(continued from page 120)

tended to have higher rates of falls with injury, with a nearly statistically reliable association ($p = 0.056$).

In analyzing individual falls prevention practices, three practices in the categories of patient monitoring, patient and family education, and postfall assessment, respectively, demonstrated a statistically reliable association ($p < 0.05$) with higher rates of falls with injury: (1) "When possible, are high-risk patients located in rooms closest to nursing stations?"; (2) "Are patients who are at risk of falling instructed to avoid ambulating or getting out of bed without assistance?"; and (3) "Under this policy, are staff required to (and educated on how to) complete a patient safety event report?"

Lastly, in analyzing specific falls prevention program elements, it was shown that hospitals that reported designing custom risk assessment tools had reliably higher rates of falls causing harm ($p < 0.05$).

DISCUSSION

In the Pennsylvania HEN Falls Reduction and Prevention Collaboration to date, the Authority has been able to do the following: (1) identify which best practices in falls prevention are being included in participating hospital falls prevention programs, (2) measure compliance with implementation of best practices, and (3) identify specific falls prevention best practices associated with higher or lower rates of falls with injury.

The three categories of falls prevention best practices with the lowest levels of full implementation (medication review, communication, and sitters) deserve attention. Hospitals reported an average of 50% of best practices in these categories as fully implemented. Of particular concern are the two categories found to be significantly associated with lower rates of falls with injury but reported to have low levels of full implementation: medication review and sitters. Also worthy of discussion are falls prevention practices associated with higher rates of falls with injury, as well as the apparent "policy-practice gap" (i.e., interventions prescribed by policy are not implemented in practice) that was identified when comparing best practices reported as having full implementation on the falls SAT survey with falls prevention practices observed during the audit process.

Medication Review

The link between medications and falls risk has been well established, both in terms of specific drug classes and polypharmacy.[13-17] The impact of medication on falls risk may be more pronounced in older adults but affects younger adults as well.[18]

Best practices in medication review related to falls risk have been put forth as part of several evidence-based falls prevention guidelines; however, the potential additional cost associated with implementing these practices may be one reason why they continue to have low levels of implementation. Further research into both the clinical effectiveness and cost effectiveness of these practices is warranted.[17] Because this category of falls prevention practices scored lowest in terms of full implementation, hospitals participating in the collaboration have been encouraged to devote attention to this area, beginning with inclusion of pharmacists on falls prevention teams.

Communication

In the category of communication, the best practices in falls prevention that were lacking full implementation involved communication of falls risk beyond the patient and the nurse caring for the patient (e.g., falls risk is communicated in the medical record, falls risk is communicated to other departments, falls risk indicators display on the nurse call system workstation). Even in hospitals reporting full implementation of falls risk indicators, audits revealed low compliance with their use in patients at risk to fall.

If risk is not communicated to others (e.g., during patient handoff), then the responsibility for falls prevention cannot be shared. Research suggests that falls prevention is only effective when it is multifactorial and provided by a multidisciplinary team.[19] Reinforcing this research is the finding in the current analysis of an association between falls prevention teams that include physicians and transportation managers or representatives and lower rates of falls with injury (see "Falls Prevention Practices and Program Elements Associated with Lower Rates of Falls with Injury"). It was reported that less than a third of falls prevention teams included these roles. By failing to communicate falls risk beyond the patient and the nursing staff, the multidisciplinary team cannot be engaged and the effectiveness of any prevention efforts may be lost.

Figure 3 (available exclusively with this article online at http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Dec;10(4)/Pages/home.aspx) displays the primary roles of falls team members as reported by HEN facilities.

Sitter Programs

The current analysis revealed an unexpected significant association between use of sitter programs and lower rates of falls with injury among hospitals in the collaboration. While the use of sitters, or one-to-one observation, has been suggested in several evidence-based falls prevention guidelines,[1,5,7,9] research into the clinical effectiveness of sitter programs has produced inconsistent results.[20] In addition, the use of these programs has been questioned, especially in the current economic environment, due to the high costs associated with their maintenance. This may explain the low utilization of sitter programs reported by hospitals participating in the collaboration.

©2013 Pennsylvania Patient Safety Authority

The significant association found between low rates of falls with injury and the use of sitter programs, along with specific sitter program elements, suggests that hospitals currently using or considering establishment of sitter programs may benefit from ensuring adherence to best practices in administering and implementing the program.

Falls Prevention Practices Associated with Higher Rates of Falls with Injury

The practices of placing high-risk patients in rooms closest to nursing stations and instructing patients to avoid ambulating or getting out of bed without assistance were two individual falls prevention practices found to have statistically significant associations with higher rates of falls with injury in the current analyses. Likewise, the category of falls alarms showed an association with higher rates of falls with injuries.

One possible explanation for this association may be that these practices may be used more frequently in hospitals that provide care to a larger number of older adults, who have a higher risk of falls and injury (e.g., fracture risk secondary to osteoporosis, bleeding risk due to anticoagulant use in patients with atrial fibrillation). Because these interventions may be necessary in high-falls-risk populations, evaluation of their effectiveness may be better achieved through tracking falls and falls-with-injury rates as they relate to changes in implementation of these practices over time.

Educating and requiring staff to complete patient safety event reports for falls was another practice found to be associated with higher rates of falls with injury. This may be explained by improved recognition and adherence to standard definitions for reportable falls events. In a culture working to improve patient safety and transparency, falls rates may appear to increase in concert with increased reporting for all adverse events.[21]

The association found between high rates of falls with injury and use of facility-designed falls risk assessment tools requires further evaluation by hospitals. The Authority has published previously about the importance of falls risk assessment and evaluation by the hospital falls prevention team of the validity of facility-designed risk assessment tools. If validity cannot be confirmed, the Authority suggests using an evidence-based falls risk assessment tool with established validity.[22]

Falls Prevention Practices Not Shown to Be Associated with Rates of Falls with Injury

In the current analyses, many falls prevention practices were found to have no association with rates of falls with injury. The data only provides associations, not inferences about cause and effect. The sample size and methodology may be insufficient to detect differences documented by other studies.

Policy-Practice Gap

Hospital falls prevention team members completing the falls SAT survey reported full implementation of the majority of best practices in falls prevention. The results of the audits completed at 63 hospitals participating in the HEN collaboration suggest otherwise. While it is important to include best practices in hospital policies and falls prevention program guidelines, assessment of the degree to which staff implement these practices with consistency and reliability, especially in patients identified as being at risk to fall, is vital.

Design of an audit process and customization of an audit tool specific to the falls prevention practices of interest in individual hospitals is suggested as part of falls prevention performance improvement efforts. Continual reassessment and improvement of hospital falls prevention programs is dependent on information gained from audits and information from postfall investigations. When compliance with falls prevention practices is low, it is the work of the multidisciplinary falls prevention team to use this information to identify barriers and design solutions.

LIMITATIONS

The falls SAT survey was administered at hospitals in July and August 2012, whereas the data used to calculate falls-with-injury rates was collected for the period of January through June 2012. It is therefore possible that hospitals implemented falls prevention measures in July and August and indicated full implementation on the falls SAT survey even though the practices were not in place when the falls with injury were occurring.

Compliance with implementation of best practices in falls prevention practices was not able to be calculated for all hospitals participating in the HEN falls collaboration. Only 63 hospitals submitted audit data. It is possible that compliance with falls prevention practices may have been higher or lower across the 83 participating hospitals. In addition, while meta-regression analyses have yielded a list of falls prevention practices that are associated with higher or lower rates of falls with injury, cause and effect cannot be inferred.

Data used in calculating falls-with-injury rates is dependent on accuracy and consistency in reporting falls and identifying injury level through PA-PSRS. Hospitals included in this analysis have agreed to a consensus definition for falls and falls with injury as a condition for participation in the HEN falls collaboration; therefore, this limitation should have been minimized. The consensus definition was introduced in March 2012, which may have affected reporting in the baseline period. This data is also dependent on accurate and complete reporting of total facility patient-days to PHC4.

©2013 Pennsylvania Patient Safety Authority

CONCLUSION

Multiple guidelines and toolkits exist to guide and support hospitals in implementing evidence-based best practices in falls prevention. Use of a self-assessment tool, such as the falls SAT survey, can be instrumental in identifying gaps between current hospital programs and evidence-based guidelines. Establishing a hospital falls prevention team and developing falls prevention policies alone is not sufficient. Use of a tool, such as the Falls Prevention Process Measures Audit Tool, is essential for monitoring compliance with falls prevention practices.

Hospitals may consider focusing attention on falls prevention best practices that the Authority has found to be associated with higher or lower rates of falls with injury. The effectiveness of falls prevention process improvement efforts may be assessed through monitoring for changes in falls and falls-with-injury rates over time as adjustments are made to falls prevention practices. Careful analysis of the associations between falls prevention practices and falls rates is warranted.

Acknowledgments

Jonathan R. Treadwell, PhD, associate director, Evidence-Based Practice Center, ECRI Institute, consulted on and contributed to statistical testing for this article. Christina Hunt, RN, MSN, MBA, HCM, senior patient safety liaison, Pennsylvania Patient Safety Authority, HEN Falls Reduction and Prevention Collaboration project team leader, consulted on and contributed to the review of this article. Denise M. Barger, BA, CPHRM, CPHQ, CPPS, HEM, patient safety liaison, Delaware Valley-South, and Richard M. Kundravi, BS, patient safety liaison, Northwest Region, contributed to the design and administration of the falls SAT survey and the Falls Prevention Process Measures Audit Tool as members of the HEN Falls Reduction and Prevention Collaboration project leadership team.

NOTES

1. Institute for Clinical Systems Improvement. Health care protocol: prevention of falls (acute care) [online]. 2012 Apr [cited 2012 May 15]. https://www.icsi.org/_asset/dcn15z/Falls.pdf
2. Registered Nurses' Association of Ontario. Prevention of falls and fall injuries in the older adult [online]. 2011 [cited 2012 May 15]. http://rnao.ca/sites/rnao-ca/files/Prevention_of_Falls_and_Fall_Injuries_in_the_Older_Adult.pdf
3. Patient Safety First. The 'how-to guide' for reducing harm from falls [online]. 2009 Sep [cited 2012 May 15]. http://www.patientsafetyfirst.nhs.uk/ashx/Asset.ashx?path=/Intervention-support/FALLSHow-to%20Guide%20v4.pdf
4. Gray-Micelli D, Quigley PA. Fall prevention: assessment, diagnoses, and intervention strategies. In: Boltz M, Capezuti E, Fulmer T, eds. *Evidence-based geriatric nursing protocols for best practice*. 3rd ed. New York: Springer Publishing Company; 2012:268-97. Also available at http://www.guideline.gov/content.aspx?id=43933
5. Boushon B, Nielsen G, Quigley P, et al. Transforming care at the bedside how-to guide: reducing patient injuries from falls [online]. 2008 [cited 2013 May 8]. http://www.ihi.org/knowledge/Pages/Tools/TCABHowToGuideReducingPatientInjuriesfromFalls.aspx
6. Health Care Association of New Jersey. Fall management guidelines [online]. 2007 Mar [cited 2013 May 8]. http://www.hcanj.org/docs/hcanjbp_fallmgmt6.pdf
7. National Center for Patient Safety. National Center for Patient Safety 2004 falls toolkit [online]. 2004 Jul [cited 2013 May 8]. http://www.patientsafety.va.gov/SafetyTopics/fallstoolkit
8. National Institute for Clinical Excellence. Clinical practice guideline for the assessment and prevention of falls in older people [online]. 2004 Nov [cited 2013 May 8]. http://www.nice.org.uk/nicemedia/pdf/CG021fullguideline.pdf
9. Agency for Healthcare Research and Quality. Preventing falls in hospitals: a toolkit for improving quality of care [online]. 2013 Jan [cited 2013 May 8]. http://www.ahrq.gov/research/ltc/fallpxtoolkit/index.html
10. ECRI Institute. Falls [self-assessment questionnaire]. *Healthc Risk Control* 2012 May;1:Self-assessment questionnaires 1.
11. Arnold TV, Barger DM. Falls rates improved in southeastern Pennsylvania: the impact of a regional initiative to standardize falls reporting. Pa Patient Saf Advis [online] 2012 Jun [cited 2013 Sep 30]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9(2)/Pages/37.aspx
12. Pennsylvania Health Care Cost Containment Council (PHC4) [website]. [cited 2013 Aug 5]. Harrisburg (PA): PHC4. http://www.phc4.org
13. Woolcott JC, Richardson KJ, Wiens MO, et al. Meta-analysis of the impact of 9 medication classes on falls in elderly persons. *Arch Intern Med* 2009 Nov 23;169(21):1952-60.
14. Leipzig RM, Cumming RG, Tinetti ME. Drugs and falls in older people: a systematic review and meta-analysis: I. Psychotropic drugs. *J Am Geriatr Soc* 1999 Jan;47(1):30-9.
15. Leipzig RM, Cumming RG, Tinetti ME. Drugs and falls in older people: a systematic review and meta-analysis: II. Cardiac and analgesic drugs. *J Am Geriatr Soc* 1999 Jan;47(1):40-50.
16. Medication assessment: one determinant of falls risk. Pa Patient Saf Advis [online] 2008 Mar [cited 2012 Jun 14]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2008/Mar5(1)/Pages/16.aspx
17. Fick DM, Cooper JW, Wade WE, et al. Updating the Beers criteria for potentially inappropriate medication use in older adults: results of a US consensus panel of experts. *Arch Intern Med* 2003 Dec 8-22; 163(22):2716-24.
18. Kool B, Ameratunga S, Robinson E. Association between prescription medications and falls at home among young and middle-aged adults. *Inj Prev* 2012 Jun;18(3):200-3.
19. Cameron ID, Murray GR, Gillespie LD, et al. Interventions for preventing falls in older adults in nursing care facilities and hospitals. *Cochrane Database Syst Rev* 2010 Jan 20;(1):CD005465.
20. Harding AD. Observation assistants: sitter effectiveness and industry measures. *Nurs Econ* 2010 Sep-Oct;28(5):330-6.
21. Hutchinson A, Young TA, Cooper KL, et al. Trends in healthcare incident reporting and relationship to safety and quality data in acute hospitals: results from the National Reporting and Learning System. *Qual Saf Health Care* 2009 Feb;18(1):5-10.
22. Feil M, Gardner LA. Falls risk assessment: a foundational element of falls prevention programs. Pa Patient Saf Advis [online] 2012 Sep [cited 2013 May 13]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Sep;9(3)/Pages/73.aspx

©2013 Pennsylvania Patient Safety Authority

Breakdowns in the Medication Reconciliation Process

Tingting Gao, PharmD, BCPS
Patient Safety Analyst
Michael J. Gaunt, PharmD
Senior Patient Safety Analyst
Pennsylvania Patient Safety Authority

ABSTRACT

Pennsylvania Patient Safety Authority analysts identified 501 reports involving breakdowns in the medication reconciliation process with event dates between November 1, 2011, and November 31, 2012. Analysts reviewed these reports to classify the events by type of reconciliation, event type, and possible causes and contributing factors. The majority of events occurred during admission medication reconciliation (69.3%, n = 347). Events most often originated during prescribing (40.3%, n = 202) and transcribing (26.9%, n = 135). Drug omission was the most frequently reported (26.7%, n = 134) event type overall. Other top event types included wrong dose and additional drug or dose. Important risk reduction strategies include standardizing processes, clearly defining the roles and responsibilities of staff involved in the medication reconciliation process, using a standardized medication reconciliation form with a scripted list of questions or prompts, and engaging patients when obtaining their history and determining treatment. (Pa Patient Saf Advis 2013 Dec;10[4]:125-36.)

Corresponding Author
Michael J. Gaunt

INTRODUCTION

Medication reconciliation is a process of comparing the medications a patient is taking and should be taking with newly ordered medications to identify and resolve discrepancies.[1,2] In other words, the process involves collecting an accurate list of the patient's medications, ensuring the medications collected and ordered are correct and appropriate for the patient, and reviewing any changes in therapy with each change in level of care. The goals of medication reconciliation are to obtain accurate and complete medication information for a patient and to use the information within and across the continuum of care to ensure safe and effective medication use.[3]

This process involves obtaining a detailed history of the medications that a patient was taking at home or during the previous level of care, including the drug name, strength, dose, route of administration, frequency, and the date and time when the last dose was taken. Having a complete and comprehensive medication history is critical and allows clinicians to reconcile it against the patient's current and newly ordered medications to identify discrepancies such as duplications, omissions, and interactions and minimize potential adverse drug events.

Medication errors are frequent during transitions of care due to inadequate communication and inadvertent omission of information.[4] For example, medication errors can occur while taking the medication history due to dependence on patient or caregiver recall. This process is further complicated by reliance on healthcare providers who have other primary responsibilities. Lack of a complete and accurate medication history may compromise a provider's ability to prescribe an effective medication management plan. With the majority of the patients taking more than one medication prior to hospital admission, there is potential for providers to overlook at least one medication when reconciling patients' home medications upon admission.[5,6] In addition, there is a positive correlation between the number of medications a patient is taking and the number of medications missed during the process of taking the medication history.[5]

This analysis serves to uniquely review medication error events reported by Pennsylvania healthcare facilities to the Pennsylvania Patient Safety Authority in order to identify the types of medication events associated with the medication reconciliation process, identify trends and factors contributing to the events, and provide risk reduction strategies to prevent these events from occurring.

METHODS

While reviewing reports submitted to the Authority, analysts have the opportunity to further classify reports using a "monitor code" for future querying opportunities. Analysts queried the Authority's Pennsylvania Patient Safety Reporting System database for reports assigned the monitor code "PI6," representing reports identified as events involving breakdowns during medication reconciliation. In addition, the event descriptions were queried for the phrases "reconcile" and "reconciliation" to identify reports that may involve medication reconciliation that were not assigned the "PI6" monitor code.

The initial query yielded 4,965 reports submitted to the Authority from June 2004 through November 2012. Analysts narrowed the time period to focus only on reports with event dates from November 2011 through November 2012, which generated 681 reports. After eliminating reports that were not applicable (e.g., "during process of reconciling specimen with requisition, the lab technician noted patient's specimen to be mislabeled"), 501 reports were analyzed in detail to identify trends and contributing factors.

©2013 Pennsylvania Patient Safety Authority

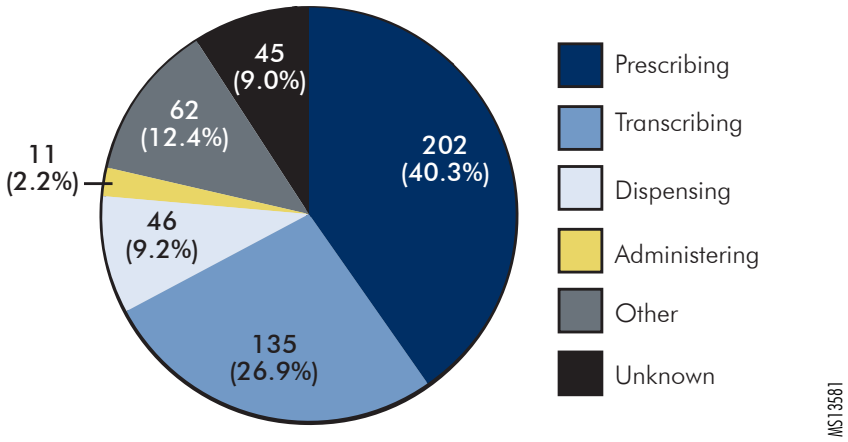
ANALYSIS

Despite the variety of ways in which breakdowns occurred during medication reconciliation and the number of events that actually reached the patient, few resulted in patient harm. Categorization of the events by harm score, which is adapted from the National Coordinating Council for Medication Error Reporting and Prevention harm index,[7] shows that 67.3% (n = 337) of the events reached the patient (harm score = C to I), 17.4% (n = 87) of the events reached the patient and required monitoring to confirm that it resulted in no harm to the patient and/or required intervention to preclude harm (harm score = D), and 3.6% (n = 18) of the events resulted in patient harm (harm score = E to I).

Likewise, analysts categorized the events according to the node of the medication-use process in which the event took place. More (40.3%, n = 202) reported events originated in the prescribing node than any other node. See the Figure for a complete breakdown of events by node.

The care areas in which the events occurred were distributed across many units. The top five care areas were medical-surgical unit (21.2%, n = 106), emergency department (ED) (12.8%, n = 64), telemetry (7.2%, n = 36), medical unit (5.8%, n = 29), and pharmacy (4.6%, n = 23). As older patients often take more medications and access medical service more frequently, it was not unexpected that the majority of patients (55.7%, n = 279) involved in these events were age 65 or older. Only 3.0% (n = 15) of patients were 18 or younger. More than 89.2% (n = 447) of the reports were reported as medication errors, only one was reported as an adverse drug reaction, and the remaining were submitted as other types of reportable events.

Figure. Medication-Reconciliation-Related Events That Occurred from November 1, 2011, through November 31, 2012, by Node, as Reported to the Pennsylvania Patient Safety Authority (N = 501)



Medication Reconciliation by Care Transition

Authority analysts categorized the events according to care transition (i.e., admission, transfer, discharge). Nearly 70% (n = 347) occurred during medication reconciliation upon admission, 10.0% (n = 50) during medication reconciliation upon discharge, and 8.6% (n = 43) during medication reconciliation upon transfer. Analysts were unable to determine the care transition in 12.2% (n = 61) of the events because there was insufficient information contained within the event reports.

Examples for each care transition are as follows:

Admission

> *Based on the medication history information from patient's family, atenolol 150 mg was prescribed. Pharmacy caught the error, saying that the dose of atenolol was too high. After checking with patient's outpatient pharmacy, [it was learned that] the patient was actually taking Avapro® [irbesartan] 150 mg. Patient did not receive the wrong medication.*

Transfer

> *When the patient was transferred from the PACU [postanesthesia care unit] to the ICU [intensive care unit] to the floor, medication reconciliation was not conducted when the patient went from ICU to the floor.*

Discharge

> *Patient was taking Altace® [ramipril] at home, which was therapeutically interchanged to lisinopril by pharmacy. Upon discharge, Altace was discontinued and lisinopril was listed as a new medication. Patient went home with new prescription for lisinopril but already had Altace at home, leading to [therapeutic] duplication.*

When analyzing the event description of each event report, analysts identified a broad spectrum of event types that occurred during care transitions. The Table provides a breakdown of the top five event types by care transition. Overall and for each care transition, drug omission, wrong dose, additional drug or dose, unknown, and wrong drug were the most common event types. Drug omission was the most frequently reported event type overall and with each care transition except transfers. Insufficient information was provided in 12.2% (n = 61) of the event reports to determine the type of event that occurred.

Drug Omissions

An omitted or missed dose may contribute to therapeutic failure and deterioration of the patient. Omissions, including dose

©2013 Pennsylvania Patient Safety Authority

Table. Top Five Event Types Associated with Medication-Reconciliation-Related Events That Occurred from November 1, 2011, through November 31, 2012, as Reported to the Pennsylvania Patient Safety Authority

EVENT TYPE	NO. OF EVENTS (%) BY CARE TRANSITION				
	Overall (N = 501)	Admission (N = 347)	Transfer (N = 43)	Discharge (N = 50)	Unknown (N = 61)
Drug omission	134 (26.7)	90 (25.9)	11 (25.6)	12 (24.0)	14 (23.0)
Wrong dose	102 (20.4)	75 (21.6)	2 (4.7)	11 (22.0)	14 (23.0)
Additional drug or dose	90 (18.0)	55 (15.9)	14 (32.6)	9 (18.0)	12 (19.7)
Unknown	61 (12.2)	31 (8.9)	13 (30.2)	8 (16.0)	9 (14.8)
Wrong drug	40 (8.0)	31 (8.9)	1 (2.3)	4 (8.0)	4 (6.6)

or drug omissions, were the second most common (26.7%, n = 134) type of event identified by analysts. The greatest number of omission events occurred during the prescribing phase (35.1%, n = 47), while 17.2% (n = 23) occurred during the transcription phase. Examples are as follows:

> *A patient was admitted for a surgical procedure. Home medications were not ordered. Patient's seizure medication was not given. The patient had a seizure. Physician contacted and ordered 2 mg Ativan® [LORazepam] and now dose of 90 mg IV [intravenous] push phenobarbital.*

> *The attending physician admitted a patient and did not perform medication reconciliation. The patient was admitted without medications prescribed. The patient was without a medication list and only remembered Colace® [docusate sodium] stool softener as a medication. Two days later, it was discovered that the medication reconciliation was not done [because] the attending thought the resident had completed the history and physical and medication reconciliation.*

> *The patient was admitted at end of the evening shift. Medications were not reconciled by doctor during overnight or day shifts, although the overnight nurse was informed of the patient's diabetes, hypertension, and past stroke history and told to call the on-call doctor. The patient received no meds until evening shift.*

A lack of detail in the event reports limited the analysts' ability to identify specific contributing factors to the drug or dose omission events. Analysts noted that in 20.9% (n = 28) of the events, the medication reconciliation form or documentation was never communicated or transmitted (e.g., faxed) to the pharmacy department or entered into the computer system. The reason for this breakdown in communication was not noted in the reports. Nearly 19% (n = 25) of the event reports simply described that the omission occurred when the drug or dose was omitted from the medication reconciliation documentation. Medication reconciliation was not completed for unspecified reasons in 13.4% (n = 18) of the events.

Roughly 18% (n = 24) of event reports either did not provide a drug name or indicated that a drug name was unknown, not documented, or other. Multiple medications were involved in 8.2% (n = 11) of the reports. Details as to the specific medications involved were not provided in the reports.

Cardiovascular drugs (e.g., amLODIPine, digoxin, diltiazem) were cited in 16.4% (n = 22) of the events, and antiplatelet or anticoagulant products were involved in 9.0% (n = 12) of the events. Examples are as follows:

> *A patient's blood pressure elevated on the day of anticipated discharge due to home medications not being reordered on admission causing a delay in discharge. This error was caused by the admission reconciliation form not being completed and transcribed as an order form. The patient was restarted on home medications and discharged a day later.*

> *A patient was discharged without Lopressor® [metoprolol] being ordered due to incomplete medication reconciliation process. The patient went into rapid atrial fibrillation, which necessitated readmission two days later.*

> *Pradaxa® [dabigatran etexilate] was continued on medication reconciliation but not profiled. The error was detected during chart check after [two] doses were missed. Patient has a history of atrial fibrillation. The attending physician was notified. There were no adverse effects noted, and the drug was started promptly.*

Wrong Dose

When breakdowns occur with the medication order, patients are at risk of receiving an incorrect dose or medication. Analysts initially identified "wrong medication order" as the most frequently reported (41.7%, n = 209) type of event associated with the medication reconciliation process. When drilling down further into these reports, nearly half (48.8%, n = 102) involved a wrong dose of medication, which was the second most frequent

©2013 Pennsylvania Patient Safety Authority

event type overall. Similar to previously mentioned drug omission events, the majority of wrong-dose events originated during the prescribing (49.0%, n = 50) and transcription (27.5%, n = 28) phases. Examples are as follows:

> *The patient takes metoprolol tartrate 100 mg q am [every morning] and 50 mg q pm [every evening]. [Medication was] reconciled and ordered as [metoprolol tartrate] 150 mg q am. [Metoprolol tartrate] 150 mg was given in morning. Patient was then taken to cardiology, [where the patient] became severely symptomatically bradycardic and hypotensive. Fluids were administered [as well as] ondansetron for nausea. [Staff] discussed the discrepancy with cardiology. Metoprolol held.*

> *During previous hospital stay, a patient received Lantus® [insulin glargine] 6 units daily at bedtime. The discharge summary notes Lantus 60 units daily at bedtime. Discharge instructions and discharge prescription listed Lantus 6 units daily at bedtime. The patient was admitted a month later, and ED personnel did not have Lantus listed as a home medication. History and physical notes Lantus 60 units daily at bedtime, and Lantus 60 units daily at bedtime was ordered. On day one, the patient's evening POC [point of care] blood glucose level was 172; Lantus dose given. On day two, the patient's evening POC blood glucose level was 161; Lantus dose given. On day three, the patient's morning POC blood glucose level was 59, and the corresponding morning lab reported blood glucose level of 50. The patient was administered dextrose 15 g PO [by mouth]; repeat POC was 85. Lantus dose was discontinued. The patient's evening blood glucose level was 60. The patient was administered dextrose 15 g PO; repeat POC was 85. The patient had no adverse outcomes beyond measures to reverse hypoglycemia.*

Most often (65.7%, n = 67), wrong-dose events involved documentation errors during the medication reconciliation process. For instance, 57.8% (n = 59) of wrong-dose events resulted from the incorrect dose recorded by the practitioner during medication reconciliation. Breakdowns in the accuracy of the patient's recall of his or her medications contributed to these documentation errors. Another 18.6% (n = 19) of the events resulted from an order entry error in a computerized prescriber order entry system or pharmacy computer system.

Analysts found a variety of medications involved in the wrong-dose events. Insulin products, a category of high-alert medications,[8,9] were involved in 8.8% (n = 9) of the events. It should be noted that 33.3% (n = 3) of the insulin reports appear to involve the misinterpretation of the insulin concentration 100 unit/mL—as is often printed on hospital and long-term care discharge instructions as well as outpatient prescription labels[10]—as the patient's specific dose. Examples are as follows:

> *A patient was admitted to general rehab. The admission orders included an order for Lantus 100 units daily and 100 units at bedtime. During acute care admission, the patient had been receiving 35 units daily and 25 units at bedtime. I spoke with admitting resident to change [the Lantus dose] back to previous dosing. Per the admitting resident, the patient's discharge instructions stated dose as 100 units. Upon review of the discharge instructions, the medication appears as follows: "Medication Name/Strength column: Insulin Glargine (Lantus) (Insulin Glargine 100 units/mL Subcutaneous Solution)" and the "How much do I take?" field is blank.*

> *A patient was on Levemir® [insulin detemir] 100 units/mL at home. When medication reconciliation was completed, the physician called an order to substitute Lantus for Levemir, but the dose was transcribed as 100 [units] instead of 10 units. The patient received 100 units of Lantus insulin. The physician was notified. The patient had a decrease in blood sugar that responded to dextrose.*

Other medications involved in wrong-dose events include metoprolol tartrate and metoprolol succinate (6.9%, n = 7), buPROPrion-containing products, including extended-release formulations (2.9%, n = 3), and oral hypoglycemic agents (i.e., glipiZIDE, glyBURIDE, and glimepiride) (2.9%, n = 3).

Additional Drug or Dose

Inadvertent prescribing or administering of an additional or unnecessary drug can pose a risk to patients. Analysts identified that in roughly 18% (n = 90) of the events, patients nearly or actually received an additional drug. Over 46% (n = 42) of these events originated in the prescribing node of the medication-use process, while 22.2% (n = 20) and 16.7% (n = 15) originated in the transcription and dispensing nodes, respectively. Examples are as follows:

> *Upon retrospective review, it was noted that this patient was hyperkalemic upon admission, and kayexalate was prescribed and administered. Additionally, [the patient's] potassium supplement was inappropriately continued from the home medication list, [which] resulted in a refractory hyperkalemia. The condition was temporary, [and it was] treated with a second dose of kayexalate. The potassium supplement was discontinued.*

> *Patient went to surgery, and after the procedure, the "OR/Transfer Medication Reconciliation" was printed and signed by surgery. One*

©2013 Pennsylvania Patient Safety Authority

minute later, the "Home Medication Reconciliation" was printed and signed by surgery, activating old medication orders that conflicted with the post-op orders. This created numerous medication order problems for nursing and pharmacy. The patient was on duplicate antisecretory medications, as well as different doses of antidepressants. The orders were evaluated by a hospitalist, and medication order issues were resolved. The patient, however, did experience new onset confusion, agitation, and bladder irritation [the day before the hospitalist resolved the issue]. Per the physician, he cannot rule out that it is medication-related.

The patient was admitted for hypertension, metoprolol was stopped, and labetalol was started. During the discharge medication reconciliation process, the provider indicated that the patient should start labetalol but also ordered the home medication of metoprolol. The patient required readmission for bradycardia.

The most frequent breakdown that occurred during these events were documentation errors (42.2%, n = 38). One key contributor involved the accuracy of the information practitioners accessed to determine the patient's current medications. In 42.1% (n = 16) of the events, patients were ordered, and in some cases received, medications documented in previous admissions, on home medication lists, or on lists provided by other facilities when in fact the patient was no longer taking that medication. Examples are as follows:

Coumadin® [warfarin] was listed on the patient's home medication reconciliation sheet. These meds were ordered by the ED physician. The patient and [the patient's adult child] both stated that the patient no longer takes Coumadin. The patient did not receive any doses while in hospital.

A medication reconciliation form was completed in the ED and accepted as admission medication orders. As per policy, the medication reconciliation form [was] reviewed with the patient and the family at the time of admission. The family stated that Remeron® [mirtazapine] and Zoloft® [sertraline] had been discontinued in the skilled facility. Transfer medication sheets were reviewed, and both meds had been discontinued. The patient did not receive incorrect medications.

It was discovered by the medical doctor that the patient had the following meds on [the medication administration record]: doxycycline, metroNIDAZOLE, Pyridium® [phenazopyridine], and Bactrim® [sulfamethoxazole and trimethoprimon]. The physician realized that the patient should not be getting these meds, as the patient no longer needs these with no UTI [urinary tract infection]. Apparently, the nurse and psychiatrist both reconciled these medications on admission, although the patient has not needed them. The patient was given these medications in the morning, as they were on the [medication administration record] to give. The patient did not have any sort of adverse reaction, and the medications were discontinued.

When the patient was admitted, the nurse reviewed the records that came with the patient to determine medications that the patient was receiving upon discharge from the referring facility. One record noted meds the patient received the day of discharge from the transferring facility prior to admission to this facility. This list was reviewed with the physician, and verbal orders were obtained from the physician for the medications reviewed. This list, however, did not match the discharge medication list record that was also in the admission papers, and this record was overlooked. The next day, the physician reviewed all records and, in the reconciliation process, realized that an error was made. Three medications were ordered in error. One of the meds was Opana® [oxymorphone], and one dose was given to the patient before the error was discovered. The patient did not have any apparent ill effects from the medication.

In other events involving documentation errors, medications from lists belonging to a different patient were ordered for a patient (15.8%, n = 6). Most often, the lists were provided by patients or other facilities. Examples are as follows:

A patient presented at ED with [the patient's] son. The son gave the ED nurse the home medication list. The list included both the patient's and patient's spouse's home medications. The nurse transcribed both the patient's and spouse's medications when completing the patient's medication reconciliation. The admitting physician used the medication reconciliation list of home meds transcribed by the ED nurse to order medications for the patient. The patient received the spouse's medication twice in error. The physician was notified. [There was] no apparent harm to the patient.

A patient [was transported] to ED from personal care facility (the patient was confused). Information (medication lists) was sent on the patient and another facility patient. When medication reconciliation was completed, the two [patients'] medication lists were combined to compile a medication list for admission. The physician reviewed the compiled list and ordered medications based on the list. The patient received [multiple doses of] the following medications from the other patient's list: Ambien® [zolpidem], Seroquel® [QUEtiapine], Celexa® [citalopram], Ventolin® [albuterol] inhaler, Neurontin®

©2013 Pennsylvania Patient Safety Authority

[gabapentin], OxyCONTIN® [oxyCODONE extended release], and Xanax® [ALPRAZolam]. During hospitalization, the patient was noted to be progressively lethargic. Rapid response was initiated, and the patient was treated and remained on the unit. Following a gastrointestinal procedure, the patient was transferred to ICU due to inability to fully wake up post sedation. Medications were adjusted, with order to hold for sedation. The remainder of hospital course was uneventful. Upon preparation for discharge, personal care facility [was] given report and medications [were] reviewed. Facility questioned medications and indications. Medication errors were discovered at that time. Patient [was] discharged back to facility in stable condition.

Prescribers indicated on medication reconciliation forms or in orders to "hold" doses of medications in 16.7% (n = 15) of event reports. However, either nursing or pharmacy staff missed the hold order. Similar to an article that appeared in the March 2006 *Pennsylvania Patient Safety Advisory*,[11] anticoagulants were in nearly a third (n = 4) of these events. An example is as follows:

Coumadin was placed on hold on medication reconciliation sheet. Coumadin was dispensed to floor with other medications. The nurse administered Coumadin, and when heparin lock was discontinued, the patient was noted to have increased bleeding time. The patient recalled that Coumadin was given night prior. The physician was notified. No other adverse effects [were noted]. Pharmacy [was made] aware, and medication was profiled but was not placed on hold as per medication reconciliation sheet.

Facilities indicated that 8.9% (n = 8) of additional drug or dose events involved multiple medications. Cardiovascular drugs, primarily drugs used to treat hypertension, were involved in 17.8% (n = 16) of all the additional drug or dose events. The next largest group of medications noted in the event reports was anticoagulants and antiplatelets (14.4%, n = 13).

Wrong Drug

Wrong-drug events was the fifth most frequently reported (8.0%, n = 40) event type overall. Similar to the other top event types, analysts identified that most events originated during the prescribing (37.5%, n = 15) and transcription (37.5%, n = 15) phases of the medication-use process. Examples are as follows:

The patient was on HumuLIN® 70/30 [insulin NPH and insulin regular] 50 units BID [twice daily] at home. [On admission, the patient was] ordered HumuLIN® N [insulin NPH] 35 units BID. The patient received 1 dose of 35 units of HumuLIN N. [Staff] spoke with resident and the patient's nurse to verify and correct.

Medication was transcribed from patient list to reconciliation [form] by nurse as amiodarone instead of amLODIPine. Earlier today, PCP [primary care physician] discussed this transcription error with nurse, and she thought PCP had crossed it off. It later became apparent that he had not.

Nurse transcribed a medication by history as isosorbide dinitrate 30 mg daily. Physician reconciled medication and pharmacist verified order. Night shift pharmacist questioned order on cart check. Physician contacted, and order changed to isosorbide mononitrate. Patient received one incorrect dose.

Medication information from a different patient was used to populate the medication reconciliation documentation and used to order and profile medications in 12.5% (n = 5) of the events. In some cases, the wrong patient's list was forwarded by an outside facility from which the patient was being transferred. In another case, the wrong patient's medication reconciliation form was placed on the patient's chart and completed by the prescriber ordering medications. Examples are as follows:

A patient presented to the facility with a medication list sent by a nursing home. The patient was placed on NPO [nothing by mouth] status. Medication reconciliation process was performed based on medication list sent from the nursing home. After administration of eye drops only, staff discovered that the med list was that of another patient from the nursing home.

When admitting a patient, the wrong patient medication reconciliation forms were placed on the patient's chart and were filled out by nurse practitioners writing admission orders (prescribing error). The error was discovered by the nurse before the list was scanned to pharmacy and profiled. The physician was notified and correct medications were ordered; no harm to patient occurred.

Another factor that contributed to wrong-drug events was the use of inaccurate medication history information provided by the patient or the patient's family either on a printed list or verbally. This occurred in 7.5% (n = 3) of the wrong-drug events. An example is as follows:

The patient's personal home list of medications lists tiazepam 15 mg PO daily as a home medication. Admitting nurse entered in computer as diazepam 15 mg daily. Pharmacy took order off as diazepam 15 mg PO daily morning meds given. The patient was unsure if she was on Valium® (diazepam) or not. Nurse double-checked home medication list and confirmed as home medication. The patient's friend gave home list of medications provided at time of admission. Medication was listed as

©2013 Pennsylvania Patient Safety Authority

tiazepam. When asked if that was the correct medication, the patient stated it was her sleeping pill, Restoril® (temazepam).

Confused drug names, or drug names with look-alike or sound-alike similarities, contributed to at least 35.0% (n = 14) of the events. It should be noted that while the event reports do not specifically cite look-alike or sound-alike names as contributing factors, analysts identified that some of the drug name pairs involved have a long, documented history of confusion and mix-ups.[12] For example, insulin products were involved in 42.9% (n = 6) of these look-alike name errors. Specific pairs involved in these events include HumuLIN 70/30 and HumuLIN N; HumaLOG Mix® 75/25 (insulin lispro protamine and insulin lispro) and HumuLIN 70/30; NovoLIN® N (insulin NPH) and NovoLOG® (insulin aspart); HumaLOG® (insulin lispro) and HumuLIN N; HumuLIN 70/30 and HumaLOG; and Levemir and Lantus. Other examples of drug name pairs involved in these events include amitriptyline and nortriptyline; isosorbide dinitrate and isosorbide mononitrate; NIFEedipine and niCARdipine; and Zyrtec® (cetirizine) and Zyrtec-D® (cetirizine and pseudoephedrine).

RISK REDUCTION STRATEGIES

Medication reconciliation conducted at all care transitions, including temporary transfers to operating rooms or diagnostic testing areas, can improve patient safety. Maintaining the most up-to-date patient medication record remains a challenge, particularly if an electronic patient medication record is not available. Healthcare facilities can strive to identify systems-based causes of the events associated with the medication reconciliation processes and implement effective risk reduction strategies to prevent harm to patients.

Standardizing the workflow processes involved in medication reconciliation and taking steps to improve the completeness and accuracy of a patient's current medication history can reduce the risk of medication errors, including those described in this article. Consider the strategies described in this section, which are based on a review of events reported to the Authority, observations from the Institute for Safe Medication Practices, and recommendations in the literature. Also, a number of organizations have made tools and resources available to healthcare facilities to aid in the successful implementation of medication reconciliation. A selection of these resources can be found in "Resources to Aid in the Successful Implementation of Medication Reconciliation."

Standardized Process for Obtaining and Communicating Complete and Accurate Medication History

– The collection of a complete, accurate, single medication list, to be shared and used by all disciplines, at admission or at an initial point of entry into the system is a cornerstone of any successful reconciliation process.[13] Complete documentation of all patient medications taken at the time of admission, including the name of the drug, dose, frequency, route, purpose of the medication,

RESOURCES TO AID IN THE SUCCESSFUL IMPLEMENTATION OF MEDICATION RECONCILIATION

A key tenet in medication error prevention is to learn from other organizations and facilities. Listed below are a number of organizations that provide tools and resources to healthcare facilities to aid in the successful implementation of medication reconciliation.

— Agency for Healthcare Research and Quality (AHRQ). AHRQ's Clinical Handoffs (MATCH) Toolkit for Medication Reconciliation provides a step-by-step guide to improving the medication reconciliation process. See http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/match/matchintro.html.

— American Society of Health-System Pharmacists (ASHP). ASHP's toolkit includes examples of programs, tools, and forms that have been implemented successfully in other organizations. Access the tool at http:// www.ashp.org/Import/PRACTICEANDPOLICY/PracticeResourceCenters/PatientSafety/ASHPMedicationReconciliationToolkit_1.aspx.

— Institute for Safe Medication Practices Canada (ISMP Canada). ISMP Canada provides information and access to tools and resources for both healthcare facilities and patients on their website at http://www.ismp-canada.org/medrec.

— Partnership for Patient Care. This collaborative between the Healthcare Improvement Foundation, Independence Blue Cross, and ECRI Institute provides a report on the results and benefits of a regional failure mode and effects analysis on medication reconciliation. Access the report at https://www.ecri.org/Documents/Patient_Safety_Center/PPC_Medication_Reconciliation.pdf.

— World Health Organization (WHO). WHO's *Assuring Medication Accuracy at Transitions in Care Standard Operating Protocol*, a component of the High 5s Project, provides information about medication reconciliation, including the problem, strength of evidence that supports the solution, and potential barriers and unintended consequences. See http://www.high5s.org/bin/view/Main/WebHome.

©2013 Pennsylvania Patient Safety Authority

and last dose taken,[14] is important for successful medication reconciliation.[15] To collect medication history, during the admission verification process, consider using a standardized form (either electronic or paper-based) that includes a scripted list of questions or prompts for the patient or the caregiver. Include a checklist on the form to ensure that the practitioner asks the patient about prescription and over-the-counter medications, vitamins, and dietary or herbal supplements that the patient may be taking. Design the checklist to remind the practitioner to also ask the patient about non-oral and non-parenteral medications, including patches, inhalers, topical products, eye drops, ear drops, depot injections, and drug-eluting implantable devices that may not be readily identified by patients as medications. Reviewing the labels of any prescription containers a patient brings and discussing how the medications are currently being used can help improve the accuracy of the information collected. Including the patient's community pharmacy contact information on the medication reconciliation form will enable pharmacist clarification when needed, keeping in mind that a patient may use more than one pharmacy.[15,16]

- Stress to all staff, including prescribers, nurses, and pharmacists, the importance of following the standardized process to reduce the risk of medication errors and patient harm.
- Work to eliminate documentation of medication reconciliation information on multiple assessment tools (e.g., history and physical forms, anesthesiologist's notes, preprocedural assessment sheets).[13]
- Standardize patient identification processes such that all staff, including prescribers, nurses, and pharmacists, utilize and verify two reliable patient identifiers to improve the accuracy of patient identification during medication reconciliation.[17] Verify the patient identity recorded on documentation sent from outside facilities is a correct match to the patient being treated.
- Consider minimizing, excluding emergent situations, the writing or entry into electronic prescribing systems of admission orders by prescribers until a complete and accurate medication history has been compiled. This can help limit potential conflicts throughout the admission should the patient's home medication and dose be determined to be different than what was ordered upon admission.
- Orders to hold a medication can lead to errors.[11] For example, indications to hold orders may be missed by nursing or pharmacy staff, resulting in medications being administered when not intended by the prescriber. A safer practice is for prescribers to discontinue the medication and then order the medication when it is to be started.

Define Roles and Responsibilities

- Clearly define the roles and responsibilities of staff, including prescribers, nurses, and pharmacists, involved in the medication reconciliation process.[13,18] Take steps to foster teamwork among the disciplines.
- Physician and prescriber engagement with patients and other practitioners is important in ensuring a successful medication reconciliation process.[19] Medication reconciliation is the responsibility of all physicians and prescribers, regardless of specialty.[19] To foster physician and prescriber engagement, obtain their feedback regarding expected responsibilities in the medication reconciliation process, as well as current workflow challenges. This can also assist in planning for changes in medication reconciliation procedures, especially the development of electronic processes. Consider enlisting the support of the pharmacy and therapeutics committee and medical executive committee in assisting prescribers to accept their responsibility for the performance of medication reconciliation in all types of care areas. True reconciliation includes the prescriber making a clinical judgment as to whether all medications on the list should be continued at the time of admission or change in level of care, held until further evaluation or for diagnostic testing, or discontinued.
- Both pharmacists and pharmacy technicians can play important roles in medication reconciliation as well. The pharmacy staff can participate in collecting and confirming essential patient information (e.g., allergies and reactions, complete medication history) with patients directly. Also, pharmacy staff can provide a valuable independent double check of the reconciliation of medication orders conducted when the patient's level of care changes (e.g., upon transfer, postoperatively, prior to discharge).

Address Design of Electronic Health Record Systems

- According to the Institute of Medicine,[20] interoperable medication data and provision of such data electronically can facilitate medication reconciliation. For facilities currently using a paper-based system for medication reconciliation, or a combination of both electronic and paper-based systems,[21] consider transitioning to the use of a completely electronic reconciliation process through an electronic health record

©2013 Pennsylvania Patient Safety Authority

(EHR) system. Ensure that the process includes a single electronic listing for all practitioners to utilize and eliminates documentation on multiple assessment tools.[13] Include all elements of a complete medication order (e.g., drug, dose, strength, frequency), and designate these as mandatory data entry fields. Explore options to provide physicians with the ability to utilize an electronic list of current medications for discharge reconciliation procedures, as well as the ability to automatically populate a patient discharge instruction sheet once the reconciliation process is complete. Require periodic testing and assessment of the EHR system and medication reconciliation application to identify and address any performance or safety issues.

- EHR systems that are integrated with computer systems in outpatient clinics and physician office practices can provide prescribers and other healthcare practitioners the opportunity to view the medications a patient was prescribed upon discharge. This can better enable the practitioner to perform medication reconciliation in the outpatient setting by comparing what the patient is taking at the time of the office visit with what was prescribed upon discharge.[20]
- Design discharge instructions to clearly display the drug name, dose, and administration instructions.[10] For example, for insulin products, make sure the wording is congruent with how medications will be administered (e.g., 10 units) rather than how they are supplied (e.g., 100 units/mL).[22]

Encourage Patient and Caregiver Involvement

- Educate patients and their families or caregivers on medication reconciliation and the important role they play in the process.[13]
- Collecting a medication history is often dependent on patient recall. When a patient is on five or more medications, the likelihood of accurate recall of a medication name, strength, dose, frequency, route of administration, and indication drops significantly.[5,23] Provide electronic access to a blank copy of the medical center's admission medication reconciliation form or a wallet card to assist patients in providing a complete medication history. Alternatively, provide a link to the universal medication form available from the Authority's website at http://patientsafetyauthority.org/NewsAndInformation/Brochures/Documents/Universal%20Medication%20Form.pdf.
- Encourage practitioners to involve patients when prescribing new medication orders and prior to medication administration. A simple statement like "Mr. Jones, I am going to give you your home blood pressure medications, lisinopril and Norvasc" or "Mrs. Jones, why do you take lisinopril?" during administration may help to identify any discrepancies that were missed and minimize the potential for medication error.
- Involve patients by planning for and implementing an aggressive public education campaign specifically designed around medication safety and medication reconciliation.[18] Healthcare facilities may consider advertising initiatives through articles in the local newspaper, speakers at community forums, and the organization's community outreach programs.

Measure Medication Reconciliation Processes

- Ensuring that the medication reconciliation process is successful and results in clinically meaningful outcomes requires the development and use of specific metrics.[18] For example, facilities can develop specific process measures (e.g., total number of admission reconciliations completed and documented within a designated time frame over the total number of admissions [new patients] in 24 hours) to monitor the success of medication reconciliation. It is also important to identify any near-miss events (and actual events) from the voluntary reporting program or other sources that can be prevented by an effective medication reconciliation process. Use this information to educate professional staff on the safety importance of implementing a successful reconciliation program.

CONCLUSION

Completing accurate medication reconciliation is important to ensure safe and effective medication use. Having a complete medication history allows clinicians to compare it with the patient's current and newly ordered medications to identify discrepancies and minimize potential adverse drug events. However, breakdowns in the admission, transfer, or discharge medication reconciliation do occur and introduce potential risk to the patient. Implementing strategies to limit these breakdowns and increase the accuracy of the medication histories obtained and reconciled can help foster smooth and safe transitions from one level of care to the next.

©2013 Pennsylvania Patient Safety Authority

NOTES

1. The Joint Commission. Using medication reconciliation to prevent errors. *Sentinel Event Alert* 2006 Jan 23; (35):1-4.
2. Institute for Safe Medication Practices. 2011 ISMP medication safety self assessment® for hospitals [online]. 2011 [cited 2013 Sep 20]. http://www.ismp.org/selfassessments/Hospital/2011
3. ASHP statement on the pharmacist's role in medication reconciliation. *Am J Health Syst Pharm* 2013 Mar 1; 70(5):453-6.
4. Kwan JL, Lo L, Sampson M, et al. Medication reconciliation during transitions of care as a patient safety strategy: a systematic review. *Ann Intern Med* 2013 Mar 5;158(5 Pt 2):397-403.
5. Shepherd G, Schwartz RB. Frequency of incomplete medication histories obtained at triage. *Am J Health Syst Pharm* 2009 Jan 1;66(1):65-9.
6. Rogers S, Wilson D, Wan S, et al. Medication-related admissions in older people: a cross-sectional, observational study. *Drugs Aging* 2009;26(11):951-61.
7. National Coordinating Council for Medication Error Reporting and Prevention. NCC MERP index for categorizing medication errors [online]. 2001 Feb [cited 2013 Jun 10]. http://www.nccmerp.org/medErrorCatIndex.html
8. Institute for Safe Medication Practices. Results of the ISMP survey on high-alert medications: differences between nursing, pharmacy, and risk/quality/safety perspectives [online]. ISMP Med Saf Alert Acute Care 2012 Feb 9 [cited 2013 Jul 15]. http://www.ismp.org/Newsletters/acutecare/showarticle.asp?id=15
9. Institute for Safe Medication Practices. ISMP's list of high-alert medications [online]. 2012 [cited 2013 Jul 15]. http://www.ismp.org/Tools/institutionalhighAlert.asp
10. Medication errors with the dosing of insulin: problems across the continuum. Pa Patient Saf Advis [online] 2010 Mar [cited 2013 Nov 13]. http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2010/Mar7(1)/Pages/09.aspx
11. Hold on to these orders. PA PSRS Patient Saf Advis [online] 2006 Mar [cited 2013 Jul 17]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2006/Mar3(1)/Pages/33.aspx
12. Medication errors linked to drug name confusion. PA PSRS Patient Saf Advis [online] 2004 Dec [cited 2013 Jul 18]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2004/dec1(4)/Pages/07.aspx
13. Agency for Healthcare Research and Quality. Medications at transitions and clinical handoffs (MATCH) toolkit for medication reconciliation [online]. 2012 Aug [cited 2013 Sep 20]. http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/match/matchintro.html
14. Cohen MR. Preventing prescribing errors. Chapter 9. In Cohen MR, ed. *Medication Errors*. 2nd ed. Washington (DC): American Pharmacists Association; 2007:186.
15. Gleason KM, Groszek JM, Sullivan C, et al. Reconciliation of discrepancies in medication histories and admission orders of newly hospitalized patients. *Am J Health Syst Pharm* 2004 Aug 15;61(16):1689-95.
16. Horn D, Gaunt MJ, Vaida AJ. Medication reconciliation: a survey of community pharmacies and emergency departments. *Patient Saf Qual Healthc* 2010 May-Jun;7(3):18-23.
17. Yang A, Grissinger M. Wrong-patient medication errors: an analysis of event reports in Pennsylvania and strategies for prevention. Pa Patient Saf Advis [online] 2013 Jun [cited 2013 Oct 23]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Jun;10(2)/Pages/41.aspx
18. Greenwald JL, Halasyamani L, Greene J, et al. Making inpatient medication reconciliation patient centered, clinically relevant and implementable: a consensus statement on key principles and necessary first steps. *J Hosp Med* 2010 Oct;5(8):477-85.
19. Schwartzberg J, Sokol P, Toepp M. *The physician's role in medication reconciliation: issues, strategies, and safety principles*. Chicago: American Medical Association; 2007.
20. Institute of Medicine. *Preventing medication errors: quality chasm series*. Washington (DC): National Academy Press; 2006.
21. Sparnon E. Spotlight on electronic health record errors: paper or electronic hybrid workflows. Pa Patient Saf Advis [online] 2013 Jun [cited 2013 Nov 20]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Jun;10(2)/Pages/55.aspx
22. Institute for Safe Medication Practices. Insulin concentrations rarely needed on orders. *ISMP Med Saf Alert Acute Care* 2012 Nov 29;18(24):1-2.
23. Vilke GM, Marino A, Iskander J, et al. Emergency department patient knowledge of medications. *J Emerg Med* 2000 Nov;19(4):327-30.

©2013 Pennsylvania Patient Safety Authority

LEARNING OBJECTIVES

- Recognize the most frequently reported event types involved in breakdowns of the medication reconciliation process.
- Identify causes and factors contributing to breakdowns of the medication reconciliation process.
- Distinguish between effective and ineffective strategies to reduce the risk of errors occurring during the medication reconciliation process.

SELF-ASSESSMENT QUESTIONS

The following questions about this article may be useful for internal education and assessment. You may use the following examples or come up with your own questions.

1. Which of the following was the most frequently reported type of event associated with breakdowns in the medication reconciliation process?
   a. Additional drug or dose
   b. Drug omission
   c. Wrong dose
   d. Wrong drug
   e. Wrong patient
2. An omitted or missed dose may contribute to therapeutic failure and deterioration of the patient's condition. Which of the following was a leading factor in drug omissions related to medication reconciliation?
   a. The medication reconciliation documentation was not communicated or transmitted to the pharmacy department.
   b. Breakdowns occurred when patients were transferred between units within a hospital.
   c. Prescribers indicated on medication reconciliation forms to "hold" doses of medications.
   d. A medication list for a different patient was used during medication reconciliation.
   e. The accuracy of information used during medication reconciliation was questionable.
3. Strategies to standardize the workflow processes involved in medication reconciliation and improve the completeness and accuracy of a patient's medication history include all of the following *except*:
   a. Design the checklist to remind the practitioner to also ask the patient about non-oral and non-parenteral medications.
   b. Assign responsibility to nursing and pharmacy for the medication reconciliation process.
   c. Standardize patient identification processes such that all staff, including prescribers, nurses, and pharmacists, use and verify two reliable patient identifiers.
   d. Enlist the support of the pharmacy and therapeutics committee and medical executive committee in assisting prescribers to accept their responsibility for the performance of medication reconciliation in all types of care areas.
   e. Work to eliminate documentation of medication reconciliation information on multiple assessment tools.

Question 4 refers to the following case:

A patient with confusion was transported to the emergency department from a personal care facility. Two medication lists were sent with the patient—one for the patient and one for a different patient at the facility. When medication reconciliation was completed, the two patients' medication lists were combined to compile a single medication list for admission. The physician reviewed the compiled list and ordered medications based on the list. As a result, the patient received multiple doses of the following medications from the other patient's list during the admission: zolpidem, QUEtiapine, citalopram, gabapentin, oxyCODONE, and ALPRAZolam. During the admission, the patient was noted to be progressively more lethargic. The rapid response team was called. The patient was treated and remained on the unit. Later in the admission, following

©2013 Pennsylvania Patient Safety Authority

SELF-ASSESSMENT QUESTIONS (CONTINUED)

a procedure, the patient was transferred to the intensive care unit due to inability to fully wake up following sedation. Medications were adjusted. The remainder of the hospital course was uneventful. Upon preparation for discharge, information about the patient's hospital stay and medications was communicated to the personal care facility. The facility questioned some of the medications and indications, revealing the medication errors that occurred upon admission. The patient was discharged back to facility in stable condition.

4. Which of the following is the appropriate strategy that would most directly prevent this event from reoccurring?
   a. Clearly define the roles and responsibilities of staff involved in the medication reconciliation process.
   b. Request pharmacy to confirm and verify essential patient information with the patient directly.
   c. Instruct nurses collecting medication history information during medication reconciliation to adhere to the "five rights."
   d. Standardize the verification of the patient identity recorded on documentation sent from outside facilities in the medication reconciliation process.
   e. Stress to all staff, including prescribers, nurses, and pharmacists, the importance of following the standardized process to reduce the risk of medication errors and patient harm.

Question 5 refers to the following case:

A patient was admitted to the general rehabilitation unit. The admission orders included an order for Lantus® (insulin glargine) 100 units daily and 100 units at bedtime. During acute care admission, the patient had been receiving 35 units daily and 25 units at bedtime. I spoke with admitting resident to change the Lantus dose back to previous dosing. Per the admitting resident, the patient's discharge instructions stated dose as 100 units. Upon review of the discharge instructions, the medication appears as follows: "Medication Name/Strength column: Insulin Glargine (Lantus) (Insulin Glargine 100 units/mL Subcutaneous Solution)" and the "How much do I take?" field is blank.

5. Which of the following strategies would be most effective in reducing the risk of this wrong-dose event?
   a. Design discharge instructions to clearly display the dose such that the wording is congruent with how the medication is to be administered rather than how it is supplied.
   b. Encourage practitioners to involve patients when prescribing new medication orders and prior to medication administration.
   c. Differentiate the names and package designs of insulin products to reduce look-alike and sound-alike confusion.
   d. Identify near-miss and actual events, and use them to educate staff on the importance of following the standardized medication reconciliation process.
   e. Develop standardized clinical guidelines on how to prescribe insulin.

©2013 Pennsylvania Patient Safety Authority

Update: Are Influenza, Pneumonia, and Vaccination Rates Improving in Nursing Home Residents?

Sharon M. Bradley, RN, CIC
Senior Infection Prevention Analyst
Pennsylvania Patient Safety Authority

INFLUENZA AND PNEUMOCOCCAL VACCINATION DATA

Since 2006, pneumonia and influenza combined have remained the seventh leading cause of death in people over 65 years of age in the United States.[1] Lower respiratory tract infections (LRTIs), including pneumonia and influenzalike illness, are the second most common healthcare-associated infections (HAIs) in Pennsylvania nursing homes.[2] Analysis of HAI events reported through the Pennsylvania Patient Safety Reporting System (PA-PSRS) shows that influenzalike illness rates of infection have remained at 0.00 to 0.01 per 1,000 resident-days over the 2010 to 2012 reporting periods.[2] LRTIs, including pneumonia, have shown a slight decrease in infection rate from 0.44 in 2010 to 0.42 in 2012.[2] See Table 1.

Influenza vaccination has been shown to reduce the risk of influenza and absenteeism in vaccinated adults. Vaccination of both residents and their contacts (e.g., visitors, clinicians) is the foundation of efforts to prevent influenza transmission. Healthcare worker vaccination in particular has been shown to reduce the risk of respiratory illness and death in nursing home residents.[3]

A previous *Pennsylvania Patient Safety Advisory* article, "Increasing Influenza and Pneumonia Vaccination Rates in Long-Term Care," reported that in 2007, influenza and pneumococcal vaccination rates for Pennsylvania nursing home residents were 3% below the "all-state average."[4] The influenza vaccination rate in Pennsylvania in 2007 was 85.9%.[5] Nursing homes in the commonwealth improved on this rate in 2008 and 2009, achieving influenza vaccination rates of 87.3% and 88.1%, respectively.[6,7] The pneumococcal vaccination rate in Pennsylvania in 2007 was 83.6 %.[5] Nursing homes in the commonwealth improved on this rate in 2008 and 2009, achieving pneumococcal vaccination rates of 86.5% and 86.1%, respectively.[6,7] However, due to concurrent improvement in nursing homes across the country, the available 2009 vaccination data from the US Department of Health and Human Services' (HHS) Agency for Healthcare Research and Quality shows that performance ratings of Pennsylvania nursing homes remained 3.0% below the all-state average of 91.1% for influenza vaccinations and 2.5% below the all-state average of 88.6% for pneumococcal vaccination.[7]

HEALTHCARE WORKER VACCINATION TRENDS

The overall national healthcare worker influenza vaccination rates have steadily increased over the last decade. Until the 2009-2010 season, less than 50% of US healthcare workers were vaccinated against influenza.[8] A Centers for Disease Control and Prevention (CDC) Internet panel survey of 1,944 self-selected healthcare workers in April 2013 found that 72.0% of all US healthcare workers reported that they had received an influenza vaccination for the 2012-2013 season. For the same season, 83.1% of healthcare workers in US hospitals received an influenza vaccination, whereas vaccination coverage was only 58.9% for healthcare workers in US long-term care facilities.[9] Among all occupational settings surveyed, vaccination was lowest among healthcare workers at US long-term care facilities in the 2011-2012 and 2012-2013 seasons. See Table 2.

A report from the Pennsylvania Health Care Worker Flu Immunization Campaign shows that the rate of influenza vaccination in Pennsylvania nursing home healthcare workers is less than 60%,[10] far below the Healthy People 2020 target of 90%.[11] This disparity may be a factor in the lack of improvement in the rate of influenzalike illness reported to PA-PSRS from Pennsylvania nursing homes.

©2013 Pennsylvania Patient Safety Authority

CDC reports 96.5% coverage among US healthcare workers who had an employer requirement for vaccination.[9] In the absence of requirements, increased vaccination coverage was associated with employers offering vaccination on-site, free of charge, and on multiple days.[9]

STRATEGIES FOR IMPROVING VACCINE UPTAKE

Nursing homes may improve their staff and resident vaccination rates and decrease LRTIs in their residents by following risk reduction strategies outlined in the *Advisory* articles "Increasing Influenza and Pneumonia Vaccination Rates in Long-Term Care" and "Strategies to Improve Outcomes in Nursing Home Residents with Modifiable Risk Factors for Respiratory Tract Infections," including strategies to increase vaccine availability and acceptance.[3,4] The articles are available on the Authority's website at http://patientsafetyauthority.org.

The Pennsylvania Department of Health brought together a voluntary association of experts—including the Hospital and Healthsystem Association of Pennsylvania (HAP), the Authority, the Pennsylvania Immunization Coalition, and Pennsylvania hospitals and health systems that have achieved nearly universal vaccination coverage—to brainstorm how best to improve vaccine uptake among healthcare workers in Pennsylvania. The task force held seminars in May and June 2013 to showcase best practices and resources for improving influenza vaccination among healthcare personnel and will be working with

Table 1. Nursing Home Respiratory Tract Infection Pooled Mean Rates, as Reported to the Pennsylvania Patient Safety Authority, 2009 to 2012

YEAR	LOWER RESPIRATORY TRACT INFECTIONS (I.E., PNEUMONIA, BRONCHITIS, TRACHEOBRONCHITIS)		INFLUENZALIKE ILLNESSES		OVERALL RESPIRATORY TRACT INFECTIONS*	
	No. of Nursing Homes Reporting	Pooled Infection Rate† (95% CI)	No. of Nursing Homes Reporting	Pooled Infection Rate† (95% CI)	No. of Nursing Homes Reporting	Pooled Infection Rate† (95% CI)
2009‡	NA	0.45 (0.44 to 0.46)	NA	0.01 (0.01 to 0.01)	NA	0.46 (0.44 to 0.47)
2010	484	0.44 (0.43 to 0.45)	42	0.00 (0.00 to 0.01)	484	0.44 (0.43 to 0.45)
2011	562	0.43 (0.42 to 0.44)	121	0.01 (0.01 to 0.01)	565	0.44 (0.43 to 0.45)
2012	492	0.42 (0.42 to 0.43)	65	0.01 (0.01 to 0.01)	494	0.43 (0.42 to 0.44)

Source: Pennsylvania Patient Safety Authority. 2012 annual report [online]. 2013 Apr 30 [cited 2013 Nov 6]. http://patientsafetyauthority.org/PatientSafetyAuthority/Documents/Annual%20Report%202012%20.pdf

* Individual nursing homes may have reported both influenzalike illnesses and lower respiratory tract infections.
† Rate calculation: number of infections ÷ number of resident-days x 1,000
‡ Infection data collection for nursing homes began in July 2009. As a result, rates given are based on six months of data collection, and the numbers of nursing homes are not given because they are not equally comparable with subsequent years.

Table 2. Influenza Vaccination Coverage among US Healthcare Workers, by Work Setting, 2010-2011 to 2012-2013 Flu Seasons

WORK SETTING*	2010-2011, %† (N‡)	2011-2012, %† (N‡)	2012-2013, %† (N‡)
Overall	64 (1,931)	67 (2,348)	72 (1,944)
Hospital	71 (617)	77 (1,187)	83 (961)
Long-term care facility	64 (220)	52 (455)	59 (427)
Ambulatory care/physician office	62 (658)	68 (747)	73 (636)
Other clinical setting	52 (436)	62 (277)	73 (237)

Adapted from: Centers for Disease Control and Prevention. Influenza vaccination coverage among health-care personnel--United States, 2012-13 influenza season. *MMWR Morb Mortal Wkly Rep* 2013 Sep 27;62(38):781-6.

* Respondents were able to select more than one work setting.
† Weighted percent vaccinated
‡ Number of workers surveyed, by occupational setting and influenza season

©2013 Pennsylvania Patient Safety Authority

healthcare facilities that are "considering or contemplating" making immunization mandatory within their facility to help them firm up their policy or develop program strategies.[10] HAP has created a best-practices guide and toolkit that can be adapted to the long-term care setting. The toolkit is available at http://www.haponline.org/downloads/Universal_Flu_Immunization_Programs_for_Health_Care_Personnel-HAP_Quality_Best_Practice_Series_Sept2011.pdf.

Two of the priority goals noted in HHS's *National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination* are to (1) progress toward the Healthy People goal of having 90% of healthcare workers receive influenza vaccination by 2020, with 75% of healthcare workers in long-term care receiving influenza vaccination by 2015, and (2) achieve 85% vaccination coverage of eligible nursing home and skilled nursing facility residents for both influenza and pneumococcus within five years of the report's publication in 2013.[12]

HHS plans to create web-based education and resources specifically targeting long-term care employers. These resources are being developed in response to the needs, barriers, and opportunities identified by stakeholders at a September 2011 workshop that addressed long-term care providers. The resources include a toolkit, planned for release by HHS during the 2013-14 influenza season, for increasing influenza vaccination of healthcare workers in long-term care settings.[13]

NOTES

1. Centers for Disease Control and Prevention. Ten leading causes of death and injury: causes of death by age group [online]. [cited 2013 Oct 1]. http://www.cdc.gov/injury/wisqars/leadingcauses.html
2. Pennsylvania Patient Safety Authority. Healthcare-associated infections. Addendum H. In: 2012 annual report [online]. 2013 Apr 30 [cited 2013 Oct 1]. http://patientsafetyauthority.org/PatientSafetyAuthority/Documents/Annual%20Report%202012%20.pdf
3. Bradley S. Strategies to improve outcomes in nursing home residents with modifiable risk factors for respiratory tract infections. Pa Patient Saf Advis [online] 2011 Dec [cited 2013 Oct 1]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2011/dec8(4)/Pages/131.aspx
4. Increasing influenza and pneumonia vaccination rates in long-term care. Pa Patient Saf Advis [online] 2009 Dec [cited 2013 Oct 1]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2009/Dec6(4)/Pages/132.aspx
5. Agency for Healthcare Research and Quality. Pennsylvania nursing home care quality measures and metrics compared to all states. 2008 state snapshots [online]. [cited 2013 Oct 1]. http://statesnapshots.ahrq.gov/snaps08/meter_metrics.jsp?menuId=14&state=PA&level=6&region=0&compGroup=N
6. Agency for Healthcare Research and Quality. Pennsylvania nursing home care quality measures and metrics compared to all states. 2009 state snapshots [online]. [cited 2013 Oct 1]. http://statesnapshots.ahrq.gov/snaps09/meter_metrics.jsp?menuId=14&state=PA&level=6&region=0&compGroup=N
7. Agency for Healthcare Research and Quality. Pennsylvania: nursing home quality measures and metrics compared to all states. 2011 state snapshots [online]. [cited 2013 Oct 1]. http://statesnapshots.ahrq.gov/snaps11/meter_metrics.jsp?menuId=14&state=PA&level=6&region=0&compGroup=N
8. Centers for Disease Control and Prevention. Health care personnel flu vaccination Internet panel survey, United States, November 2012 [online]. 2013 Jul 17 [cited 2013 Oct 1]. http://www.cdc.gov/flu/fluvaxview/hcp-ips-nov2012.htm
9. Centers for Disease Control and Prevention. Influenza vaccination coverage among health-care personnel--United States, 2012-13 season. *MMWR Morb Mortal Wkly Rep* 2013 Sep 27;62(38):781-6.
10. The Pennsylvania Health Care Worker Vaccination Taskforce. About this resource [online]. [cited 2013 Oct 1]. http://pahcwfluvax.org/about
11. Healthy People 2020. U.S. Department of Health and Human Services. Immunization and infectious diseases: objectives: IID-12.9 [online]. [cited 2013 Oct 1]. http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=23
12. US Department of Health and Human Services (HHS). Long-term care facilities. Chapter 8. In: US HHS. National action plan to prevent health care-associated infections: road map to elimination April 2013 [online]. [cited 2013 Oct 30]. http://www.hhs.gov/ash/initiatives/hai/actionplan/hai-action-plan-ltcf.pdf
13. Stone N. HAI action plan metrics—LTCF update. Presented at: Road Map to Eliminate HAI: 2013 Action Plan Conference; 2013 Sep 25-26; Washington (DC).

©2013 Pennsylvania Patient Safety Authority

Data Snapshot: Pediatric Laboratory Events

Lea Anne Gardner, PhD, RN
Senior Patient Safety Analyst
Pennsylvania Patient Safety Authority

Specimen collection problems are costly in terms of the time required to secure a new specimen, trauma inflicted on the patient, potential delay in diagnosis and treatment, and financial costs of additional resources used.[1-3] The pediatric population has a heightened vulnerability to and fear of specimen collection, especially with venipunctures.[4,5] For example, two events reported through the Pennsylvania Patient Safety Reporting System identified infants who needed additional services (i.e., blood transfusion and oxygen therapy, respectively) after repeat specimens were required.

Typically, data and discussions related to laboratory-related errors combine pediatric and adult populations or tend to be adult-centric; however, this analysis focuses solely on the pediatric population and includes all types of specimen collection (e.g., blood, urine, biopsies). For the purposes of this study, "pediatrics" encompasses newborns through age 21, based on a 1988 American Academy of Pediatrics official statement.[6]

Between January 2010 and December 2012, the laboratory-related events that occurred accounted for 57.6% (n = 11,477 of 19,923) of the pediatric-related, procedural-error-related events reported and 14.0% (n = 11,477 of 81,701) of the total pediatric events reported by Pennsylvania children's hospitals, acute care hospitals, community hospitals, rehabilitation hospitals, ambulatory surgical facilities, and birthing centers that provided care for pediatric populations.

The Table shows a breakdown of the pediatric laboratory-related events. The categories (e.g., specimen mislabeled, specimen label incomplete or missing, specimen quality

Table. Pediatric Laboratory Events Reported to the Pennsylvania Patient Safety Authority, January 1, 2010, through December 31, 2012

LABORATORY EVENT TYPE	NO. OF EVENTS	% OF EVENTS
Specimen quality problems (e.g., wrong color tubes used, blood hemolyzed)	2,512	21.9
Specimen label incomplete or missing (e.g., requisition missing hospital-specific information or label, requisition does not match specimen information)	2,357	20.5
Specimen mislabeled (e.g., label missing patient data)	1,889	16.5
Results missing or delayed	1,093	9.5
Other (e.g., tourniquet left on, missing patient identification bands, lab equipment failed)	907	7.9
Tests ordered but not performed	858	7.5
Wrong patient (e.g., ordered on wrong patient, performed test on wrong patient)	503	4.4
Specimen delivery problem	408	3.6
Wrong result	342	3.0
Tests not ordered	299	2.6
Wrong test ordered	194	1.7
Wrong test performed	115	1.0
Total	**11,477**	**100.1**

Note: Total percentage does not equal 100 due to rounding.

©2013 Pennsylvania Patient Safety Authority

problems) are defined according to descriptions provided in the literature[3,7,8] and those used in the Pennsylvania Patient Safety Authority's collaborative improvement project to reduce errors in blood specimen mislabeling.[9-11] For example, the events found in the category of mislabeled specimens include events involving specimens lacking the five minimal data requirements and mismatches between the specimen label information and the requisition form (e.g., mismatched or missing patient identifiers).

As previously noted by the Authority and in the literature, ensuring proper patient identification; proper collection, handling, and labeling of specimens; and safe delivery of the specimens to the laboratory can reduce patient stress, financial costs, the use of additional resources, and the occurrence of delayed results, delayed patient care, additional needlesticks, and additional treatments (e.g., transfusions).[9,10,12,13]

NOTES

1. Paxton A. Specimen rejection: what price for patient care? [online]. CAP Today 2012 Jul [cited 2013 Oct 25]. http://www.cap.org/apps/portlets/contentViewer/show.do?printFriendly=true&contentReference=cap_today%2F0712%2F0712d_specimen_rejection.html
2. Latino RJ. Root cause analysis: investment or expense? [online]. [cited 2013 Oct 29]. http://reliability.com/industry/articles/RCA_Investment_or_Expense.pdf
3. College of American Pathologists. When a rose is not a rose: the problem of mislabeled specimens [online]. 2010 Feb 23 [cited 2013 Aug 26]. http://www.cap.org/apps/cap.portal?_nfpb=true&cntvwrPtlt_actionOverride=%2Fportlets%2FcontentViewer%2Fshow&cntvwrPtlt%7BactionForm.contentReference%7D=practice_management%2Fdirectips%2Fmislabeled_specimens.html&_pageLabel=cntvwr
4. Paxton A. Promise and provisos of pediatric diagnostic testing [online]. CAP Today 2010 Dec [cited 2013 Oct 25]. http://www.cap.org/apps/cap.portal?_nfpb=true&cntvwrPtlt_actionOverride=%2Fportlets%2FcontentViewer%2Fshow&_windowLabel=cntvwrPtlt&cntvwrPtlt%7BactionForm.contentReference%7D=cap_today%2F1210%2F1210d_pediatric.html&_state=maximized&_pageLabel=cntvwr
5. Duff AJA. Incorporating psychological approaches into routine paediatric venipuncture [online]. Arch Dis Child 2003 [cited 2013 Oct 25]. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1719315/pdf/v088p00931.pdf
6. American Academy of Pediatrics Council on Child and Adolescent Health: age limits of pediatrics [online]. Pediatrics 1988 May [cited 2013 Nov 19]. http://pediatrics.aappublications.org/content/81/5/736.full.pdf
7. Clinical and Laboratory Standards Institute (CLSI). Specimen labels: content and locations, fonts, and label orientation; approved standard [online]. 2011 [cited 2013 Aug 28]. http://www.readbag.com/clsi-source-orders-free-auto12-a
8. Wagar EA, Stankovic AK, Raab S, et al. Specimen labeling errors: a Q-probes analysis of 147 clinical laboratories [online]. Arch Pathol Lab Med 2008 Oct [cited 2013 Aug 26]. http://www.archivesofpathology.org/doi/pdf/10.1043/1543-2165(2008)132%5B1617%3ASLEAQA%5D2.0.CO%3B2
9. Reducing errors in blood specimen labeling: a multihospital initiative. Pa Patient Saf Advis [online] 2011 Jun [cited 2013 Aug 28]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2011/jun8(2)/Pages/47.aspx
10. Shetterly M. Blood specimen labeling collaborative: path to results. Pa Patient Saf Advis [online] 2011 Jun [cited 2013 Aug 28]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2011/jun8(2)/Pages/53.aspx
11. Shetterly M. Collaborative patient safety effort: addressing phlebotomy specimen mislabeling. Pa Patient Saf Advis [online] 2009 Sep [cited 2013 Aug 28]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2009/Sep6(3)/Pages/107.aspx
12. Wagar EA, Tamashiro L, Yasin B, et al. Patient safety in the clinical laboratory: a longitudinal analysis of specimen identification errors [online]. Arch Pathol Lab Med 2006 Nov [cited 2013 Oct 25]. http://www.pathology.medsch.ucla.edu/downloads/06PatientSafety.pdf
13. The Joint Commission. National Patient Safety Goals effective January 1, 2014: laboratory accreditation program [online]. 2013 [cited 2013 Oct 25]. http://www.jointcommission.org/assets/1/6/LAB_NPSG_Chapter_2014.pdf

©2013 Pennsylvania Patient Safety Authority

Quarterly Update on Wrong-Site Surgery: Areas to Focus Attention

John R. Clarke, MD
Editor Emeritus, Pennsylvania Patient Safety Advisory
Clinical Director, Pennsylvania Patient Safety Authority
Professor of Surgery, Drexel University

Ten wrong-site procedures were reported in Pennsylvania operating suites this past quarter, the lowest yet recorded for the first quarter of any academic year since reporting began. Another two were reported belatedly for last quarter, raising the total for the last academic year to 48, which still represents the lowest total for any academic year. See Figure 1.

In particular, problems with wrong-site anesthetic blocks, wrong-side pain procedures, and wrong-level spinal surgery persist, representing 4 of the 10 reported wrong-site procedures. As yet another example of a wrong-side block, see the following:

> *Physician at bedside . . . for pre-op femoral nerve block catheter placement on right side. During pre-op block time-out, physician verified right side. Physician proceeded with catheter placement without nurse in attendance. Nurse returned to bedside and . . . realized that the procedure was being done on the left side. Nurse immediately notified physician of the incorrect side. Procedure stopped, catheter removed. . . . Time-out redone for right femoral nerve block catheter, and correct procedure was done.*

NEAR-MISS REPORTS

The following near-miss reports from this quarter illustrate both areas of continued weakness and the effectiveness of the evidence-based best practices to prevent wrong-site surgery.[1,2]

Problems with scheduling:

> *Two scheduling cards stapled together. One stated a pre-op diagnosis of AAA [abdominal aortic aneurysm] and the procedure being AAA repair. Other scheduling card has a pre-op diagnosis of right popliteal aneurysm with the procedure being ligation right popliteal aneurysm and right fem-pop bypass. . . . Computer also said pre-op diagnosis of AAA. This is the incorrect procedure according to the patient and the surgeon.*

Fixed early:

> *Upon review of the printed schedule and discussion with the patient, it was determined that the surgery was entered in by the scheduler under the wrong extremity. This was caught early, and the surgery was performed on the correct foot.*

Problems with registration and patient identification:

> *Patient presented to registration [for surgery]. However, the patient's twin sister [had been] registered. Patient was banded with sister's information [while confirming] her name and date of birth. . . . When registration went back to verify her information, the patient stated that it was her sister's information that was registered.*

> *Patient was registered under wrong patient [name]. Incorrect DOB [date of birth] was entered and ID [identification] bracelet and stickers were printed for this wrong patient. When registration person . . . went to get info from the patient, he discovered that this was the wrong information for this patient.*

Preoperative verification and marking continue to be done ineffectively or not at all:

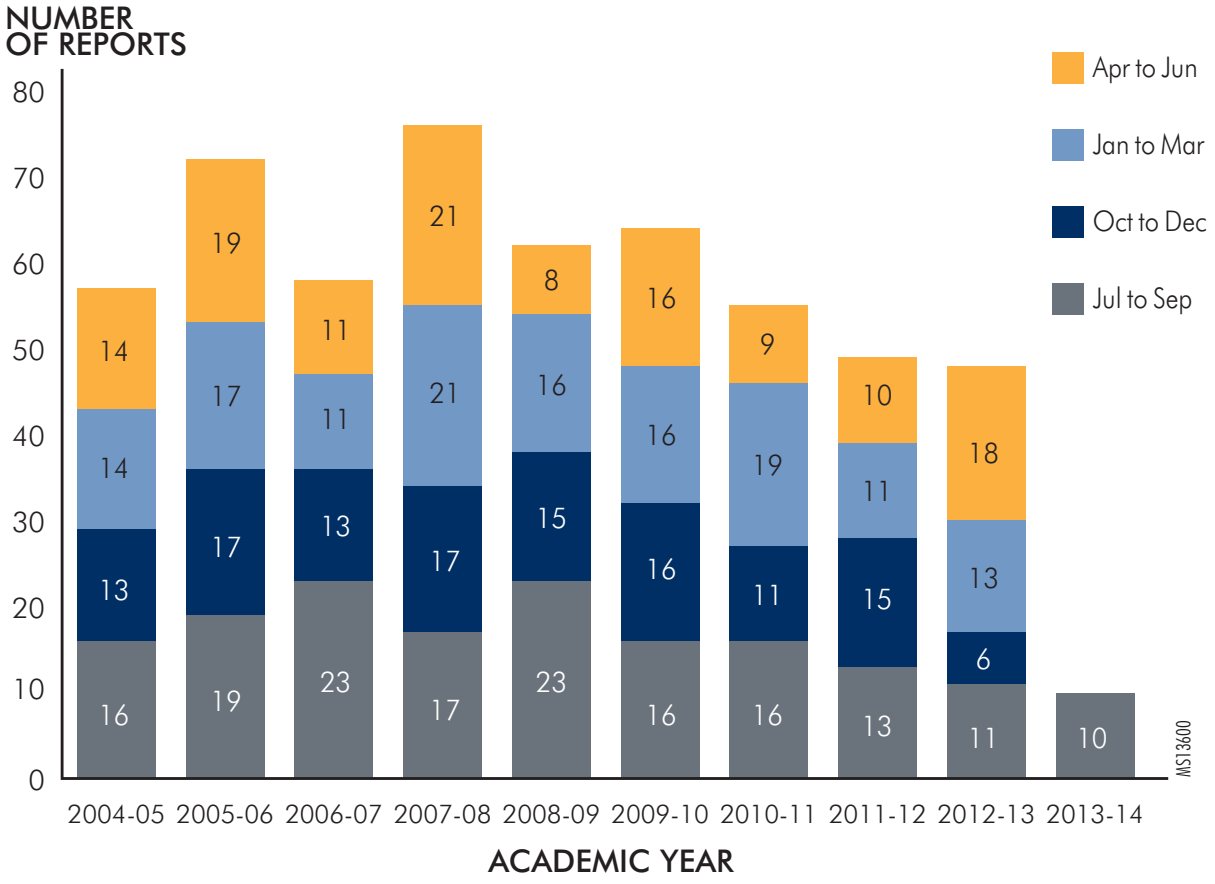
> *Patient arrived in OR [operating room]. Operative consent stated incision and drainage of right middle finger. Patient's right index finger marked for surgery, and abscess present on the index finger. Patient stated procedure to be done on the index finger. Consent changed by the surgeon in the OR to "Incision and drainage of right index finger."*

> *Upon reviewing the consent during the time-out, it was noticed that the . . . consent did not specify the area of the spine that was to be exposed. The consent should have read "exposure of the lumbosacral spine" but instead read "exposure of the spine."*

Scan this code with your mobile device's QR reader to access the Authority's toolkit on this topic.

©2013 Pennsylvania Patient Safety Authority

Figure 1. Pennsylvania Patient Safety Authority Wrong-Site Surgery Reports by Academic Year



Note from the preceding examples that discrepancies on the consents are to be identified during the preoperative verification process prior to the patient entering the OR.

> *Called [surgeon] to notify him of situation. Surgeon [came] in five minutes later and performed time-out for wrong patient. Surgeon did not know which patient was in the room.*
>
> *Patient brought to OR without surgical site being marked and [with] no history or physical completed.*
>
> *After patient anesthetized, . . . it was noted that patient was not marked.*
>
> *Patient with [two lesions]. Patient's second surgical site not marked (only the first). Notified charge nurse. Surgeon arrived and marked [second site] with* X.

Note that the use of an X to mark the site, as indicated in the preceding example, is discouraged because it has ambiguous meanings, such as "yes, the surgery is here" and "no, the surgery is not here."

A near miss caught by an OR team member speaking up:

> *Assisting surgeon found that attending surgeon had marked the patient but that the spinal levels [marked] were not correct. Attending surgeon checked the patient with the consent and x-rays. Patient was correctly marked before the start of the case.*

An example of the patient providing incorrect information:

> *Patient surgical site verified in holding area. Patient verified right total hip. When brought to OR, patient stated he was to have right shoulder done. Family called to verify correct procedure. . . . [Right hip also] verified by surgeon.*

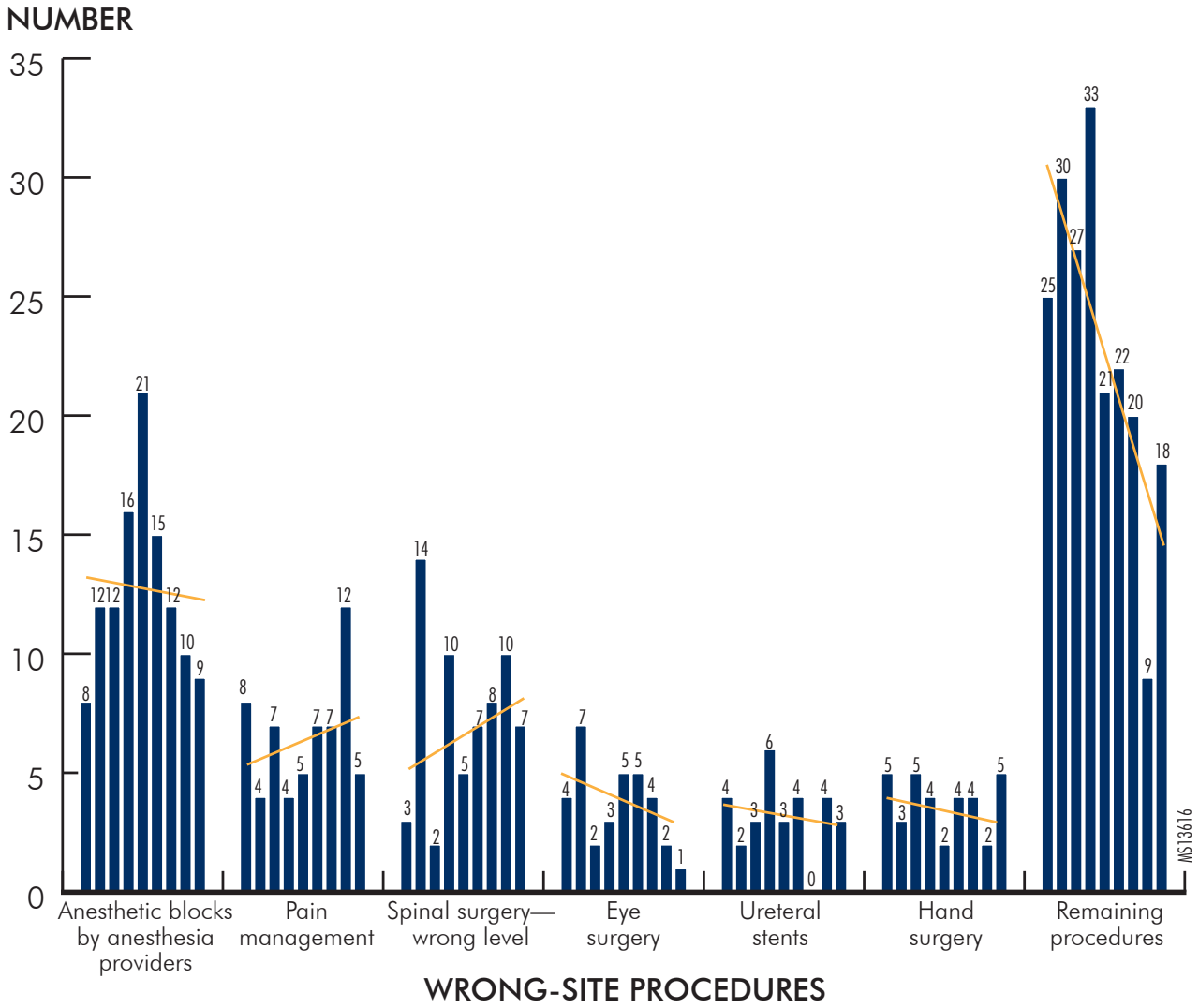
Note that the operating team not only checked in reconciling the information but also double-checked.

There were a number of chart problems reported this quarter:

> *Patient was on OR table being draped. Staff member called for a time-out, but the patient's chart and*

©2013 Pennsylvania Patient Safety Authority

Figure 2. Trends in Pennsylvania Patient Safety Authority Wrong-Site Surgery Reports by Procedure



Each procedure cluster of bar values represents academic years, from left to right, spanning 2004-2005 through 2012-2013.

consent had not been brought [to the OR] with the patient from the holding area. The chart and consent were brought to the OR, and the time-out was completed.

Patient arrived in block room. . . . On his chart, I found information for two other patients.

Anesthesia brought the correct patient to the room with the chart for a different patient. The error was found during the in-room interview between the patient and the circulator.

Another near miss, again caught by an OR team member speaking up:

Patient was in the OR for total left knee. During the time-out, staff read incorrect patient information. Other staff in the room noted this error and corrected it till all were in agreement, and the case was then performed . . . as planned.

And notably, a good catch during a time-out for an organ donation:

The OR team [was sent] an e-mail with the UNOS [United Network for Organ Sharing] number prior to surgery. That number did not match exactly when the organ time-out was done. [Situation identified and corrected.]

©2013 Pennsylvania Patient Safety Authority

Table. Most Common Wrong-Site Procedures in the Operating Suite by Type, July 1, 2004, through June 30, 2013 (N = 541)

PROCEDURE	NO.	%
Anesthetic blocks by anesthesia providers	115	21
Spinal surgery—wrong level	66	12
Pain management	59	11
Hand surgery	34	6
Eye surgery	33	6
Ureteral stents	29	5
Remaining procedures	205	38

Note: Percentages do not add up to 100 due to rounding.

As in the previous quarter, specimens were identified as having been mislabeled:

> *Specimen received in cytology with incorrect side from patient labeled. Received labeled as "left" renal washing, when it was from the "right."*

> *The pathologist was in the frozen section room performing frozen sections for the surgeon. Upon grossing the first specimen labeled right cheek, the pathologist noticed the sutures marking the margins did not correlate with the [description of the] specimen on the right side. The RN [registered nurse] who brought the specimen out said it was mislabeled and should have been labeled left cheek. The frozen section was then completed. As . . . the pathologist was grossing the second specimen, labeled left cheek, the pathologist again said the sutures did not match the specimen being from the left side. After a discussion with the RN, the surgeon came out to the frozen section room to discuss the issue with the pathologist. Upon the surgeon coming out, they discovered the specimens were placed into the wrong containers. The first specimen originally labeled right cheek was actually the specimen from the left cheek [and vice versa].*

As cited in a previous *Pennsylvania Patient Safety Advisory* article, Bixenstine et al. reported a study in which 23.8% of surgical specimens had their laterality labeled incorrectly.[3]

MAJOR AREAS OF FOCUS

In a previous update, the most common wrong-site procedures were identified.[4] The six most common, each representing 5% or more of all wrong-site procedures, are listed again in the Table, adjusted for the addition of the two new reports from the second quarter of 2013.

These six wrong-site procedures were tracked by year and compared with the remaining wrong-site procedures (see Figure 2). Overall, wrong-site procedures have trended down 3.4% per year in reference to the overall yearly average. Compared with the remaining 38% of wrong-site procedures, which have trended down an average of 8.5% per year in reference to their yearly average, only eye surgery has seen a similar downward trend (9.5%). Ureteral stenting and hand surgery have less downward trending than the overall yearly average (3.1% and 2.2%, respectively). Anesthesia blocks have been relatively unchanged (trending down 0.4% per year), while spinal surgery and pain management procedures have trended toward more wrong-site procedures (upward 3.0% and upward 3.8% per year, respectively).

These yearly trends suggest that the focus should be directed toward improving the three most common types of wrong-site procedures: anesthesia blocks, pain management procedures, and wrong-level spinal surgery.

NOTES

1. Pennsylvania Patient Safety Authority. Principles for reliable performance of correct-site surgery [online]. 2012 Dec [cited 2013 Oct 21]. http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/PWSS/Documents/principles.pdf
2. Quarterly update: the evidence base for best practices for preventing wrong-site surgery. Pa Patient Saf Advis [online] 2010 Dec [cited 2013 Oct 21]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2010/dec7(4)/Pages/151.aspx
3. Bixenstine PJ, Zarbo RJ, Holzmueller CG, et al. Developing and pilot testing practical measures of preanalytic surgical specimen identification defects. *Am J Med Qual* 2013 Jul-Aug;28(4):308-14.
4. Clarke JR, Arnold TV. Quarterly update on wrong-site surgery: work to be done. Pa Patient Saf Advis [online] 2013 Sep [cited 2013 Oct 21]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Sep;10(3)/Pages/110.aspx

©2013 Pennsylvania Patient Safety Authority

A Decade of Dedication to Improvement

John R. Clarke, MD
Editor Emeritus, Pennsylvania Patient Safety Advisory
Clinical Director, Pennsylvania Patient Safety Authority
Professor of Surgery, Drexel University

This issue of the quarterly *Pennsylvania Patient Safety Advisory* (vol. 10, no. 4) completes the first decade of presenting the reviews and analyses of reports from the Pennsylvania Patient Safety Reporting System (PA-PSRS). During this first decade of publication, the Pennsylvania Patient Safety Authority has published more than 440 articles in 40 quarterly issues and 12 supplementary issues, starting with a four-page *Advisory* in March 2004. That inaugural issue contained information about the Authority, Patient Safety Awareness Week, and four clinical topics motivated by pilot reports from PA-PSRS: potentially dangerous abbreviation in surgery, fall narratives, falls associated with wheelchairs, and hidden risks with magnetic resonance imaging.[1]

Early issues of the *Advisory* were characterized by advice to providers, such as "risks can be reduced by using wheel locks."[1] Over time, the Authority noticed that *Advisory* issues were followed by a transient decrease in event reports—or occasionally an increase in reports as providers became aware of the problem[2] or recognized the value of reporting the problem—followed by a return of the reported events as providers' extra vigilance waned. Checklists, algorithms, and other decision aids were added to the *Advisory* to augment the efforts to educate providers—for example, an algorithm to identify patients at risk for contrast-induced nephropathy.[3]

Occasionally, the Authority noticed a sustainable effect. For instance, a supplementary *Advisory* on insulin overdoses due to confusion between similarly packaged insulin and tuberculin syringes[4] produced system changes within facilities.[5] This observation led the Authority to focus the *Advisory* on providing actionable information to patient safety committees and system managers, rather than providers, with enough information for providers to establish a need for system change. It was satisfying, for instance, to hear a patient safety officer relate that members of the patient safety committee compared the facility's policy for healthcare industry representatives in the operating rooms with the elements listed in an *Advisory* article on that subject.[6]

Even more satisfying was the response of facilities to a single near-miss incident involving confusion about the meaning of a color-coded patient wristband.[7] Because the single report did not provide enough information to offer solutions, the Authority conducted a focused follow-up survey to better understand the problem. One hundred thirty-nine facilities responded with a kaleidoscope of colors and meanings. This information prompted a group of 11 facilities in Pennsylvania, chaired by Bonnie Haluska of Allied Services Rehabilitation Hospital, to collaborate on standardizing color codes and the information they should convey.[8] This information was subsequently used by the American Hospital Association to standardize color-coded wristbands nationally.[9]

Aggregation of reports from all facilities in the commonwealth affords the Authority the luxury of analyzing many instances of an event, especially a rare event that no one facility might see more than once, such as surgical fires,[10] and identifying multiple weaknesses that can result in an adverse outcome. The emphasis of the *Advisory* staff is on identifying *each way* a system fails, which is usually more useful than identifying *each time* a system fails. A comprehensive review of all the failure modes leads to a comprehensive critique of the system for delivering care, resulting in advice for making the entire system more robust, not just correcting the one weakness associated with a single event. This approach has allowed the Authority to develop meaningful strategies without worrying about whether the number of events reported or the number of situations at risk for such an event is accurate.

As facilities tried to implement system changes and educate their hospital and physician staffs about the need for change and the choices for safe practices, they found that

©2013 Pennsylvania Patient Safety Authority

physicians wanted scientific evidence that the changes would represent improvements. These sentiments were conveyed to the Authority and prompted the *Advisory* staff to develop and disseminate the evidence supporting safe practices. Collecting sufficient scientific evidence required more than counting relevant event reports and recounting their patterns and their narratives in a contextually deidentified manner. Once a topic was selected, based on novelty, frequency and severity, and the potential for improvement, the Authority sought supplemental information from the facilities, which many facilities readily contributed in an effort to provide themselves and others with a deeper understanding of the relationship between processes and outcomes.

One example of cooperation by facilities has been the willingness to standardize facility criteria for reporting a specific event, such as falls,[11] so that comparisons can reliably be made across multiple, unrelated facilities.

The ongoing project to prevent wrong-site surgery is another excellent example of the magnitude of the cooperation by facilities with the techniques the patient safety analysts have used to develop scientific evidence to identify and support safe practices. Facilities have cooperated by letting patient safety analysts observe their processes[12] and by completing questionnaires about their experiences.[13]

Most importantly, facilities have cooperated by submitting information about their policies,[14] recording their compliance with policies,[15,16] and using a common form for root-cause analyses of both near-miss and actual wrong-site surgery events.[17] The willingness of facilities to provide additional specific information in follow-up to their initial near-miss and wrong-site surgery reports helped the Authority to identify processes that differed when comparing groups with wrong-site surgery to those without. The Authority ultimately identified 21 evidence-based best practices for the processes related to performing the Universal Protocol to effectively prevent wrong-site surgery.[16] Getting sufficient information to identify patterns and differences in patterns between groups with different outcomes has proven critical to establishing the evidence base for safe practices in the delivery of healthcare.

The *Advisory* staff made a commitment at the onset of the project to prevent wrong-site surgery in 2007. The commitment was not the obvious: to follow up on the success of the project at some time in the future. The commitment was to report on the impact of the project *in every quarterly issue*. This self-induced challenge seemed embarrassing as quarter after quarter produced the same number of reports. But this obvious lack of progress added an urgency to the realization that identifying and presenting evidence-based best practices, although necessary to create change, were not sufficient to successfully disseminate and implement those best practices and systematically reduce errors.

Recognizing the need to effectively disseminate the evidence-based best practices published in the *Advisory*, the Authority appointed a director of educational programs, Franchesca Charney, to develop and implement educational opportunities for healthcare providers to learn collectively within their facilities and across facilities.[18] The Authority developed a team of patient safety liaisons, now eight, to provide a presence in facilities, working with each facility individually to overcome any obstacles it may be having in implementing evidence-based safe practices.[19]

The *Advisory* staff noted some successes in individual facilities when leadership was engaged and supportive and when frontline staff were involved in and had a sense of owning a system redesign—"commitment from the top down; process from the bottom up."[20]

To facilitate learning collectively and collaboratively, the Authority developed a secure website, PassKey (Patient Safety Knowledge Exchange), that allows facilities to share information within the confidentiality confines of the Authority.[21]

With the knowledge of a prior successful collaboration,[8] the lessons learned for successful implementation in individual facilities,[20] the PassKey infrastructure for collaborations,[21] and interest expressed by facilities to patient safety liaisons about working collaboratively with other facilities,[22] the Authority considered a collaborative learning model: facilities learning from each other how to identify and overcome barriers and redesign systems to successfully implement evidence-based best practices.[23]

In the spring of 2008, the Authority accepted an offer from the Health Care Improvement Foundation's Partnership for Patient Care to develop a collaborative learning model for preventing wrong-site surgery. The program used the principles of educating providers about evidence-based best practices, identifying gaps in policies and compliance, and collectively discussing systems to implement best practice and strategies to overcome barriers to implementation.[24] In follow-up meetings, the 30 facilities in the collaboration discussed successes and failures in implementing system redesigns and overcoming barriers.[24] The collaborative learning model proved successful for implementing evidence-based best practices[15] and was successfully replicated in a second initiative to prevent wrong-site surgery.[16]

The collaborative learning model has proven generalizable. The Authority has now also experienced success in using collaborative learning with volunteer facilities to improve the accuracy of blood specimen labeling[23,25] and the rates of falls with harm.[26]

Unfortunately, either a commitment of leadership to a system redesign to implement best practices or collaborative learning is as necessary as the evidence-based best practices to successfully reduce errors. As an example, all the improvements in preventing wrong-site surgery

©2013 Pennsylvania Patient Safety Authority

have occurred in the facilities that had the commitment of leadership and/or participated in collaborative learning to implement best practices. The other facilities in Pennsylvania have actually shown an increase in wrong-site surgeries.[27]

Having achieved successes with identifying evidence-based best practices and overcoming barriers to implement them, with good compliance, the Authority is beginning to address the sustainability of the compliance.[28]

Broader challenges still need attention, such as changing cultures, developing effective teamwork,[29] establishing reliable methods of communicating information,[30,31] and minimizing diagnostic errors.[32]

Do reporting and analyzing medical errors, both near-miss "Incidents" and adverse "Serious Events," and disseminating evidence-based best practices for providing reliable care produce value for the healthcare system? Documentation that these activities directly result in improvement in health outcomes is speculative, despite aforementioned success stories noted in this journey (e.g., collaborations), but providers should be pleased to see that improvement has occurred during the decade. Following passage of the enabling Medical Care Availability and Reduction of Error Act,[33] medical malpractice claims have dropped from a peak of 701 in 2003 to 329 in 2010, with a decrease in payments from $378,700,000 to $146,500,000 over the same period.[34]

Compared with that first modest issue,[1] the *Advisory* has grown and changed over the past 10 years. The *Advisory* is now a peer-reviewed, open-access, online journal with a large, diverse, and representative editorial advisory board. It is indexed in the National Library of Medicine Catalog and the Cumulative Index to Nursing and Allied Health Literature (CINAHL® Plus). The *Advisory* is currently distributed to more than 4,650 healthcare providers in Pennsylvania and over 4,000 additional subscribers in all 50 states and 37 other countries. Many *Advisory* articles are accompanied by learning objectives and self-assessment questions and are subsequently associated with continuing medical education credits or nursing continuing education credits from the Pennsylvania Medical Society and Pennsylvania State Nurses Association, respectively.

Hopefully, the *Advisory* will continue to change as the sciences of analyzing patient safety events and implementing safe practices mature.

One other change has already happened. After 10 years as editor and turning 70, I have stepped down to make room for the next generation. You will note on the masthead that I am now editor emeritus and that Karen P. Zimmer, MD, MPH, is acting editor. I will continue to contribute to the *Advisory*, especially the wrong-site surgery updates, but take this opportunity to give thanks for the support of the publisher of the *Advisory*, the Authority; past and current members of Authority's board of directors; the Authority's staff under the leadership of Michael Doering and Franchesca Charney; and Thomas Ignudo and his Hewlett-Packard team supporting PA-PSRS. I also thank the members of the editorial advisory board, who have provided many helpful suggestions; the many experts who have provided peer review of the *Advisory* before publication; and the patient safety officers at the facilities, many of whom have become my friends while showing commitment to the patient safety effort by making the extra effort to provide supplemental information. I am very grateful for the privilege of working with the past and current staff at ECRI Institute and the Institute for Safe Medication Practices, who produce the *Advisory* under contract to the Authority. In particular, I must thank the *Advisory*'s support staff and all the patient safety analysts over the years who have done the hard work of reviewing and analyzing the patient safety reports with the leadership of Theresa Arnold, DPM, and William Marella; the data analyst, Edward Finley, who finds needles in the haystack on a daily basis; our coordinator, Miranda Minetti, who keeps me pointed in the right direction; and the linchpin of the *Advisory*, Jesse Munn, the very patient managing editor.

NOTES

1. Pennsylvania Patient Safety Authority. Patient safety week advisory [online]. 2004 Mar [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2004/Mar1(1)/Documents/mar;1(1).pdf
2. Forgotten but not gone: tourniquets left on patients. PA PSRS Patient Saf Advis [online] 2005 Jun [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2005/jun2(2)/Pages/19.aspx
3. Pennsylvania Patient Safety Authority. Management of patients undergoing iodinated contrast-related procedures [online]. 2007 [cited 2013 Oct 24]. http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/cin/Documents/CIN_algorithm.pdf
4. Overdoses caused by confusion between insulin and tuberculin syringes. PA PSRS Patient Saf Advis [online] 2004 Oct 28 [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2004/oct28_1(suppl1)/Pages/home.aspx
5. Follow-up on previous *Advisory* articles. PA PSRS Patient Saf Advis [online]. 2004 Dec [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2004/dec1(4)/Documents/dec;1(4).pdf
6. Healthcare-industry representatives: maximizing benefits and reducing risks. PA PSRS Patient Saf Advis [online] 2006 Mar [cited 2013 Oct 24]. http://

©2013 Pennsylvania Patient Safety Authority

patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2006/Mar3(1)/Pages/13.aspx

7. Use of color-coded patient wristbands creates unnecessary risk. PA PSRS Patient Saf Advis [online] 2005 Dec [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2005/dec14_2(suppl2)/Pages/dec14;2(suppl2).aspx
8. Pennsylvania Patient Safety Authority. The color of safety [online]. [cited 2013 Oct 24]. http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/wristbands/Documents/wristband_manual.pdf
9. American Hospital Association. Implementing standardized colors for patient alert wristbands [online]. 2008 Sep 4 [cited 2013 Oct 24]. http://www.ashrm.org/ashrm/advocacy/advisories/files/2008wristbands.pdf
10. Clarke JR, Bruley ME. Surgical fires: trends associated with prevention efforts. Pa Patient Saf Advis [online] 2012 Dec [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Dec;9(4)/Pages/130.aspx
11. Gardner LA. Standardizing reporting of patient falls: a survey of Pennsylvania hospitals. Pa Patient Saf Advis [online] 2012 Jun [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9(2)/Pages/43.aspx
12. Insight into preventing wrong-site surgery. PA PSRS Patient Saf Advis [online] 2007 Dec [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2007/dec4(4)/Pages/109b.aspx
13. Improvement in preventing wrong-site surgery! Traction or transient? Pa Patient Saf Advis [online] 2009 Sep [cited 2013 Oct 24]. http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2009/Sep6(3)/Pages/104.aspx
14. Quarterly update on the preventing wrong-site surgery project. PA PSRS Patient Saf Advis [online] 2008 Jun [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2008/Jun5(2)/Pages/69.aspx
15. Pelczarski KM, Braun PA, Young E. Hospitals collaborate to prevent wrong-site surgery. *Patient Saf Qual Health* 2010 Sep-Oct:20-6.
16. Pennsylvania Patient Safety Authority. The evidence base for the principles for reliable performance of the Universal Protocol [online]. 2012 [cited 2013 Oct 24]. http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/PWSS/Documents/u_principles.pdf
17. Blanco M, Clarke JR, Martindell D. Wrong site surgery near misses and actual occurrences. *AORN J* 2009;90(2):215-22.
18. Pennsylvania Patient Safety Authority. Pennsylvania Patient Safety Authority hires director of educational programs [press release online]. 2008 Oct 30 [cited 2013 Oct 24]. http://patientsafetyauthority.org/NewsAndInformation/PressReleases/2008/Pages/pr_2008_October_30.aspx
19. Pennsylvania Patient Safety Authority. Pennsylvania Patient Safety Authority hires patient safety liaison to help healthcare facilities implement guidance [press release online]. 2008 Aug 28 [cited 2013 Oct 24]. http://patientsafetyauthority.org/NewsAndInformation/PressReleases/2008/Pages/pr_2008_August_28.aspx
20. Quarterly update on the preventing wrong-site surgery project. Pa Patient Saf Advis [online] 2010 Jun [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2010/Jun7(2)/Pages/65.aspx
21. Pennsylvania Patient Safety Authority. PassKey (Patient Safety Knowledge Exchange) [online]. [cited 2013 Oct 24]. http://patientsafetyauthority.org/PassKey/Pages/PassKey.aspx
22. Shetterly M. Collaborative patient safety effort: addressing phlebotomy specimen mislabeling. Pa Patient Saf Advis [online] 2009 Sep [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2009/Sep6(3)/Pages/107.aspx
23. Clarke JR. Editorial: the value of collaborative learning for disseminating best healthcare delivery practices. Pa Patient Saf Advis [online] 2011 Jun [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2011/jun8(2)/Pages/45.aspx
24. Clarke JR. What keeps facilities from implementing best practices to prevent wrong-site surgery? Barriers and strategies for overcoming them. Pa Patient Saf Advis [online] 2012 Nov [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/nov20_9(suppl%201)/Pages/01.aspx
25. Reducing errors in blood specimen labeling: a multihospital initiative. Pa Patient Saf Advis [online] 2011 Jun [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2011/jun8(2)/Pages/47.aspx
26. Arnold TV, Barger DM. Falls rates improved in southeastern Pennsylvania: the impact of a regional initiative to standardize falls reporting. Pa Patient Saf Advis [online] 2012 Jun [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9(2)/Pages/37.aspx
27. Clarke JR. Quarterly update on preventing wrong-site surgery. Pa Patient Saf Advis [online] 2012 Mar [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Mar;9(1)/Pages/28.aspx
28. Clarke JR. Quarterly update on wrong-site surgery: trying to hold the gains. Pa Patient Saf Advis [online] 2013 Jun [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Jun;10(2)/Pages/76.aspx
29. Supplement 2 [volume 7]. Pa Patient Saf Advis [online] 2010 Jun [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2010/jun16_7(suppl2)/Documents/jun16;7(suppl2).pdf
30. Safe patient outcomes occur with timely, standardized communication of critical values. Pa Patient Saf Advis [online] 2009 Sep [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2009/Sep6(3)/Pages/93.aspx
31. Communication of radiograph discrepancies between radiology and emergency departments. Pa Patient Saf Advis [online] 2010 Mar [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2010/Mar7(1)/Pages/18.aspx
32. Diagnostic error in acute care. Pa Patient Saf Advis [online] 2010 Sep [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2010/Sep7(3)/Pages/76.aspx
33. Medical Care Availability and Reduction of Error (Mcare) Act, 2002 Pa. Laws 154, No. 13. Also available at http://patientsafetyauthority.org/PatientSafetyAuthority/Governance/Documents/act_13.pdf
34. Marella WM. Commentary: signs of safety improvement in Pennsylvania's healthcare community. Pa Patient Saf Advis [online] 2011 Mar [cited 2013 Oct 24]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2011/mar8(1)/Pages/41.aspx

©2013 Pennsylvania Patient Safety Authority

Continuing Success through Collaboration

Christina Hunt, MSN, MBA, HCM, RN, CPPS
Senior Patient Safety Liaison
Pennsylvania Patient Safety Authority

The *Merriam-Webster* dictionary defines "collaborate" as follows: "to work jointly with others or together especially in an intellectual endeavor."[1] In 2007, the Pennsylvania Patient Safety Authority began its collaborative efforts with organizations and healthcare facilities in Pennsylvania. Initial work focused on developing and sharing information to improve patient safety. The Authority has grown to engage in more and more collaborative projects with Pennsylvania facilities to improve patient safety outcomes not only at the facility but also throughout the commonwealth. Much of the work that has been done is discussed in articles published in the *Pennsylvania Patient Safety Advisory*, and these articles can be found on the Authority's website at http://www.patientsafetyauthority.org.

COLLABORATIVE LEARNING MODEL

The Authority has developed a collaborative learning model that consists of five components. Each of these components plays an integral role in the success of the collaborations in Pennsylvania. The five components are as follows:[2]

1. The collection and analysis of event reports to support the development of evidence-based healthcare delivery best practices
2. Personal communications between the Authority's patient safety liaisons and safety experts within each licensed healthcare facility in Pennsylvania
3. Use of a confidential electronic network, the Patient Safety Knowledge Exchange (PassKey), to permit confidential communications among patient safety officers
4. Partnering with other institutions on focused patient safety projects
5. Use of the Pennsylvania Patient Safety Reporting System (PA-PSRS) to assist in the monitoring of outcomes

AUTHORITY COLLABORATIONS

The Authority has offered collaborations on falls prevention, reducing errors in specimen labeling, prevention of wrong-site surgery, surgical site infection reduction, reduction of opioid errors, and ambulatory surgical facility preoperative screening and assessment.[3-7] The ambulatory surgical facility preoperative screening and assessment collaborative results will be published in a forthcoming issue of the *Advisory*. Each of these collaborations has engaged facilities in Pennsylvania to work on event-related topics to reduce harm and improve patient safety in the commonwealth. Since December 2011, efforts have primarily focused on the Hospital Engagement Network (HEN) collaborations.

PFP AND HEN

In December 2011, $218 million was awarded to 26 HENs nationwide. The Hospital and Healthsystem Association of Pennsylvania was awarded 1 of the 26 contracts. The contracts are part of the federal Partnership for Patients (PfP) initiative and are funded by the Centers for Medicare and Medicaid Services. The initiative has two goals:

1. To keep patients from getting injured or sicker and to decrease preventable hospital-acquired conditions by 40% by the end of 2013
2. To help patients heal without complication by reducing hospital readmissions by 20% by the end of 2013

The HENs were tasked to develop collaborative learning projects to help hospitals achieve the PfP goals in a rapid improvement fashion.[8]

For the PA-HEN, the Hospital and Healthsystem Association of Pennsylvania has partnered with the Authority, the Health Care Improvement Foundation, Quality

©2013 Pennsylvania Patient Safety Authority

Insights of Pennsylvania, and the Pennsylvania Health Care Quality Alliance. The three collaborations that the Authority is responsible for are adverse opioid drug events, falls reduction and prevention, and preventing wrong-site surgery. In addition to these collaborations, the Authority is also responsible for statewide education on culture. These collaborations kicked off in the spring of 2012 and have been moving forward with positive outcomes.

Opioid adverse drug event collaboration. The opioid adverse drug event collaboration has 22 participating facilities and is concentrating efforts on reducing errors related to opioids. Resources offered to participants include an opioid knowledge assessment tool (available at http://www.patientsafetyauthority.org/EducationalTools/PatientSafetyTools/opioids/Pages/assessment.aspx), an opioid organization assessment tool, educational webinars, one-on-one calls with facilities, and collaborative learning and networking. The collaborative has been monitoring naloxone associated with opioid use and rapid response team calls as outcome measures. At the time of this publication, naloxone use has decreased approximately 20% from baseline and rapid response team calls have decreased approximately 32% from baseline.

Falls collaboration. The falls reduction and prevention collaboration has 79 participating facilities and is concentrating efforts on reducing falls with harm. Using standardized definitions and enhancements made to PA-PSRS, hospitals participating in the HEN falls collaboration are able to obtain comparative data and detailed reports.[9] Some of the resources the collaborative has offered participants are a self-assessment survey tool, a quarterly point prevalence audit tool, action plan guidance, educational webinars, coaching calls, consultative facility visits, in-person regional meetings, and a behavioral health workgroup (tools are available at http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/falls/Pages/home.aspx). At the time of this publication, the data for the collaborative shows a 28% reduction in falls with harm from the baseline data.

Wrong-site surgery collaboration. The prevention of wrong-site surgery collaboration has 27 participating facilities and is concentrating its efforts on reducing and eliminating wrong-site, wrong-person, and wrong-procedure surgery. Some of the resources that the collaborative has offered include a self-assessment checklist, an observational monitoring tool, an audio conference coaching series, on-site operating room observations and leadership debriefings, webinars, and a reassessment of policies and procedures (tools are available at http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/PWSS/Pages/home.aspx). At the time of this publication, the collaborative has achieved an overall average of 11.5% improvement over five process measures, and 67% of the participating facilities have not reported a wrong-site surgery event during the collaboration period.

As of this writing, the HEN collaborations are awaiting confirmation of an extension of the contract to the third year (i.e., option year 1) to continue the work on these projects to attain the goal of 40% reduction in harm.

In closing, the Authority encourages all Pennsylvania facilities to engage in collaborative improvement efforts. This will provide your facility with the opportunity to experience the collaborative learning model, to help impact patient safety in Pennsylvania, and to benefit from the collaborations.

NOTES

1. Merriam-Webster. Collaborate [online]. [cited 2013 Aug 20]. http://www.merriam-webster.com/dictionary/collaborate
2. Pennsylvania Patient Safety Authority. 2012 annual report [online]. 2013 Apr 30 [cited 2013 Aug 20]. http://patientsafetyauthority.org/PatientSafetyAuthority/Documents/Annual%20Report%202012%20.pdf
3. Arnold TV, Barger DM. Falls rates improved in southeastern Pennsylvania: the impact of a regional initiative to standardize falls reporting. Pa Patient Saf Advis [online] 2012 Jun [cited 2013 Aug 20]. http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9(2)/Pages/37.aspx
4. Reducing errors in blood specimen labeling: a multihospital initiative. Pa Patient Saf Advis [online] 2011 Jun [cited 2013 Aug 20]. http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2011/jun8(2)/Pages/47.aspx
5. Clarke JR, Arnold TV. Quarterly update on wrong-site surgery: work to be done. Pa Patient Saf Advis [online] 2013 Sep [cited 2013 Sep 17]. http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Sep;10(3)/Pages/110.aspx
6. Bradley SM, Bell M, Ahuja V. Multifaceted differences in implementation of practices for prevention of colorectal and bariatric surgical site infection. Pa Patient Saf Advis [online] 2012 Dec [cited 2013 Aug 20]. http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Dec;9(4)/Pages/136.aspx
7. Grissinger M, Lamis RL. Results of the PA-HEN organization assessment of safe practices for a class of high-alert medications. Pa Patient Saf Advis [online] 2013 Jun [cited 2013 Sep 17]. http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Jun;10(2)/Pages/59.aspx
8. Centers for Medicare and Medicaid Services. Hospital Engagement Networks: connecting hospital to improve care [fact sheet online]. 2011 Dec 14 [cited 2011 Dec 14]. http://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-Sheets/2011-Fact-Sheets-Items/2011-12-14.html
9. Gardner LA, Finley E. Falls, a hospital-acquired condition: the Pennsylvania Patient Safety Authority's enhanced reporting program. Pa Patient Saf Advis [online] 2012 Jun [cited 2013 Sep 17]. http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9(2)/Pages/47.aspx

©2013 Pennsylvania Patient Safety Authority

Authority Welcomes New Board Members and Recognizes Former Members for Their Contributions

Michael C. Doering, MBA
Executive Director
Pennsylvania Patient Safety Authority

The Pennsylvania Patient Safety Authority Board of Directors has gone through some significant changes in 2013. The Authority welcomed six new board members, including a new chair, and said goodbye to three former members.

The three former board members are Anita Fuhrman, RN, Terry Hyman, Esq., and Marshall W. Webster, MD.

Fuhrman, a registered nurse, was one of the founding members of the board appointed in January 2003. Recently retired, Fuhrman was director of the Lebanon Outpatient Surgical Center in Lancaster, Pennsylvania. Hyman, a partner with Schmidt Kramer PC in Harrisburg, Pennsylvania, was appointed to the board in June 2009. Webster, senior vice president at the University of Pittsburgh Medical Center, most recently served as president and chief executive officer of the University of Pittsburgh Physicians. Webster was appointed to the board in March 2005.

As members of the Pennsylvania Patient Safety Authority Board of Directors, these individuals were instrumental in ensuring that the Authority did not simply collect data about adverse events but used that information effectively to improve patient safety in Pennsylvania's hospitals, ambulatory surgical facilities, birthing centers, abortion facilities, and nursing homes.

Some milestones during their collective tenures include the following:

- In March 2004, the Authority began publishing the *Pennsylvania Patient Safety Advisory*. The award-winning academic journal is the Authority's flagship publication based on the analysis of Serious Events and Incidents. Over 440 *Advisory* articles have been published since March 2004, and the *Advisory* is received by subscribers in all 50 states, as well as in other US districts and territories and 37 other countries.
- In June 2004, all Pennsylvania hospitals, ambulatory surgical facilities, and birthing centers began reporting Serious Events (events that harm the patient) and Incidents or near misses (events that do not harm the patient) through the Pennsylvania Patient Safety Reporting System (PA-PSRS). Pennsylvania is the only state that makes it mandatory to collect both types of events. In December 2013, the Authority reached a milestone of collecting over two million event reports.
- In December 2005, the Authority published an *Advisory* article about the risks associated with color-coded wristbands. The article was generated from a near miss that occurred in northeast Pennsylvania in which a patient almost died because of confusion over the meaning of a color-coded wristband. From that published article, facilities in northeast and central Pennsylvania developed a grassroots effort to standardize the meanings of color-coded wristbands. Currently, almost 40 states and the US military have standardized the colors and meanings of color-coded wristbands. All states reference the near miss in Pennsylvania as the reason for standardizing their colors.
- In October 2006, the Authority received the prestigious national John M. Eisenberg Award for advancing patient safety and quality in the commonwealth from the Joint Commission and the National Quality Forum.
- In 2007, the Authority developed and began implementing a strategic plan to foster its mission of improving patient safety in the commonwealth. Also, in July 2007, legislation was signed into law that gave the Authority the opportunity to work with the Pennsylvania Department of Health and other healthcare organizations to reduce healthcare-associated infections (HAIs) in hospitals and nursing homes.

(continued on page 154)

©2013 Pennsylvania Patient Safety Authority

NEW BOARD MEMBERS

As the Authority moves forward with implementing the 2012 strategic plan, it welcomes six new board members, including a new board chair. They are as follows:

Carrie DeLone, MD, is physician general for the Commonwealth of Pennsylvania. As physician general, DeLone advises the governor and the secretary of health on health matters and policy. In her role as physician general, DeLone also becomes chair of the Authority per the Medical Care Availability and Reduction of Error Act. DeLone has been physician advisor to the medical staff at Holy Spirit Hospital in Camp Hill, Pennsylvania, for the last nine years. In that role, she educated physicians and hospital administrators and interacted with insurers. DeLone received her BS in biology from Villanova University and an MS in physiology form Georgetown University and then attended Temple University School of Medicine.

Radheshyam Agrawal, MD, FACP, FACG, AGAF, is a practicing gastroenterologist at Allegheny General Hospital in Pittsburgh, Pennsylvania, a part of the newly formed Allegheny Health Network. Agrawal is associate clinical chief of research and education in the Division of Gastroenterology, Hepatology and Nutrition. He is also associate professor of medicine at the Drexel University College of Medicine. At Allegheny General, he served for over 30 years as the director of the Gastroenterology Fellowship Program, training over 100 gastroenterology fellows. Agrawal is a fellow of the Federations of State Medical Boards and was appointed to the Committee on Ethics and Professionalism. He is also a member of the National Committee on Foreign Medical Education and Accreditation.

Jan Boswinkel, MD, is the vice president of medical operations and patient safety officer at the Children's Hospital of Philadelphia (CHOP). Boswinkel provides executive leadership for the Office of Patient Safety and Quality, which includes patient safety, performance improvement, clinical regulatory accreditation, infection prevention and control, antimicrobial stewardship, emergency preparedness, and occupational health. He received his BS degree from Swarthmore College and his medical degree from the Perelman School of Medicine at the University of Pennsylvania. Prior to his medical career, Boswinkel was vice president of Cross Markets Proprietary Trading at J.P. Morgan, where he worked for nine years in London and New York. Boswinkel completed his pediatric residency at CHOP. He is certified as a patient safety officer through the Institute for Healthcare Improvement and served as an instructor for CHOP Safety and Leadership Methods for Error Prevention.

John B. Bulger, DO, MBA, is the chief quality officer at Geisinger Health System in Danville, Pennsylvania. He leads Geisinger's Division of Quality and Safety and is responsible for leading and disseminating Geisinger quality. Bulger founded Geisinger Medical Center's hospital model in 1999 and led the program's development to include 6 hospitals and over 60 physicians. Bulger is a clinical associate professor of medicine and regional assistant dean at Philadelphia College of Osteopathic Medicine and associate professor of medicine at Temple University School of Medicine. He is a lifelong resident of Pennsylvania. He received his BS at Juniata College, his medical degree from Philadelphia College of Osteopathic Medicine, and an MBA from Pennsylvania State University, State College, Pennsylvania.

Daniel J. Glunk, MD, practices internal medicine in Williamsport, Pennsylvania. He splits his professional time between active practice and as Susquehanna Health System's chief quality officer. Glunk chairs Susquehanna Health's Continuing Medical Education Committee and CQI Committee of the medical staff, as well as serves as the system's continuing medical education director. In 1991, he won Teacher of the Year Award from his hospital. Glunk served as chair of the Pennsylvania Medical Society board from 2002 to 2006 and then served as president from 2008 to 2009. Glunk earned a bachelor's degree from Wilkes University in Pennsylvania and a medical degree from Hahnemann University. His residency was completed at the University of Pittsburgh, where he was chief resident at Shadyside Hospital.

Eric H. Weitz, Esq., is a trial attorney based in Pennsylvania and New Jersey. He has a nationwide practice representing individuals in a wide variety of complex matters. Weitz was elected to serve a three-year term on the Board of Governors for the Philadelphia Bar Association and currently serves as vice-chairman of the board. He serves on the Board of Governors for the Pennsylvania Association for Justice (formerly known as the Pennsylvania Trial Lawyers), and he currently serves on the executive committee. For six consecutive years, Weitz has been named a Pennsylvania Super Lawyer by *Law and Politics* magazine and *Philadelphia Magazine*, including being named among the Top 100 Pennsylvania lawyers and Top 100 Philadelphia lawyers for 2011 and 2012. He received his undergraduate degree from S.I. Newhouse School of Public Communications at Syracuse University, where he earned a bachelor of science, cum laude, in television, radio, and film management. Weitz received his juris doctor, cum laude, from Villanova University School of Law.

©2013 Pennsylvania Patient Safety Authority

(continued from page 152)

- In 2008, the Patient Safety Liaison (PSL) program was begun, with a director of educational programs overseeing the initiative. To date, the program has eight PSLs, each with a region in the commonwealth. All hospitals, ambulatory surgical facilities, birthing centers, and abortion facilities have a designated PSL assigned to their facility to help them improve patient safety. Also, in 2008, hospitals began reporting HAIs to the Centers for Disease Control and Prevention. In addition, the Authority held the first of four pilot sessions developed to educate hospital chief executive officers and administrators about patient safety and its significance in reducing medical costs. Known as the Boards on Board program, to date, it has educated more than 60 Pennsylvania hospital boards of trustees.
- In 2009, continuing with implementation of the 2007 strategic plan initiatives, Pennsylvania nursing homes (more than 700) began reporting HAIs through PA-PSRS. The Authority also launched its new website featuring an enhanced search engine with simplified navigation and features allowing users to share patient safety information more easily. On average, the Authority website receives more than 85,000 hits and more than 39,000 visitors per month, with *Advisory* content receiving the heaviest traffic.
- In 2010, the Authority's blood mislabeling specimen collaborative improvement project ended in northeast Pennsylvania. Nine facilities participated in the collaboration, and facilities saw a 37% aggregate drop in their blood specimen mislabeling errors. One facility saw a decrease of 84%. Best practices were established from the collaboration for other regions to implement in their facilities.
- In 2011, the Authority expanded on its collaborative efforts by partnering with the Hospital and Healthsystem Association of Pennsylvania through the federal Partnership for Patients program developed to "keep patients from getting injured or sicker" and to "help patients heal without complication." The Authority received $1.8 million to focus on reducing falls, wrong-site surgeries, and adverse drug events statewide.
- In 2012, the Authority expanded upon the 2007 strategic plan and developed initiatives to build upon the Authority's successes. The Authority has begun implementing that plan to determine, among other initiatives, how to measure the Authority's effectiveness in patient safety, how to engage patients and providers more in patient safety, and how to strategically align it with healthcare providers and trends critical to patient safety. Also, in 2012, through the PSL program, the Authority's educational programs grew substantially. In 2006, there were about 200 healthcare personnel educated by the Authority annually. In 2012, more than 8,000 healthcare personnel were educated by Authority programs. Also, through 2012, Pennsylvania acute care and nursing home facilities have directly attributed more than 3,600 changes in care and practice to *Advisory* articles. More than 40 educational toolkits have been developed from *Advisory* articles, including multiple individual tools and over 30 consumer tips based on data received from Pennsylvania healthcare facilities.

In 2013, as we say farewell to Anita, Terry, and Marshall, I'd like to bestow upon them my heartfelt gratitude for the dedicated work they have each contributed to enhance and improve the Authority. We've come a long way, and because of their commitment, dedication, and leadership, the Authority is recognized as a respected source of patient safety information by every US state and in 37 countries. Their presence will be missed, but their contributions will not be forgotten.

©2013 Pennsylvania Patient Safety Authority

POSTOPERATIVE VOIDING

During discussion with a regional patient safety liaison, a Pennsylvania healthcare facility requested guidance on whether to discharge ambulatory surgery patients who have not voided postoperatively. The request specifically sought any evidence-based practices associated with spinal procedure patients.

A literature search of the National Quality Measures Clearinghouse, PubMed, the Cumulative Index to Nursing and Allied Health Literature, the American Society of Anesthesiologists' publications, and the American Society of PeriAnesthesia Nurses' journals revealed no specific evidence-based practices associated with postoperative voiding following spinal surgical procedures. The Association of periOperative Registered Nurses does not have a formal position statement regarding postoperative voiding.[1]

A summary of guidance points from the literature on whether or not patients who have had outpatient surgery should void before discharge is as follows:

- Discharge criteria should be developed in consultation with the anesthesia department.[2]
- Individual institutions vary in their requirements on voiding.[2]
- Patients who may be required to void include those who
  - have a history of postoperative urinary retention;[1]
  - have a history of prostatic hypertrophy;[2]
  - have received a large amount of narcotics in the operating room or postanesthesia care unit;[1]
  - have received spinal or epidural anesthesia, unless short-acting;[3] or
  - have undergone urological, gynecological, or anorectal procedures.[1]
- A bladder scanner can be used in conjunction with other assessments to evaluate patients for bladder volume and potential urinary retention prior to discharge home.[4]
- In the *Journal of PeriAnesthesia Nursing*, it is suggested that discharge instructions inform patients to seek help if they have not voided six to eight hours after discharge.[5]

Notes

1. Ruhl M. Postoperative voiding criteria for ambulatory surgery patients. *AORN J* 2009 May;89(5):871-4.
2. American Society of PeriAnesthesia Nurses. Frequently asked questions [online]. Revised 2012 Nov 11 [cited 2013 Oct 1]. http://www.aspan.org/ClinicalPractice/FAQs/tabid/14107/Default.aspx
3. Mulroy MF, Salinas FV, Larkin KL, et al. Ambulatory surgery patients may be discharged before voiding after short-acting spinal and epidural anesthesia. *Anesthesiology* 2002 Aug;97(2):315-9.
4. Parr K. Do patients really need to void prior to discharge? [online]. Outpatient Surg Mag 2011 Jun [cited 2013 Oct 2]. http://www.outpatientsurgery.net/surgical-facility-administration/patient-safety/do-patients-really-need-to-void-prior-to-discharge--06-11
5. Ead H. From Aldrete to PADAA: reviewing discharge criteria after ambulatory surgery. *J Perianesth Nurs* 2006 Aug;21(4):259-67.

©2013 Pennsylvania Patient Safety Authority

Corrections

These corrections have been made to the online versions of the articles. The editor regrets the errors.

Gardner LA, Gibbs C. Class III obese patients: is your hospital equipped to address their needs? Pa Patient Saf Advis [online] 2013 Mar [cited 2013 Oct 31]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Mar;10(1)/Pages/11.aspx

Gardner LA, Pagano M. Skin integrity, immobility, and pressure ulcers in class III obese patients. Pa Patient Saf Advis [online] 2013 Jun [cited 2013 Nov 25]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Jun;10(2)/Pages/50.aspx

Gardner LA, Pagano M. Class III obese patients: the effect of gait and immobility on patient falls. Pa Patient Saf Advis [online] 2013 Sep [cited 2013 Oct 31]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2013/Sep;10(3)/Pages/96.aspx

These articles contained a statement in error on page 11 of the March issue, pages 50 and 54 of the June issue, and page 96 of the September issue that needs correction about the definition of a class III obese patient. The statement should indicate that class III obese patients are identified as having a body mass index (BMI) greater than or equal to 40 or weighing 100 pounds or greater than their ideal body weight.

In addition, on page 11 of the March issue, the statement should indicate that from 2000 to 2005, the prevalence of individuals reporting a BMI greater than 40 increased by 52%.

Increasing influenza and pneumonia vaccination rates in long-term care. Pa Patient Saf Advis [online] 2009 Dec [cited 2013 Nov 11]. http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2009/Dec6(4)/Pages/132.aspx

This article contained two statements in error on page 132 that need correction about immunization rates of Pennsylvania long-stay residents. The statements should indicate as follows: (1) the influenza immunization rate of Pennsylvania long-stay residents—the number of residents who were assessed and given influenza vaccination in the 2007 season—was 3.1% lower than the "all-state average" of 89.0%; and (2) the pneumococcal polysaccharide vaccine administration rate also fell 3.2% below the all-state average of 86.8%.

©2013 Pennsylvania Patient Safety Authority

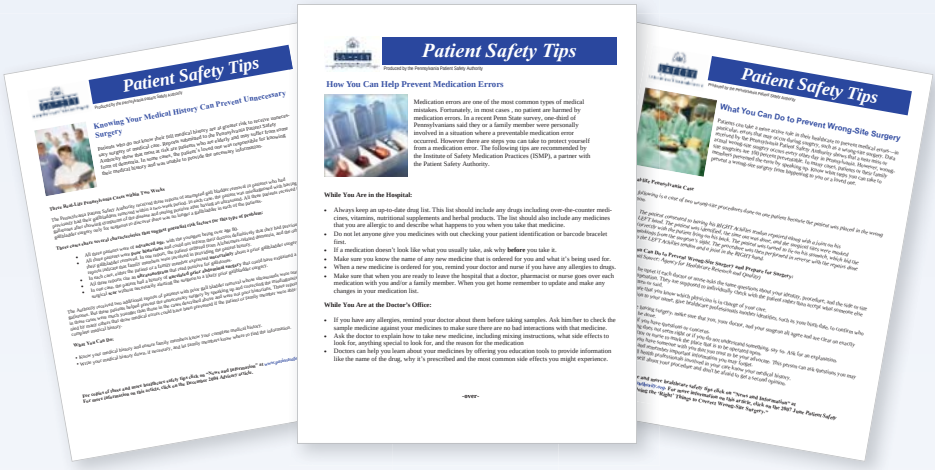
SHARE PATIENT SAFETY BEST PRACTICES TO KEEP YOUR PATIENTS SAFE

The Pennsylvania Patient Safety Authority is committed to providing consumers of the healthcare industry with information they can use to receive quality care as a patient. Authority data shows the more a patient participates in his or her healthcare, the more likely he or she is to have a positive outcome when using the healthcare system.

Help your patients and their families participate more in their healthcare by making consumer tips available in your waiting rooms or patient areas.

REMEMBER TO ENCOURAGE YOUR PATIENTS TO SPEAK UP!

The Authority has published consumer tips on a variety of topics that include but are not limited to medication errors, wrong-site surgery, color-coded wristbands, C. difficile, methicillin-resistant *Staphylococcus aureus* (MRSA), negative-pressure wound therapy, magnetic resonance imaging (MRI) scans, lower respiratory tract infections, dialysis, and living wills.



PATIENT SAFETY AUTHORITY

An independent agency of the Commonwealth of Pennsylvania

Certain patient safety tips are also available online en Español.
For more information, visit the Pennsylvania Patient Safety Authority website at www.patientsafetyauthority.org.

Scan this code with your mobile device's QR reader to access the Authority's Patient Safety Consumer Tips.

MS13019

PENNSYLVANIA PATIENT SAFETY ADVISORY

THE PENNSYLVANIA PATIENT SAFETY AUTHORITY AND ITS CONTRACTORS

The Pennsylvania Patient Safety Authority is an independent state agency created by Act 13 of 2002, the Medical Care Availability and Reduction of Error (Mcare) Act. Consistent with Act 13, ECRI Institute, as contractor for the Authority, is issuing this publication to advise medical facilities of immediate changes that can be instituted to reduce Serious Events and Incidents. For more information about the Pennsylvania Patient Safety Authority, see the Authority's website at http://www.patientsafetyauthority.org.

ECRI Institute, a nonprofit organization, dedicates itself to bringing the discipline of applied scientific research in healthcare to uncover the best approaches to improving patient care. As pioneers in this science for more than 40 years, ECRI Institute marries experience and independence with the objectivity of evidence-based research. More than 5,000 healthcare organizations worldwide rely on ECRI Institute's expertise in patient safety improvement, risk and quality management, and healthcare processes, devices, procedures, and drug technology.

The Institute for Safe Medication Practices (ISMP) is an independent, nonprofit organization dedicated solely to medication error prevention and safe medication use. ISMP provides recommendations for the safe use of medications to the healthcare community, including healthcare professionals, government agencies, accrediting organizations, and consumers. ISMP's efforts are built on a nonpunitive approach and systems-based solutions.