

PENNSYLVANIA PATIENT SAFETY ADVISORY



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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.

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Improving Care for Patients with Autism Spectrum Disorder in the Acute Care Setting

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ABSTRACT

As the number of Pennsylvanians diagnosed with autism spectrum disorder (ASD) continues to grow, healthcare facilities are seeing an increase in the number of these individuals seeking care. Negative interactions with the healthcare system and concerns about the quality of care provided to this population have been reported by individuals with ASD, their families, and healthcare providers. The Pennsylvania Patient Safety Authority received 138 reports of events involving patients with ASD from July 2004 through August 2014. Qualitative analysis of event report narratives revealed 12 patient safety concern themes involving patients with ASD. Injury to self or potential injury to self was identified as the most frequently reported concern (n = 75), followed by interference or lack of cooperation with care (n = 30). Other events included aggressive behavior and/or injury to others, use of chemical or physical restraints, patient communication difficulties, and caregiver communication difficulties and/or consent issues. The patient safety concerns commonly encountered by ASD patients and their families as reported to the Authority are consistent with the concerns cited in the published literature. Resources such as those developed by the Western Pennsylvania Autism Services, Education, Resources, and Training Collaborative are available to help healthcare facilities improve care for this population. (Pa Patient Saf Advis 2014 Dec; 11[4]: 141-8.)

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INTRODUCTION

Autism spectrum disorder (ASD) is a complex, lifelong neurodevelopmental condition characterized by impairments in the areas of communication and social interaction and restricted, repetitive patterns of behavior, interests, or activities.¹ Autism is considered a spectrum condition because symptoms range from mild to severe and vary over time or in response to changes in situations.² The Centers for Disease Control and Prevention estimates that the prevalence of ASD in the United States is 14.7 per 1,000 (1 in 68) for children eight years of age, with an estimated two million Americans carrying a diagnosis of ASD.¹ Prevalence estimates vary by sex, with approximately 1 in 42 boys and 1 in 189 girls identified as having ASD.¹

In 2005, there were nearly 20,000 Pennsylvanians with ASD, according to a census study commissioned by the Pennsylvania Bureau of Autism Services. Given trends and projected numbers from the census update, the bureau estimates that there were over 55,000 children and adults in Pennsylvania with ASD in 2013.³

The bureau conducted a needs assessment of individuals with ASD and their families in 2011; respondents reported increased contact with the healthcare system, most prominently through emergency medical services, the emergency department (ED), and acute inpatient hospitalization. The top five reasons for acute inpatient hospitalization, in descending order, were (1) aggression (including defiant or oppositional behaviors), (2) self-injury, (3) anxiety and/or depression, (4) running away, and (5) obsessions. Respondents, particularly caregivers for adults with ASD, frequently reported dissatisfaction surrounding interactions with the healthcare system. Over half of this group cited increased acute care resource utilization that was undesired, unwanted outcomes, and poor discharge planning. In general, caregivers reported difficulty finding providers who understood and could address the needs of individuals, particularly adults, with ASD.⁴

These findings align with literature that suggests that most general healthcare providers have little knowledge of the commonly used therapies to treat ASD and their side effects, the medical conditions that bring patients with ASD to the healthcare system, and the optimal means to manage these individuals.⁵

An analysis of events reported to the Pennsylvania Patient Safety Authority involving patients with ASD revealed concerns similar to those reported from the Pennsylvania autism needs assessment and those reported in the literature. Risk reduction strategies and resources are available to assist healthcare providers in the acute care setting to meet the needs of individuals and families living with ASD and to improve the safety and quality of services provided.

METHODS

Analysts queried the Pennsylvania Patient Safety Reporting System (PA-PSRS) database for reports of events involving patients with ASD from the inception of the reporting program in July 2004 through August 2014. Event reports that contained the terms “autistic,” “autism,” “ASD,” or “Asperger” were selected and analyzed individually in order to identify those reports that described events involving patients with ASD. The resulting event reports were then analyzed according to patient age, facility type, event type, and harm score. In addition, qualitative analysis was performed to identify common patient safety concerns described in the event report narratives.

RESULTS

Analysts identified 138 events involving patients diagnosed with ASD that were reported through PA-PSRS from July 2004 through August 2014. Figure 1 shows that the majority of these events were reported for patients under the age of 20 (60.9%, n = 84), with most of these events reported for patients under age 10 (37.7%, n = 52).

Figure 2 displays the number of events reported for children and adolescents (i.e., under age 18) and adults (i.e., age 18 or older) with ASD for each of the seven facility types reporting through PA-PSRS. Although acute care and children’s hospitals reported the majority of events (82.6%, n = 114), events have been reported for individuals with ASD at each facility type.

The highest number of events involving patients with ASD were reported using the PA-PSRS event type category labeled “other,” followed by falls and errors related to, or complications of, procedures, treatments, or tests (see Table 1). The majority of events were reported as Incidents (i.e., events without harm to the patient) (90.6%, n = 125). Of the 13 events reported as Serious Events (i.e., events resulting in harm to the patient), 10 were reported as resulting in temporary harm and 3 were reported as resulting in permanent harm, up to and including death.

Through qualitative analysis of event report narratives, analysts were able to identify 12 commonly reported patient safety concerns. The most commonly reported patient safety concern was injury or potential injury to self, followed by interference or lack of cooperation with care. Table 2 lists the number of events reported for each of the 12 patient safety concerns identified. Within the category of injury or potential injury to self (n = 75), falls were the most commonly reported patient safety concern (46.7%, n = 35), followed by intentional self-harm or self-soothing behavior resulting in harm (24.0%, n = 18), other accidental injury (16.0%, n = 12), patient removal or

Figure 1. Autism-Related Events Reported to the Pennsylvania Patient Safety Authority, by Age Group, July 2004 through August 2014 (N = 138)

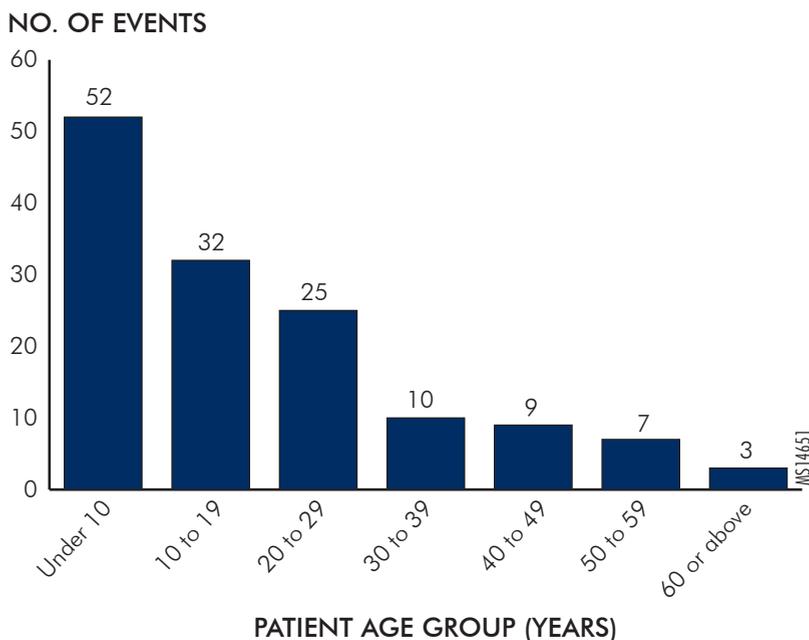
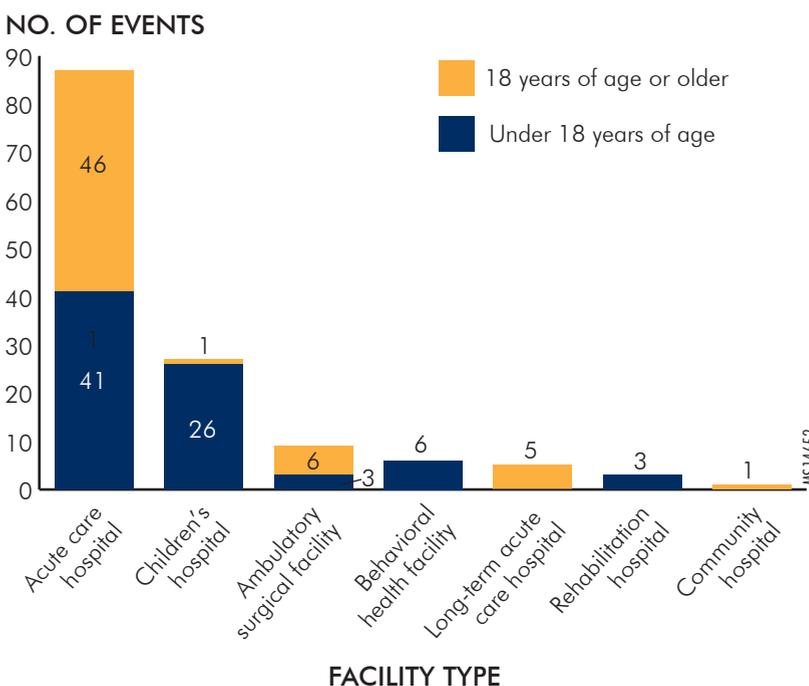


Figure 2. Autism-Related Events Reported to the Pennsylvania Patient Safety Authority, by Facility Type and Age Group, July 2004 through August 2014 (N = 138)



dislodgement of intravenous catheters or other medical devices (10.7%, n = 8), and ingestion of a foreign body or nonfood substance (2.7%, n = 2).

The following are examples of events reported to the Authority involving patients with ASD:

A behavioral health patient who is also autistic and mentally challenged

has a history of self-injurious behavior. The patient became agitated and slid up in the bed thrashing. The patient hit their head on the radiator, sustaining a small laceration to the back of the head which required sutures placed by the emergency department physician.

A patient with history of autism, bipolar disorder, and aggression fell in the operating room while trying to run from anesthesia. The patient sustained a small open area on the right arm, and a bandage was applied.

Patient's mother wishes to sign out AMA [against medical advice]. She states that she cannot wait and will take her child to see their primary care provider in the morning. She states that her child is autistic and must be kept on a schedule. AMA paperwork was signed, risks were understood and acknowledged, and the mother was encouraged to return for worsening symptoms. The patient left prior to being evaluated by a physician.

A physician came to radiology to report a problem. I was then informed that our sonography technician on call was extremely rude to a nine-year-old autistic patient and their family in the emergency room and that the technician didn't finish the ultrasound and informed the mother that since the patient was uncooperative, she was finished. The technician returned to repeat the exam. I called the emergency room to ask them if they wanted me to help/observe the technician this time. After about a half hour, the little one exhausted himself and finally lay extremely still without assistance, and the ultrasound was completed after delay.

A nonverbal, autistic patient was admitted from a group home for leg surgery. The patient was disruptive on the medical-surgical unit on post-op day #1 and was transferred to a higher level of care for private room accommodations. On post-op day #2, the patient was agitated, trying to get out of bed independently with a cast and wound vacuum-assisted closure device attached to their leg. The patient removed three intravenous catheters. The staff was unable to

Table 1. Autism-Related Events Reported to the Pennsylvania Patient Safety Authority, by Event Type,* July 2004 through August 2014 (N = 138)

EVENT TYPE	NO. (%) OF EVENTS
Other	37 (26.8)
Fall	35 (25.4)
Error related to procedure, treatment, or test	24 (17.4)
Complication of procedure, treatment, or test	20 (14.5)
Skin integrity	16 (11.6)
Medication error	5 (3.6)
Equipment, supplies, or device	1 (0.7)

* Event types are defined by Pennsylvania Patient Safety Reporting System taxonomy and are assigned to events by healthcare facilities at the time of report submission.

Table 2. Autism-Related Events Reported to the Pennsylvania Patient Safety Authority, by Patient Safety Event Concern,* July 2004 through August 2014 (N = 138)

PATIENT SAFETY EVENT CONCERN	NO. (%) OF EVENTS†
Injury or potential injury to self	75 (54.4)
Interference or lack of cooperation with care	30 (21.7)
Aggressive behavior and/or injury to others	21 (15.2)
Chemical restraint and/or sedation used	21 (15.2)
Patient communication issues	16 (11.6)
Caregiver communication difficulties and/or consent issues	12 (8.7)
Mechanical and/or physical restraints used	12 (8.7)
Patient did not receive care and/or caregiver signed patient out against medical advice	11 (8.0)
Other medical condition contributed to a poor outcome	8 (5.8)
Delays in care caused increased agitation	7 (5.1)
Staff not prepared to care for special needs	5 (3.6)
Other challenging and/or impulsive behavior without injury	4 (2.9)

* Patient safety event concerns were identified as a result of qualitative analysis of event report narratives.

† Event report narratives may have described more than one patient safety concern; therefore, the number of events totals more than 138 and percentages total more than 100.



ascertain how to best deal with the patient. The primary physician and nurse from the group home came to the unit and explained the patient's baseline and ways to deal with the patient's behaviors. The psychiatrist also noted that the medication reconciliation was done incorrectly and that the patient was not receiving the proper doses of medication. The patient has had a sitter, but now two sitters are in the room. Medications were readjusted and the care plan was updated with specific interventions that are used at the group home.

DISCUSSION

Growth in the number of Pennsylvanians of all ages living with ASD, together with increased contact with the healthcare system reported by these individuals and their families, suggests that the number of events involving ASD patients reported through PA-PSRS represents only a small subset of such events. The actual number may in fact be much higher, as identification of these events is dependent upon the inclusion of terms that identify a patient with ASD in the event description. Many such events may have been reported without mention of the ASD diagnosis. Though the number of reports submitted through PA-PSRS from July 2004 through August 2014 involving patients with ASD may be small (N = 138), 9.4% (n = 13) were labeled Serious Events. In contrast, Serious Events represented only 3.1% (n = 7,543) of all events reported through PA-PSRS in 2013 (N = 246,606).⁶

In a 2014 study of patient safety incidents encountered by patients with intellectual disabilities (including ASD) at National Health Service hospitals in England, Tuffrey-Wijne et al. found limitations in using event reports to monitor and prevent such patient incidents. These limitations included a failure to identify patients with intellectual disabilities in the clinical documentation and event

reporting systems and a tendency for reporters to focus on incidents resulting in immediate or potential physical harm, such as falls, as opposed to delays or omissions of care—the types of incidents more often reported by patients and families as resulting in patient harm.⁷

Analysis of PA-PSRS event reports suggests that the same may be true for events involving patients with ASD in Pennsylvania. Still, examination of these event reports enables identification of common concerns faced by both the recipients and providers of care for this population.

The majority of research in the area of ASD to date has been focused on prevalence of the disorder, potential etiologies, early identification strategies, and interventions aimed at reducing associated symptoms, building adaptive skills, and maximizing quality of life for children with ASD. Two areas currently in need of further research are improving care of the patient with ASD in the acute care environment^{5,8} and specifying the needs of adults with ASD in all care settings.⁹

A small number of guidelines have been published to aid the care of children and adults with ASD. However, similar to the focus in ASD research, these guidelines focus primarily on diagnosis, early recognition, and interventions targeted to treating the condition itself; they do not outline interventions specific to caring for patients with ASD in the acute care setting.^{2,10,11} Individual hospitals may have developed clinical practice guidelines—for example, Cincinnati Children's Hospital's Best Evidence Statements (BEST).¹² These BEST guidelines primarily outline outpatient cognitive and behavioral therapies for treating children with ASD; however, some of the BEST statements may be applicable to the acute care setting. For instance, one such BEST statement offers guidance for oral anxiolytic use prior to ambulatory healthcare encounters with patients with developmental and behavioral challenges, including patients with ASD.¹³

In the absence of robust literature and clinical guidelines specific to the care of patients with ASD in the acute care setting, the Authority reached out to professionals and organizations with a vested interest in improving this care.

Treating the Autistic Patient

The Center for Autism, in Philadelphia, was established in 1955 and was the first clinic in the United States devoted exclusively to the treatment of autism. The mission of the center is to improve the quality of life for individuals with ASD and their families. The center does this by providing treatment, support, education, and resources that are needed to advocate for individuals with ASD.¹⁴ In a conversation with the Authority, Joel Bregman, MD, chief of psychiatry at the center, highlighted the following challenges in caring for individuals with ASD in the acute care setting.¹⁵

Lack of knowledge by healthcare

providers. Most of the healthcare professionals who have treated autistic patients for decades know that medical care for this population is poor, according to Bregman. “There are a number of groups and centers that specialize in autism that have become increasingly concerned about the adequacy of medical care for those with autism throughout the age span—not just children, but for adolescents and adults, as well. There hasn't been a part of medical education that I'm aware of in medical school, or nursing programs or other health-related fields, that really gives adequate instruction or training in working with people with ASD. It can be incredibly challenging because people with autism don't interact and function the way most people do.”

It is important that healthcare providers have a working knowledge of the social, communication, and behavioral features of ASD, according to Bregman, because “the ASD patient can be misleading in terms of what they understand and don't

understand, or what they are receiving or experiencing.” For instance, a common behavioral feature of ASD is hypersensitivity to sights or sounds, but not all individuals respond in the same way; “some have a low level of arousal and it takes an awful lot to get them going,” Bregman said. Another common feature is compulsive or ritualistic behavior, “and if things are out of sequence or don’t fit their schedule, they can just fall apart. Often it’s the small things and not the bigger things. So if a staff member in the emergency room used their right hand to get the liquid soap sanitizer rather than their left that could just throw them totally off. It doesn’t make sense. People who don’t understand are not even going to be thinking that it can cause such a tremendous problem, but it can.”

Time pressures. The speed at which the healthcare delivery system functions can serve as a barrier to effectively interacting with and providing care to patients with ASD, Bregman said. “We don’t spend much time with patients. We don’t sit and talk with them. We don’t ease into discussions and exams. It’s hurry, hurry, hurry. You can’t do that with people who have autism.”

Waiting. Waiting or delays in care can be extremely anxiety-provoking in patients with ASD. “Waiting is incredibly difficult; it’s a concept that doesn’t register,” Bregman said. “One thing you can do right away at the door is to get these patients back into a room and not have them wait.” Bregman explained that the time and effort expended to expedite this care when the patient presents to the emergency room or other healthcare setting will end up saving time later during the healthcare encounter. “What will unfortunately happen is that it will cost you more time if you have them wait.”

Communication with caregivers. The more information healthcare providers can obtain about an individual with ASD early in the healthcare encounter or prior to the

healthcare encounter, the better, according to Bregman. “A parent, a group home manager, or a caregiver should have prepared some basic information about the person—what their issues are, what their medical problems are, some other tips about what to avoid, or how to approach them.” By working with the caregivers and asking them what works and what does not work, the healthcare provider will have greater success treating the ASD patient.

Communication with patients. Most people with autism, although very bright, are also very concrete and literal, Bregman said. He recommends that healthcare providers avoid using abstract terms. “‘Are you well?’ and ‘Do you hurt?’ are incredibly abstract questions. You have to be specific. You can try a general question, but if you don’t get an answer, ask them to point to where it hurts. You have to be concrete. Even photographs can be helpful.”

De-escalation. If an autistic patient is becoming anxious and displaying agitated or aggressive behavior and an emergency call for assistance is made, that can escalate things even more, Bregman said. “Imagine yourself in a different country, with a whole different culture, whole different language, whole different way of doing things, and you were trying to understand it but you really couldn’t. Then a hoard of people started running at you with open arms—it can be absolutely terrifying. If you’re slow, if you’re gentle, if you’re quiet, if you don’t rush them and you take your time and let them know what’s going to happen, verbally and non-verbally, you can avoid an autistic patient becoming out of control.”

Need for Education

The rising prevalence of ASD and the limited training and understanding of ASD by general healthcare providers suggests the need for more education and training to address the special needs of this population.^{4,5} Healthcare providers working in the ED are in particular need of this

education and training. The ED serves as the gateway for medical care for the majority of acutely ill patients, including those with ASD. All patients presenting with acute ailments expect that the ED and emergency physicians in particular will be able to diagnose and initiate management of critical conditions. Without special preparation and a sensitive approach to the patient with ASD and their caregiver, the diagnosis and management of these conditions is likely to be ineffective and potentially endanger these individuals when they are most in need.⁵

Autism Services, Education, Research, and Training (ASERT) Collaborative.

The Western Pennsylvania ASERT Collaborative is one of three regional ASERT Collaboratives in the state, and it includes professionals with backgrounds in education, medicine, psychology, and social work who specialize in the care of patients and families living with ASD. Funded by the Pennsylvania Bureau of Autism Services, the ASERT Collaboratives were tasked with taking action to address the areas of concern identified in the previously cited Pennsylvania autism needs assessment. In response, the western group developed ACT for Autism, a program consisting of educational materials and training opportunities for first responders¹⁶ and ED personnel¹⁷ who provide care to individuals with ASD. See “Autism Services, Education, Resources, and Training (ASERT)” for further information about this program.

Joann M. Migyanka, DEd, an associate professor of special education at the Indiana University of Pennsylvania and a member of the Western Pennsylvania ASERT Collaborative, recalled an incident in Indiana, Pennsylvania, that prompted the creation of the first ACT for Autism training program¹⁶ for first responders:

A young man with ASD was standing on a street corner waiting for the bus. He became agitated because the bus was late and had begun to soothe himself by humming, rocking, and jumping up and down. A passerby mistook



these actions and called police, who drove to the scene with sirens blaring and bright lights flickering. As a result, the young man became even further agitated. As the police were arresting him, a nearby shop owner who knew the young man came out to speak to the police and clarify the situation.

“Loud noises and bright lights can cause increased agitation and anxiety in a person with ASD,” Migyanka said. “A person with ASD has difficulties with sensory processing. First responders need to approach without loud sirens and flashing lights, in a slow, calm manner and respect personal space.”

After working with first responders, ASERT Collaborative members identified a need to develop similar training for ED personnel, prompting the development of the second ACT for Autism training program for ED healthcare providers.¹⁷

AUTISM SERVICES, EDUCATION, RESOURCES, AND TRAINING (ASERT)

ASERT is a statewide initiative funded by the Pennsylvania Department of Public Welfare’s Bureau of Autism Services that aims to support individuals with autism spectrum disorder (ASD) and their families. There are three ASERT regions in Pennsylvania: western, central, and eastern. Each region has established an ASERT Collaborative: a partnership of medical centers, centers of autism research and services, universities, and other providers of services for individuals of all ages with ASD and their families. These collaboratives are charged with understanding and meeting the needs of this population that are common across the state as well as region-specific. Working independently and in partnership, the ASERT Collaboratives sponsor a number of programs for individuals and families on subjects as diverse as navigating interactions with the justice system to the development of life care and social skills. They also provide training programs supporting licensure requirements for behavioral specialists. Through these programs, the ASERT Collaboratives seek to improve the lives of the rising number of Pennsylvania residents and families living with ASD.

ACT for Autism

The Pennsylvania Bureau of Autism Services conducted a needs assessment of individuals and their families living with ASD in 2011.¹ Respondents reported increased contact with the healthcare system, most prominently through emergency medical services, the emergency department, and acute inpatient hospitalization. Respondents expressed frustration with the healthcare system due to a lack of familiarity with the special needs of individuals with ASD among healthcare personnel and a lack of accommodation for the issues that can make care challenging for this patient population.

In response, the Western Pennsylvania ASERT Collaborative brought together a group of healthcare professionals, autism treatment experts, and special education specialists to develop ACT for Autism, a training program for first responders, emergency department staff, and acute care providers. This program provides information about the nature of ASD and commonly utilized therapies; medical conditions that can cause individuals with ASD to present to the healthcare system; and techniques to safely, effectively, and rapidly assess and treat patients with ASD.

ACT for Autism outlines the steps that can be taken to improve interactions between healthcare personnel and individuals with ASD:

- **A**ssess the treatment environment and the acute needs of the ASD patient.
- **C**ommunicate effectively with the patient, allowing the patient to convey their needs to the provider.
- **T**reat the patient using diagnostic and therapeutic interventions in a manner that is as minimally disconcerting to this population as possible.

ACT for Autism has been presented in a variety of local, state, and national venues to first responders and emergency department personnel. Evaluation of the effectiveness of the program has been favorable, with recipients of the training showing increased knowledge and improved comfort in caring for patients with ASD.²

Accessing Training Materials

The ACT for Autism training modules consist of separate programs for emergency medical services and emergency department staff. Each program includes a DVD and accompanying training manual with a knowledge assessment quiz.

Hospitals interested in ACT for Autism training can contact the Western Pennsylvania ASERT Collaborative through the website <http://www.paautism.org> or obtain ACT for Autism training materials from the Indiana University of Pennsylvania marketplace website at https://ep01.iup.edu/C20877_ustores/web/index.jsp.

Notes

1. Bureau of Autism Services. Pennsylvania Department of Public Welfare. Pennsylvania autism needs assessment: a survey of individuals and families living with autism [online]. 2011 Sep [cited 2014 Sep 12]. http://www.paautism.org/desktopmodules/asert-api/api/item/ItemDetailFileDownload/160/ASERT%20Autism%20Needs%20Assess_Statewide%20Summary.pdf
2. McGonigle JJ, Migyanka JM, Glor-Scheib SJ, et al. Development and evaluation of educational materials for pre-hospital and emergency department personnel on the care of patients with autism spectrum disorder. *J Autism Dev Disord* 2014 May;44(5):1252-9.

Evaluation of pre- and postintervention surveys administered to ACT for Autism training program attendees, both first responders and ED healthcare providers, suggests that the program is effective in supporting training about (1) the characteristics of ASD, (2) the challenges posed by this condition for patients and families in prehospital and acute care settings, and (3) methods to improve interactions between these individuals and the healthcare team.¹⁸

RISK REDUCTION STRATEGIES

The following strategies are suggested for healthcare facilities seeking to improve the quality of care for patients with ASD.

- Provide to all staff, including healthcare providers and allied health professionals, education and training that covers information about the characteristics of ASD, the challenges faced by patients with ASD and their families in the acute care setting, and methods to improve interactions between these individuals and the healthcare team.^{2,5,8,10,11,16,17}
- Identify treatment areas where accommodations can be readily made for ASD patients.^{5,8,16,17}
- Design treatment areas using evidence-based environmental modifications shown to be beneficial in caring for ASD patients:
 - Designate a location away from busy waiting rooms and other noisy treatment areas.^{5,8,16,17}
 - Avoid the use of fluorescent lighting.^{5,8,16,17}
 - Reduce the amount of room-based equipment.^{5,8,16,17}
 - Use portable monitors and treatment implements for patient assessment and management.^{5,8,16,17}

- Provide age-appropriate and soft, warm, or other texturally soothing materials to both distract and comfort patients.^{5,8,16,17}
- Gain as much information as possible from caregivers about the patient with ASD and the best way to communicate with them.^{2,5,8,10,11,16,17}
- Utilize the following general approaches to communication:
 - Approach the patient calmly and slowly, leaving distance between yourself and the patient.^{2,5,8,10,11,16,17}
 - Address the patient using their first name.^{16,17}
 - Ask simple yes/no, rather than multistep or abstract, questions.^{16,17}
 - Provide an explanation using simple terms and a demonstration, when possible, prior to touching the patient or performing any procedure.^{5,8,16,17}
 - Reassure the patient that you are trying to help them, and praise them for cooperation.^{16,17}
- Develop a protocol for de-escalating ASD patients who present in acute distress. The protocol could include the following techniques that have been shown to be effective:
 - Provide an appropriately structured and soothing environment.^{5,8,16,17}
 - Utilize therapeutic communication and verbal de-escalation techniques.^{5,8,16,17}
 - Minimize the number of individuals caring for a patient.^{5,8,16,17}
 - Use warm blankets, rather than physical restraints, to wrap the patient.^{5,8,16,17}
- Administer medications recommended for anxiolysis or sedation in patients with ASD when necessary (i.e., benzodiazepines and/or antipsychotic medications).^{5,8,13,16,17}
- Consider convening a focus group to examine the issues faced by patients and families living with ASD who receive care at the facility. Invite stakeholders from the community, including patients, caregivers and other family members, representatives of autism support agencies, and other professionals specializing in the care of individuals with ASD.^{2,10,11}
- Learn more about the needs of Pennsylvanians with ASD and resources available to help meet those needs, such as the ACT for Autism training programs.¹⁶⁻¹⁸

CONCLUSION

A growing number of Pennsylvanians have been diagnosed with ASD, and the number of these individuals seeking acute medical care is increasing. Concerns about the quality and safety of care provided to this population have been reported—both through PA-PSRS and in surveys conducted by the Pennsylvania Bureau of Autism Services of individuals with ASD and their families. Treating a patient with ASD can be difficult, as these patients can exhibit significant social, communication, and behavioral challenges; when a patient with ASD presents in an emergency situation, the challenges can be even more substantial. Proactive education about the characteristics of ASD and training outlining approaches to care for individuals with ASD may help healthcare personnel successfully deliver medical services and decrease stress for both providers and patients.



NOTES

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Omission of High-Alert Medications: A Hidden Danger

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ABSTRACT

A drug omission occurs when a patient does not receive a medication that has been ordered or when a medication has not been ordered despite being appropriate for an underlying condition. Over 2,700 medication errors categorized as drug omissions involving more than 500 different medications were reported to the Pennsylvania Patient Safety Authority from January 1, 2013, through April 30, 2013. Antibiotics (19.7%) and medications used for respiratory therapy (11.5%) were the most common medications cited in reports. More than 21% of reports involved at least one high-alert medication. A majority of omissions during the administration process (52.9%), followed by occurrence during the transcription (22.9%) and prescribing (12.0%) processes. Most administration omissions involved a medication intended to be given by an intravenous (IV) route (32.9%) or by other injectable routes (38.0%). The most commonly cited types of omissions involving an IV high-alert medication included IV infusions that were not started, IV tubing that was not connected or was clamped, and IV infusion pumps that were not turned on or were turned off. Risk reduction strategies include developing a consistent administration process for IV medication setup, tracing IV lines, and using healthcare technology fully and properly. (Pa Patient Saf Advis 2014 Dec;11[4]:149-55.)

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INTRODUCTION

A drug omission can be defined as an event in which an appropriate medication is not provided to a patient, either because the medication has not been prescribed or has not been administered. There are clinical reasons why patients may not receive medications (e.g., when patients are designated “nothing by mouth” [NPO] status, when patients are off of the unit for tests or otherwise unavailable to take their medications).

The impact of a drug omission varies from insignificant to severe harm, depending on the medications and the patient’s medical conditions.¹ Suboptimal treatment may also lead to an increased length of stay. The frequent occurrence of drug omissions may both reflect and contribute to significant organizational inefficiency.

Drug omissions can occur during any stage of the medication-use process. Medications may be omitted from initial medication lists obtained upon admission, prescribers may omit a drug when writing or entering orders, orders for medications may not be transcribed onto a paper medication administration record (MAR), pharmacy personnel may neglect to enter an order into the pharmacy computer system or may not deliver medications to patient care areas on time, or nurses may fail to administer the medication as prescribed. Based on an analysis of other medication error reporting programs, drug omissions are frequently the most common type of medication error reported.²

While there are studies showing that omissions are a leading type of medication error, there are few studies that reveal the reasons why they are occur. Green et al. studied admission prescription charts, recording all drugs prescribed but not given in the first 48 hours, along with the reason given for omission during the administration process. Twenty percent of prescriptions did not reach the intended patient, affecting 17% of the patients.¹ Warne et al. examined the documentation of medication administration in medical and surgical patients to determine the point prevalence of medication omissions, finding that 79% of patients did not receive at least one dose for one drug during one admission and that the average number of medication omissions was 2.5 per patient.³ Other studies examining omissions have shown various rates of occurrence ranging from 1.1% to 58%.^{4,5} McMillan et al. and Dean et al. suggest that up to 57% of missed medications could be detrimental⁶ or even life-threatening.⁷

Analysis of drug omissions reported to the Pennsylvania Patient Safety Authority has identified where in the medication-use process these events occur, the reasons why medications were not prescribed or administered to patients, and the factors that may have contributed to these events. The analysis focused on high-alert medications,⁸ as these drugs pose an increased risk of patient harm when involved in medication errors.

METHODS

Analysts queried the Authority’s Pennsylvania Patient Safety Reporting System (PA-PSRS) database for reports assigned the event type “medication error/omissions.” Based on another analysis of medication error reports that showed that drug omissions were the most common medication error event type, analysts queried a short duration of time.² The query yielded 2,787 medication error reports that had been submitted to the Authority from January 1, 2013, through April 30, 2013, representing 16.1% of all medication events submitted (N = 17,276) and the most common type of medication error reported in that time period.

RESULTS

Categorization of the reports by harm score, which is adapted from the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) harm index,⁹ shows that 88.6% (n = 2,469) of the drug omission events reached the patient (harm score = C to I) and that only 0.2% (n = 5) of the events resulted in patient harm (harm score = E to I). According to the NCC MERP harm index, when a patient does not receive the medication (i.e., an error of omission), the error is considered to have reached the patient.⁹

Overall, 91 unique care areas were associated with drug omissions. The most common units implicated in drug omissions included medical-surgical units (17.8%, n = 496), respiratory care–diagnostic/therapeutic units (8.0%, n = 223), and rehabilitation units (6.8%, n = 189). Omissions that take place during prescribing (e.g., failure to prescribe a medication) are not necessarily a reflection of the care area but may simply reflect the location of the patient at the time of the omission.

More than half of the reports involved the elderly population (65 years old or above) (51.8%, n = 1,445), followed by the adult population (18 to 64 years) (41.2%, n = 1,147). Only 7.0% (n = 195) of the reports involved the pediatric population (less than 18 years of age)

More than 500 different medications were cited in omission reports (see the Table), with antibiotics mentioned in 19.7% (n = 549) of the reports and medications used for respiratory therapy involved in 11.5% (n = 320) of the reports. Over 21% (n = 593) of the reports involved at least one high-alert medication. While omissions may be viewed as events that normally would not result in harm to a patient, the omission of high-alert medications, such as anticoagulants (e.g., heparin, warfarin) or hypoglycemic agents (e.g., insulin), could result in serious harm

Table. Top 10 Medications Involved in Drug Omission Events Reported to the Pennsylvania Patient Safety Authority from January 1, 2013, through April 30, 2013 (n = 994, 35.7% of total reports)

MEDICATION	NO. OF REPORTS	% OF TOTAL REPORTS*
Insulin [†]	140	5.0
Albuterol sulfate and ipratropium bromide	137	4.9
Vancomycin	134	4.8
Albuterol	110	3.9
Multiple medications	101	3.6
Heparin [†]	100	3.6
Hydration	78	2.8
Warfarin [†]	72	2.6
CeFAZolin	63	2.3
Enoxaparin sodium [†]	59	2.1

* Total drug omission reports (N = 2,787)

[†] A high-alert medication

such as thrombotic or hyperglycemic events. Due to this potential for harm, the analysis focuses on the omission of high-alert medications.

ANALYSIS

Omission of High-Alert Medications

When studying admission prescription charts, Green et al. identified the two dominant reasons for medications not being given to patients: (1) the medication was not available in the patient care area (38% of omissions) or (2) the patient was designated NPO status (32% of omissions). In 10% of cases, the patient refused the medication; in 19% of cases, no reason for omission was given; and in 0.3% of cases, the patient was away from the unit. There was no correlation between the day of the week admitted and the number of medication omissions related to drug unavailability in the patient care area. In particular, weekends (when the pharmacy runs at a reduced staff level) were no different from weekdays (when the pharmacy is fully staffed).¹

In order to identify prescribing and administration errors, Ghaleb et al. conducted a prospective review of medication charts as well as a prospective observation of nurses preparing and administering drugs. They found that 5% of the errors were omissions—either the drug was not available on the patient care unit or the nurse did not realize the drug was due for the patient.¹⁰

A retrospective review of electronic medication administration records (eMARs),¹¹ which included adult hospitalized patients who were ordered pharmacologic venous thromboembolism (VTE) prophylaxis with unfractionated heparin or enoxaparin over a seven-month period, measured the proportion of ordered doses of VTE prophylaxis not administered. Heparin regimens had higher rates of nonadministration and documented patient refusal than enoxaparin. For example, while medicine floors had significantly higher overall rates of nonadministration and documented patient refusals, heparin regimens had significantly higher nonadministration and documented refusal rates than enoxaparin regimens

TYPES OF OMISSIONS

Following are descriptions of how drug omissions involving intravenous (IV) high-alert medications occurred during the administration node, as reported to the Pennsylvania Patient Safety Authority from January 1, 2013 through April 30, 2013:

- IV accidentally discontinued
- IV bag empty
- IV drug delivery system vial (e.g., Add-Vantage™) not activated
- IV hung but not infusing (e.g., IV pump never turned on or was turned off)
- IV line occluded
- IV medication not sent with patient upon transfer to another unit
- IV not connected
- IV not hung
- IV not started
- IV stopped
- IV tubing clamped when it should have been infusing
- Nurse distracted
- Problem with IV solution bag (e.g., bag defective)
- Wrong IV solution hung and ordered solution not given

on medicine floors. Likewise, on virtually every floor that had substantial use of both heparin and enoxaparin regimens ordered every 12 hours, these rates were significantly higher for the heparin regimens. Nearly 12% of ordered doses of pharmacologic VTE prophylaxis were not administered, nearly identical to rates reported in other studies.^{11,12}

Administration Node

A majority (52.8%, n = 313) of the drug omission reports that involved high-alert medications (n = 593) describe omissions that took place during the administration process. Predominantly, these events involved a medication intended to be given by an intravenous (IV) route (32.9%, n = 103) or other injectable route (e.g., subcutaneous, intramuscular [IM]) (38.0%, n = 119).

Most event descriptions did not provide enough information to determine what may have led to the omission of the medication. Analysis did reveal a variety of types of drug omissions (see “Types of

Omissions”). The most common types of omissions involving an IV high-alert medication included IVs that were not started (7.0%, n = 22), IV tubing that was not connected (3.2%, n = 10), IV tubing that was clamped (2.9%, n = 9), and the IV infusion pump not being turned on or being turned off (2.2%, n = 7).

Following are examples of reports of drug omission errors occurring during the administration process:

[The patient] only had a PCA [patient-controlled analgesia pump] running with KVO [keep vein open] fluids. [The patient] had an order for a heparin drip to be restarted. After assessing the patient and reviewing the orders, I noticed the nurse reviewed an order in the afternoon stating to restart a heparin drip in two hours, per vascular. I called down to see if this order had been discontinued since there was no heparin drip with the patient. The heparin drip was then started at night.

The patient was on a heparin drip. It [was determined] that the prior nurse had changed the IV tubing and never connected it to patient. [The tubing was] under the patient’s bed. The patient had a KVO that had been turned off but never disconnected, which made me think that it was the heparin tubing connected to the patient. When I realized this, I reconnected the heparin tubing, kept the rate the same, and placed an order to recheck the aPTT [activated partial thromboplastin time]. I also notified the charge RN.

The nurse hung a new TPN [total parenteral nutrition] bag with lipids. Two hours later, the nurse assessed the line and found the tubing clamped and fluid leaking from the lipids port, which was loose. Pump did not alarm, indicating problem with line. Hourly blood sugar was lower than previous result. The nurse did not open IV clamp when new bag hung.

Patient admitted with a third-degree heart block, hypotension, and MI [myocardial infarction]. She was on 0.5 mcg/kg/minute of Levophed™ [norepinephrine] and was receiving hemodialysis in her room. When her Levophed beeped to KVO, the dialysis nurse in the room turned the drip off instead of notifying the nurse that the bag needed to be changed.

Transcription Node

The transcription node comprised the second most common (22.9%, n = 136) node where reported omissions of high-alert medications originated. For this analysis, the transcription node included any process that involved the communication of an order after the medication was prescribed and before a medication was dispensed or obtained and administered. The most common types of omissions included orders that were not transcribed



and/or orders that were missed (52.9%, n = 72) and orders that were not transmitted (e.g., faxed or scanned) to the pharmacy or other care area (16.2%, n = 22).

Following are examples of reports of drug omission errors occurring during the transcription node:

Methotrexate order incorrectly listed on emergency department's medication reconciliation form as [two doses daily]. [Order was] clarified to weekly. However, when transcribed, the two doses were transcribed to begin one week apart. Patient missed [one] dose (seeking additional clarification of schedule) and potentially would have missed [a second] dose if the error was not detected.

While doing the 24-hour chart check, it was noted that an order was written on the VTE risk assessment sheet for Lovenox® [enoxaparin] 40 mg subcutaneous once daily. The order was never faxed to the pharmacy, and in turn, the patient missed two doses of the medication. Once discovered, the order was immediately faxed, verified on the MAR, and signed off.

Prescribing Node

The third most common node involved in reported omissions of high-alert medications was the prescribing node (12.0%, n = 71), which, for this analysis, included any activity pertaining to the ordering or reordering of a medication. The most common classes of high-alert medication mentioned in omissions occurring during this node were anticoagulants (63.4%, n = 45), insulin (12.7%, n = 9), and TPN therapy (7.0%, n = 5). Medication classes such as anticoagulants and TPN are often ordered with the expectation that a new order will be written daily or an order is automatically stopped and the medication would not be administered until the next new order is written. The most frequently noted breakdown in the prescribing

process for anticoagulants involved problems with the reordering process (44.4%, n = 20), such as prescribers not being called to write new orders, orders being discontinued and not rewritten, or orders not being written due to the unavailability of lab results.

Following are examples of reports of drug omission errors occurring during the prescribing node:

Patient was on Coumadin® [warfarin sodium] for atrial fibrillation. The patient missed two days of Coumadin secondary to the medication not being ordered. This was noticed on the day of discharge back to outside facility. Medication ordered for outside facility.

Patient did not receive evening dose of warfarin because the INR [international normalized ratio] was not available. Order for warfarin was placed by the physician's assistant, but recent order set change does not prompt nonphysicians to order an INR for warfarin [on the first day of administration]. Previously, this "ONCE" INR was prechecked in the order set.

At a 658-bed academic hospital with computerized prescriber order entry (CPOE) that lacked electronic medication administration charting, a retrospective manual chart audit compared expected (from CPOE) and actual timing of medication administrations.¹³ The analysis showed that the most common event involved dose omissions (12.6%). The authors concluded that while inpatient CPOE orders are legible and can be conveyed electronically to nurses and the pharmacy, unit-based medication administrations do not consistently occur as ordered. As more facilities use CPOE systems to enter drug orders, drug omission events may originate from issues associated with these systems. Of the events in the prescribing phase reported to the Authority (n = 71), nine (12.7%) involved electronic systems and eight (11.3%) involved anticoagulants.

Examples of these events include the following:

A 60-year-old inpatient was admitted status post right femoral rodding. The patient was ordered Arixtra® [fondaparinux sodium] 7.5 mg [treatment dose], but when the nurse rescheduled the medication, the order date ended and dropped off the active orders. The patient missed doses for two days. On the third day, it was discovered the patient missed two doses, and the Arixtra was reordered.

Physician wanted to restart patient's heparin drip at night. He entered the order through CPOE as a nursing communication instead of choosing the heparin drip and picking a start time. Since this order was a nursing communication, pharmacy did not receive any notification to restart the heparin drip. Pharmacy was not aware that there was nursing communication that contained a medication order until nursing contacted pharmacy.

An order was entered for warfarin 2 mg po [by mouth] once daily and validated by pharmacy. Because order start time by the physician is after [the prescribed time of administration], the first occurrence for order became [the following day]. The patient missed the dose.

RISK REDUCTION STRATEGIES

The drug omission events submitted to the Authority reveal the complex nature and large variety of factors that contribute to drug omissions. While medication omissions are often thought to occur or originate primarily during the administration process, omission errors were identified in all phases of the medication-use process. Unfortunately, most of the PA-PSRS event reports did not explicitly describe the errors nor disclose the causes and contributing factors linked to the errors; however, these

reports, observations from the Institute for Safe Medication Practices (ISMP), and the medical literature suggest strategies that healthcare facilities may consider to decrease the risk of drug omissions.

Use Healthcare Technology Fully and Properly

Although not always easy to implement, technological innovations can enhance patient safety.¹⁴ Paper transcription omissions may be avoided with CPOE systems that integrate with eMARs and pharmacy computer systems. The need to identify pending orders in a paper chart and then transcribe the order to a paper or eMAR as well as send the order to the pharmacy can be eliminated.

Technology could help to reduce omissions in the following ways:¹⁵

- A bar-code medication administration (BCMA) system or eMAR could help to detect omissions caused by simple oversights when the drug was administered but administration was not documented or when administration was intentionally held or omitted but neither the omission nor the reason were charted. However, some unexplained omissions are likely to continue even with real-time BCMA and eMAR systems. For example, nurses might fail to give a scheduled dose or chart a reason when they unexpectedly have to attend to a life-threatening emergency for a patient in a room nearby to the index patient.
- BCMA and eMAR systems could reduce some omissions that occur because the nurse is unaware of the order. New orders are readily available in the eMAR, thus eliminating the need to monitor and track down multiple paper charts. However, these systems would not impact errors of omission that occur due to the nurse's urgent duties elsewhere. In addition, BCMA and eMAR systems

typically do not serve as order notification vehicles, so the nurse must actively look elsewhere for new medication orders.

- eMAR technology can help reduce the risk of drug omissions through the use of signals or alerts to remind nursing when a dose is due.

The author also noted that errors due to a wrong or erroneous actual medication order could potentially increase with the implementation of BCMA and eMAR technology.¹⁵ The current lag between ordering and administration (predominantly for “stat” or “now” orders) allows time for corrections when faulty orders are detected, whereas the window for corrections would be greatly reduced with BCMA and eMAR technology replacing the slower manual transcription process.

The use of well-designed standard order sets for high-alert medications, whether electronic or paper formats, have the potential to reduce variation and unintentional oversight through standardized formatting and clear, predictable presentation of orders.¹⁶ For example, order sets that include medications appropriate to the condition and available in a facility's formulary may help to reduce the incidence of missed orders.

However, medication administration discrepancies are likely to persist even after implementing CPOE and other electronic systems unless interventions are made to address workarounds and usability issues. In fact, while historical studies have shown error reduction up to 81%, CPOE systems can also lead to error risk.¹⁷ Therefore, these systems need to be continually examined and enhanced. Many factors such as system, user, organizational, and environmental attributes, as well as level of support from others, can impact successful adoption of technology.¹⁸ Technical design of the system is also important, as staff acceptance and use of technology can be impacted by the technology's usability and usefulness.¹⁹

Transcribing and Communicating Orders

ISMP has observed that the following strategies can be used to identify contributing factors of omissions related to the transcribing and communication of orders:

- Ensure that there is a standardized and consistent process in place for reviewing the previous day's MAR and validating whether any new medications have been ordered prior to transcribing information to the new record.
- Standardize the way in which nursing personnel designate a discontinued order and how new orders are added to the MAR or eMAR. If using a paper-based system, provide nurses with the ability to print a new MAR at any high-risk transition point in the patient's stay (e.g., new admission, transfer, postoperative).
- If a paper-based ordering and documentation system is currently in use, convene a group of staff involved in these processes to determine the risk points in identifying when orders are handwritten and need to be further transcribed and communicated, in part to avoid repeated duplication and possible error.
- Establish a process to track and trend any identified MAR omissions. For example, in organizations with pharmacy-generated MARs, nurses on the night shift perform a verification process as soon as the new MARs are delivered to the units. Inform pharmacy of any discrepancies and allow time for pharmacists to review and investigate reported variances, make corrections to the MAR if needed, and communicate changes back to the nursing unit. Reports of MAR discrepancies due to omissions should continue to be collected and used for safety and quality initiatives in order to identify patterns, trends,



causes, and contributing factors, as well as to help create solutions.

- Develop a standardized workflow for pharmacists performing order entry in which they self-check sheets of orders for omissions. Many computer systems include electronic notation capabilities that can be leveraged for this purpose.

IV Administration of High-Alert Medications

Developing a consistent process, including standardized policies and procedures, for IV medication setup to support identification of IV lines that are not connected to the patients despite being placed within an infusion pump, IV pumps that are not turned on, and IV tubing that is clamped can help reduce the risk of IV infusion omissions. ISMP suggests that “when using multiple channel pumps, nurses should handle just one IV solution at a time.”²⁰ Physically tracing the line can help ensure that the correct channel has been used to program the infusions as well as confirm that the IV line has been connected to the patient at the correct

port. The Joint Commission recommends tracing all lines back to their origin before connecting any devices or infusions.²¹ In addition, nurses could hang the high-alert solution, prepare it for infusion, and then have another nurse independently validate the original order, the patient’s identification, the dose and concentration, the insertion site (route), and the pump or channel setting before initiating the infusion.²⁰

Affixing a label with the name of the drug to each IV line, at the end closest to the patient and above each channel on the pump, may help prevent omissions with infusions and may also help prevent errors if tubing has to be detached from patients during procedures, imaging, or transfers. While this additional labeling alone should not be used to identify the medication, the labels can aid practitioners in line tracing and independent double checks.

CONCLUSION

Analysis of drug omission reports involving high-alert medications submitted to

the Authority reveals that these events take place across the continuum of the medication-use process. While the majority of reported events took place during the administration process, omissions can originate in all nodes, even with the use of healthcare technology. Developing more effective technology, using that technology fully and properly, developing a consistent administration process for IV medication setup, tracing IV lines, and standardizing policies and procedures can help to reduce omission errors.

The reports submitted to the Authority reveal the incidence of errors, the severity of errors, and the frequency with which high-alert medications are not administered to the patient. Using this information to raise professional staff awareness of the prevalence of omission errors is likely to be helpful, as a lack of research and data in the field has contributed to low appreciation of this common threat to safety. It is important to note that more research must be done to determine the exact causes of drug omissions and the best risk reduction strategies for drug omission.

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Decision Tree Helps Standardize Reporting of Falls Event Types

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ABSTRACT

Toileting-related falls are estimated to account for approximately 50% of inpatient falls; however, in Pennsylvania, in 2012, only 12.8% of reported falls were toileting-related. Falls event reporting through the Pennsylvania Patient Safety Reporting System (PA-PSRS) requires entry of a single falls event category selected from a list of 13 choices. Pennsylvania Patient Safety Authority analysts noted variations in event type reporting: 22.8% of found-on-floor falls event reports and 11.3% of other/unknown (i.e., unspecified) category event reports were determined to be toileting-related falls. To standardize and improve the reliability and validity of reporting the type of patient fall, a PA-PSRS falls event type decision tree was developed and released in 2012 in collaboration with the PA-PSRS falls reporting program. A two-year analysis of hospital Serious Event falls reports submitted by hospitals enrolled in the PA-PSRS falls reporting program before and after release of the decision tree revealed a 5.7% increase in reports of toileting-related falls. This increase may signal that the specificity of falls event reporting can be improved through the use of the decision tree. (*Pa Patient Saf Advis* 2014 Dec; 11 [4]:156-62.)

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INTRODUCTION

Falls are among the most frequently reported events to the Pennsylvania Patient Safety Reporting System (PA-PSRS).¹ In 2012, the Pennsylvania Patient Safety Authority developed and released a new falls reporting program through PA-PSRS to address the need to provide falls rate benchmarking data and process measure reports to hospitals. A key element of this program is the standardization of the definitions of falls and falls with harm and several other data fields, including new data fields (e.g., inpatient status) and existing data fields (e.g., falls event type), to ensure all participating hospitals identify, measure, and report falls in the same manner.

PA-PSRS falls event types were identified with the establishment of PA-PSRS, reflecting event types that range from activity-based descriptions to stationary or location-based descriptions.² There are 13 different falls event type choices in PA-PSRS, of which healthcare staff can choose only one event type to describe a fall when reporting; see “PA-PSRS Falls Event Types and Definitions” for more information.

Why Focus on Falls Event Types?

In 2012, a question was raised by a Pennsylvania hospital about how to select a PA-PSRS falls event type when there was more than one appropriate option. In the case described, a patient was utilizing a walker and ambulating to the bathroom with a staff member when the patient began to lose balance and was assisted to the floor—should this be classified as an assisted falls or a toileting-related fall?²

Reporting variations can be caused by a lack of a standardized approach among people filling out the falls event reports; incomplete information when reporting; fear of blame, repercussions, or punitive actions; limitations in the transfer of pertinent information from the primary reporter to the designated reporter; insufficient staff education on appropriate methods of filling out the event reports;³ or constraints imposed by the design of the reporting system.

Why Toileting-Related Falls?

Toileting-related falls are estimated to account for approximately 50% of all falls.^{4,8} Yet in Pennsylvania, in 2012, 12.8% of reported falls were submitted as toileting-related. This low percentage of toileting-related falls led to an examination of report narratives, which revealed a subset of PA-PSRS found-on-floor and other/unknown falls event reports that described falls related to toileting activities.

An analysis of one year of baseline PA-PSRS data (January through December 2012) revealed that 12.8% of falls (n = 4,528 of 35,358) were attributed to toileting-related activities, 33.0% of falls (n = 11,682) were attributed to the found-on-floor falls event category, and 7.7% of falls (n = 2,716) were attributed to the other/unknown falls event category. The identification of toileting-related falls embedded in the found-on-floor and other/unknown event type categories demonstrates variations in reporting.

Following are a few examples of toileting-related narratives reported through PA-PSRS as found-on-floor falls:

The patient needed to go to the bathroom but did not call so as to not bother [the staff]. [The patient] took the water cup and came into the bathroom, voided in the water cup, and poured the specimen into the toilet to maintain accurate output. Somehow when he was dumping the cup or trying to void, he fell to the floor, hitting his left forehead and left elbow. The patient pulled the call light cord in the bathroom, and no one knew he was in the bathroom.

PA-PSRS FALLS EVENT TYPES AND DEFINITIONS

The following are the Pennsylvania Patient Safety Reporting System (PA-PSRS) falls event types and their definitions:

- Ambulating: Patient falls while walking anywhere within the facility (not associated with toileting activities).
- Assisted: A caregiver sees a patient about to fall and intervenes, lowering them to a bed or floor. This includes therapeutic falls.
- Found on floor: Patients are found on the floor and the reason for the patient being out of the bed cannot be identified.
- From stretcher: Patient falls off a stretcher, even if the patient is being transferred.
- Grounds of facility: Patient falls in a non-care-area unit, such as the cafeteria or admissions office.
- Hallways of facility: Patient falls in a unit hallway or elevator. This event type can be used for environmental falls, such as when a fall occurs due to the floor being wet.
- In the exam room/from the exam table: Patient falls while receiving services that require the patient to use an exam table or room, such as a radiology room, operating room, or a physician's office.
- Lying in bed: Patient falls out of bed. For example, this situation can occur when one or more siderails are not up or when a patient is reaching for an object while in bed.
- Other/unknown (e.g., unspecified, intentional): The fall is not clearly identifiable from the other 12 choices or is an unanticipated physiologic fall (e.g., seizure or other medical condition at the time of the fall).
- Sitting at side of bed: Patient falls after sitting at the side of the bed when getting ready to stand, eat a meal, move to a chair, or stand to determine stamina.
- Sitting in chair/wheelchair: Patient falls out of a chair or wheelchair while sitting, getting ready to stand, moving back to bed, or lowering into a chair or wheelchair.
- Toileting: Patient falls while leaving the bed and going to or coming from the bathroom or when standing up to use the bedside commode, bathroom commode, or urinal. This event type includes patients who are found on the floor while in the process of going to or returning from the bathroom or bedside commode for elimination purposes.
- Transferring: Patient falls while transferring from stretcher to bed or wheelchair to bed or while being transferred off the unit to a different unit or department, such as the physical therapy department.

Source: Pennsylvania Patient Safety Authority. Falls event type decision tree for hospital users [memorandum]. Program memorandum no. 2012-06. 2012 Dec 20.

Patient found on floor in the bathroom. Patient stated, "I was in a hurry to have a BM [bowel movement] and tripped going into the bathroom."

The patient had been seen by physical therapy. After the session was

completed, the patient was placed in a chair. The patient attempted to go to the bathroom independently, became incontinent of urine, slipped, and fell on their buttocks. The chair alarm was not in place.

Toileting-related falls are not the only event type categorized as found-on-floor or other/unknown falls events; medical conditions, ambulating-related falls, and assisted falls are additional examples of event types that have been categorized as found-on-floor or other/unknown falls events. Examples of other/unknown PA-PSRS falls event narratives that Authority analysts deemed non-toileting-related are as follows:

The nursing assistant found the patient supine on the floor. The patient's blood sugar was 57. The patient was assisted into bed and denies pain. The patient stated, "I don't remember what happened."

An inpatient who was admitted post-op after [major surgery] cried out for help after falling onto his buttocks from the side of the bed when reaching for his eyeglasses.

Defining Toileting-Related Falls

In her research, Tzeng (2010) conceptualized toileting to include both the process of going to the toilet and the intention of going to the toilet. In this study, toileting referred to all activities that were intended to relieve elimination needs, including getting out of bed, moving from the bed to the bathroom, entering the bathroom, using the toilet, stand-to-sit and sit-to-stand movements, moving from the bathroom to the bed, and getting back to bed. Tzeng concluded that "this study should be repeated to investigate any differences in the prevalence of toileting-related falls incidents across different types of hospitals and inpatient care units. This effort would allow nursing staff and managers to allocate scarce healthcare resources to various falls prevention initiatives in a more efficient manner by, for example, prioritizing falls prevention strategies on the basis of the most prevalent toileting-related falls that occur in their work settings."⁸

Variations in the reporting of PA-PSRS falls event types and the request for how to select falls event types led to the development of a decision tree.

Utility of Falls Event Data

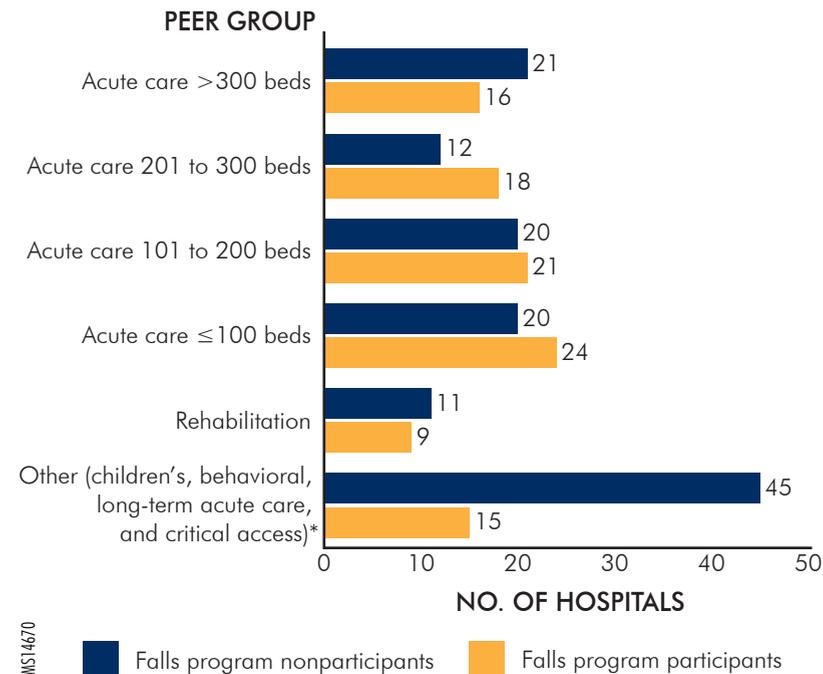
A falls dashboard provided by the new PA-PSRS falls reporting program contains two tables (see the online version of this article for an example) that identify the top three falls event types individualized for each reporting facility, combined with (1) patient characteristics present at the time the patient fell (e.g., altered elimination needs) and (2) falls prevention strategies that were in place at the time the patient fell. If toileting-related falls are one of the top three event types reported through PA-PSRS by a specific facility, the falls event table will display the number of patients with a toileting-related fall who also had altered elimination needs, an altered mental status, or other relevant patient characteristics.

Development of the Falls Event Decision Tree

The falls event decision tree provides a systematic approach to evaluate the circumstances surrounding falls and to standardize falls reporting. The decision tree contains a series of questions in a yes/no format that guides staff in identifying the falls event type that best reflects the patient's circumstances. The decision tree can be accessed at <http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/falls/Pages/home.aspx>.

The reporter starts by dividing patients into categories based on whether a patient is conscious or there is a reliable witness to the fall. The next two questions exclude falls that were intentional or the result of a medical condition (e.g., a seizure). If the answer to both questions is no, then these falls are considered unplanned, unanticipated falls. The reporter next evaluates the patient's mobility (i.e., whether patients were stationary or ambulatory)

Figure 1. Number of Hospitals by Falls Reporting Program Participation (N = 232)



* Peer groups with less than five hospitals were grouped together.

when the fall occurred. The answer to the mobility question separates the choice of possible event types in half. The found-on-floor and other/unknown falls event types are category selections for use only when the more descriptive options are not appropriate.

The decision tree was pilot-tested by 13 hospitals participating in the falls program; 76.9% of responding hospitals (n = 10 of 13) found it useful. One year after the release of the PA-PSRS falls decision tree, the Authority's 2013 annual survey of hospitals asked respondents enrolled in the falls reporting program if they used the falls event decision tree and whether it was useful. Seventy-one percent of responding hospitals (n = 27 of 38) indicated that they found the falls event type decision tree very useful, moderately useful, or somewhat useful.¹ In light of positive results from both the pilot and

the survey results, an investigation was performed to determine if there were changes in the assignment of falls event types among hospitals participating in the falls reporting program. See "PA-PSRS

PA-PSRS FALLS REPORTING PROGRAM ENROLLMENT

The Pennsylvania Patient Safety Reporting System (PA-PSRS) falls reporting program is a computer-based program for hospitals to receive falls analytic reports (e.g., falls dashboard, falls rates with benchmarking data) based on their own falls data submitted through PA-PSRS. The program requires hospitals to standardize the definition of falls and falls with harm and enter utilization data (e.g., patient-days) into PA-PSRS. Enrollment is available to Pennsylvania hospitals through PA-PSRS.

Table 1. Change in Serious Event Falls Reporting for Hospitals Enrolled in the Falls Program (103 hospitals with 1,128 falls)

FALLS EVENT TYPE	NO. OF FALLS-RELATED SERIOUS EVENTS		% CHANGE IN PROPORTION OF FALLS EVENT TYPES
	2012 (n = 603)	2013 (n = 525)	
Toileting	84	103	5.7
Sitting at side of bed	7	20	2.6
From stretcher	6	8	0.5
In the exam room/from the exam table	7	8	0.4
Hallways of facility	7	8	0.4
Sitting in chair/wheelchair	38	34	0.2
Lying in bed	29	25	0.0
Grounds of facility	10	8	-0.1
Transferring	20	12	-1.0
Ambulating	123	99	-1.5
Other/unknown	43	27	-2.0
Assisted	20	6	-2.2
Found on floor	209	167	-2.9

Falls Reporting Program Enrollment” for information on enrolling in the program.

METHODS

Analysts queried the PA-PSRS database for hospital-based falls Incidents and Serious Events reported from January 1, 2012, through December 31, 2013.

Analysts excluded hospitals that did not report falls events during both calendar years, because the absence precluded a comparison of falls event type reporting before and after release of the decision tree. Also excluded were hospital falls events from outpatient surgical centers. Hospital characteristics (i.e., program participation and PA-PSRS peer-group designation based on bed size and specialty status) were assigned to each falls event report.

Analysts categorized the falls events into two groups: (1) hospitals enrolled in the PA-PSRS falls reporting program and (2) hospitals not enrolled in the program. Two sets of analyses were performed to see if there were changes in how falls

event types were reported. For the first analysis, chi-square and Cramer’s V statistical tests were conducted to determine any statistically significant difference in event type reporting and the effect size of any changes in the selection of event types related to enrollment in the falls program.

Given that (1) the decision tree had only been available to hospitals since December 2012, (2) hospitals enrolled in the falls program with access to the falls dashboard were more likely to use the decision tree, and (3) new practices take time to spread,⁹ minimal changes in reporting event types were expected when evaluating the Incident and Serious Event data for 2012 and 2013. This led to the decision to focus the second analysis only on Serious Event reports from hospitals enrolled in the program in 2012 (i.e., before decision tree release) and 2013 (i.e., after decision tree release). Chi-square and Cramer’s V statistical tests were conducted to determine any effect size with the release of the decision tree. A comparison of the percentage change in event reporting between hospitals based

on program participation for the two-year time period was also performed.

A third analysis evaluated the found-on-floor and other/unknown event report narratives with IBM SPSS Modeler data mining and text analytics software to identify toileting-related falls reported within these event categories. The SPSS Modeler extracts and groups reports by terms, acronyms, or combinations of terms identified through manual, nonexhaustive analysis of narratives. The following are a sample of terms used for this analysis: “bathroom,” “bathroom assistance,” “bedpan,” “bedside commode,” “bowel movement,” “commode,” “defecate,” “diarrhea,” “elimination,” “feces,” “frequent loose stool,” “incontinence,” “toilet,” “toileting,” “underwear,” “urinal,” “urinate,” and “void.” In cases where a term identified more than 100 reports, an individual review of the first 100 narratives was performed. If 80% or more of these narratives within the sample indicated a toileting-related fall, all of the reports in that term were counted as toileting-related falls.



RESULTS

Program Participation and Event Reporting

Almost half of Pennsylvania hospitals are enrolled in the falls program (44.4%, n = 103 of 232). Figure 1 shows falls program participation by peer group designation. Hospitals reported 68,804 falls events; 51.9% (n = 35,731) were reported by participants in the falls program and 48.1% (n = 33,073) by nonparticipants.

A chi-square test was used to compare the number of falls reports by event type for hospitals enrolled in the falls program to hospitals not enrolled in the falls program. The chi-square test result was 164.6 (p value < 0.001), and the Cramer's V test result was 0.0489.

Changes in Event Reports Submitted by Hospitals Enrolled in the Falls Reporting Program

A comparison of Serious Event reports between 2012 and 2013 noted a decrease in falls reports in 2013, from 603 to 525. Increases were noted in the change in proportion of falls reported as toileting-related (5.7% increase) and sitting at the side of the bed (2.6% increase). Decreases were noted in the proportion of reports of found-on-floor (2.9% decrease), assisted (2.2% decrease), and other/unknown (2.0% decrease) falls. The chi-square test result was 24.5 (p value = 0.017), and the Cramer's V test result was 0.1475. Table 1 provides a classification of the actual number of falls per category and the percentage change in proportion. Figure 2 shows the percentage change in proportion of falls with harm by falls program participation.

Event Narrative Analysis

The SPSS modeler identified up to 90 different toileting-related terms among the found-on-floor and other/unknown falls event reports for both years. Approximately one-quarter of the found-on-floor falls were

toileting-related, and slightly more than 15% of the other/unknown event reports were toileting-related.

The actual number of toileting-related falls from these two event types were moved (reassigned) from the found-on-floor and other/unknown event categories and placed into the toileting-related event category. Moving these event reports shows how toileting-related circumstances contribute to a greater proportion of falls types. A similar shift was noted in falls reported by hospitals not enrolled in the falls program. Table 2 provides the number and percentage of falls as reported in 2013 and with reassignment.

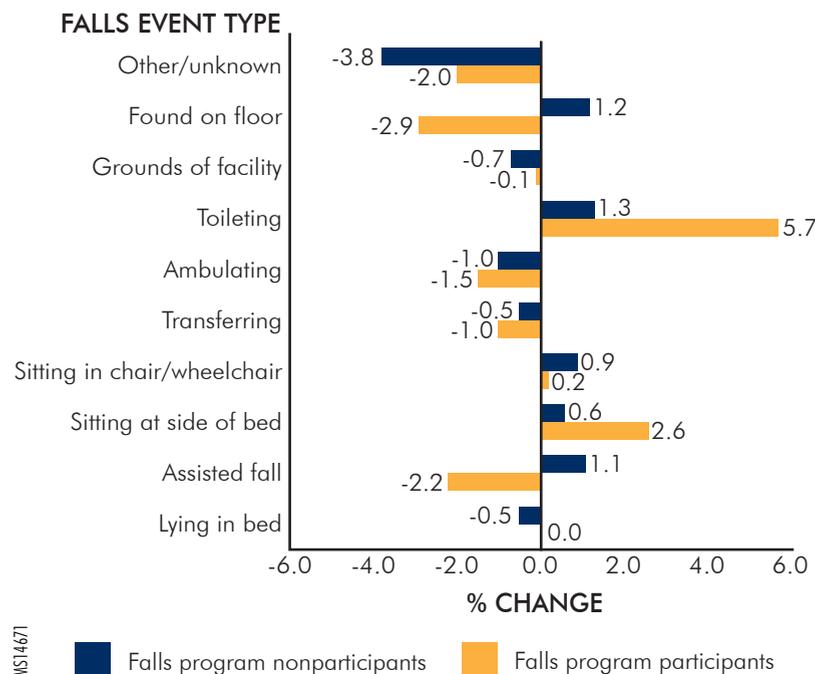
DISCUSSION

The Authority facilitated the development of the PA-PSRS falls reporting program to standardize falls reporting. The falls

reporting program includes the aforementioned decision tree, which is designed as a systematic approach to standardize the reporting of a fall event according to the associated circumstances. Based on the results from the pilot testing and the Authority's 2013 annual survey, it was anticipated that hospitals enrolled in the falls program would report an increased proportion of falls related to toileting. The first analysis compared hospital event reports based on program enrollment. The positive result of the chi-square test is likely due to the large number of falls (n = 68,804); the Cramer's V test demonstrated a very minimal effect in the assignment of falls event types due to program enrollment.

The second analysis, a chi-square test evaluating the change in proportion of reported Serious Event falls by facilities

Figure 2. 2012 to 2013 Change in Proportion of Falls with Harm by PA-PSRS Falls Event Type*



* Pennsylvania Patient Safety Reporting System (PA-PSRS) falls event types with fewer than 10 event reports for at least one time period were not included.

enrolled in the falls program before and after the decision tree was released (i.e., 2012 versus 2013) was statistically significant. The Cramer's V test was indicative of a small effect of the decision tree on event reporting. In this subset (i.e., Serious Event reports from enrolled programs), toileting-related falls reports increased by 5.7% (from 13.9% in 2012 to 19.6% in 2013) and sitting at side of bed falls event increased 2.6% (from 1.2% in 2012 to 3.8% in 2013). While no definitive conclusions can be drawn about the increase in the reporting of toileting-related falls, the positive survey results (from the Authority's annual survey) about the usefulness of the decision tree may help explain the changes in event reporting.¹

An in-depth analysis of the other falls event types is beyond the scope of this article; however, a cursory review of falls identified as assisted falls and ambulating falls uncovered the presence of toileting-related falls being reported as these event types. Assisted falls are identified in the decision tree as occurring when a patient is in physical therapy rather than when the patient is being assisted to the bathroom for elimination purposes. Some falls reported as ambulating falls involved patients who were ambulating to the bathroom when the fall occurred. Even more toileting-related falls are likely to be identified with the use of the decision tree.

The analysis of the event narratives exemplifies the challenge in assigning a falls event type to a single category that best

reflects the circumstances surrounding a fall. The reassignment of falls event types highlights the issue that toileting-related falls may occur more often than the current PA-PSRS data shows. Standardizing and clarifying the assignment of falls event types provides a clearer picture of what is actually happening to patients who fall in an inpatient setting, improves the specificity and validity of the data, and better informs falls prevention programs. Table 3 provides an example of how a found-on-floor fall would be reported using the decision tree.

Improving Falls Reporting

Standardizing the assignment of falls event types using a systematic approach of yes/no questions (i.e., the falls decision

Table 2. Reassignment of Toileting-Related Falls Using 2013 Pennsylvania Patient Safety Reporting System Data

EVENT TYPES	FALLS PROGRAM PARTICIPANTS		FALLS PROGRAM NONPARTICIPANTS	
	2013 REPORTING, NO. (%) OF FALLS	REASSIGNMENT OF FALLS, NO. (%) OF FALLS	2013 REPORTING, NO. (%) OF FALLS	REASSIGNMENT OF FALLS, NO. (%) OF FALLS
Toileting	2,492 (14.4)	3,980 (23.0)	1,921 (11.6)	3,385 (20.5)
Found on floor	5,433 (31.4)	4,068 (23.5)	5,499 (33.3)	4,251 (25.7)
Other	1,387 (8.0)	1,264 (7.3)	1,425 (8.6)	1,209 (7.3)
Total number of falls	17,315		16,527	

Note: Only 3 of the 13 event categories are represented here. The number of toileting-related falls that were identified in the found-on-floor and other/unknown category were subtracted from their respective category and added to the toileting-related falls totals. The percentages of falls by event type were then calculated based on the reassignment. Percentages reflect the proportion of the total number of falls for 2013.

Table 3. Application of the Falls Event Type Decision Tree

EXAMPLE OF CURRENT EVENT REPORTING	APPLICATION OF THE FALLS EVENT TYPE DECISION TREE
<p>When submitting a patient fall event report through the Pennsylvania Patient Safety Reporting System, an event type is selected based on how the situation was perceived by the reporter. The event type selected is found on floor. The event narrative is as follows:</p> <p><i>The patient was found on the floor in the bathroom. The patient states that she was going to the bathroom and got urine on the floor and slipped on it. The patient stated she did not fall, she just sat down. The patient stated that she did not hit her head and no other part of her body was injured except for a skin tear on her left leg. The patient had been walking to the bathroom all day with no problems.</i></p>	<p>The decision tree has a series of yes/no questions that assist the reporter in identifying a falls event type that best describes the underlying circumstances. Using the example narrative, here are the series of questions and the results using the decision tree.</p> <ul style="list-style-type: none"> — Was the patient awake? Yes — Did the patient have an unplanned (unintentional) fall? Yes — Did the patient have a seizure or other contributory medical condition at the time of the fall? No — Was the patient standing or moving when the fall occurred? Yes — Was the patient standing or ambulating for purposes of elimination? Yes — Select event type #7: Toileting fall.



tree) increases the consistency of the data reported back to the falls team and provides falls team members with more reliable information about the circumstances and patient's activities at the time of the fall. The following are ways to engage staff in standardizing reporting:

- Ensure leadership recognizes the value of and supports standardization of adverse event reporting.
- Educate staff about the PA-PSRS falls event type decision tree (what it is and how to apply it in everyday use), and provide the decision tree in convenient locations and formats (e.g., printouts at the point of care, electronic links to the decision tree).
- Show staff the PA-PSRS falls dashboard, which is where the falls event type data is reported.
- Teach staff how applying the decision tree can change the data in the falls dashboard, how to read the tables within the dashboard, and how the information can be used.
- Provide simulations or vignettes for staff to help them learn how to use the decision tree.

- Ensure ongoing educational programs that focus on reporting involve all healthcare staff, including experienced staff and new staff.

Limitations

The use of two years of falls data provided a sizeable database to test the differences between hospitals enrolled versus hospitals not enrolled in the falls program; however, when using such a large database, a statistically significant test result is almost certain. Not knowing which of the hospitals enrolled in the falls program actually used the decision tree prevented a comparison of falls event type reporting based on implementation of the tool. Conversely, personnel in hospitals that were not enrolled in the falls program also had access to the decision tree through PA-PSRS and may have used it when submitting their falls reports; however, not having access to the falls dashboard, this group may have had less incentive to use the decision tree. In addition, the analysts were unaware of any data mining and text analytic software features that would have allowed assignment of other event types within the found-on-floor reports to

mutually exclusive categories; hence, this analysis focused solely on toileting-related event types.

CONCLUSION

Standardized reporting is not a panacea for preventing falls; it is a method to obtain specific data about inpatient falls that teams can use to tailor their falls programs to meet the needs of their patients. A falls event type decision tree was developed to address variability and questions related to categorizing and reporting falls event types. Analysis of reports submitted in the year following release of the decision tree demonstrated a shift in categorization patterns, with a small effect size likely attributable to the decision tree. Education of healthcare staff on the use of the decision tree provides staff with the ability to improve the specificity and validity of reporting falls event types. Continued monitoring of falls event reporting is required to determine if the classification of falls changes over time, resulting in a more precise picture of the circumstances affecting inpatient falls in Pennsylvania.

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A Systems and Behavioral Approach to Improve Hand Hygiene Practice

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ABSTRACT

Despite convincing evidence since the 1840s that improved hand hygiene reduces infection rates, studies show that healthcare worker compliance with hand hygiene is consistently sub-optimal in many healthcare settings. Optimal hand hygiene is a critical component in any process focused on achieving and sustaining zero incidents of healthcare-associated infections (HAIs). Pennsylvania hospitals and nursing homes have reported a slow but steady decline in HAIs through the National Healthcare Safety Network and the Pennsylvania Patient Safety Reporting System. Reliance on current methods to detect hand hygiene compliance—such as direct observation, hand hygiene product use measurement, and electronic monitoring—has been problematic. Implementation of a credible hand hygiene program can be enhanced by integration of systems supporting hand hygiene activities with an understanding of workflow and human behavior. Healthcare facilities may improve hand hygiene practice by applying a multimodal framework of system and behavioral strategies to investigate, understand, and mitigate gaps in infrastructure and behavioral components of hand hygiene. (Pa Patient Saf Advis 2014 Dec;11[4]:163-7.)

INTRODUCTION

Considerable efforts are being made to reduce healthcare-associated infections (HAIs) in Pennsylvania healthcare facilities.¹ According to the Pennsylvania Department of Health, the incidence of HAIs in Pennsylvania hospitals has declined substantially since the passage of Act 52 in 2007. However, the Pennsylvania Department of Health also reported that dramatic improvements in the incidence of hospital HAIs have slowed, and in some cases, improvement regressed slightly from 2011 to 2012.² From 2010—the first full year of nursing home reporting to the Pennsylvania Patient Safety Reporting System (PA-PSRS)—through 2013, there has been improvement in the HAI incidence of most nursing homes. However, in this same time period, the incidence of *Clostridium difficile*–associated diarrhea was unchanged and the reporting of influenza-like illnesses increased.¹

Since Semmelweis discovered in the 1840s that handwashing prevented deaths from puerperal sepsis, studies have continued to show convincing evidence that improved hand hygiene reduces infection rates.^{3,4} Good hand hygiene is recognized as the single most important method for preventing HAIs.⁵ Professional and regulatory agencies expect infection control programs to emphasize healthcare worker adherence to hand hygiene practices.^{6,8} Hand hygiene practice standards have been embraced by the Centers for Disease Control and Prevention, the World Health Organization (WHO), the Joint Commission, the Society for Healthcare Epidemiology of America, and other expert organizations.^{5,9,11}

Despite professional and regulatory guidance, healthcare worker compliance with hand hygiene is consistently suboptimal in many healthcare settings. For example, a 2010 systematic review of hand hygiene compliance studies found a dismal overall compliance rate of 40%.¹² It remains critical for healthcare facilities to optimize basic hand hygiene as they strive for zero HAI incidents. Current regulations and guidelines provide few practical strategies to successfully motivate clinicians to improve hand hygiene practices at the bedside.⁹ The inconsistency and lack of sustainability of methods to motivate healthcare worker compliance suggests that hand hygiene behavior is complex. However, implementation of a credible hand hygiene program can be enhanced by use of systems that address healthcare delivery workflow and human behavior.¹³

HAND HYGIENE COMPLIANCE IN PENNSYLVANIA

Pennsylvania Patient Safety Authority analysts queried the PA-PSRS database for events associated with hand hygiene for the 10-year period of June 2004 through June 2014; the query returned 789 event reports. Analysts reviewed the reports to identify those associated with compliance. Pennsylvania healthcare facilities reported 35 events related to hand hygiene compliance. A sampling of these reports included the following:

- Handwashing was not performed before or after a postoperative dressing change procedure, and no gloves were worn for a dressing change.
- A surgeon did not do a surgical scrub before gowning for the first case, then used foam soap before scrubbing for the second case and touched drapes on the sterile table without being sterile.
- An x-ray tech ignored isolation precautions by not wearing gloves or sanitizing their hands after touching the patient.



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- A nurse did not attempt to clean their hands or wear gloves while accessing a cancer patient’s port, leaving the room twice and not performing hand hygiene or using clean gloves either time.
- An anesthesia provider suctioned a patient’s airway without gloves, wiped his hands on his jacket, and administered intravenous medication without hand hygiene or gloves. The nurse offered him hand sanitizer prior to medication administration, but the physician refused.
- A nurse inserted a rectal suppository in a patient and then performed a blood draw without washing their hands between procedures.

EFFECTIVENESS OF CURRENT HAND HYGIENE METHODS

Alcohol-Based Handrubs

The widespread provision of alcohol-based handrubs (ABHRs) has been shown to improve hand hygiene compliance. ABHRs improve the availability of the product at the point of care, shorten the time necessary to clean hands, and decrease skin irritability with emollient-enriched formulas.^{5,9} Alcohol solutions containing 60% to 95% alcohol are the most effective hand hygiene antimicrobials, with the exception of effectiveness against *Clostridium difficile*, which requires soap and water handwashing to remove spores.⁵ Kendall et al. cite multiple studies from 2002 to 2012 demonstrating improvement in hand hygiene and decreases in HAI rates with implementation of point-of-care ABHR dispensers.¹⁴ Despite this improvement, a 12-month multicenter collaboration focused on ABHRs demonstrated that overall hand hygiene adherence remains low across the country.^{12,15}

Compliance Monitoring

Current methods to detect compliance include direct observation, product measurement, and electronic monitoring. However, reliance on these methods

is problematic because of observer bias, expense, method validity, practicality, and lack of sustainable, effective strategies to use the outcomes to change clinician behavior.⁹ Reliance on these methods has proved ineffective in hardwiring optimal hand hygiene behaviors.

Direct observation. This is the gold standard for assessing hand hygiene compliance, but it is labor-intensive and subject to method variation. Observer bias, the Hawthorne effect, and technical challenges may result in overlooking incidents of contamination before and during the patient encounter.⁹

Product measurement. An increase in the use of product does not verify technique or compliance with the WHO Five Moments for Hand Hygiene.⁹ See “WHO Five Moments for Hand Hygiene” for more information.

Electronic monitoring. Recent technologies have been developed with room entry and wearable motion sensor components that record hand hygiene opportunities, detect when hand hygiene dispensers are accessed, and/or use lights, vibration, or audible alerts to prompt healthcare workers to perform hand hygiene. Electronic

monitoring eliminates observer bias but does not validate technique or compliance with performance of hand hygiene opportunities at the WHO moments 2, 3, and 5.⁹ Electronic monitoring is subject to technical challenges and may require financial investment and ongoing maintenance. In contrast to room entry and motion sensor methods of monitoring, a recent study in two South Carolina hospitals demonstrated that observation via a 24-hour video monitoring system can be used to validate performance of all of the WHO Five Moments for Hand Hygiene.¹⁶

CLOSING THE HAND HYGIENE PRACTICE GAP

Rather than relying on measuring compliance or purchasing new products, it may be more effective to focus available resources on implementation of systems that address healthcare delivery workflow and human behavior.¹⁷ Current research demonstrates that no single intervention can change long-standing patterns of behavior.¹⁸ A multimodal approach has emerged as the best sustainable method to improving hand hygiene compliance. This approach consists of instituting a structured framework of strategies for

WHO FIVE MOMENTS FOR HAND HYGIENE

According to the World Health Organization (WHO), the five moments for hand hygiene that will most effectively interrupt microbial transmission during patient care are as follows:

1. Before touching a patient: protects patients from harmful organisms on healthcare workers’ hands
2. Before clean/aseptic procedures: protects patients from harmful organisms on themselves or the healthcare worker
3. After body fluid exposure risk: protects the healthcare worker and the environment from the patient’s harmful organisms
4. After touching a patient: protects the healthcare worker and the environment from the patient’s harmful organisms
5. After touching patient surroundings: protects the healthcare worker and the environment from the patient’s harmful organisms

Source: World Health Organization. Five moments for hand hygiene [online]. [cited 2014 Nov 3]. http://www.who.int/gpsc/tools/Five_moments/en

hand hygiene compliance with the additional focus on the internal and external determinants of behavior changes.^{11,19} A tool to facilitate mapping strategies to specific staff beliefs and behaviors, entitled Decision-Making Map to Improve Hand Hygiene Behavior, is available on the Authority's website at <http://patient.safetyauthority.org/EducationalTools/PatientSafetyTools/Pages/home.aspx>.

COMPONENTS OF A MULTIMODAL APPROACH

Assess Barriers to Hand Hygiene

A robust hand hygiene improvement program begins with assessment of barriers to optimal practice. A facility-specific assessment targets hand hygiene systems problems, workplace reminders, safety climate, training, evaluation, and feedback on resources, knowledge, compliance, and leadership. A sample of a barrier assessment, Hand Hygiene Self-Assessment Framework 2010, is available on the WHO website at http://www.who.int/gpsc/country_work/hhsa_framework.pdf.

Survey Hand Hygiene Behaviors and Beliefs

It is critical to assess healthcare workers' beliefs about hand hygiene to target internal motivators (such as attitude, social norms, perceived control, and intentions) and external motivators (such as the activity level in the work setting and the location of hand hygiene stations). An example of a behavior belief survey, the Perception Survey for Health-Care Workers, is available on the WHO website at http://www.who.int/gpsc/5may/tools/evaluation_feedback/en.

Institute a Hand Hygiene "Bundle"

Key components of a bundle of hand hygiene interventions include the following:¹⁸

- Integrate administrative and leadership support with the healthcare facility quality improvement effort.

- Institute a multidisciplinary team to coordinate implementation.
- Determine the effectiveness of preventive strategies with ongoing monitoring and timely feedback about HAI rates and hand hygiene compliance.
- Implement methods to reinforce behavior and accountability, including education, reminders, and support for appropriate hand hygiene behavior.

These components are consistent with the WHO key elements of a hand hygiene program, which include system changes and strategies to ensure available resources, training, monitoring, performance feedback, workplace reminders, and institution of a safety climate.¹¹

Map Specific Strategies for Hand Hygiene Compliance to Behaviors

Valuable strategies to improve hand hygiene behaviors correlate with individual beliefs that influence the intention to perform hand hygiene.²¹ The behavioral determinants of intention include the following:

- The person believes that hand hygiene at the point of care prevents the spread of organisms and patient harm from HAIs.
- The person believes that hand hygiene compliance is expected and valued by peers, supervisors, and patients.
- The person believes that they have control over the resources necessary to comply with hand hygiene and can remove barriers to performance.

The results of a behavior, belief, and/or barrier assessment will indicate which motivators need to be targeted. Studies have shown that mapping specific interventions to these internal and external motivators of behavior can increase healthcare worker hand hygiene performance. Multiple strategies to address these

behavioral motivators have been documented in the literature.^{13,18,20,22}

Strategies to enhance staff behavior beliefs that hand hygiene prevents HAIs include the following:¹⁴

- Explain the rationale and science behind the WHO Five Moments for Hand Hygiene.
- Require that a clinical role model provide hand hygiene education that is specific to the various staff members' job tasks.
- Use visual aids, such as a fluorescent marker to demonstrate organism transfer.
- Define administrative goals and targets for hand hygiene for all staff.
- Institute persuasive communication moments, such as one-to-one point-of-care conversations by leadership on the value of proper hand hygiene.
- Post intranet screensavers and various changeable visual reminders by the sinks, mirrors, doors, or charts.
- Provide feedback, at staff meetings or group sessions, on successful hand hygiene efforts as well as episodes of patient harm from HAIs.

Strategies to enhance the belief that hand hygiene compliance is valued and expected by administrators, role models, peers, and patients include the following:¹³

- Engage staff and physicians as active role models.
- Require a signed contract or commitment to formulated hand hygiene goals.
- Develop, distribute, and practice peer-to-peer talking points.
- Provide visible praise, encouragement, and/or material rewards in recognition of successes.
- Include hand hygiene compliance/performance evaluations in annual performance and competency evaluations.
- Make hand hygiene compliance a credentialing requirement.



- Empower patients to speak up using patient report cards.
- Have staff wear the Joint Commission’s “Ask me if I’ve washed my hands” buttons.¹⁰

Strategies to increase the person’s belief that they have control over resources for good hand hygiene performance include the following:¹³

- Ensure availability of ABHR or handwashing stations at the point of care in all patient care areas.
- Develop a system to ensure soap, ABHR stations, and towels are stocked, functional, and convenient.
- Install a touchless hand lotion dispenser in all work areas to prevent skin irritation from multiple handwashings.
- Practice integrating missed opportunities for hand hygiene into high-workload situations.
- Demonstrate methods to integrate hand hygiene into workflows and to keep up with the workload while maintaining good hand hygiene.

Intervene to Address Disruptive Behaviors

If hand hygiene compliance is not achieved after application of all of the previously mentioned strategies, closer investigation may uncover that systems or belief barriers remain. If noncompliance appears to be the result of reckless or unprofessional behavior, then an alternative approach may be necessary to manage the behavior.

A graduated intervention scale entitled the disruptive behavior pyramid has been described as an effective measure to curtail reckless hand hygiene behaviors when other methods have failed.²³ This scale focuses on four escalating interventions: (1) informal conversation for a single incident of not performing hand hygiene, (2) nonpunitive awareness interventions if a pattern of poor hand hygiene exists, (3) leader-developed action plans for persistent noncompliance with hand hygiene, and (4) if all other strategies have been exhausted and the individual has been educated and coached but noncompliance continues, corrective action to hold the healthcare worker accountable for reckless hand hygiene behavior.

CONCLUSION

Healthcare facilities may fall short of goals to improve hand hygiene compliance if that improvement is dependent solely on the availability of ABHR stations, the deployment of current monitoring methods, and compliance with regulatory and professional standards and guidelines. Implementation of a credible hand hygiene program can be enhanced by using systems that target healthcare delivery workflow with strategies that influence healthcare worker behaviors and integrate handwashing into patient care activities. Studies have shown that mapping specific interventions to internal and external motivators of behavior can improve healthcare worker hand hygiene performance. A multimodal framework of system and behavioral strategies is vital to investigate, understand, and mitigate gaps in hand hygiene compliance; remove obstacles to hand hygiene performance; and convince healthcare workers that hand hygiene compliance is valued, expected, and important.

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LETTER TO THE EDITOR: UTERINE POWER MORCELLATION—WHAT ARE THE RISKS?

Are you able to provide information about the risk of spread of unsuspected malignancies by the use of power morcellation in gynecological surgery? There are reported instances of cancers which have been found in pathologic examination of morcellated specimens. Thank you.

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Editor's Note

Thank you for your inquiry regarding the risk of spreading unsuspected malignancies by use of power morcellation in gynecologic surgery. This procedure received national attention this past year. In April 2014, the US Food and Drug Administration (FDA) issued a safety communication stating, "If laparoscopic power morcellation is performed in women with unsuspected uterine sarcoma, there is a risk that the procedure will spread the cancerous tissue within the abdomen and pelvis, significantly worsening the patient's likelihood of long-term survival. For this reason, and because there is no reliable method for predicting whether a woman with fibroids may have a uterine sarcoma, the FDA discourages the use of laparoscopic power morcellation during hysterectomy or myomectomy for uterine fibroids."¹

In July 2014, FDA's Obstetrics and Gynecology Devices Panel of the Medical Devices Advisory Committee held a two-day conference to provide advice and recommendations to FDA,² and Wright et al. identified a prevalence of 27 uterine cancers per 10,000 women who underwent morcellation.³ Johnson and Johnson had already stopped the sale of its laparoscopic power morcellators in April 2014,⁴ and in July 2014, it withdrew its power morcellators from the market worldwide.⁵ In November 2014, FDA released an immediately-in-effect guidance document recommending that manufacturers of laparoscopic power morcellators include a boxed warning and two contraindications in their product labeling.⁶

While there are published cases of this issue in the literature, the Pennsylvania Patient Safety Authority analysts were unable to locate any events reported through the Pennsylvania Patient Safety Reporting System (PA-PSRS) that addressed the use of power morcellation or a morcellator in gynecologic surgeries. The time interval between the use of power morcellation in gynecologic

surgery and the evidence of the spread of uterine cancer makes it unlikely that this type of event would be captured in PA-PSRS.

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Assessment Tools Help Diagnose Obstructive Sleep Apnea

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ABSTRACT

Obstructive sleep apnea (OSA) is a common sleep disorder that may first be diagnosed when a surgical patient presents for preadmission testing. OSA is characterized by partial or complete obstruction of the upper airway during sleep and can present significant problems in the perioperative period, including difficult airways, increased sensitivity to anesthetic agents, and postoperative adverse events. Analysis of reports submitted to the Pennsylvania Patient Safety Authority over five years identified 99 OSA-related events. Thirty-three reports were classified as Serious Events associated with patient harm. An article published on OSA and the risk it places on positive postoperative outcomes was presented in the September 2007 issue of the Pennsylvania Patient Safety Advisory. The article offered an OSA screening tool to use during preoperative evaluation. Since 2007, additional assessment tools, such as the STOP-Bang questionnaire, have become available to help facilities identify and manage patients at high risk for this condition. (Pa Patient Saf Advis 2014 Dec; 11[4]:168-71.)



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INTRODUCTION

Obstructive sleep apnea (OSA) is a syndrome characterized by periodic, partial, or complete obstruction of the upper airway during sleep.¹ It is the most prevalent sleep disorder in the adult population, and studies have found the frequency of OSA is higher in patients presenting for surgery than in the general population.² In the perioperative period, both pediatric and adult patients with OSA, even if asymptomatic, present special challenges that must be addressed to minimize the risk of morbidity or mortality.¹

Chung et al. indicate that OSA affects 2% to 26% of the general population.³ Symptoms associated with OSA include snoring, excessive daytime somnolence, and restless sleep. Risk factors associated with OSA include male gender, smoking, alcohol consumption, older age, larger neck circumference, and obesity. OSA is associated with a number of medical comorbidities, including hypertension, heart failure, myocardial infarction, diabetes, and stroke.⁴

Events reported through the Pennsylvania Patient Safety Reporting System (PA-PSRS) indicate that OSA conditions that are not detected during the preoperative screening and assessment process may place patients at increased risk for postoperative complications requiring hospital admission.

An article published on OSA and the risk it places on positive postoperative outcomes was published in the September 2007 issue of the *Pennsylvania Patient Safety Advisory*. Analysis was performed on about 250 reports in which OSA was identified over approximately three years. About 20% of these reports were classified as Serious Events, including three deaths. The article indicated that sleep apnea was present in the medical history in the majority of the reports.⁵

As a result of the analysis, the article offered an OSA preoperative screening tool to use during preoperative evaluation. Since 2007, assessment tools, such as the STOP-Bang questionnaire,⁶ have become available to help facilities identify and manage patients at high risk for this condition.⁷

METHODS

To determine the scope of recent OSA events within the database and how OSA affected postoperative outcomes, a search of PA-PSRS was performed of events occurring from January 2009 through 2013. Using the keywords “sleep apnea” and “PAP” (positive airway pressure), about 1,500 records were returned for analysis.

The reports included medical and surgical patients in both ambulatory surgical facilities and hospitals. OSA was either present in the patient's medical history or was identified after an event occurred. Analysis of the reports showed OSA was identified in 99 reports of an OSA-related event. Thirty-three (33.3%) of the reports were classified as Serious Events associated with patient harm.

A comparison of the data analyzed in the September 2007 article was considered, but the search terms and data fields in the 2007 analysis were not comparable to the analysis for this article. A literature search was also performed for studies completed after 2007 (i.e., since the analysis conducted for the September 2007 *Advisory* article) to review any information published after that time about OSA. Several studies were returned that provided OSA assessment tools, such as the American Society of Anesthesiologists checklist, STOP questionnaire, and the STOP-Bang questionnaire, to help prevent OSA-related events.

RESULTS

Analysis of event reports showed a downward trend, with 27 OSA-related events occurring in 2009, 23 in 2010, 20 in 2011, 14 in 2012, and 15 in 2013. Review of the event narratives suggests OSA conditions that are not detected during the preoperative screening and assessment process may place patients at increased risk for postoperative complications.

Seven issues of concern when OSA was diagnosed during the perioperative or postoperative periods were identified. The following are examples of the reports in these categories:

1. Cancellation on the day of surgery
Patient presented for surgery in an outpatient setting. Has a history of sleep apnea, so procedure cancelled at this time. To be rescheduled for a later date at the hospital.
2. Extended length of stay in the post-anesthesia care unit (PACU)
While in PACU, patient experienced periods of apnea and had a difficult time maintaining her oxygen saturation levels despite numerous attempts to encourage deep breathing. Patient presents as morbidly obese. Surgeon and anesthesia notified.
3. Postoperative reintubation
The patient was reintubated when the oxygen saturation levels dropped. Patient was monitored and then extubated prior to leaving PACU. It is noted the patient has a history of significant sleep apnea and in the past had respiratory distress following anesthesia and sedatives.
4. Postoperative transfer from ambulatory care center to acute care for further treatment
Patient had tonsillectomy, uvulopharyngopalatoplasty due to diagnosis of severe sleep apnea. When extubating patient in the operating room after the procedure was finished, the patient became very combative and then became limp. Patient was reintubated.

Patient was unable to maintain patent airway without mask and nasal trumpet. Transferred to hospital ICU [intensive care unit] for observation and pulmonary consult.

5. Undiagnosed sleep apnea contributing to cardiac arrest
Patient with severe sleep apnea previously undiagnosed. Restless and thrashing in bed upon PACU arrival. Required three people to contain for safety. Patient pulled monitors off. Apnea continued lasting 10 to 25 seconds. Saturation in the 90s with O₂ facemask at 10 liters per minute and dipping to the 70s with apnea periods. Cardiac arrest. ACLS [advanced cardiac life support] applied. Pt [patient] returned to sinus rhythm. Admitted to intensive care.
6. Unplanned ICU admission
Patient seen pre-op by preanesthesia clinic and had positive sleep apnea screening using the STOP-Bang tool. Patient previously undiagnosed. No pulmonology consult and no sleep study ordered. Patient had surgery and oxygen desaturation in PACU to 50% to 70% several times. Patient had to be admitted to intensive care and followed by pulmonology.
7. Use of reversal agents following narcotic administration
Patient given Dilaudid® 2 mg prior to extubation and Dilaudid 2 mg postextubation prior to coming out to PACU. Pt was very somnolent and had difficulty with breathing and airway due to sleep apnea, requiring nasal trumpet and high humidity O₂. Patient given Narcan®.

RISK REDUCTION STRATEGIES

Preoperative Evaluation

A critical element in reducing the risk of surgical complications for OSA patients is the initial preoperative screening evaluation. The preoperative evaluation includes (1) a comprehensive review of previous

medical records, (2) an interview with the patient and/or family, and (3) a physical examination.¹

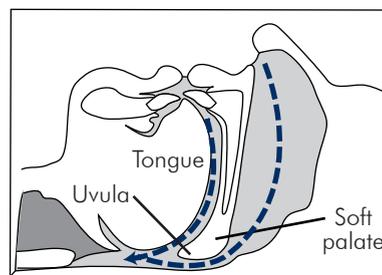
The evaluation may be initiated in a preanesthesia clinic (if available) or by direct consultation of the operating surgeon with the anesthesiologist. After the evaluation, if OSA is suspected, the anesthesiologist and the surgeon work together to decide whether to obtain formal polysomnography or empirically treat the patient as though they have OSA.¹ See “Figure. Anatomy of Obstructive Sleep Apnea.”

Medical Record Review and Physical Examination

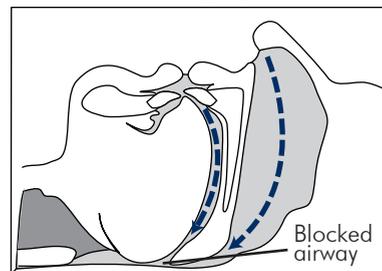
The anesthesia provider’s review of the patient’s medical record focuses on any previous airway difficulty with anesthetics, hypertension or other cardiovascular problems, and other congenital or acquired medical conditions. Also considered are the results of any sleep studies, if available. The physical examination includes

Figure. Anatomy of Obstructive Sleep Apnea

Normal breathing during sleep



Obstructive sleep apnea



MS14561

an evaluation of the airway, nasopharyngeal characteristics, neck circumference, tonsil size, and tongue volume.¹

Assessment Tools Used during the Interview

Proper screening and OSA diagnosis before surgery may reduce anesthesia-related risks associated with this condition. Since a significant number of patients arrive for surgery lacking a formal diagnosis, it is suggested that the preoperative process include the incorporation of available OSA screening tools.

A screening tool helps to reduce the likelihood that an unrecognized OSA patient presents for surgery, creates a heightened awareness of which patients may be at increased risk, and identifies poorly compliant and inadequately treated patients.⁸

There are several OSA questionnaires available as screening tools to identify patients at risk before a surgical

procedure. They vary in the number of questions asked and the time required for staff to either administer or analyze the results. The questionnaires are meant as screening tools and are not meant to replace a history and physical or a formal polysomnogram.⁹

STOP questionnaire. The STOP questionnaire is described as an easy-to-use screening tool for OSA. It was validated in surgical patients at preoperative clinics. The interviewer asks the following questions: Do you snore loudly? Do you often feel tired, fatigued, or sleepy during the daytime? Has anyone observed you stop breathing during sleep? Do you have or are you being treated for high blood pressure? Answering yes to two or more questions indicates a high risk of OSA, while answering yes to one or zero questions indicates a low risk of OSA.^{7,10}

STOP-Bang questionnaire. The STOP-Bang questionnaire⁶ further improves

the sensitivity of the STOP questionnaire to detect OSA, especially moderate and severe forms of OSA. The additional questions are as follows: Is body mass index greater than 35? Is patient age greater than 50? Is neck circumference greater than 40 centimeters? Is gender male? Answering yes to five to eight questions signals a high risk of OSA, answering yes to three to four questions indicates an intermediate risk, and answering yes to zero to two questions signifies a low risk of OSA.^{3,7}

See <http://www.stopbang.ca/screen.php> for the STOP-Bang questionnaire online screening tool.

Berlin questionnaire. The Berlin questionnaire is a 10-question test validated in the primary care setting and organized into three categories: snoring, excessive daytime sleepiness, and hypertension.⁷

Additional tools. Other assessment tools are also utilized to screen for OSA.⁷ See the Table for information about the

Table. Obstructive Sleep Apnea (OSA) Assessment Tools and Key Characteristics

ASSESSMENT TOOL	KEY CHARACTERISTICS
American Society of Anesthesiologists checklist ¹	Composed of three categories: predisposing physical characteristics, history of apparent airway obstruction during sleep, and somnolence.
Apnea Score ²	Asks three questions about pauses while sleeping, frequency of loud snoring, and history of adenoidectomy.
Berlin questionnaire ³	The patient is instructed to answer questions in three categories. If the patient scores positive in at least two of the three categories, the patient is found to be at a high risk for OSA. If the patient scores positive in only one or none of the categories, the patient is deemed to be at a low risk for OSA.
Haraldsson's questionnaire ²	Asks five questions about snoring, pauses while sleeping, midsleep awakening, and fatigue.
STOP questionnaire ⁴	Asks yes/no questions. Examines snoring loudness, daytime fatigue, pauses while sleeping, and treatment for high blood pressure.
STOP-Bang questionnaire ^{4,5}	Enhances the sensitivity of the STOP questionnaire. Described as concise and easy to use. Incorporates body mass index, age, neck circumference, and gender into the scoring model of the STOP questionnaire.
Wisconsin questionnaire ²	Identifies the habitual snorer versus the nonhabitual snorer. Examines the snorer's frequency and loudness, as well as pauses while sleeping.

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STOP, STOP-Bang, Berlin, and other questionnaires and tools.

Nursing's Role

With training, nurses can administer the questionnaires during the preoperative phase of assessment. In a quality improvement project, 15 preoperative nurses at an acute care facility were taught to use the STOP-Bang scoring model.¹¹

Evaluation of the nurses using the tool included completion of a learning competency; comparison of patients' diagnosis of OSA before and after using the screening tool; and analysis of critical events involving respiratory or cardiac arrests, near arrests, opioid reversal agents, and pulse oximeter readings less than 90%.¹¹

A step-by-step team process was then implemented to evaluate the practice change. As a result of incorporating an OSA questionnaire, the pilot project concluded that

patient advocacy improved and a safer perioperative environment was created.¹¹

PACU nurses. In an interview conducted by Authority analysts, Dr. William Brian Somerset, assistant professor, anesthesiology, Temple University, said nurses have an especially important role in the safe management of OSA patients.¹² Given the high prevalence of OSA and the large number of undiagnosed patients, nurses (particularly PACU nurses) have an especially important role in the safe management of OSA patients, according to Somerset.

It is important for PACU nurses to be familiar with screening questionnaires in order to have a high index of suspicion for OSA patients. Patients with suspected or diagnosed OSA should not be discharged to an unmonitored setting until they are no longer at risk for postoperative respiratory depression. PACU nurses are frequently the last gatekeepers prior

to patients moving to an unmonitored environment; therefore, they are an integral step in the safe care of these patients, according to Somerset.

CONCLUSION

Identifying patients with OSA prior to a surgical procedure appears to help diminish the potentially negative outcomes associated with OSA and anesthesia administration during surgery. A standardized approach to the management of these patients may reduce harm. Encouraging clinicians to be acquainted with specific risk factors for OSA remains an important aspect of quality healthcare. Incorporating a screening tool into the preoperative period appears to help identify OSA patients.

Acknowledgments

Nancy M. Dooley, BS, RN, CCRN, staff nurse, Abington Memorial Hospital, contributed to the data analysis for this article.

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Reviewer Commentary

Many patients with suspected obstructive sleep apnea (OSA) without a formal diagnosis or optimization will continue to undergo surgical procedures. This will likely continue secondary to the number of patients with OSA exceeding the number of sleep laboratories, the urgent nature of many surgical procedures, the finite economic resources available, and the compliance issues. If we accept the reality that patients with OSA need procedures and frequently will not be diagnosed or treated, then I would argue that we begin to consider extended postanesthesia care unit stays, transfer to higher level of care, and even some unplanned intensive care unit admissions as providing the necessary due diligence.

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Philadelphia, Pennsylvania

Quarterly Update on Wrong-Site Surgery: Electronic Records Can Help Prevent Harm but Are Not Harmless

John R. Clarke, MD

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Clinical Director Emeritus, Pennsylvania Patient Safety Authority
Professor of Surgery, Drexel University

There were eight event reports of wrong-site surgery in Pennsylvania operating rooms (ORs) during the third quarter of 2014 and two reports belatedly confirmed from a prior quarter (see the Figure). The eight reports matched those of the second-lowest quarter ever and were the lowest number of reports for the beginning of an academic year (July through September).

Six of the reports involved injections: one unwanted preoperative regional block, one preoperative regional block done on the wrong side and attributed to the lack of an “all stop” time-out, two wrong-side pain injections, and two preliminary local blocks by the surgeons prior to any time-outs, as noted below:

Surgeon preinjected the right ear instead of the left ear per consent. He realized his mistake as he was preparing to drape the patient.

Prior to [the surgeon] coming into the room, the patient’s left foot was put up on a prep pillow and wrapped with Webril™. This was the nonoperative side. When the surgeon came into room, he proceeded to inject that foot. He injected 1 mL. [Then, he] stopped and questioned which side we were working on, and the nurse said the right. . . . The right foot was then prepared for injection, and the procedure was completed as scheduled.

Two reports were of surgery on the wrong finger. One was related to accepting nonspecific information on the consent and from the patient:

Patient’s surgical consent read “trigger finger release right.” When the circulator asked the patient what he was having done, the patient replied, “I’m having one of my right trigger fingers released. I need them all done.” While the patient was making the previous statement, he was pointing to the mark identified by both the patient and the surgeon in the holding area, which was located below his right third finger. Documentation reflected patient’s initial complaint in the surgeon’s office was of his right trigger thumb.

Numerous near-miss reports continue to demonstrate persistent areas of risk and the effectiveness of practices that prevent wrong-site surgery.^{1,2}

This past quarter, more than a dozen procedures were scheduled incorrectly, with potential downstream ramifications:

Patient in holding area; wrong side on consent for surgery and OR schedule. Left side was indicated on consent as well as on the OR schedule, when it is the right side that needs the surgery. Discussed with family (patient is demented), who did not know which side. It was found by reading the HP [history and physical], which indicated it was the right foot that was injured. . . . The old consent was discarded and a new consent obtained.

The [scheduling] error was not discovered until the patient entered the OR, where the RN picked up on the discrepancy. . . . Although the pre-op holding RN did check the schedule, he did not notice the scheduling discrepancy.

More than 30% of the incorrectly scheduled cases documented the surgeon’s office as the source of error:

The case information was forwarded to the chair[person], who discussed it with [the surgeon] because this was the third case this year from that office that a procedure site was scheduled incorrectly.

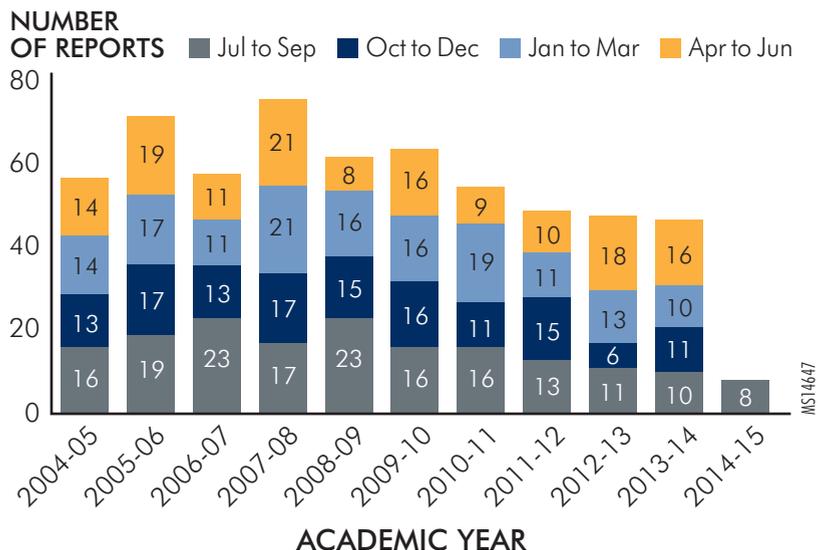
The office scheduling sheet was pulled and clearly states left. . . . The patient was marked for the correct side that corresponded with the consent, the right [side].

Monitoring the accuracy of information from surgeons’ offices is important because 11% of all wrong-site operations can be traced back to incorrect information from surgeons’ offices.^{3,4}



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



Fortunately, providers receiving patient information check for discrepancies and identify them as soon as discovered for reconciliation by the surgeon, based on primary sources of information:

Schedule did not have full procedure listed. Called to PAT [preadmission testing] department to have schedule corrected prior to the day of surgery.

At least 10 consents were incomplete or inaccurate, some to an extent suggesting that the informed consents were not obtained by the surgeons:

Surgical consent did not list any procedure to be performed. Patient already given sedating medicines.

When verifying the procedure with the patient, the patient reported that he was having an appendectomy. The consent indicated “laparoscopic, possible open, cholecystectomy.”

Preregistration came from office clearly stating “carpal tunnel release.” Registration entered “Colonoscopy.” . . . Consent stated the incorrect procedure.

Surgeons are not always doing a proper preoperative verification of the documents, with confirmation by the patient:

[Surgeon] entered the room while the patient was being fitted for a TLSO [thoracolumbar sacral orthosis] brace. The [surgeon] did not identify the patient and proceeded to dilate the incorrect patient’s eye [preoperatively].

Patient arrived in the OR visibly concerned. Patient stated that a doctor came into her room in the holding area . . . and marked her left hip for hip surgery. The patient is not here today for hip surgery and was concerned arriving to the OR if she was going to receive the correct care. I went over her consent with her in great detail, and she agreed that she was here to have neck surgery.

The correct identities of at least four patients were ascertained only by checking the patients’ identifiers in the preoperative holding areas or ORs:

CRNA made decision to take fourth patient on schedule back to

OR instead of [third patient on schedule] . . . because the third patient’s family had just taken her CPAP [continuous positive airway pressure] equipment back to their car. CRNA did not notify the surgeon, the OR team, or the preoperative nurse that she was taking a patient out of order.

A physician called the OR to schedule an emergency C-section on a patient but did not mention the patient’s name or room number. The nursing supervisor was notified, and she provided the wrong patient’s name and room number. The OR was scheduled under the wrong patient’s name. During the surgical time-out, staff discovered the wrong patient had been scheduled due to misinformation by the nursing supervisor. The correct patient was in the OR.

In at least three reports, the information on the white board in the OR was incorrect prior to the time-out:

Patient and paperwork confirms cataract surgery on the left eye. Dry-erase board lists cataract surgery on the right eye. Dry-erase board changed to reflect the correct eye. This was changed before the “time-out.”

Surgeons do not always participate in a time-out:

Physician began surgery without doing a time-out. This was realized approximately six minutes into the procedure, and the time-out was completed.

Two reports illustrate the difference between a properly done time-out and a poorly done time-out:

Patient was having right knee surgery. The tourniquet was applied on the left leg. The patient was prepped and draped for left knee surgery. During time-out, it was confirmed that the right knee was the operative knee. The drapes were removed and the correct leg was prepped and draped.

CRNA was relieved for a break minutes before the time-out. One of the elements of the time-out is [verifying that] the antibiotics are given. Two grams of Ancef® were ordered, and . . . none had been documented. . . . I . . . gave the patient the 2 grams at 0936. . . . When [the CRNA] returned from her break, I asked her to reverify the time the Ancef was given, and she reported that she had given the patient 2 grams at 0904.

ELECTRONIC RECORDS: ARE THEY ALWAYS HELPFUL?

In theory, electronic records can help implement evidence-based best practices to prevent wrong-site surgery.^{1,2} Electronic scheduling can ensure that the specific site is included when an operation is scheduled. Electronic records are more accessible by everyone who is in a position to identify discrepancies among the documents in the preoperative period. Primary source documents are more readily accessible when reconciliation of discrepant documents is necessary. In the OR, all documents can be displayed on monitors that are visible to the entire OR team. Intraoperative verification by radiographic confirmation can be done more rapidly by both the surgeon and radiologist.

In response to the following edited query from a facility, the Pennsylvania Patient Safety Authority looked for events implicating electronic records:

I'm looking for any best practices that are available that discuss the inclusion of validating that the correct EMR [electronic medical record] is open/selected as part of the surgical time-out process. Currently our time-out policy does not address the validation of the correct anesthesia and OR EMR as part of the surgical time-out. Has the Pennsylvania Patient Safety Authority received any events related to the incorrect anesthesia or OR EMR being used for documentation of the care of the surgical patient although the patient and procedure were correct and verified through consents and patient identifiers?

A review of the near-miss reports from this past quarter identified the following:

Patient stated operative site is left leg. MD consent identified left leg. NaviCare system and Epic system indicate right leg. Site confirmed and performed on correct leg.

During the time-out, the image of the consent would not load on the computer. Attempts to print the consent were not successful. Staff had visually seen the consent prior to the time-out, and the procedure was completed due to the high risk of awakening the patient and a delay of the surgery.

Patient was prepped and draped for a left partial nephrectomy. Surgeon halted the surgery due to inconsistency with radiology films that were displayed in the operating room. The charge nurse and administrators were then notified of the situation. Surgeon reevaluated the radiology films and report and determined that incorrect films were placed in patient's [electronic medical] records. Surgeon . . . determined that the left kidney was [nevertheless] the correct kidney.

All surgical paperwork on the chart stated right carpal tunnel release, which was correct. H&P [history and physical] stated left carpal tunnel release. Pre-op nurse noted the discrepancy prior to the admission of the patient to pre-op. Correct H&P was located in the patient's electronic medical record. Patient had a left carpal tunnel release performed prior to this date of surgery, and preadmitting testing pulled the wrong H&P from the [patient's electronic] medical record.

The Authority hypothesized that electronic systems were capable of having incorrect information entered, just like paper records. It also hypothesized that electronic systems could make it easier to access archaic or outdated information, when more recent information is more accurate.

Analysts reviewed the complete registry of 596 wrong-site operations. There were 12 wrong-site procedures based on another patient's information, a contributing factor that is not unique to an electronic record:

- A pathology report of cancer, attributed to the wrong patient during dictation, was the basis for surgery.
- Wrong radiographs were used to localize the lesion.
- Another patient's H&P was mislabeled, incorrectly included in the chart, and used as the basis for the procedure.
- Another patient's consent was mislabeled in the surgeon's office and incorrectly included in the chart.
- The surgeon called his office and got incorrect information from the office charts. (Presumably, this communication error might not have occurred with compatible electronic office records.)
- The patient was accompanied by another patient's chart.
- The patient, identified by passive query, was the wrong patient.
- The patient was operated on out of order without any identifiers or verification.
- In the OR, the surgeon consulted the wrong patient's office chart.
- Three patients were confused with other patients with the same name and similar problems.

One patient received a different procedure than intended as a result of staff accessing the wrong information electronically. He had consented to a procedure. The consent was in the electronic system. He then changed his mind and requested a different procedure. The consent for that procedure was in the electronic system; however, there was no mechanism for labeling the original consent as void and superseded by the second consent. The original consent was accessed

electronically and used as the reference for the intended procedure.

The Authority concludes that wrong-site errors due to incorrect information in the

patient's record or the incorrect patient's record are possible with both paper and electronic records. Outdated information may be easier to access electronically. Consider making sure that the name of

the patient and the date of the document are easily identified in electronic records. Additionally, consider an electronic method for time-stamped notations for corrections of information.

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What Can Pennsylvania Learn from Minnesota's Program to Prevent Wrong-Site Surgery?

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INTRODUCTION

Both Pennsylvania and Minnesota have adopted best practices and redesigned delivery systems as part of initiatives to decrease wrong-site surgery events.^{1,2} Wrong-site surgery events involve surgical procedures performed on the wrong patient, wrong body part, wrong side of the body, or wrong level of a correctly identified anatomic site.^{3,4}

Both states have mandatory reporting systems and have endeavored to eliminate wrong-site surgery events. In January 2014, Minnesota reported in its 10th annual public report that wrong-site surgery decreased by 36% from October 2012 to October 2013, the largest decline in wrong-site surgery events since the program's inception in 2003.² Although wrong-site events in Pennsylvania have declined an average of approximately 5% per year over the past seven academic years (from 2007 to 2014), the improvement noted is not as dramatic as that experienced by Minnesota.⁵

What can Pennsylvania learn from the successes achieved by Minnesota? Pennsylvania Patient Safety Authority analysts attempted to obtain answers by reviewing Minnesota's program history and interviewing key representatives to discover the critical elements of Minnesota's success.

A HISTORICAL LOOK AT THE TWO PROGRAMS

Pennsylvania: Collaborating for Prevention

Wrong-site surgery project. Pennsylvania's wrong-site surgery project started with the initial identification of evidence-based best-practice principles in 2007, based on events of wrong-site surgery reported through the Pennsylvania Patient Safety Reporting System (PA-PSRS) since July 2004.⁶ Identification of wrong-site events in Pennsylvania follows the National Quality Forum definition for procedures performed in the operating room suite, including punctures of the skin for the injection of local or regional anesthesia.⁷ Since 2008, the Authority has issued statewide guidance on wrong-site surgery prevention through quarterly updates in the *Pennsylvania Patient Safety Advisory*.⁷

Evidence-based practices. Twenty-one evidence-based best practices consistent with the Universal Protocol⁸ have been identified, covering preoperative verification of all relevant documents, properly marking the correct surgical site, conducting a proper time-out, and using intraoperative radiologic confirmation to verify the correct vertebral level during spinal surgery.⁹

Collaborative learning. Nine facilities implemented successful wrong-site surgery prevention programs on their own, allowing the Authority to identify the importance of leadership, nursing engagement, and other attributes of successful implementation.¹⁰ That knowledge informed the Authority's strategic program, which provided assessments, education, tools, technical assistance, resources, and interactive forums to help participants implement best practices to prevent the occurrence of wrong-site surgery.¹ The first collaboration of 30 facilities resulted in a 73% reduction of wrong-site surgery.¹¹ The second collaboration of 19 facilities resulted in no wrong-site surgeries in any of the facilities' operating rooms for more than one year.¹²

The Authority has continued its collaborative learning initiative through a federally funded program with other Pennsylvania facilities.

Anesthesia time-outs. Because wrong-site anesthesia blocks represented 21% of all wrong-site events reported through PA-PSRS between July 2004 and June 2013, a statewide webinar was held to address the importance of anesthesia time-outs for preventing wrong-site regional and local anesthetic blocks.¹



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Wrong-site surgery educational resources, programs, and activities, including on-site visits and one-on-one coaching calls, continued in 2014.¹

Minnesota: Effective Time-Outs

Adverse event reporting. In 2003, Minnesota became the first state in the nation to establish a mandatory adverse health event reporting system focusing on all 27 serious reportable events identified by the National Quality Forum. As part of the law, it also issued an annual public report that identified adverse events by facility. The law covered Minnesota hospitals and ambulatory surgical centers (ASC).¹³

SAFE SITE. In the first few years following the implementation of the adverse health event reporting law, reports of wrong-site surgeries and procedures increased. The Minnesota Hospital Association (MHA) reported that an analysis of the data and root-cause analyses showed that these events came primarily from breakdowns in following basic best practices.¹⁴

In response, in 2007, MHA initiated the Call to Action framework for SAFE SITE, a program of best clinical practices including a toolkit to implement recommendations. Initial efforts focused on the operating room, then efforts expanded to include anesthesia, bedside procedures, clinic settings, the emergency department, and radiology.¹⁴

Time-out campaign. In 2008, the Minnesota Department of Health (MDH) and MHA began working closely with the University of Minnesota's Center for Design in Health to develop a time-out process grounded in human factors principles. Based on observed surgeries in eight facilities around Minnesota, the researchers helped to develop a comprehensive preprocedure verification process called the Minnesota Time Out. The three organizations collaborated to conduct regional training sessions and to develop a range of training tools and resources, including

videos, to help facilities learn how to conduct the Minnesota Time Out correctly.¹⁵

In 2011, MHA, MDH, the Minnesota Medical Association, and other organizations formed the Minnesota Safe Surgery Coalition, whose mission was to eliminate wrong surgeries and procedures.¹⁴

Senior staff commitment. During the spring of 2011, the Minnesota Safe Surgery Coalition initiated a three-year campaign to eliminate wrong-site procedures, with the first year focusing on ensuring that the Minnesota Time Out was conducted for every patient, every invasive procedure, every time. Each facility that signed up to participate in the Minnesota Time Out campaign was required to have its chief executive officer (CEO) sign off on this commitment.¹⁵

To assist in engaging physicians in the process, MHA developed a DVD that featured prominent Minnesota surgeons talking about the importance, value, and simplicity of the Minnesota Time Out. Other resources included videotaped simulations of the time-out for auditing practice, sample policies and scripts, and talking points.^{14,15}

INTERVIEW WITH MINNESOTA REPRESENTATIVES

To learn what makes the Minnesota program successful, Authority analysts conducted an interview with Julie Apold, MA, senior director, patient safety, at MHA and Rachel Blake Jokela, RRT, RCP, adverse health events program director, Division of Health Policy, at MDH.¹⁶

Authority: What made you specifically focus on the time-out process?

Julie Apold (JA): We saw in the data that every time we did have an event occur, there was a breakdown in the time-out steps. If those steps would have been completed according to best practice and in the correct order, they would most likely have prevented the events from occurring.

Authority: What was the motivation for your renewed effort in 2011 other than the fact that you weren't moving the needle?

Rachel Blake Jokela (RBJ): That was the impetus. We weren't seeing the decrease we wanted to see. What else could we be doing to push this forward? Looking at the adverse health event data as it was coming in real time and seeing the things that we were missing, almost every time, it was a step in the Minnesota Time Out that was not being done correctly or not being done in the right order. So then we thought, this time-out is the key. This is the gold piece. We need to do a campaign just around this. What is the one thing that facilities can do to make these numbers go down? We felt it was implementing the Minnesota Time Out and hardwiring this in their facilities.

Authority: How did you accomplish this?

JA: We brought them [facilities representing Minnesota hospitals and ASCs] around the table and discussed best practices. We got a sense of what would make a difference. We engaged the groups in the discussion.

Authority: Who were the people who became the thought leaders on this subject?

JA: Many times, they [surgical team representatives] were the champions that you knew were doing good work. We also had a listserv for the different areas we were working on, and you would notice people who were really involved and engaged. They presented themselves. They really had a passion to make a change in that area.

Authority: How did you achieve success?

JA: We found a model that works for us. We bring an advisory group together, put together best practices, and come to consensus. We then invite hospitals statewide to participate and engage the CEOs. They sign on to the initiative with a letter of commitment. We have [developed] the best practices and the tools, and we bring people [organizations representing

Minnesota hospitals and ASCs) together in a face-to-face kick-off. We do data collection through a web-based portal and update their practices each quarter. We use best practices and that made a real difference. They had to do a baseline survey before they did the kickoff and were asked if they had these best practices in place. Then at the end of the survey, they were asked to create an action plan for the quarter. Then we would do the kickoff and quarterly webinars. Each quarter, they would update their information to include any best practices and create a new action plan for any best practices not yet implemented. It was a systematic way to get the best practices into place and know what [goals] they are working toward. This project model has really worked well for us.

Authority: Why did you focus on the biggest problem area?

JA: We know that you can't do everything at once. We look at the quarterly aggregate data and are able to identify gaps in areas in need of improvement. We can then focus education and resources in those areas. The process gives us a common language to talk among the hospitals because they are all working toward the same goals and the same best practices.

Authority: Do they share their experiences with each other in the webinars and so on?

JA: Yes. They are very open. We also have a listserv so they can ask questions of each other if they get stuck or need a tool or other resource.

Authority: Do you just measure whether they have instituted a policy or do you look at compliance as well?

JA: We don't go out and observe or audit. There is no way we could do that. You need to have your champions in place, a good education process, a good process for collecting and analyzing data and feeding it back to staff, [and] good education for your patients and families.

The questions around best practices are implementation strategies. Not that you just have a policy in place but that you are doing these things.

Authority: Do they self-report based on some internal secret shopper audit or do they say, "Yes, we are doing it"?

JA: The more honest they are with those answers, the better outcomes they will achieve. If they are saying they are at 100% but they are having wrong-site surgeries, then you know those two things are not fitting together.

Authority: Do you focus on implementing the infrastructure or the best-practices problem? Or a combination of both?

JA: A combination of both. You need the infrastructure to support the best practices: Here is the infrastructure; I have the data, the team, [and] education in place. On the other side are the best practices around site marking, scheduling, time-out, et cetera.

Authority: Can you think of one area Minnesota is struggling with?

RBJ: I think one area we are still struggling with is visualization of the site mark: who marks the site, when to mark the site, [and] how to mark the site. In the time-out, someone needs to visualize the site mark. The common reason why an event occurs is that the site mark is not done properly. The event will state that no one looked for the site mark because they just assumed it was there. We are going to be targeting this through a mini-campaign to stress that you really need to be looking at the site mark every single time.

Authority: Have you seen people get tired of this initiative and less enthusiastic?

JA: I think they are all motivated to make it work. We've been doing this formally since 2007 (i.e., quarterly reporting, coming to advisory group meetings). I don't see the enthusiasm waning at all. They want that number to be zero. We are also seeing the best practices spread to areas outside of the operating room. For example, anesthesia providers have really

bought in to this effort. They're marking with an A with a circle around it—their distinctive mark—and that's really been spreading across the state. They have also been conducting their own time-out separate from the surgical time-out even when the anesthesia block occurs just prior to a surgical procedure. The number of wrong-site anesthesia events has decreased significantly due to these efforts.

Authority: Can you comment on the close relationship between the department of health and the hospital association in regard to the patient safety effort?

RBJ: I think that is key. We've heard for years people from other states can't believe that the department of health and the hospital association work together. For patient safety, it has always been a collaborative effort. All of our hospitals are members of the MHA, and anything that comes out from them really has a lot of clout. Folks want to sign on and want to be involved. If it was just the MDH, we wouldn't be remotely where we are right now.

Authority: Is there anything that we've missed in your "secret sauce" that we haven't touched on?

RBJ: We haven't just seen a decrease in wrong-site surgery but also in other wrong-site procedures and in retained foreign objects. We've been doing the work for many years, and it's starting to pay off. It's a matter of time, and it can take a little while. There is usually a six-month lag before we see results.

JA: We use "safety alerts" very carefully. A safety alert highlights a safety concern based on review of the data. We develop a safety alert document that provides the data along with action steps to address the identified issue sent via e-mail to the safety contacts in the facilities. We may go a year without one. Because we don't do them very often, they [healthcare facilities] really pay attention to them. You can see from the data when there is a safety alert because you see a decrease in the number of events related to the safety alert.

CONCLUSION

Pennsylvania and Minnesota have achieved success in their wrong-site surgery programs using different approaches. Pennsylvania identified key best practices and worked closely with hospitals that

volunteered to participate in collaborations. In Minnesota, MHA and MDH worked together to develop a time-out process grounded in human factors principles, obtained the commitment of CEOs of facilities across the state, and used thought leaders committed to the

goal of preventing wrong-site surgery to create a uniform standard across the state. Pennsylvania may wish to consider duplicating such a statewide initiative to create a voluntary standard approach to preventing wrong-site surgery.

NOTES

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Correction

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This article contained statements in error about the predominance of patient-to-patient aggression related to patient population type, resulting from a data classification error. Corrections have been made to the article online. The editor apologizes for the error.

A Change in Clinical Direction



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

The Pennsylvania Patient Safety Authority welcomes Ellen S. Deutsch, MD, MS, FAAP, FACS, as clinical director for the Pennsylvania Patient Safety Authority and editor of the *Pennsylvania Patient Safety Advisory*. Dr. Deutsch practiced pediatric otolaryngology for 20 years in the Delaware Valley before accepting the position as director of surgical simulation for the Center for Simulation, Advanced Education and Innovation at the Children's Hospital of Philadelphia. She has a longstanding interest in human factors and systems improvements and recently completed a master's degree in healthcare quality and patient safety. Her experience includes leadership positions in national and international organizations and authorship of numerous presentations and peer-reviewed publications.

As we approach 2015, we are excited to continue our journey to make healthcare as safe as possible for patients in Pennsylvania. The quest to optimize safety is indeed a journey; we have made excellent progress, but we will continue to strive for even more. We are grateful for the grand vision and excellent work over the last 11 years of John Clarke, MD, clinical director emeritus and editor emeritus, who has been slowly retiring. We also appreciate the Authority patient safety liaisons, analysts, editors, staff, and all who have made the *Advisory* such a valuable tool since its first issue in March 2004.

During the coming year, look for enrichments in the readability of the articles and the practical resources available through the *Advisory*. We will be revisiting the content, design, and distribution methods of the *Advisory* articles and resources. We will be presenting information in a practical, straightforward manner while maintaining the important scientific process that provides validity. We will be experimenting with different formats for information to arrive in your inbox and for you to access and download articles and tools in a convenient manner.

In the background, our analysts will have access to new tools to enable us to mine the rich information included in the event narratives that Pennsylvania healthcare facilities report through the Authority's Pennsylvania Patient Safety Reporting System. We depend on the questions you ask, as well as the information provided by Pennsylvania facilities, to inform our work. We encourage facilities to continue to submit useful information in event reports, especially the narratives, and to let us know what more we can do to facilitate your efforts. Our combined work will support healthcare providers throughout Pennsylvania in our collaborative quest to provide the safest care possible for Pennsylvania patients and their families.

Join me in another heartfelt thank you to Dr. Clarke and a sincere welcome to Dr. Deutsch as she begins her guidance of the *Advisory* and the Authority's clinical activities.

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.



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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.

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.