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Your Assignment, Should You Choose To Accept It (http://patientsafety.pa.gov/ADVISORIES/Pages/201803_commentary.aspx)
A member of the editorial board and patient voice council discusses the advantages of high-value education for providers, which ultimately benefits patients.

Safety Stories (http://patientsafety.pa.gov/ADVISORIES/Pages/201803_SafetyStories.aspx)
This recurring feature highlights successes of healthcare workers in keeping patients safe; in this instance, identifying when a component of a system was missing.

Celebrate the 2018 I Am Patient Safety Winners (http://patientsafety.pa.gov/ADVISORIES/Pages/201803_IAMPS.aspx)
The Pennsylvania Patient Safety Authority’s annual I Am Patient Safety contest promotes individuals and groups within Pennsylvania’s healthcare facilities who have demonstrated an exceptional commitment to patient safety. It is with great pleasure that the Authority shares the stories of the 2018 contest winners.
Latex: A Lingering and Lurking Safety Risk

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Abstract

After the topic of latex allergies surfaced in the 1980s, awareness grew and risk reduction strategies were created; however, a review of events reported through the Pennsylvania Patient Safety Reporting System (PA-PSRS) questions the persistence of latex exposure protections. Pennsylvania healthcare facilities reported 616 latex-related events through PA-PSRS that occurred from 2014 through 2016, including 72 near miss events. Analysis revealed that latex indwelling urinary catheters were the most common source of inadvertent exposure in patients with documented latex allergies (75.0%, n = 408 of 544). The perioperative care area accounted for the highest number of
both exposures and near misses (57.1%, n = 352 of 616). Event narratives highlight contributing factors such as
deficits in communication, documentation, supply management, and staff awareness. Strategies to address these
contributing factors may include screening, thoughtful handoffs, evaluation of product alternatives, assessment of
staff awareness, and observation of practice patterns.

Introduction

The journey to reduce the incidence of latex allergies exemplifies interdisciplinary collaboration among researchers,
healthcare workers, manufacturers, and government agencies. Latex gloves have been the focus of much of the
literature on latex allergies because of their pivotal role in the latex allergy epidemic. The increased demand for latex
gloves after implementation of universal precautions in the late 1980s coincided with the rise in reported latex
allergies. Factors contributing to increased latex sensitization during this time period have been studied extensively
and include greater use of gloves, higher allergen content in gloves due to changes in manufacturing processes, and
conversion from cornstarch to talc donning powder. Risk reduction strategies have focused on reducing latex
sensitization as well as ensuring the safety of individuals affected by latex allergies.

For patients and healthcare workers with latex allergies, the potential causes of a life-threatening reaction extend well
beyond gloves. An estimated 40,000 household and industrial products used every day contain latex. Maintaining a
latex-safe healthcare environment is challenging and may become even more so as the affected population grows
smaller—due to the success of efforts to decrease sensitization—and there is greater risk of staff being unfamiliar
with the issue or overlooking it.

To evaluate the current state of latex events in healthcare, Pennsylvania Patient Safety Authority analysts queried the
Pennsylvania Patient Safety Reporting System (PA-PSRS) database. As governed by the Medical Care Availability
and Reduction of Error (MCARE) Act of 2002 and Act 30 of 2006, a total of 571 acute-care facilities, including
hospitals, ambulatory surgery facilities, birthing centers, and abortion facilities, reported through PA-PSRS as of
December 31, 2016.

The following analysis evaluates safeguards and risks in the care of patients identified as having a latex allergy in
reports submitted through PA-PSRS.

Methods

Analysts identified reports involving latex allergies by querying PA-PSRS for reports of events that occurred from
January 1, 2014, through December 31, 2016, containing the keywords "latex" or "rubber."

Analysts manually reviewed all reports and categorized them as exposures, near misses, or exclusions. Breaches in
latex precautions that reached the patient were categorized as exposures (i.e., use of a latex product in the care of a
patient with a documented latex allergy). Unsafe circumstances that if undetected could have led to an exposure
were categorized as near misses. All events containing the keyword "rubber" but not "latex" were excluded. Additional
events were excluded based on the following criteria: unrelated to the topic, new or suspected latex allergy, and
allergic reaction described in the context of multiple potential allergens.
Exposure events were categorized according to the specific latex product. Events involving exposure to multiple latex products were counted more than once in the product analysis. Taking a Safety-II view, analysts categorized near misses by the success modes that prevented potential exposures. Events describing multiple success modes were counted more than once in the success modes analysis. The reported care areas for both exposure and near miss events were grouped into categories of like units and departments.

Analysts conducted a review of the literature to ascertain the history of the latex allergy epidemic, physiological and clinical background on latex allergies, and risk reduction strategies.

**Results**

The query identified 1,051 reports, of which 435 were excluded, 544 were categorized as exposure events, and 72 were categorized as near miss events.

**Exposure Events**

**Harm Score and Care Area**

The majority of exposure events (98.7%, n = 537 of 544) were reported as Incidents (i.e., an event that could have injured the patient but did not either cause an unanticipated injury or require the delivery of additional health care services). Seven events were reported as Serious Events, all with a harm score of E (i.e., an event that occurred that contributed to or resulted in temporary harm and required treatment or intervention). The reactions described in these seven serious events include rash, itching, hives, burning sensation, throat tightness, and hypotension.

Medication administration was the most common treatment, and interventions included surgical site irrigation and a return visit to the emergency department after discharge.

More than half of latex exposure events occurred in perioperative care areas, followed by medical-surgical units, and emergency departments (Figure 1).

![Figure 1. Latex Exposure Events and Near Miss* Events by Care Area (N = 616) ](image)

**Product Type**

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Note: As reported to the Pennsylvania Patient Safety Authority, January 2014 through December 2016.
Thirty-six unique medical products were described in the 544 exposure events. Seven reports described exposure to multiple latex products. Indwelling urinary catheters were the most common source of latex exposure described in event narratives, followed by gloves, Penrose drains, and red rubber catheters (Figure 2). Red rubber catheters were used as tourniquets during surgery, intermittent urinary catheters, and feeding tubes.

**Figure 2. Source of Latex Exposure (N = 544*)**

![Diagram showing sources of latex exposure](image)

Indwelling urinary catheter  
(n = 408, 75.0%)

Gloves  
(n = 53, 9.7%)

Penrose drain  
(n = 19, 3.5%)

Red rubber catheter  
(n = 17, 3.1%)

Other sources of exposure with 9 or fewer reports  
(n = 54, 9.9%)

- Arrow cholangiogram kit
- Bone marrow collection kit
- Condom catheter
- Davol drain
- Holter monitor electrodes
- Influenza vaccine
- Intermittent urinary catheter
- Leg bag
- Lithoplasty balloon
- Malecot catheter
- Mouth guard
- Probe cover
- Resistance band
- Rubber band
- Steri-Strips
- Suprapubic catheter
- Swan-Ganz catheter
- Tourniquet
- T-tube
- Viewing wand cover

* These sources of latex exposure total more than the 544 exposure events because some reports described more than one source of latex exposure.

**Note:** As reported to the Pennsylvania Patient Safety Authority, January 2014 through December 2016.

In the seven Serious Event reports, indwelling urinary catheters were the most common source of exposure (n = 4 of 7), followed by intermittent urinary catheter (n = 1), gloves (n = 1), and Swan-Ganz catheter (n = 1).

**Near Miss Events**

**Care Area**

As with exposure events, more than half of the near miss events occurred in perioperative care areas, followed by ancillary departments such as endoscopy and pharmacy, and medical-surgical units (Figure 1).
Success Modes

Event narratives included a variety of success modes that prevented patient exposures (Figure 3). The top three success modes were staff recognition that the patient had no latex allergy wristband, staff identification of the allergy during a preoperative interview, and staff recognition that a latex allergy was undocumented. Sources of missing allergy documentation included the operating room schedule and both paper and electronic health records. After discovery of a latex allergy, 14 events described subsequent operating room tear downs and six described case cancellations in ambulatory surgery facilities.

Themes from Event Narratives

An example of an event report involving insufficient communication with patients is as follows:*  

*Patient did not specify latex allergy when asked if allergic to anything.*

Examples of event reports involving insufficient communication between members of the care team are as follows:

*Tech came in to give a break and opened a pair of latex gloves on the sterile field.*

*Patient’s latex allergy not noted until “time out” performed. Operating room set up using latex gloves. Staff had already touched patient wearing latex gloves.*

Examples of event reports involving imperfect documentation are as follows:

*Patient had latex bracelet on and sticker on chart. Allergy not documented on chart or Anesthesia history and physical.*

*Latex allergy not noted on schedule. Operating room setup non-latex free. Instruments touched with sterile latex gloves. Needed more
than 1 hour to resterilize instruments.

Examples of event reports involving ineffective product management are as follows:

* Nurse inadvertently reached for latex foley instead of latex-free alternative.

* Cabinet where latex gloves are kept was not taped shut.

An example of an event report involving limited staff knowledge is as follows:

* Resident states that he thought all our foleys were latex-free and had discussed this with another resident prior to inserting the foley.

* The details of the PA-PSRS event narratives in this article have been modified to preserve confidentiality.

Discussion

Review of events reported through PA-PSRS indicates that latex exposures and near misses continue to occur, and latex indwelling urinary catheters are involved in 75% of inadvertent exposures in patients with documented latex allergies. Exposure and near miss data suggests that the perioperative care area is a high risk location as well as a strong safety checkpoint.

Lingering and Lurking Risks

Latex indwelling urinary catheters accounted for 7.7 times more exposures than latex gloves in the events reported through PA-PSRS. Latex products that come in contact with mucous membranes (e.g., urinary catheters) cause more severe reactions than those that contact the skin (e.g., gloves), which makes the predominance of reports involving indwelling urinary catheters even more concerning. The relatively small number of exposures involving latex gloves aligns with several decades’ worth of work to improve the safety and use of gloves made from synthetic alternatives. The risk posed by latex indwelling urinary catheters is not new; reports of anaphylactic reactions to latex indwelling urinary catheters date to the early 1990s. This analysis indicates that in the journey to making healthcare safer for individuals with latex allergies, further study of the safety and use of latex indwelling urinary catheters may be a natural next step.

In this analysis, the majority of latex-related events occurred in the perioperative care area. The quantity and proximity of supplies in this area make it a particularly risky setting for latex allergic patients. Latex has been identified as the second leading cause of anaphylaxis during anesthesia, following neuromuscular blocking agents and just slightly more frequent than antibiotics. Success modes analysis demonstrates many risk mitigation activities in the perioperative care area, including identifying patients with latex allergies, identifying latex products already in use, removing latex products from the care area, and reconciling missing safety alerts, such as wristbands. These activities demonstrate the crucial role that all perioperative team members—including surgeons, anesthesiologists, and nurses—play in screening for latex allergies, monitoring environmental safety, and ensuring these risks are communicated to the entire care team.

Reactions to latex fall into three categories: irritant contact dermatitis, allergic contact dermatitis, and immediate hypersensitivity. The most common reaction, irritant contact dermatitis, manifests as dry, cracked skin typically on the hands and is not considered a true allergy. Allergic contact dermatitis resembles poison ivy lesions and develops from an allergic reaction to the chemicals used in latex manufacturing. Immediate hypersensitivity is an allergic reaction to proteins in natural rubber latex and can range from mild skin redness hours after exposure to
anaphylaxis within minutes. Although the majority of exposure events in PA-PSRS did not describe the patient having a reaction after the latex product was discontinued, seven serious events did describe reactions resembling that of immediate hypersensitivities.

**Contributing Factors and Success Modes**

**Handoffs**

Prevention of latex exposures begins with having knowledge of the patient's allergy and sharing this information with the healthcare team. According to the Joint Commission, "an estimated 80% of serious medical errors involve miscommunication between caregivers during the transfer of patients." Described by Anthony and Preuss as "funneling," degradation of information over time sets the stage for adverse events to occur. In an increasingly electronic world, the assumption that documentation in the electronic health record (EHR) constitutes communication may affect what information is included in handoffs. Omission of latex allergy information during patient handoffs was a recurring theme in event report narratives. Receiving providers in turn discovered latex allergies through safety checks including paying attention to information provided by wristband, chart sticker, paper and electronic records, door sign, and preoperative interview.

**Preprocedure Patient Assessment**

Clinical practice guidelines for procedures such as urinary catheterization and phlebotomy include assessment of patient allergies as a step for safe practice. Event report narratives describe deviance from such guidelines. Possible explanations for such deviations include mental slips, distractions, normalized deviance, assumptions about product safety, production pressure, cumbersome EHR workflows, or accessing the EHR only after task performance. Interventions such as wristbands, door signs, and chart stickers provide visual safety alerts at the point of care. Success modes analysis demonstrates variable compliance but heavy reliance on such visual reminders.

**Asking About Allergies**

The way in which patients are asked about their allergy history can affect the completeness of the information received. In a study by Al-Niaimi et al., only 33% of 156 surveyed healthcare workers at a large teaching hospital reported routinely checking for a latex allergy when asking patients about allergies. Bismil et al. evaluated the difference in 367 orthopedic patients' responses when asked the general question "do you have any allergies?" versus a follow-up question specifically asking about an allergy to latex, iodine, or elastoplast. Of the 42 patients with documented allergies to at least one of these allergens, 38% did not report their allergy when asked the general question and 100% reported their allergy when asked the specific question. PA-PSRS event narratives describe providers discovering latex allergies only after circling back to explicitly ask patients about an allergy to latex. In the perioperative care area, such late discoveries resulted in operating room teardowns, instrument reprocessing, delayed starts, and cancelled cases. Explicitly asking about an allergy to latex is one way to prevent such delays in care and operational inefficiencies.

Staff perceptions of reported versus actual allergies can affect patient safety. In a root cause analysis involving management of a patient with a latex allergy, Minami et al. identified a staff perception that "most allergic reactions were minor and that many patient-reported allergies were not actual allergies." Discounting patient reports of latex reactions overlooks the cumulative risks associated with repeated latex exposures as well as the possibility of subsequent exposures causing more severe reactions.

**Product Identification**

Beyond knowledge of a patient's allergy, preventing latex exposures requires application of this information when caring for the patient. The notion that hospitals or medical products are "latex-free" is a common misperception. Reliable methods do not currently exist to test products for the allergens that induce latex allergies or to ensure that
products remain free of contamination after manufacturing. In 2014, the Food and Drug Administration (FDA) issued guidance recommending that products be labeled as "not made with natural rubber latex." Given the quantity, variety, and transitory nature of products in healthcare organizations, reading product labels is the most fundamental yet essential way to protect against accidental exposures.

**Limitations**

A limitation of this analysis is that harm score and event location are provided by the report submitter. Information about the source of latex exposure and the patient's allergy status also is provided by the report submitter. As with all reporting systems, the type and number of reports collected depend on the degree to which facility reporting is accurate and complete.

**Risk Reduction Strategies**

The following strategies come from the success modes of near miss event reports and from the literature.

**Communication and Documentation**

- Establish a latex consultation service to help evaluate and manage latex allergic patients.
- Create an EHR latex allergy alert for indwelling and intermittent urinary catheter orders and an order that specifies to use a latex-safe alternative catheter.
- Inform latex allergic patients and families of your organization's efforts to reduce latex exposure risk and engage them as partners in monitoring the environment and reminding all members of the care team about their allergy.
- Use latex precaution signs as visual reminders and an additional interdisciplinary communication tool. Consider placement on patient doorways, the inside and outside of operating room doors, above the head of the patient's bed, and on the anesthesia station in the operating room.
- Evaluate compliance with visual safety alerts, such as wristbands, signs, and chart stickers or bands. Consider packaging these alerts in a single bag for easier access and application.
- As patients travel throughout the organization, ensure that receiving departments are notified in advance of latex allergic patients to allow time for adequate preparation.
- Use patient handoff tools that include communication about patient allergies.
- Use latex-safe alternative gloves to set up the operating room until the patient is brought into the room and the patient's allergy status has been confirmed.
- Incorporate a question asking explicitly about latex allergies into preoperative communication, including operating room scheduling forms, nursing-driven preoperative telephone calls, preoperative assessments, preoperative interviews, and preoperative checklists.
- Include allergies in the preoperative time-out and consider using a checklist such as the one from the World Health Organization (http://www.who.int/patientsafety/safesurgery/ss_checklist/en/).
Knowledge and Awareness

- Assess healthcare workers’ knowledge and practices surrounding latex allergy screening, product labeling, and safety precautions when caring for patients with latex allergies; tailor educational interventions accordingly.4,5,24,26
- When caring for latex allergic patients, check all product labels for latex and ask questions if labeling is unclear.28,29
- Implement a latex allergy annual competency.33
- Observe indwelling and intermittent urinary catheterization procedures for compliance with checking for a latex allergy prior to beginning the procedure.
- Review incident reports involving latex from the past 12 months to identify trends and opportunities.4

Product Management

- Identify and replace as many products as possible with suitable latex-safe alternatives.17,28,31,33
- Evaluate all new product proposals for latex content.28
- Establish a process for reviewing the latex content of all product substitutions sent by vendors and alerting frontline staff of any new products containing latex.
- Use signage in product storage areas to draw attention to products that are stocked as both latex and latex-safe alternatives.22
- Leverage the bar code technology used for perioperative supply charges to link product information with patient allergy alerts.36
- Make latex-safe supply carts available to all patient care areas.3,7,29,30 Establish a process to ensure carts are stocked and checked regularly.
- Ensure powdered surgeon’s gloves, powdered patient examination gloves, and absorbable powder for lubricating a surgeon’s gloves are no longer stocked or in circulation at your facility.37

Conclusion

Despite the decreasing incidence of latex allergies, the potential for significant patient harm remains. Evaluation of product safety should go beyond latex gloves; based on PA-PSRS event reports, organizations may benefit from focusing on indwelling urinary catheters and procedures in perioperative care areas.

Notes


36. Greene J. Tracking supply charges with bar coding. OR Manager. 2006 Jul;22(7):14-7. PMID: 16892864

Hot Topic: Nonsurgical, Healthcare-Associated Burn Injuries

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Abstract

Burns are preventable injuries. Although most burns occur in the home, a recent review of events reported through the Pennsylvania Patient Safety Reporting System (PA-PSRS) found reports of patient burns occurring in the healthcare environment. These healthcare-associated burns may be related to the patient's medical treatments or to components of the healthcare environment. In addition, the risk of burns may be increased in patients with certain underlying medical conditions.
An analysis of reports submitted in 2016 through PA-PSRS identified 230 events of burns, of which 61.3% (n = 141) occurred in nonsurgical healthcare settings. Of the 141 nonsurgical burns 75.9% (n = 107) were considered thermal in nature (caused by direct contact with heat sources such as hot metals, scalding liquids, steam, and flame). The most frequent thermal burns involved dietary spills of heated drinks or food (49.5%; n = 53 of 107) and heating devices (30.8%; n = 33), including powered devices such as circulating water or air blankets, warm compresses, and instant hot packs.

Implementing processes to assess and identify patients at risk for burns and developing risk reduction strategies are key to decreasing nonsurgical, healthcare-associated burns. Highlighting the relationship of temperature and time to development of a serious burn is essential in burn risk education; an object that feels only warm to the touch can cause serious injury if left on the skin over time.

Introduction

Burns are preventable injuries, and 73% of reported burns occur in the home. But a recent review of events reported through the Pennsylvania Patient Safety Reporting System (PA-PSRS) from January through December 2016 found reports of patient burns occurring in the healthcare environment. Burns are defined as injury to tissues caused by contact with heat therapy devices (dry, moist, or radiant), hot liquids, chemicals (e.g., corrosive substances), electricity, friction, or radiant and electromagnetic energy (e.g., x-rays).

Healthcare-associated burns are caused either directly by therapies related to a patient's care (e.g., hot compresses, magnetic resonance imaging [MRI] studies) or indirectly from the effects of therapy or components of the healthcare environment (e.g., scald burns from spills of hot dietary items). The risk of a healthcare-associated burn may be increased in patients with certain underlying medical conditions. The majority of burn events reported through PA-PSRS in 2016 occurred in areas outside of the operating room (OR), including critical care, obstetrical, postanesthesia, rehabilitation, behavioral health, medical/surgical specialty, and outpatient units.

A literature search revealed that patient burns in nonsurgical areas have received less attention than burns occurring in the OR and that there is often a lack of burn risk assessment and prevention strategies in the nonsurgical healthcare setting. This issue may be related, in part, to a perception that objects used outside of the OR have less associated risk than electrocautery or electrosurgical devices used in the surgical setting. However, even objects such as warm compresses and hot drinks that may not feel hot to the touch can cause a significant injury if left in contact with skin over time.

For historical context, a data snapshot of iatrogenic burn injuries (those caused inadvertently by medical treatments) reported through PA-PSRS during 2007 revealed 224 reports of burns, two-thirds of which were thermal in nature. A review of 2016 events shows that healthcare-associated burn events continue to occur in the commonwealth. This article analyzes healthcare-associated burns occurring in nonsurgical healthcare settings reported through PA-PSRS during 2016, identifies specific types of events that highlight the need for burn-risk assessment, and provides risk reduction strategies.

* For this article, the term healthcare-associated is used instead of iatrogenic, but criteria for identifying and analyzing burns occurring in the healthcare setting for the 2016 query were similar to the criteria for the 2007 query.
Methods

Analysts queried the PA-PSRS database for events of patient burns submitted from January 1 through December 31, 2016. The following terms describing skin integrity were used to identify reports of burn injury: burn, welt, first degree, second degree, third degree, heat, hot pack, blister, skin lesion, and induration. Key words describing temperature and etiologies of burns were also included, as follows: thermal, scald, hot pack, heat water, very hot, coffee, tea, broth, soup, popcorn, and steam. Reports with the following terms were excluded: rug burn, razor burn, brush burn, c/o burn, cigar, scratch pad, bovie, denies burn, fired, match, evaporate, tape burn, burn net, go smoke, allow to smoke, stapler, sparkle, and did not fire.

The query identified 976 events; analysts' review of free-text narratives in the event details found 230 events that met criteria for healthcare-associated burns. Exclusions included patients admitted for the treatment of burns, burns caused by devices or incendiaries not typically found in the healthcare setting (e.g., straightening or curling irons and lighters), and surgical fires. Also excluded were events of patient use of the term "burning" to describe symptoms of other disease processes such as epigastric or chest pain, or sensations related to intravenous catheter infiltration, flushing, or infusion of fluids. Of the 230 reports of burns that met criteria for healthcare-associated burns, a further 89 were excluded because they occurred in an OR (n = 81), or labor and delivery room setting (n = 5), or when the surgical procedure occurred in a care area outside the OR (e.g., interventional radiology and neonatal intensive care unit; n = 3).

Analysts evaluated care areas, objects involved, and burn severity. Degree of injury was based on event detail descriptors including red or blistering, and/or when the level of burn injury was specifically identified as first, second, or third degree. Burn injuries are typically categorized by their etiology (cause); a common classification system was used for this analysis of the PA-PSRS data, as follows:

- **Thermal**: caused by direct contact with heat sources such as hot metals, scalding liquids, steam, and flame.\(^1\)
  Thermal burns from radiant energy are also possible, such as from warming lamps and examination lamps.\(^10\)
- **Electrical**: from electrical current, either alternating current (AC) or direct current (DC).\(^1\)
- **Radiation**: due to prolonged exposure to ultraviolet rays of the sun or to other sources of radiation, such as x-ray.\(^1\)
- **Chemical**: due to contact with strong acids, alkalies, detergents, or solvents.\(^1\)

Results

Analyst identified 141 nonsurgical, healthcare-associated burn events. Patient care areas are shown in Figure 1.
Burns injuries ranged from superficial first degree (involving only the epidermis), to full thickness third degree (involving the epidermis and dermis). Table 1 shows the number of nonsurgical, healthcare-associated burns based on the severity of dermal injury.

Table 1. Degree of Injury of Healthcare-Associated Burns Reported (n = 101 of 141*)

<table>
<thead>
<tr>
<th>Degree of Burn Injury</th>
<th>Number of Injuries</th>
<th>Percentage of Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>First degree</td>
<td>60</td>
<td>59.4%</td>
</tr>
<tr>
<td>Second degree</td>
<td>38</td>
<td>37.6%</td>
</tr>
<tr>
<td>Third degree</td>
<td>3</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

* There were 40 reports of burns with no symptoms described.

The most common burns (75.9%; n = 107) were considered thermal in nature. Figure 2 demonstrates the incidence of burn events reported based on the etiology of the burn.

* Two reported burns had undetermined etiology.

Note: Data reported through the Pennsylvania Patient Safety Reporting System, January 1, 2016, through December 31, 2016.
Of the thermal burns, the majority involved dietary spills of heated drinks or food (49.5%; n = 53 of 107) and heating devices (30.8%; n = 33), including powered devices such as circulating water or air blankets and nonpowered devices such as heated compresses, packs, or water bags.

Although not as common, thermal burns associated with MRI studies and patient monitoring devices, chemical burns from contact with caustic solutions, and electrical burns from electrical nerve stimulation devices were among some of the other nonsurgical, healthcare-associated burn injuries reported. Refer to Figure 3 for objects resulting in burn injuries.

Examples of healthcare-associated burn events from the PA-PSRS database are as follows:

**Thermal burns from hot dietary drinks:**

A stroke patient was found with hot soup spilled on to chest. The patient examined by the MD and noted to have small blisters on anterior chest where soup had spilled. Second degree burns were identified and wound team consulted for management of injury.

My patient was sitting in bed with the head of bed up and said, "I spilled my tea." The patient stated he was unsure what happened. He was cleaned up, gown and linens changed. The MD was notified and examined the patient, identified a large reddened area on left inner thigh and groin measuring 12cm x 5cm with multiple small fluid filled blisters.

**Thermal burns from heating devices:**

*Data reported through the Pennsylvania Patient Safety Reporting System, January 1, 2016, through December 31, 2016.*
Patient complained of left hip pain and asked for a warm compress. An ice bag was filled with water from the instant hot water dispenser and the bag was then placed on the patient's hip. A few minutes later, the patient was placed on the bedpan and the compress was removed. The following morning during rounds, the patient was examined by her physician and a thermal burn was found on her hip. The patient was readmitted at a later date for debridement of the burn and received follow-up care with the wound team.

The patient, who has no lower body sensation, had a warming pad placed on his left lower back, hip, and buttock, which was left in place for over 12 hours. The right buttock area is reddened and there are 3 blisters in the shape of the pattern on the pad.

Thermal MRI burn:

Patient had an MRI of the thoracic spine earlier in the day and came into the ED with two small burns thought to be related to the MRI. There was one small first degree burn and one small second degree burn. The patient was discharged with antibiotic cream for treatment of affected areas.

Chemical burn:

A newborn needed a frenulectomy before being discharged. The procedure was completed and the area treated with an application of silver nitrate to control bleeding. Contact with silver nitrate caused an unintended superficial chemical burn to oral mucosa and lips.

Electrical burn:

This patient received electrical stimulation treatment two days ago. He stated at this visit that he had burns where the electrodes had been located on his lower back. The patient stated that the area had blistered and opened so he had placed a dry gauze over the site. Area was assessed by this therapist and noted to have mild erythema and appearance of dried blister on left lower back. The site was cleansed with saline and covered with gauze, the patient was referred to PCP for further treatment of wound, and electrical stimulation treatment was conducted at a different site.

* The details of the PA-PSRS event narratives in this article have been modified to preserve confidentiality.

**Discussion**

Review of recent event report data shows that the number of reported healthcare-associated burn events has not decreased compared with such burn events in the data snapshot completed 10 years ago in Pennsylvania. Review of the 2016 data found that the majority of healthcare-associated burns occurring in nonsurgical areas were thermal burns caused by commonly used objects, such as hot dietary items and heated devices or therapies.

Development of burn prevention strategies begins with the awareness by healthcare providers that patients are at risk of burns from common and frequently used care items. Exposure, temperature, and time as well as patient risk factors are important considerations when developing burn prevention strategies. Table 2 highlights the relationship of temperature and time to the development of a serious burn injury.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>°C</th>
<th>°F</th>
<th>First Degree</th>
<th>Second and Third Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>113</td>
<td>2 hours</td>
<td>3 hours</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>121</td>
<td>2 minutes</td>
<td>4 minutes</td>
<td></td>
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</tbody>
</table>
Attention to the risks associated with medical device and current technology is another element to consider when developing burn prevention practices. Although occurring less frequently, electric, radiation and thermal burns from medical devices were also reported. More than one-third (n = 45 of 141) of the burn injuries reported involved the use of medical devices, including pulse oximeters, electrical nerve stimulators, defibrillators, ultraviolet light (phototherapy) equipment, and MRI scanners.

Patient factors can also increase the risk and severity of burn injury. The elderly and very young are at higher risk because they have thinner skin. Patients with impaired dexterity are prone to spills and at risk for scald burns, particularly in the healthcare setting where hot meals are served on free-moving patient tables and drinks are served in containers that may tip or be hard to grasp. Patients who have sensory deficits, including peripheral neuropathy related to a medical condition such as diabetes or spinal cord injury, may be unable to recognize when a heated object is causing injury to the skin. Difficulties with communication skills adds to burn risk; for example, patients who have difficulty communicating because of developmental delays, loss of cognition, or dysphasia (e.g., patients with stroke or brain injury) may be unable to express that they are having pain related to contact with a heated object. Patients receiving general anesthesia, sedation, neuromuscular blocking agents, or nerve blocks are also at risk for burns because of their temporary inability to sense or communicate pain associated with a burn injury.

**Risk Reduction Strategies**

To decrease the risk of healthcare-associated burns, determine whether there are current strategies and policies for assessing and recognizing patient and environmental factors that add risk for burns.

Ensure that environmental burn prevention strategies are in place, such as the following:

- Maintain hot tap water at appropriate temperatures to prevent scald burns.
- Maintain warming and solution cabinets at recommended temperatures.
- Implement policies for use of instant hot water dispensers and microwave ovens, based on the patient population and specifications of the devices.
- Implement policies for serving food and beverages at safe temperatures.
- Provide tableware designed to prevent spillage.
- Educate dietary services staff on the safe preparation and delivery of heated beverages and food.

Develop and implement policies, resources, and education for risk assessment and prevention of burns specific to the following:

- Patient population and needs (e.g., infants, elderly, neurologically impaired)
- Manufacturer guidelines and recommendations for safe use of all powered warming, monitoring, and therapy devices.
• Use and risks of hot compresses, pads, and water bags.\(^6\)

• MRI safety.\(^{19-22}\)

All education should include assessment of the skin under any warming or monitoring device at recommended intervals with particular attention to understanding the relationship of time to temperature and the risk of serious burn (i.e., objects that feel only warm to the touch, if left on the skin over time can lead to serious burn injury).\(^5-7\)

**Conclusion**

Implementing assessment and identification of patients at risk for burns (e.g., elderly, young children, insensate, and cognitively or physically impaired) and developing burn risk reduction strategies is key to decreasing nonsurgical, healthcare-associated burns. Ensuring that healthcare providers understand the impact of the relationship of temperature and time to development of a serious burn injury may prevent painful injuries from healthcare-associated burns. Always assume that any “warmed” object has the capacity to cause a burn.

**Acknowledgments**

Mark E. Bruley, CCE, FACCE, Vice President, Accident and Forensic Investigation, ECRI Institute, was consulted for his expertise and knowledge of healthcare-associated burns during the development of this article.

**Notes**


Invasive Group A Streptococcus

Invasive group A streptococcus (iGAS) can cause severe, life-threatening illness among the elderly, particularly long-term care (LTC) residents. The incidence of iGAS infection is higher among long-term care residents than among community members of the same age, and residents who develop iGAS infections have significant morbidity and mortality risk due to advanced age, close living conditions, and comorbidities (e.g., diabetes, cardiovascular disease). Outbreaks of iGAS in LTC facilities in the United States and Canada have mortality rates of 8% to 40%.

Because of the potential severity of illness, even a single case of iGAS requires public health action. Healthcare practitioners and healthcare facilities in Pennsylvania are required to report positive group A streptococcus cultures from invasive sites (e.g., blood, synovial fluid) through the Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS) within five days of identification. In fall 2012, the Bureau of Epidemiology at the Pennsylvania Department of Health started tracking reports of iGAS in LTC facilities. To identify LTC-associated infections reported through PA-NEDSS, the Department of Health staff ask the following question: "Is the patient a resident of a nursing home or other chronic care facility, or were they recently transferred from such a facility?" If the answer is yes, then the case is counted as an LTC-associated case. Reports of iGAS in current or recent LTC residents increased from 25 reports in PA-NEDSS in 2013 to 63 reports in 2016.

Since 2009, Pennsylvania LTC facilities have reported healthcare-associated infections through the Pennsylvania Patient Safety Authority's Pennsylvania Patient Safety Reporting System (PA-PSRS). PA-PSRS reports of LTC-associated infections are based on different criteria from PA-NEDSS and comprise a subset of the PA-NEDSS reports.

To further understand the differences between iGAS reporting in the two systems, Authority analysts compared the number of iGAS cases identified through PA-NEDSS with the number of iGAS cases identified through PA-PSRS during the same period. Authority analysts queried the PA-PSRS database for any reports potentially indicative of iGAS (e.g., mention of streptococcus or strep) submitted from January 2013 through December 2016, and selected reports with documentation of group A streptococcus or Streptococcus pyogenes, based on culture results or notification by the hospital receiving the patient in transfer. Analysts identified 18 reports (Figure).
Although fewer LTC-associated iGAS events were reported through PA-PSRS than through PA-NEDSS, both databases contain an increase in event reports over time. It is unknown whether this increase is a true increase in the number of illnesses or a result of improved awareness and reporting.

Group A streptococcus infection may present as pharyngitis or skin infections, including impetigo or cellulitis, and can cause severe infection including pneumonia and bacteremia. iGAS is spread by droplet or contact transmission with an infected person. Fomite transmission (such as contaminated clothing or equipment) is unlikely. In LTC settings, healthcare workers with active streptococcal skin infections, pharyngitis, or asymptomatic carriage have been known to transmit the bacteria to residents.

Effective surveillance, monitoring, and adherence to infection prevention practices can help identify iGAS cases early and help prevent outbreaks. Please see "Infection Prevention Strategies for One Culture-Confirmed iGAS Infection," below, for more guidance.

Notes

Supplemental Material

Infection Prevention Strategies for One Culture-Confirmed iGAS Infection*

Because of the potential severity of iGAS infection, even one case should be investigated by the facility and the Department of Health.

Infection Control—Staff Education and Monitoring Includes Employees and Contracted Staff

Report any cases of invasive group A streptococcus (iGAS) infection through the Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS). If you are unsure whether a case from your facility has been reported, or if you are seeking guidance, call your local district office or state health center. You may also call 1-877-PA-HEALTH to be directed to the correct office.2,6,7

• Place residents who have iGAS infection on the appropriate precautions, as follows4,5,8
  ◦ Standard precautions for skin or wound infection if a dressing covers and contains drainage
• Standard, contact, and droplet precautions if no dressing is present or the dressing does not adequately contain drainage

• Droplet and standard precautions for pharyngitis or pneumonia (through the first 24 hours of antimicrobial therapy)\(^4\)

• Droplet and standard precautions for invasive disease (through the first 24 hours of antimicrobial therapy)\(^4\)

• Provide education on proper hand hygiene and respiratory etiquette to staff, residents, and visitors.\(^1,5,7,9\)

• Provide education on wound care and dressing changes.\(^8\)

• Provide education on environmental cleaning, with a focus on high-touch areas.\(^5\)

• Provide education on equipment cleaning, reinforcing the importance of cleaning and disinfecting equipment that is shared between residents; or use dedicated equipment, if possible.\(^4\)

• Monitor compliance with hand hygiene, respiratory etiquette, standard and transmission-based precautions, personal protective equipment, usage, and cleaning practices.\(^5\)

**Surveil to Identify Additional Cases**

• Perform retrospective review of all resident cultures for the previous month for culture-confirmed infections.\(^2,7\)

• Maintain active symptom surveillance for invasive and noninvasive cases for four months after the onset of the most recent infection.\(^7\)

  • Check residents daily for symptoms of iGAS infection and order a culture for anyone who is symptomatic\(^7\)

  • Survey staff for symptoms of iGAS and order a culture for any staff member who is symptomatic; refer staff with positive cultures to a physician for treatment\(^7\)

• Provide staff education on recognition of iGAS infections, the importance of basic hygiene, and not working while ill.\(^1,6,8\)

**Identification of Potential Carriers**

• In consultation with the Department of Health Bureau of Epidemiology, you may be asked to order cultures for people (e.g., family, friends, healthcare workers) who come into close contact with residents who have iGAS infections.\(^7\)

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* Additional actions and recommendations might be necessary if more than a single case is identified.
Update on Wrong-Site Surgery: More Data Provides More Insight

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Introduction

From July 2004 through September 2017, there were 779 wrong-site perioperative events, including wrong-site nerve blocks, reported through the Pennsylvania Patient Safety Reporting System (PA-PSRS) and analyzed by the Pennsylvania Patient Safety Authority. This update provides an overview of the wrong-site events over time, as well as a focused analysis of the events reported between October 2016 and September 2017.

Update on Wrong-Site Surgery

Overall Results

The three most common types of wrong-site procedures reported through PA-PSRS since July 2004 have remained consistent and continue to account for about 50% of all wrong-site surgery events:

- Perioperative nerve blocks administered by anesthesiologists and surgeons (25.7%, n = 200 of 779)
- Spinal procedures (e.g., wrong level; 12.5%, n = 97)
- Pain-management procedures (12.2%, n = 95)

The percentage of wrong-site nerve blocks and spinal procedures decreased slightly since the last update published in December 2016 (i.e., 0.8% and 3.8%, respectively). However, the most notable change was in the percentage of wrong-site pain-management procedures, which increased 7% from the last update. See Figure 1 for the overall number of wrong-site procedures reported to the Authority by academic year and Figure 2 for the number of wrong-site nerve blocks reported by academic year. One wrong-site event occurring in the third quarter of academic year 2016-2017 was belatedly recognized. Adjustments in the number of reported events are reflected in Figure 1.
One-Year Overview

Update on Wrong-Site Surgery: More Data Provides More Insight | Advisory

http://patientsafety.pa.gov/ADVISORIES/Pages/201803_WSSUpdate.aspx
Sixty wrong-site surgery events were reported from Pennsylvania facilities since the last published analysis in December 2016 (i.e., October 2016 through September 2017). The majority of events were reported from hospitals (66.7%; \( n = 40 \) of 60) while 33.3% were reported by ambulatory surgical facilities (ASFs).

See Figures 3 and 4 for a representation of reports by clinical specialty and facility type. The most common clinical specialties for which a wrong-site event was reported during the one-year period were pain management (21.7%; \( n = 13 \)), anesthesia (15.0%; \( n = 9 \)), and ophthalmology (15.0%; \( n = 9 \)). Although all clinical specialty types were identified in the ASF reports, 10 of the 40 reported events from hospitals did not identify a specialty.

Wrong-site nerve blocks accounted for nearly one-quarter (23.3%; \( n = 14 \) of 60) of the events reported in this 12-month period. The majority of wrong-site nerve blocks were administered by anesthesiologists (\( n = 9 \)) and the remaining five were administered by surgeons in various clinical specialties, including ophthalmology, orthopedics,
and otolaryngology. All wrong-site nerve blocks were administered on the wrong side of the body. Pain management procedures (the majority of which were wrong-side spinal injections) accounted for 21.7% (n = 13) of the reported events.

The most improvement was noted in the number of wrong-site spinal procedures reported in the one-year period (6.7%; n = 4). As compared to the number of spinal events published in the last update (i.e., March 2016 through September 2016), a total of five wrong-level spinal procedures were reported within the two quarters (i.e., about one event every 43 days). In the 12 months of October 2016 through September 2017, four wrong-level spinal procedures were reported (i.e., about one event every 91 days).

During the last four quarters that were analyzed, the following wrong-site surgery events were also reported (excluding wrong-site nerve blocks):

- Ophthalmology procedures (10%, n = 6 of 60), such as laser trabeculoplasty
- Urology procedures (6.7%, n = 4), such as ureteroscopy/ureteral stent placement
- Otolaryngology procedures, excluding wrong-site anesthetic injection, (5%; n = 3), such as tonsillectomy
- Procedures by various disciplines (26.7%; n = 16) including hand surgery, neurosurgery, orthopedics, pulmonology, vascular surgery, and unspecified specialties

Summary

The twelve months represented in the update (i.e., October 2016 through September 2017) show an upward trend in the number of wrong-site surgery events reported. The most common wrong-site procedures include nerve blocks and spinal injections for pain management. The Authority performs in-depth analyses based on the information available in the reports submitted through PA-PSRS. The detail provided in the event narratives allows Authority analysts to understand common causes and to suggest process improvement strategies to prevent future occurrences of wrong-site surgery. The more detail provided in the reports (e.g., medical specialties involved, special circumstances, recommendations for improvement) the more information can be learned and shared statewide. Facilities providing surgical services are urged to consult their regional Patient Safety Liaison for education opportunities and to access helpful wrong-site surgery prevention resources and tools on the Authority's website (/pst/Pages/Wrong%20Site%20Surgery/hm.aspx).

Notes

Your Assignment, Should You Choose To Accept It

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Introduction

I am not a doctor or a nurse. I don't play one on TV. I am well and truly retired. But I did spend the last 30 years of my working life in a large manufacturing operation in a highly regulated industry. Over the years I have endured (yes, in some cases, that's the perfect word) hundreds of hours of corporate training. Some of it was good. Some of it was ghastly. As a manager, I've also done my share of training others. And since confession is good for the soul, I have to admit that the training I gave wasn't always good. Now involved as a volunteer in several patient safety initiatives, I am constantly reminded of the importance of training.

High Value Training

Classroom-style training remains a high value use of time. However, our modern institutions have also warmly accepted processes such as hands-on training, simulation exercises, and event recreations. They can focus instruction in different ways from the classroom setting, and, being interactive by nature, they can be more responsive to trainee questions and issues.

When you are on the receiving end of training, open your mind to the possibilities. Training is not punishment. Dig deep and find a way to motivate yourself about learning. For example, mentor someone who is newer to your organization than you are. Helping others to learn, you will learn more deeply and more successfully.

If you are a training manager or other leader who provides training, do all that you can to stay on the leading edge of technique and process. Constantly look for new ways to re-train on the same old material. Look for ways to test the effectiveness of your offerings. Poet Antonio Porchia said: "I know what I have given you. I do not know what you have received." Find out if what you are giving is actually being received. If it isn't, change something; look for ways to be a better trainer.

I believe that there is always a need for improvement—always an opportunity to up our game in regard to training. So like the old Mission: Impossible television series and more recent movies, I offer this need to improve training as "your assignment, should you choose to accept it." While the Mission: Impossible assignments self-destruct after they are read, I don't think the Advisory will self-destruct after you read this, but who knows?
High Value Impact

A physician friend once told me, "Medicine would be a great profession—but for having to deal with the patients." I don't think he was serious, at least not completely. I believe he was giving voice to the common frustration felt by anyone in a job that has frequent interaction with other people. Someone in human resources, education, the law, or retail sales might say much the same thing in a moment of exasperation.

For the health and welfare of others, it is necessary for those irritations and distractions to be constrained. This is where professionalism comes in. In my way of thinking, this is where all that training and retraining comes in. The very concept of patient safety requires that an individual's training kick in even when he or she is distracted on a personal level.

I had the opportunity to serve on the panel of judges for the Pennsylvania Patient Safety Authority's contest, "I Am Patient Safety." A large number of the submissions included "good catch" scenarios. Those stories pointed to an individual being knowledgeable, focused, and professional enough to pick up on one small detail that made all the difference for a patient.

Good training can help to fill in the proficiency gaps for the individual with less experience. Good training serves as a reminder of why policies and procedures need to be followed. Consistent training can also help the more experienced person resist the temptation to take shortcuts and half measures.

Yesterday's training on insulin needle length or on coordinating anesthesia and surgical sites or the need to double-check the patient's whiteboard may not change life in a big way. It won't remove all the distractions from your life. It won't alter the fact that the kids were arguing over their morning cereal. It won't keep you from being upset that your neighbor's dog left an ugly present on your front walk. It won't turn the emergency room into a place of tranquility. But the training time and effort will be well worth it if they help override distractions and make everyone involved more knowledgeable, focused, and professional.

Your assignment—and you really should choose to accept it—is to take full advantage of every training opportunity. You will be better for the endeavor. However, those who benefit most will be the patients who place their safety and their lives in your trust.
Safety Stories

"Safety Stories" (previously "Saves, System Improvements, and Safety-II") is an occasional feature in the Pennsylvania Patient Safety Advisory, highlighting successes of healthcare workers in keeping patients safe. The Safety-II approach assumes that everyday performance variability provides adaptations needed to respond to varying conditions and that humans are a resource for system flexibility and resilience.¹

What's Missing?

The following event report, submitted through the Pennsylvania Patient Safety Reporting System (PA-PSRS),* illustrates the value of a systems perspective:

Upon collecting a patient’s specimen, the RN [registered nurse] noted that the buffer vial did not contain liquid buffer. She obtained another collection kit, collected the specimen, and submitted it to the lab for testing. Staff examined the other collection kits and found another buffer vial that was empty. Lab Director notified the manufacturer.

It can be difficult to identify when a component of a system is missing. It is often easier to identify that a part is present, but is crooked or the wrong size or color. The Authority applauds this nurse for her alertness in recognizing that a necessary element of a vial was missing.

In addition, the Authority congratulates this nurse and her facility team for not just improving safety for the single patient who was almost affected, but for applying a systems perspective by investigating whether other vials might have a similar problem. After finding more than one problematic vial, the facility notified the manufacturer, so that the problem could be evaluated and mitigated at the point of manufacture. This system perspective will likely enhance the safety of patients in multiple facilities.

The Authority commends the nurse and her facility for recognizing a problem and seeking to correct the problem at its source.

* The details of the PA-PSRS event narrative in this article have been modified to preserve confidentiality.

Note

Celebrate the 2018 I Am Patient Safety Winners

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Introduction

To those who care for patients daily, thank you for your dedication and commitment to providing safe patient care in Pennsylvania!

It is with great pleasure that the Pennsylvania Patient Safety Authority shares the stories of the 2018 I Am Patient Safety contest winners. Sharing stories and learning from other healthcare facilities are two strategies that can help healthcare organizations in developing a culture of safety. This contest allows Pennsylvania healthcare facilities to showcase stories about how they are improving their safety culture and to demonstrate new strategies for providing safe patient care. Other showcased stories involve one person, at one point in time, making a big difference—with the ultimate goal of improving safety for every patient.

Across the Commonwealth, facilities submitted 206 nominations in nine categories. Each nomination shared a story of patient safety, with perspectives ranging from personal to organizational. Judges reviewed the nominations for each category to identify winners who demonstrated commitment and influence to improve patient safety; judges even selected two winners for one category.

We hope you find these stories inspirational and thought provoking. As you read these stories, please consider how you might continue with us on our journey of providing safe healthcare to all patients.

I Am Patient Safety: 2018 Winners

The Authority announced winners on Facebook Live on November 16, 2017, including a special recognition, the Executive Director's Choice Award. The winners have been featured (/NewsAndInformation/Brochures/Pages/IAPS_2018_Winners.aspx) on the Authority's website and at social media outlets. Let's continue to work together to provide safe patient care!

Ambulatory Surgical Facility / Ambulatory Care Center Award

Deborah Balogh, RN
Shriners Hospitals for Children—Erie Ambulatory Surgery Center
Best Use of Authority Resources Award

Janeen Smith, BSN, RN; Ann-Louise Jeffery, MSN, RNC-MNN; Liz Waterhouse, RNC-OB; Jodi Levine, MD, FAAP; Trish Ward, MSN, RNC-OB; and Katie Costantini, MSN, RNC-MNN
Chester County Hospital

Focus on the Patient Award

Hannah Do, MD
Cancer Treatment Centers of America® at Eastern Regional Medical Center

Good Catch Award

Dawn Emes, BSN, RN, CMSRN
Lehigh Valley Hospital - Muhlenberg

Improving Diagnosis Award

Janet Cahill
Einstein Medical Center Montgomery

Improving Diagnosis and the Executive Director's Choice Award

Michelle Nelsen, RN
UPMC Hamot
Individual Impact: Going Above and Beyond Award

Raymond J. Cipollini
Einstein Medical Center Montgomery

Innovation Award

Carol Mathews, BSN, RN, CWOCN; Cecilia Zamarripa, MSN, RN, CWON; Lisa Donahue, DNP, RN, CPPS; Sarah Martin-Cua, MBA, MSN, RN; Kristian Feterik, MD, MBA
UPMC Presbyterian Shadyside

Long-Term Care Award

Heather Kline, RNAC, IP
Kendal at Crosslands

Video Award

The multidisciplinary falls team
UPMC Susquehanna—Williamsport Regional Medical Center
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