

# PENNSYLVANIA PATIENT SAFETY AUTHORITY

## 2012 ANNUAL REPORT





## Letter from the Board Chair



April 30, 2013

Dear Fellow Pennsylvanians:

The Pennsylvania Patient Safety Authority (Authority) continues to work to improve patient safety in Pennsylvania's healthcare facilities.

Through its Patient Safety Liaison (PSL) program, the Authority educational programs grew substantially in 2012, not only in the number of courses given, but also in the number of healthcare personnel from tall disciplines who attended them. Last year, the Authority conducted 165 educational sessions with over 7,300 attendees. That's a 70 percent increase in attendance since 2010. Additionally, the number of individuals who attend per session has nearly doubled, from 22 per session in 2010 to 45 per session in 2012. Two PSLs were hired in 2012 to help with the numerous education requests from Pennsylvania healthcare facilities.

The Authority's efforts to improve patient safety in Pennsylvania healthcare facilities continued through its collaborations with the Hospital and Healthsystem Association of Pennsylvania (HAP) and other Pennsylvania healthcare organizations through the federal Partnership for Patients program. The goals of the program are to help Pennsylvania hospitals achieve a 40 percent reduction in preventable harm and a 20 percent reduction in preventable readmissions. The Authority's collaborations with Pennsylvania facilities focus on reducing falls, wrong-site surgeries, and adverse drug events statewide. More about the Partnership for Patients Pennsylvania collaborations are detailed in this annual report.

Along with the statewide collaborations, the Authority has continued to publish its *Pennsylvania Patient Safety Advisory*. The award-winning academic journal is the Authority's flagship publication based on analysis of adverse events and near misses occurring in Pennsylvania's healthcare facilities. Since the first *Advisory* was issued in March 2004, the Authority has published more than 425 articles on a variety of clinical issues. In 2012, some highlighted articles include "The Role of the Electronic Health Record in Patient Safety Events," "Falls Risk Assessment: A Foundational Element of Falls Prevention Programs," and "The Breadth of Hospital-Acquired Pneumonia: Nonventilated versus Ventilated Patients in Pennsylvania."

Facilities responding to an annual Authority survey have made over 1,200 process changes in their facilities in 2012 based on *Advisory* articles and educational programs. That number has doubled from previous years.

Last year, the Authority continued to educate nursing homes through *Advisory* articles covering infection topics and through a poster campaign during International Infection Prevention Week to promote handwashing. Posters were developed for nursing homes and other Pennsylvania healthcare facilities to hang in their clinical staff and patient areas.

Moving forward, the Authority has developed a strategic plan that will enhance the projects and programs begun in the last several years. The Authority expects to broaden its infection control program, increase the collaborations within individual hospitals, and create a patient advisory panel.

As a new member and chair of the Pennsylvania Patient Safety Authority Board of Directors, I look forward to working with Pennsylvania healthcare facilities and nursing homes to continue the tremendous work being done to improve patient safety in the commonwealth. On behalf of the board, I am pleased to submit this annual report for your review.

John B. Bulger, DO, MBA  
Chair, Board of Directors  
Pennsylvania Patient Safety Authority



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## **Introduction**

The Pennsylvania Patient Safety Authority is an independent state agency established under Act 13 of 2002, the Medical Care Availability and Reduction of Error (Mcare) Act. It is charged with taking steps to reduce and eliminate medical errors through the collection of data, identification of problems, and recommendation of solutions that promote patient safety in hospitals, ambulatory surgical facilities (ASFs), birthing centers, and abortion facilities. In June 2009, the Authority began collecting infection reports from nursing homes. The Authority's role is nonregulatory and nonpunitive.

The Authority initiated statewide mandatory reporting in June 2004, making Pennsylvania the only state in the nation to require reporting of Serious Events and Incidents (near misses). All reports are confidential and nondiscoverable, and they should not include any patient or provider names. In 2007, the legislature added a chapter to the Mcare Act that addressed the reporting of healthcare-associated infections (HAIs) in Pennsylvania and required infection reporting from nursing homes. The law requires significant involvement by the Authority.

## **Patient Safety Authority Strategic Plan 2012**

Prior to 2007, the Pennsylvania Patient Safety Authority was primarily focused on the development and implementation of the Pennsylvania Patient Safety Reporting System (PA-PSRS), data collection, analysis of collected reports, and guidance provided through the *Pennsylvania Patient Safety Advisory*. In 2007, the Authority's board of directors developed a strategic plan to build on those successes and have a greater impact on patient safety in Pennsylvania. The board desired the Authority to develop broader programs that focused on education, training, collaboration, and communication. Staff developed significant new initiatives like the Patient Safety Liaison program, the Patient Safety Knowledge Exchange (PassKey), new websites, and other educational programs to achieve the objectives identified by the board.

In 2012, the board again wanted to build on the successes achieved by the Authority since 2007 and develop a new strategic plan. The development of the 2012 strategic plan was very inclusive, and the Authority sought input from over 70 separate stakeholders through interviews, surveys, and attendance at a two-day strategic planning retreat. During the retreat, five critical issues were identified by the board:

- How can we best measure the Authority's effectiveness in improving patient safety?
- How do we bring consistency to reporting among the Authority, the Pennsylvania Department of Health (DOH), and healthcare facilities?
- How do we mutually engage patients and providers in patient safety?
- How do we strategically align ourselves with healthcare providers and trends critical to patient safety?



A summary of the estimated costs associated with the new initiatives and projects is presented below.

**Estimated Costs (in \$000s)**

Project	Staff	Ops	IT		FY 12-13	FY 13-14	FY 14-15
1. DOH Meeting support Education and training DOH data mart? HIT programming		0-5 10-30	50-100 150-250		0-5	10-25 50-100 150-250	
2. Standards Programming			150-250			150-250	150-250
3. Measurement Patient safety analyst Data analyst	225 175					225 175	225 175
4. NH HAI Infection preventionist PSRS business rules Revise McGeer criteria	130		budgeted budgeted		budgeted budgeted	130	130
5. Alignment with national priorities External review		50-70				50-70	
6. Integrate patient voice Travel and meeting support		20-30				20-30	20-30
7. Develop strategic partnerships	budgeted				budgeted	budgeted	
8. Execute HEN collaboratives	budgeted				budgeted	budgeted	
9. PA-PSRS data warehouse			650-900			650-900	
Total						<b>\$1620-1995</b>	<b>\$800-990</b>

The complete 2012 Strategic Plan is included as **Addendum F** to this report.

## *Data Collection and Analysis*

The Pennsylvania Patient Safety Reporting System (PA-PSRS) is a secure, web-based system that permits Pennsylvania hospitals, ambulatory surgical facilities (ASFs), birthing centers, and abortion facilities to submit reports of what Pennsylvania law defines as “Serious Events,” “Incidents,” and “Infrastructure Failures” (please see **Addendum A** for definitions). Data collection through PA-PSRS provides the base that supports all Authority activities and initiatives.

Statewide mandatory reporting through PA-PSRS went into effect June 28, 2004. All information submitted through PA-PSRS is confidential. By law, reports should not contain any identifiable information, and no information about individual patients and providers is requested. In addition, no information about individual facilities is made public. Facilities are required to report Infrastructure Failure events to the Pennsylvania Department of Health (DOH), Incidents to the Authority, and Serious Events to both

agencies. PA-PSRS is designed so facilities are only required to submit this information one time. PA-PSRS automatically routes the reports to the appropriate agency.

In 2008, PA-PSRS was modified to enable nursing home facilities to report healthcare-associated infections (HAIs). The Authority further modified PA-PSRS in 2012 to accommodate the standardization of patient falls event reporting in order to support a statewide patient falls reduction collaboration that includes over 80 hospitals.

In 2012, 267,506 reports were submitted to the Authority by 1,270 Pennsylvania facilities through PA-PSRS (this does not include Infrastructure Failure reports, which are forwarded to DOH and not seen by Authority staff). Table 1 identifies the number of reports submitted to PA-PSRS, by facility type, Table 1a breaks out the number of reports by hospital type.”All acute level facilities” includes all facility types with the exception of nursing homes.

**Table 1. Number of Reports Submitted to PA-PSRS, by Facility Type (2012)**

Facility Type	Hospitals	Ambulatory Surgical Facilities	Birthing Centers/ Abortion Facilities	All Acute-Level Facilities	Nursing Homes (HAIs only)	All Facilities Reporting via PA-PSRS
<b>No. of Reports Submitted</b>	230,017	4,967	265	235,249	32,257	267,506
<b>No. of Facilities Active for Year Ending December 31, 2012</b>	241	292	26	559	711	1,270

**Table 1a. Number of Reports Submitted to PA-PSRS, by Hospital Type (2012)**

Hospital Type	No. of Hospitals	Incidents	Serious Events	Total
Acute Care	155	196,843	5,148	201,991
Children's	7	8,013	78	8,091
Behavioral	19	3,022	589	3,611
Rehabilitation	20	7,751	502	8,253
Community	13	2,226	72	2,298
Long-Term Acute Care	27	5,700	73	5,773
<b>Hospital Total</b>	<b>241</b>	<b>223,555</b>	<b>6,462</b>	<b>230,017</b>

Prior to 2010, event reporting increased significantly every year. During the past few years, reporting appears to have leveled off (see Table 2). However, there has been significant growth in reporting by acute nonhospital facilities, such as ASFs. ASFs submitted approximately 18 reports per facility in 2012 compared with approximately 13 reports per facility in 2010, a 38% increase. This significant increase may be due to the patient safety liaisons’ efforts to engage ASFs in reporting events, “Why Reporting Matters”.

**Table 2. Reports by Acute Facility Types since 2009 (excludes nursing homes)**

Year	Hospitals		Ambulatory Surgical Facilities, Birthing Centers, and Abortion Facilities		All Facilities
	No.	% of Facility Type	No.	% of Facility Type	Total
2009	223,026	98.39	3,644	1.61	226,670
2010	221,855	98.33	3,769	1.67	225,624
2011	223,995	97.88	4,840	2.12	228,835
2012	230,017	97.78	5,232	2.22	235,249
2004 to 2012*	1,755,096	98.38	28,894	1.62	1,783,986

\*The Pennsylvania Patient Safety Authority began mandatory reporting statewide on June 28, 2004.

Facilities submit reports by event type. Table 3 shows the percentage of reports submitted under each of the nine primary event types in 2012. The most frequently reported occurrences were in the event type Errors Related to Procedures/Treatments/Tests (22%), up 1 percent from 2011. The second most frequently reported event type was Medication Errors (18%); however, this number is down 2 percent from 2011. These two event types account for 40% of all reports submitted. While Errors Related to Procedures/Treatments/Tests was the event type most frequently reported through PA-PSRS, these errors were not the ones most frequently associated with harm to the patient.

Also shown in Table 3, the largest number of Serious Event reports was under the primary event type category Complications of Procedures/Treatments/Tests, accounting for 44% of all Serious Event reports and 57% of all reports of events resulting in or contributing to the patient's death.

**Table 3. Reports by Event Type and Submission Type for 2012**

Event Type	Serious Events			Incidents			Total	% of Total
	No. of Reports	% of Type	% of Total	No. of Reports	% of Type	% of Total		
Medication Errors	235	1	3	42,663	99	19	42,898	18
Adverse Drug Reactions (not a medication error)	287	6	4	4,844	94	2	5,131	2
Equipment / Supplies / Devices	42	1	1	4,667	99	2	4,709	2
Falls	1,115	3	14	35,168	97	15	36,283	15
Errors Related to Procedures / Treatments / Tests	658	1	8	50,785	99	22	51,443	22
Complications of Procedures / Treatments / Tests	3,576	10	44	31,874	90	14	35,450	15
Transfusions	26	1	0	3,492	99	2	3,518	1
Skin Integrity	794	2	10	34,072	98	15	34,866	15
Other / Miscellaneous <sup>1</sup>	1,306	6	16	19,645	94	9	20,951	9
<b>Total</b>	<b>8,039</b>	<b>3</b>	<b>100</b>	<b>227,210</b>	<b>97</b>	<b>100</b>	<b>235,249</b>	<b>100</b>

Approximately 3.4% of reports indicate harm and were reported as Serious Events. Harm was less likely to be reported under the event type categories Medication Errors, Equipment/Supplies/Devices, Transfusions, and Errors Related to Procedures/Treatments/Tests (2% or less).

The Authority analyzes the data received through PA-PSRS in many different ways. To see PA-PSRS reporting data broken down by gender, age, region, and other characteristics, see **Addendum B**.

## *The Pennsylvania Patient Safety Advisory*

The *Pennsylvania Patient Safety Advisory* is the Authority’s flagship publication. This quarterly, peer-reviewed, online journal is the Authority’s primary means of communicating with healthcare facilities about the significant trends identified in events submitted through its reporting system. Articles in the *Advisory* also contain information on prevention

<sup>1</sup> This is not a single category of completely unclassified reports but rather a category that includes specific subcategories that did not logically fit under other existing top-level headings. Examples of subcategories under Other/Miscellaneous include inappropriate discharge, other unexpected death, and electric shock to the patient.

strategies that can be used to reduce or eliminate the events healthcare facilities have reported. Accompanying many articles are electronic tools healthcare workers can use to monitor adherence to safety practices or to educate the staff in their organizations.

The *Advisory* is disseminated through the Authority's website at <http://www.patientsafetyauthority.org>. Each year, the Authority asks patient safety officers and infection prevention staff to rate the *Advisory* on its quality, relevance, usefulness, and other factors.

To review these ratings and other results from this annual stakeholder survey, please refer to **Addendum G**.

The *Advisory's* primary audience includes patient safety officers and other facility staff working on safety, risk management, and quality improvement, as well as department and unit managers—individuals who can make system-level changes to improve safety. Where topics are useful for frontline healthcare workers, the Authority often develops educational programs, checklists, and other tools that can help to change practices at the bedside. In some instances, the Authority publishes its analysis and guidance in journals related to the appropriate clinical specialty.

Since the first *Advisory* was issued in March 2004, the Authority has published more than 425 articles on a variety of clinical issues. In 2012, the Authority published 35 articles, such as:

- The Role of the Electronic Health Record in Patient Safety Events
- Falls Risk Assessment: A Foundational Element of Falls Prevention Programs
- The Breadth of Hospital-Acquired Pneumonia: Nonventilated versus Ventilated Patients in Pennsylvania

To review summaries of selected articles from 2012, please see **Addendum C**.

## **Training and Education Efforts**

The Authority offers numerous education and training events to healthcare providers. These events include regional or statewide sessions that attract representatives from numerous facilities and training focused on the needs of individual facilities given within the walls of the facility. The Authority's educational programs have grown substantially over the past several years with respect to the number of offerings provided, total attendance, and attendance per offering. As seen in Figure 1, the Authority educated over 7,300 Pennsylvania healthcare providers in 2012. This represents an increase of 59% since 2010.



PA Healthcare Providers Educated

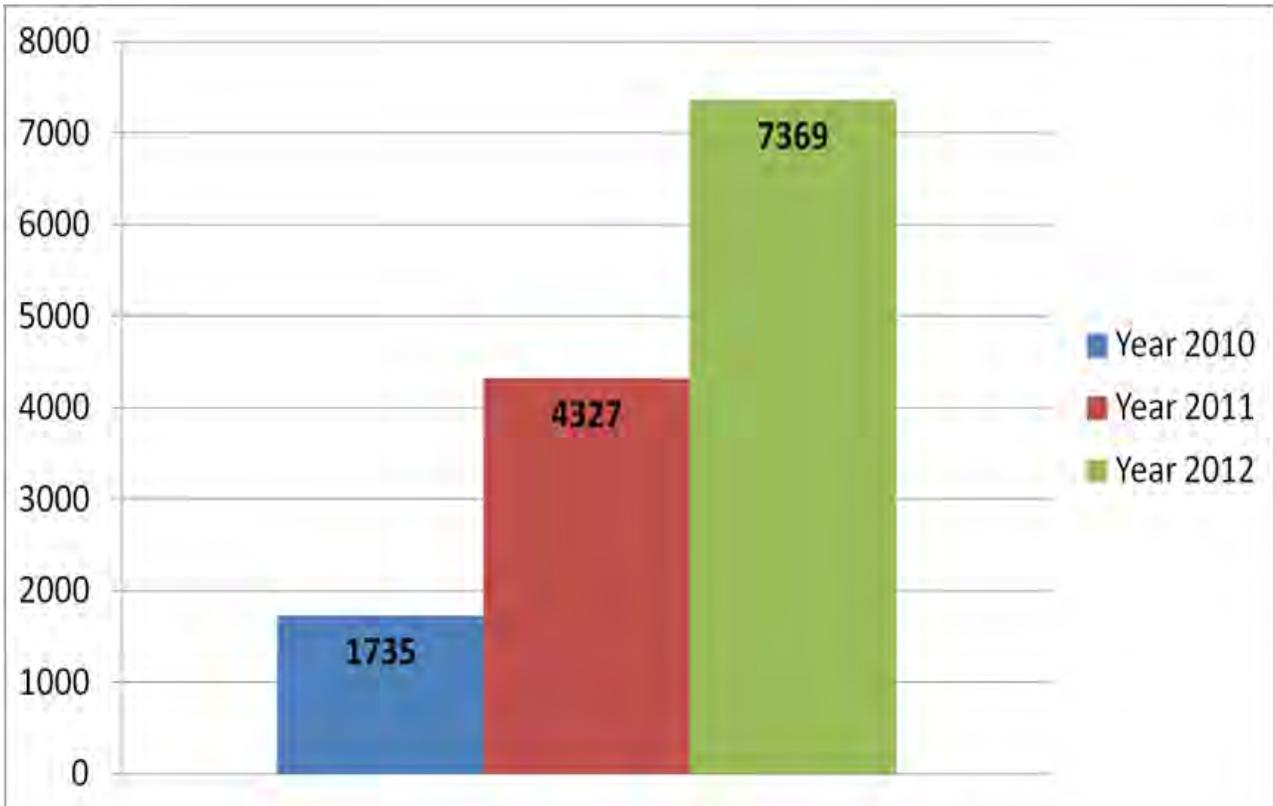
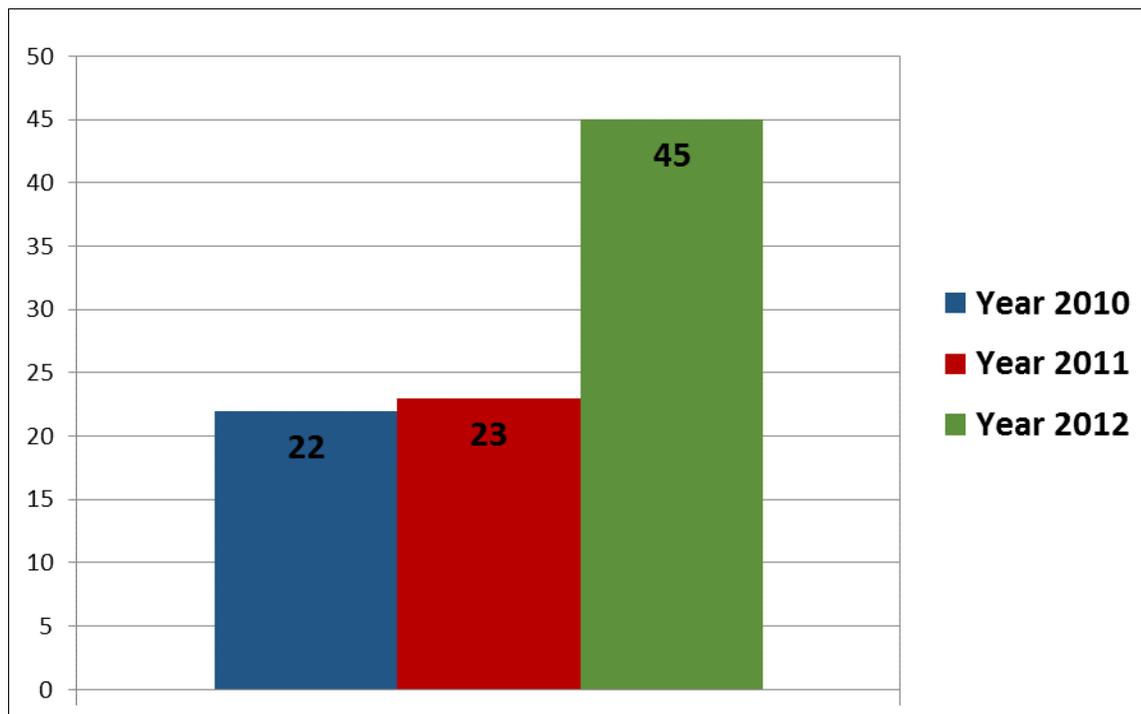


Figure 1. Pennsylvania Healthcare Providers Educated from 2010-2012

In addition, as identified in Figure 2, attendance at each educational event doubled from approximately 22 in 2010 to 45 in 2012. These educational events are always conducted free of charge for all attendees.

### Attendance per Educational Event



**Figure 2. Attendance per Educational Event**

Interest in the Authority's educational programs has been influenced by many factors. A needs assessment is taken (in the form of program evaluations, verbal feedback from facilities, and statewide annual surveys) in an attempt to identify educational opportunities. The types of programs offered in 2012 included education on the Medical Care Availability and Reduction of Error (Mcare) Act, new patient safety officer (PSO) training, patient safety foundational concepts, specific clinical topics (e.g., infection prevention, medication safety), and collaboration-specific programs (e.g., falls, wrong-site surgery, adverse drug events).

The importance of facility boards of trustees embracing patient safety within their facilities is crucial for a culture of safety to occur. This safety and quality focus is recognized as fundamental to a healthcare facility's mission of providing safe, trusted, affordable, and cost-effective healthcare. The Authority has partnered with the Hospital and Healthsystem Association of Pennsylvania and the American Hospital Association to educate a large number of hospital boards of trustee members about patient safety and its effect on quality in their healthcare facilities. Approximately 60 facilities in Pennsylvania have participated in the program since its inception. The program is supported by several healthcare organizations and agencies that provide pay-for-performance incentives and grant subsidies for participation in the program. They include Blue Cross of Northeastern Pennsylvania, Capital BlueCross, CHART Risk Retention Group, Highmark, Independence Blue Cross, and the Pennsylvania Office of Rural Health.

In 2012, the Authority developed and offered a statewide program titled Patient Safety You Design. This was a full-day conference that provided attendees the opportunity to select from four different curriculums (root-cause analysis, data, teamwork, and just culture). Each curriculum is supported by a three-hour presentation with thorough content on a particular topic. The participants have the option to choose any two topics they feel will expand their knowledge. A detailed description of these four programs is provided in **Addendum D**.

## *The Patient Safety Liaison Program*

The Patient Safety Liaison (PSL) program has been in existence for a little over four years. Since its inception, the depth of the PSL program has grown tremendously. The Authority's eight PSLs are each responsible for a region of the commonwealth. Every Pennsylvania hospital, ambulatory surgical facility (ASF), birthing center, and abortion facility is assigned a PSL. The PSLs act as researchers, educators, consultants, facilitators, collaborators, and conduits for sharing and learning. Their primary contacts within the facilities are the facilities' patient safety officers. However, as the program has taken root, the PSL has become a patient safety resource to many in a given facility. At an increasing rate, the PSLs are invited to assist with patient safety analysis, review of processes and procedures, and education of hospital staff within the walls of the facilities.

The PSLs act as consultants for Pennsylvania's healthcare facilities to provide numerous educational resources developed by the Authority, including educational sessions about networking and teamwork and communication.

Whether it is used to gain new knowledge or confirm existing knowledge, networking can be a great benefit. Networking provides a forum for patient safety officers to learn what works and what doesn't work, to establish contacts with other patient safety officers for future collaboration, to garner support, and to spark new ideas. Due to the unique nature of the demographics, structure, function, and standards of their settings, hospital and ASF sessions are held separately. Topics of interest include but are not limited to: PA-PSRS, infection prevention, mitigation for natural disasters, influenza vaccinations, handoff communication, event investigation, survey activities, psychiatric patient assessment, HYDROmorphone safety, and prevention of wrong-site surgery.

The PSLs have also discussed patient safety with leaders of entry-level and advanced-degree nursing programs to incorporate patient safety into the classroom curriculum. Professional organizations on a regional, state, and national level have also called upon the Authority and the PSLs to speak on a variety of patient safety topics such as basic patient safety concepts, the importance of medical event reporting, transparency, and patient engagement.

The Authority will continue to develop, coordinate, and offer educational programs that focus on identified patient safety education needs of healthcare providers. The ongoing goal is to reach out to all clinical and nonclinical staff, leadership and frontline staff,

patients, and others who are part of the healthcare team in an effort to provide learning opportunities that will help them reduce and eliminate medical errors.

## **Collaborative Efforts with Facilities to Improve Patient Safety**

The Authority has been working to engage Pennsylvania facilities in collaborative projects to improve patient safety. The outcomes of these collaborations are shared statewide through articles in the *Pennsylvania Patient Safety Advisory* to allow all facilities to learn from the work of other Pennsylvania facilities. They include the following:

### **The Ambulatory Surgical Facility Preoperative Screening and Assessment Collaboration**

In 2012, the Authority used a statewide needs assessment of ASFs completed in 2011 to identify potential contributing factors to same-day cancellations of procedures and transfers to acute care. This information was used to develop a screening and assessment process based on best practices and consensus in participating ASFs in the northeast region of Pennsylvania. There are 11 ASFs working on this collaboration intended to improve the preoperative screening and assessment of patients in ASFs. The project is expected to conclude in 2013.

### **Surgical Site Infection Prevention Collaborative (PA-NSQIP)**

The Authority and the Pennsylvania National Surgical Quality Improvement Program (PA-NSQIP) have been collaborating on a program to reduce surgical site infections among the PA-NSQIP member hospitals and to transfer successful strategies and lessons learned to other Pennsylvania hospitals. This collaboration has included development of best-practice survey tools and on-site visits with a survey team consisting of a nurse, physician, and Authority representative. This collaboration team specifically focused on two types of surgical procedures: colectomy and bariatric surgery. Detailed information about the site assessment and findings are outlined in the December 2012 *Pennsylvania Patient Safety Advisory*. A summary is on page E2 of this annual report.

### **Pennsylvania Hospital Engagement Network**

The Authority's efforts to improve patient safety with Pennsylvania healthcare facilities continued through its collaborations with the Hospital and Healthsystem Association of Pennsylvania (HAP) and other Pennsylvania healthcare organizations through the federal Partnership for Patients program. The Pennsylvania Hospital Engagement Network (PA-HEN) was awarded a two-year contract to work with hospitals to reduce healthcare-acquired conditions. Approximately 130 Pennsylvania hospitals are participating in the HEN collaborative projects.

The goals of the program are to:

- *Keep patients from getting injured or sicker.* By the end of 2013, decrease preventable hospital-acquired conditions by 40 percent compared with 2010.
- *Help patients heal without complication.* By the end of 2013, decrease preventable complications during a transition from one care setting to another so that hospital readmissions are reduced by 20 percent compared with 2010.

HAP is the primary contractor with the federal government for this program. They have partnered with the Authority, the Health Care Improvement Foundation, the Pennsylvania Health Care Quality Alliance, and Quality Insights of Pennsylvania in developing PA-HEN. Highlights of the Authority projects (focused on adverse drug events, falls, and wrong-site surgery) are below. Additional details regarding the projects are presented in **Addendum E**.

### **Preventing Adverse Drug Events: Management of Opioids**

PA-HEN felt that it was important to implement a statewide adverse drug event (ADE) project aimed at reducing and preventing harm related to the use of opioids based on the PA-PSRS and Institute for Safe Medication Practices (ISMP) data, coupled with the lack of standardized process and outcome measures for evaluating safety in relation to opioid use. There are 29 PA-HEN hospitals participating in this project. The goal of this project is to decrease the number of harmful events when using opioids by December 2013 through increasing the awareness of patient harm occurring from using opioids within organizations; improving the knowledge of and processes associated with using opioids within organizations; assisting facilities in identifying risks currently present within their organizations and proactively reducing potential harm to patients; and decreasing the number of harmful events with the use of opioids within the HEN participants, by quarter, compared with concurrent and historical controls.

The project activities in 2012 included the development, dissemination, and analysis of an opioid knowledge assessment tool and an opioid organizational assessment tool. The project also included webinar-based education programs, one-on-one coaching calls, and implementation of a collaborative workspace for monthly data collection.

In 2013, the PA-HEN ADE opioid project will include process measures, recruitment of organizations to present monthly webinars, repeating the opioid knowledge and organization assessment, and offering more collaborative opportunities among hospitals within the project.

### **Preventing Patient Falls and Reducing Harm**

Falls with injury are the most frequently reported hospital-acquired conditions and are one of the most frequently reported Serious Events in Pennsylvania. They continue to represent a patient safety challenge for many hospitals. The project goal is to achieve a 20 percent reduction in the rate of falls with harm in participating facilities and units by December 2013. There are 82 hospitals formally enrolled in the PA-HEN falls reduction and prevention

project. In order to ensure the project data is consistent, the definitions of patient falls and patient falls with harm were standardized. This was done using feedback obtained from stakeholders and a survey of all Pennsylvania hospitals.

In order to support the standardized definitions, modifications were made to PA-PSRS, including the introduction of denominator fields to support the capture of patient-days or other data for outpatient units that provide care to patients. The falls project has also provided enrolled hospitals with educational offerings, coaching calls and regional meetings to encourage program participation and collaboration among peers. The Authority also provided a self-assessment tool to hospitals participating in the project. In addition, facilities were asked to complete an audit on the unit or units where they are piloting small tests of change as part of the PA-HEN collaborative.

In 2013, increases in the adoption of best practices in falls prevention across all categories will be measured through repeat administration of the falls self-assessment tool. The falls reduction and prevention team will continue to support the participating facilities by meeting face-to-face with them, reviewing data for validity and reliability, and providing educational resources. A number of facilities in the project have experienced no falls with harm since the project began, and there are a few that have reduced their falls with harm and have maintained that reduction for at least three months.

### **Preventing Wrong-Site, Wrong-Person, Wrong-Procedure Surgery Project**

Since July 2004, more than 500 wrong-site surgery (WSS) events have been reported through PA-PSRS. Over an eight-year period, Pennsylvania data shows that WSS events are reported at a rate of one event per week. As a partner with the PA-HEN, the Authority collaborated with 25 Pennsylvania hospitals and two ambulatory surgery centers to prevent wrong-site surgeries. The Authority reached out specifically to those healthcare facilities that were having continued problems with WSS. The Authority developed and implemented a strategic program that provided education, tools, technical assistance, resources, and interactive forums to help participants achieve an overall 20 percent improvement with identified process and outcome measures for preventing WSS.

Two regionalized workshops were conducted for surgical leaders and their teams in July 2012. The workshop agenda included a review of the evidence-based best practices for preventing WSS with references to medical literature and the Authority's database.

Over 80 percent of collaborative facilities have attended webinars and audio conferences, and nearly 100 percent participated in baseline data collection and attended on-site workshops. An aggregated data set summarizing the baseline results of the data collection tools was compiled, automated, and posted on a confidential website. This tool helped benchmarking efforts to implement and sustain policies and procedures that prevent WSS. The Authority's WSS surgery team observed on-site in the operating room and conducted educational sessions for surgical teams.

Facilities will continue to be offered on-site visits in 2013.

Also, a *Pennsylvania Patient Safety Advisory* article summarizing the Authority's overall WSS efforts is on page E11 of this annual report; it notes that WSS in Pennsylvania since 2007 has declined by 37 percent from an average of 19 reports per quarter to an average of 12 reports per quarter.

## *The Authority's HAI Reduction Efforts*

Pennsylvania is a recognized leader in healthcare-associated infection (HAI) reduction. Through addressing the challenges presented by HAI, patient harm and excess treatment costs may be avoided. The Authority provides frontline staff, managers, infection preventionists, and administrators with data to help direct their infection prevention activities. Integration with current clinical practice through collaboration gives the Authority the ability to develop resources and tools designed for overall prevention of HAIs.

In order to leverage the unique resources and strengths of different organizations, the Authority works closely with the Pennsylvania Department of Health, the Pennsylvania Health Care Cost Containment Council, the Hospital and Healthsystem Association of Pennsylvania (HAP), the Association for Professionals in Infection Control and Epidemiology, the Health Care Improvement Foundation, the Pennsylvania Health Care Quality Alliance, and other government agencies and professional associations across the spectrum of healthcare delivery.

Through its Partnership for Patients initiative, the Centers for Medicare and Medicaid Services (CMS) initiated the Hospital Engagement Network. The network was formed by CMS contracting with state and national organizations with the goal of promoting practices and strategies through collaboration with hospitals in order to enhance the culture of safety. The collaboration offers opportunities for participating hospitals to take part in projects aimed at decreasing adverse events. In partnership with HAP, Authority analysts develop content and consult on programs that focus on the prevention of HAIs and mitigation of associated risks. The overall goal is a 40 percent reduction in preventable harm.

These are just a few examples of the Authority's HAI reduction efforts. For more detail on these and other initiatives, please refer to **Addendums E and H**.

## *Recommendations to the Department of Health*

Since its inception, the Pennsylvania Patient Safety Authority has had a special focus on preventing surgical procedures from being performed on the wrong patient, wrong body part, wrong side of the body, or wrong level of a correctly identified anatomic site—collectively referred to as “wrong-site surgery.” While this type of event is rare at the level of an individual hospital or ASF, the Authority has developed the largest database of reports on wrong-site surgery cases in the United States, and possibly the world. The Authority's

analysis of several hundred of these reports allowed the Authority to identify principles that, when followed, can prevent these events.<sup>2</sup>

The Authority used these principles in two collaborative programs with multiple hospitals to help them reduce or eliminate wrong-site surgery. Working with the Health Care Improvement Foundation, the Authority helped a group of 30 hospitals in southeastern Pennsylvania to reduce these egregious events by 73%. The Authority convened a second group of operating room staff from 19 facilities elsewhere in the state to try to achieve one year with no wrong-site surgeries.

Having developed the evidence base for these principles and demonstrated that facilities adopting these principles can drastically reduce the occurrence of wrong-site surgery, the Authority took the initial steps toward issuing formal recommendations on wrong-site surgery prevention. The Authority met with the Pennsylvania Department of Health (DOH) in January 2012 to discuss the process for making recommendations and obtained its agreement in principle that recommendations on this topic would benefit the commonwealth.

In March 2012, the Authority distributed draft recommendations for public comment to the patient safety officers of all acute care facilities that perform surgery, as well as to the Pennsylvania chapters of relevant clinical specialty societies and professional associations. The Authority received feedback from these stakeholders on whether they envisioned any barriers to implementation of the principles. In November 2012, the Authority published a supplementary *Pennsylvania Patient Safety Advisory* discussing the feedback received from the Pennsylvania professional organizations. The Authority and DOH expect to address the wrong-site surgery recommendations in late 2013.

## *Anonymous Reports*

Act 13 of 2002 (Mcare) includes an important provision that permits individual healthcare workers to submit what the Mcare Act defines as an “anonymous report.” Under this provision, a healthcare worker who has complied with section 308(a) of the act may file an anonymous report regarding a Serious Event. Act 13 of 2002 requires facilities to make anonymous report forms available to healthcare workers. The Authority does not receive many anonymous reports. The Authority makes the forms available on the PA-PSRS website, which is accessible without a password. The reporting form is a simple, one-page questionnaire. To ensure healthcare workers are aware of the option to submit an anonymous report, the Authority developed an anonymous report pamphlet. The pamphlet includes an anonymous report form with guidelines for filing a report so patient safety officers can make them easily accessible for hospital staff. While making their routine visits

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<sup>2</sup> Pennsylvania Patient Safety Authority. The evidence base for the principles for reliable performance of the Universal Protocol [online]. Dec 2011 [cited 2012 Apr 12]. [http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/PWSS/Documents/u\\_principles.pdf](http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/PWSS/Documents/u_principles.pdf).

to facilities in their region, the Authority's patient safety liaisons also ensure patient safety officers are making the anonymous report forms accessible to employees.

Healthcare workers are able to submit an anonymous report according to the protocols established through the PA-PSRS system. Individuals completing the form do not need to identify themselves, and the Authority assigns professional clinical staff to conduct any subsequent investigations. The Authority encourages healthcare workers to submit anonymous reports when they believe their facility is not responding appropriately to Serious Events. Act 13 of 2002 requires that the annual report include the number of anonymous reports filed and reviews conducted by the Authority. The Authority received one anonymous report in 2012 that complied with Act 13 of 2002 requirements.

### **Referrals to Licensure Boards**

Act 13 of 2002 requires the Authority to identify the number of referrals to licensure boards for failure to submit reports under the act's reporting requirements. No such situations were identified during 2012. However, it is important to note that the Authority is unlikely to receive information related to a referral to a licensure board, as PA-PSRS reports do not include the names of individual licensed practitioners.

### **Fiscal Statements and Contracts**

Act 13 establishes the Patient Safety Trust Fund as a separate account in the state treasury. Under Act 13, the Authority, which has sole discretion to determine how those funds are used to effectuate the purposes of the patient safety provisions of the act, administers funds in the Patient Safety Trust Fund.

Funds for the Patient Safety Trust Fund come from assessments made by the Pennsylvania Department of Health (DOH) on certain medical facilities. The department has 30 days following receipt of those moneys to transfer them to the Patient Safety Trust Fund.

The Authority recognizes that Pennsylvania hospitals, birthing centers, ASFs, abortion facilities, and nursing homes bear financial responsibility for costs associated with complying with mandatory reporting requirements. Accordingly, the Authority has focused on two fiscal goals: to be moderate in the use of moneys contributed by the healthcare industry and to assure that healthcare facilities paying for PA-PSRS receive direct benefits from the system in return.

In this regard, in designing PA-PSRS, the Authority included within the system a variety of integral and analytical tools that provide immediate, real-time feedback to facilities about their own adverse event and near-miss reports and activities and a report that aggregates reports into the National Patient Safety Goal categories. Facilities can use these tools for

their internal patient safety and quality improvement programs. The Authority also publishes the *Pennsylvania Patient Safety Advisory*, a scholarly journal issued quarterly that includes detailed analysis and identification of trends of reports submitted through PA-PSRS. Finally, the Authority has provided numerous training and education programs on such topics as reporting basics, Beyond the Basics, regional root-cause analysis, failure mode and effects analysis, and reduction of methicillin-resistant *Staphylococcus aureus* (MRSA) in ASFs, and new patient safety officer school, to name a few. These programs are generally offered for free. As identified elsewhere in this report, the Authority is expanding its services to be increasingly collaborative with reporting facilities and other patient-safety-centric organizations. By directly offering clinical guidance, feedback, and educational programs to providers about actual events that occurred in Pennsylvania, the Authority provides value to the healthcare industry that funds this program.

### **Funding Received from Hospitals, ASFs, Birthing Centers and Abortion Facilities**

Act 13 sets a limit of \$5 million on the total aggregate assessment on healthcare facilities for any one year beginning in 2002, plus an annual increase based on the consumer price index (CPI) for each subsequent year. On January 22, 2012, the Authority board authorized a recommendation to DOH that the FY 2011-2012 acute care surcharge assessment total \$5.1 million. This amount was an increase of \$100,000 over the surcharge assessment from the previous fiscal year and 18.8% less than the maximum annual amount that could have been assessed for the year pursuant to Act 13. At the time of this recommendation, the Authority board took several points into consideration, including:

- The Authority budget increased by \$58,000, or 1% over the previous fiscal year.
- The Authority FY 2010-2011 budget was approximately \$5.93 million, of which approximately \$5.1 million related to non-HAI (healthcare-associated infection) expenditures.

Act 13 requires that the annual report include a summary of fund receipts and expenditures, including a financial statement and balance sheet. The following tables are presented to meet these requirements and also include Act 52/HAI financial information:

**Table 4. Acute Care Facility Assessments**

<b>Fiscal Year</b>	<b>No. of Facilities Assessed by DOH</b>	<b>ff</b>	<b>Approved Assessments</b>	<b>ff</b>	<b>Total Assessments Received by DOH</b>	<b>ff 1</b>
2002-03	356		\$5,000,000		\$4,663,000	
2003-04	377		\$2,500,000		\$2,542,316	
2004-05	414		\$2,500,000		\$2,508,787	2
2005-06	450	3	\$2,500,000		\$2,500,149	
2006-07	453		\$2,500,000		\$2,500,034	
2007-08	526		\$5,400,000		\$5,391,583	
2008-09	524		\$4,000,000		\$3,972,677	
2009-10	519		\$5,000,000		\$4,989,781	
2010-11	542		\$5,000,000		\$4,981,443	
2011-12	550		\$5,100,000		\$5,063,723	
					<b>\$39,113,493</b>	

[1] Amounts assessed and amounts received will differ because a few facilities may have closed in the interim or are in bankruptcy. In a few cases, DOH is pursuing action to enforce facility compliance with Act 13's assessment requirement.

[2] Total assessments received are greater than assessments made because some funds received were late payments for the previous year's assessment.

[3] The number of facilities assessed by DOH differs from the number of Act 13 facilities cited elsewhere in this report due to the differences in the dates chosen to calculate the number of facilities for these two different purposes.

### **Funding Received from Nursing Homes**

Act 52 allows DOH to assess the nursing homes up to \$1 million per year. In 2008, following the Authority's suggestion, DOH assessed 725 nursing home facilities \$1,000,782 for FY 2008-2009. This money can only be spent on activities related to HAI prevention and implementation and maintenance of Act 52. On January 22, 2012, the Authority board authorized a recommendation to DOH that the FY 2011-2012 nursing home surcharge assessment total \$800,000. This amount is equal to the previous year's assessment and approximately 21.2% below the maximum assessment permitted under Act 52 based on annual CPI adjustments.

**Table 5. Nursing Home Assessments (long-term care)**

<b>Fiscal Year</b>	<b>No. of Facilities Assessed by DOH</b>	<b>ff</b>	<b>Approved Assessments</b>	<b>ff</b>	<b>Total Assessments Received by DOH</b>	<b>ff</b>
2008-09	725		\$1,000,000		\$1,000,782	
2009-10	711		\$800,000		\$799,382	
2010-11	707		\$800,000		\$799,829	
2011-12	707		\$800,000		\$804,473	4
					<b>\$3,404,466</b>	

[4] Total assessments received are greater than assessments made because some funds received were late payments for the previous year’s assessment.

### **Annual Expenditures**

During calendar year 2012, the Authority spent approximately \$5.429 million. See Table 6 below.

**Table 6. Actual Expenditures for Calendar Year 2012**

<b>Control Level</b>	<b>Amount</b>
61: Personnel	\$1,599,364
63: Operating	\$4,575,487
44: Hospital Engagement Network Augmentation	\$(745,061)
<b>Net Expenditures</b>	<b>\$5,429,791</b>

### **Patient Safety Authority Contracts**

Act 13 requires the Authority to identify a list of contracts entered into pursuant to the act, including the amounts awarded to each contractor.

During the calendar year 2012, the Authority received services under the following contracts. Please note that while contract amounts are given for the fiscal or contract years, actual amounts expended are given for the calendar year.

[Key: FC (funds commitment); PO (purchase order); CY (calendar year)]

**ECRI Institute, FC # 4000013036**

Five-year contract for program administration, clinical analysis, training, and data collection and reporting infrastructure services

November 2008 to June 30, 2013

Total contract amount: \$20,170,397 over 5 years

Amount Expended in 2008: \$496,373.04 (November and December)

Amount Expended in 2009: \$3,664,012.67 (January through December)

Amount Expended in 2010: \$3,747,379.11 (January through December)

Amount Expended in 2011: \$3,854,487.96 (January through December)

Amount Expended in 2012: \$4,253,118.44 (January through December)

**IKON Office Solutions, PO #4300182251**

Color Copier Lease

October 1, 2009 to September 30, 2013 @ \$414.30/month plus overages

2012 Lease Expense: \$4,971.60

2012 Overage Expense: \$2,885.45

Amount Expended in 2012 (Jan–Dec 2012): \$7,857.05

**IKON Office Solutions, PO # 4500514315**

B&W Copier Lease

July 1, 2011 to June 30, 2012 @ \$232.03/month

1<sup>st</sup> Half CY 2012 Lease Expense(Jan-Jun): \$1,392.18

**IKON Office Solutions, PO # 4500514316**

B&W Copier Lease

July 1, 2012 to June 30, 2013 @ \$232.03/month

2<sup>nd</sup> Half CY 2012 Lease Expense (Jul-Dec): \$1,392.18

**Amount Expended in 2011 (IKON – All POs): \$10,641.41**

**Harrisburg Parking Authority (HPA), FC#490001139**

Parking at the Chestnut Street Garage—CY 2012

10 months, 4 spaces at \$155 per space, or \$620/month

2 months, 5 spaces at \$155 per space, or \$775/month

**Amount Expended in 2012 (HPA): \$7,850.00**

*A motion was passed by the Pennsylvania Patient Safety Authority Board of Directors to extend the ECRI Institute contracts through June 2014.*

## Patient Safety Authority Balance Sheet

The following balance sheet reflects the status of the Patient Safety Trust Fund as of December 31, 2012:

Table 7. Patient Safety Trust Fund Balance Sheet as of December 31, 2012 (unaudited)<sup>3</sup>

<b>ASSETS</b>	
Temporary Investments	\$4,609,644
<b>TOTAL ASSETS</b>	<b>\$4,609,644</b>
<b>LIABILITIES AND FUND BALANCE</b>	
<b>Liabilities:</b>	
Accounts Payable and Accrued Liabilities	\$67,617
Invoices Payable	366,026
Accrued Payables Goods Receipt	69
<b>TOTAL LIABILITIES</b>	<b>\$433,712</b>
<b>Fund Balance:</b>	
Restricted for Encumbrances	\$2,496,569
Health-Related Programs	1,679,932
<b>TOTAL FUND BALANCE</b>	<b>\$4,175,932</b>
<b>TOTAL LIABILITIES AND FUND BALANCE</b>	<b>\$4,609,644</b>

<sup>3</sup> Source: Comptroller Operations, Commonwealth Office of the Budget.

## Board of Directors and Public Meetings

Members of the board of directors are appointed by the governor and the general assembly according to certain occupational or residence requirements. As of December 31, 2012, members include:

- Physician appointed by the Governor who serves as Chair: Vacant  
Residence:
- Appointee of the President pro tempore of the Senate: Marshall W. Webster, MD  
Residence: Pittsburgh (Allegheny County)
- Appointee of the Minority Leader of the Senate: Cliff Rieders, Esq.  
Residence: Williamsport (Lycoming County)
- Appointee of the Speaker of the House: Stanton N. Smullens, MD  
Residence: Philadelphia (Philadelphia County)
- Appointee of the Minority Leader of the House: Terry Hyman, Esq.  
Residence: Carlisle (Cumberland County)
- Nurse appointed by the Governor: Joan M. Garzarelli, RN, MSN  
Residence: Irwin (Westmoreland County)
- Pharmacist appointed by the Governor: Gary A. Merica, RPh  
Residence: Red Lion (York County)
- Hospital employee appointed by the Governor: Vacant  
Residence:
- Healthcare worker appointed by the Governor: Anita Fuhrman, RN, BS  
Residence: Lebanon (Lebanon County)
- Non-healthcare worker appointed by the Governor: Lorina L. Marshall-Blake  
Residence: Philadelphia (Philadelphia County)
- Physician appointed by the Governor: Vacant

Act 13 of 2002 requires the board of directors to meet at least quarterly. During 2012, the board met frequently to assess and develop future patient safety educational and advocacy activities, including developing another strategic plan and enhancing its PSL program. Representatives of healthcare, consumer, and other stakeholder groups, including the general assembly, have attended and spoken at public meetings. Following are the dates of all public board meetings held by the Authority during 2012:

January 24, 2012  
March 6, 2012  
April 24, 2012  
July 24, 2012  
September 11, 2012  
October 23, 2012

Summary minutes of the public meetings are available on the Authority's website at <http://www.patientsafetyauthority.org>.

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**Fax:** 717-346-1090  
**E-mail:** [patientsafetyauthority@pa.gov](mailto:patientsafetyauthority@pa.gov)

## **ADDENDA SECTION**

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## ADDENDUM A: Definitions

### Definitions

Act 13 requires healthcare facilities to submit reports of the following three kinds of occurrences:

**Serious Event**—An adverse event resulting in patient harm. The legal definition, from Act 13, reads: “An event, occurrence or situation involving the clinical care of a patient in a medical facility that results in death or compromises patient safety and results in an unanticipated injury requiring the delivery of additional health care services to the patient. The term does not include an incident.”

**Incident**—A “near miss” in which the patient was not harmed. Act 13 defines this as: “An event, occurrence or situation involving the clinical care of a patient in a medical facility which could have injured the patient but did not either cause an unanticipated injury or require the delivery of additional health care services to the patient. The term does not include a serious event.”

**Infrastructure Failure**—A potential patient safety issue associated with the physical plant of a healthcare facility, the availability of clinical services, or criminal activity. Act 13 defines this as: “An undesirable or unintended event, occurrence or situation involving the infrastructure of a medical facility or the discontinuation or significant disruption of a service which could seriously compromise patient safety.” Reports of Infrastructure Failures are not addressed in this report, because these are submitted only to the Department of Health.

Reports of Serious Events and Incidents are submitted to the Pennsylvania Patient Safety Authority for the purposes of learning how the healthcare system can be made safer in Pennsylvania. In contrast, reports of Serious Events and Infrastructure Failure are submitted to the Department of Health for the purposes of fulfilling their role as a regulator of Pennsylvania healthcare facilities.

Act 13 requires the following types of facilities to submit reports of Serious Events, Incidents, and Infrastructure Failures to the Authority through the Pennsylvania Patient Safety Reporting System (PA-PSRS):

- **Hospital**—The Health Care Facilities Act (35 Pa. Stat. Ann. § 448.802a) defines a hospital as “an institution having an organized medical staff established for the purpose of providing to inpatients, by or under the supervision of physicians, diagnostic and therapeutic services for the care of persons who are injured, disabled, pregnant, diseased, sick or mentally ill, or rehabilitative services for the rehabilitation of persons who are injured, disabled, pregnant, diseased, sick or mentally ill. The term includes facilities for the diagnosis and treatment of disorders within the scope of specific medical specialties, but not facilities caring exclusively

for the mentally ill.” For the purposes of this report, at the end of 2012, there were 241 hospitals in the commonwealth of Pennsylvania.

- **Ambulatory Surgical Facility**—The Health Care Facilities Act defines an ambulatory surgical facility as “a facility or portion thereof not located upon the premises of a hospital which provides specialty or multispecialty outpatient surgical treatment. Ambulatory surgical facility does not include individual or group practice offices or private physicians or dentists, unless such offices have a distinct part used solely for outpatient treatment on a regular and organized basis. Outpatient surgical treatment means surgical treatment to patients who do not require hospitalization but who require constant medical supervision following the surgical procedure performed.” For the purposes of this report, at the end of 2012, there were 292 ambulatory surgical facilities in the commonwealth of Pennsylvania.
- **Birth Center**—The Health Care Facilities Act defines a birthing center as “a facility not part of a hospital which provides maternity care to childbearing families not requiring hospitalization. A birth center provides a home-like atmosphere for maternity care, including prenatal labor delivery and postpartum care related to medically uncomplicated pregnancies.” For the purposes of this report, at the end of 2012, there were five birthing centers in the commonwealth of Pennsylvania.
- **Abortion Facility**— Act 30 of 2006 extended the reporting requirements in Act 13 to abortion facilities that perform more than 100 procedures per year. For the purposes of this report, at the end of 2012, there were 21 qualifying abortion facilities in the commonwealth of Pennsylvania.
- **Nursing Home** – Act 52 of 2007 revised Act 13 of 2002 (Mcare) to require nursing homes to report healthcare-associated infections to the Authority. Reporting from these facilities began in June 2009. For the purposes of this report, at the end of 2012, there were 711 nursing homes in the commonwealth of Pennsylvania. See page 4 for data received to date from nursing homes.

Other pertinent definitions used in this report include:

- **Medical Error**—This term is commonly used when discussing patient safety, but it is not defined in Act 13. The word “error” appears in PA-PSRS and in this report. For example, one category of reports discussed is Medication Errors. In PA-PSRS, the word “error” is used in the sense intended by the Institute of Medicine Committee on Data Standards for Patient Safety, which defined an error as “the failure of a planned action to be completed as intended (i.e., error of execution), or the use of a

wrong plan to achieve an aim (i.e., error of planning).” It also includes failure of an unplanned action that should have been completed (i.e., omission).<sup>4</sup>

- **Adverse Event**—This term also appears in this report, though it is not defined in Act 13. The Institute of Medicine Committee on Data Standards for Patient Safety defined an adverse event as “an event that results in unintended harm to the patient by an act of commission or omission rather than by the underlying disease or condition of the patient.” The Authority considers this term to be broader than “medical error,” as some adverse events may result from clinical care without necessarily involving an error.

Within Act 13, the term “medical error” is used in the “Declaration of Policy”: “Every effort must be made to reduce and eliminate medical errors by identifying problems and implementing solutions that promote patient safety.” It is also used in defining the scope of chapter 3, “Patient Safety”: “This chapter relates to the reduction of medical errors for the purpose of ensuring patient safety.”

While PA-PSRS does include reports of events that result from errors, the program’s focus is on the broader scope of actual and potential adverse events—not only those that resulted from errors.

- **Patient Safety Officer**—Act 13 requires each healthcare facility to designate a single individual to serve as that facility’s patient safety officer. Under Act 13, the patient safety officer is responsible for submitting reports to the Authority. Act 13 also assigns other responsibilities to the patient safety officer.

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<sup>4</sup> Committee on Data Standards for Patient Safety; Institute of Medicine, *Patient safety: achieving a new standard of care*. Washington (DC): National Academies Press; 2004.

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## **ADDENDUM B: Detailed Overview of Data Reported through PA-PSRS**

### Introduction

The Pennsylvania Patient Safety Reporting System (PA-PSRS) is a secure, web-based system that permits healthcare facilities to submit reports of what Act 13 defines as “Serious Events” and “Incidents.” Statewide mandatory reporting through PA-PSRS went into effect June 28, 2004. All information submitted through PA-PSRS is confidential, and no information about individual facilities is made public.

As defined by Act 13, PA-PSRS is a facility-based reporting system. It is important for Pennsylvania consumers to recognize there are other complaint and error-reporting systems that are available for individuals. The Department of Health can issue sanctions and penalties, including fines and forfeiture of license, to healthcare facilities who fail to comply. Citizens can file complaints related to hospitals and ambulatory surgical facilities by calling the Department of Health at 1-800-254-5164; for complaints related to birthing centers, they can call the Department of Health at 717-783-1379. Complaints against licensed medical professionals can be filed with the Department of State’s Bureau of Professional and Occupational Affairs at 1-800-822-2113.

All reports are submitted by facilities through a process identified in their patient safety plans, as required by the act. However, Act 13 provides for one exception to this facility-based reporting requirement. Under this exception, a healthcare worker who feels that his or her facility has not complied with Act 13 reporting requirements may submit an anonymous report directly to the Pennsylvania Patient Safety Authority. (See the section on anonymous reports on pages 14 and 15.)

To access PA-PSRS, facilities need only a computer with Internet access. There is no need for a facility to procure costly equipment or software to meet statutory reporting requirements, and only minimal self-directed training is necessary to learn how to navigate the PA-PSRS system.

In submitting a report, acute care facilities respond to 21 core questions through check boxes and free-text narratives. The system directs the user through the process, offering drop-down boxes of menu options and guiding the user to the next series of questions based on the answers to previous questions. The process is similar for nursing homes, which began reporting healthcare-associated infections (HAIs) in June 2009, with the system posing different questions depending on what type of infection is reported. The system is very user-friendly, despite the software’s underlying complexity.

Questions answered by the facilities include those related to demographic information (such as a patient’s age and gender), the location within a facility where the event took place, the type of event, and the level of patient harm, if any. In addition, the report collects considerable detail about “contributing factors,” details related to staffing, the

workplace environment and management, and clinical protocols. Facilities are also asked to identify the root cause of a Serious Event and to suggest procedures that can be implemented to prevent a reoccurrence.

Once a report is submitted, the Authority's clinical team initiates an analysis. This team includes professionals with degrees and experience in medicine, nursing, law, pharmacy, health administration, risk management, product engineering, and statistical analysis, among other fields. In addition, through our contract staff, the Authority has access to a large pool of subject matter experts in virtually every medical specialty.

After the system electronically receives and prioritizes each report, the clinical team performs additional review, following up with individual facilities as necessary. The team's role is to identify situations of immediate jeopardy or trends that may compromise patient safety and to offer solutions for improvements.

As a result of this comprehensive analysis, the Authority issues the *Pennsylvania Patient Safety Advisory* based on data submitted through PA-PSRS, supplemented by a scholarly search of the medical and clinical literature. *Advisory* articles are directed primarily to healthcare professionals for use by both clinical and administrative staffs. The Authority encourages these providers to use the articles as learning tools for patient safety and continuous quality improvement. In a recent survey, there were more than 1,200 responses indicating that Pennsylvania facilities have implemented improvements as a result of information contained in this year's *Advisories* and associated toolkits.

Primary distribution of the *Advisories* is through e-mail, enabling the Authority to circulate the *Advisories* to thousands of individual healthcare providers, hospitals, and government and healthcare organizations around the world, including national patient safety and quality improvement organizations. As a result, the Authority is able to generate considerable interest in Pennsylvania's approach to promoting patient safety and in the lessons learned through PA-PSRS.

More information about the *Pennsylvania Patient Safety Advisory* and the data collected through PA-PSRS is in the section "Summaries of Select 2012 Advisory Articles" (**Addendum C**). In addition, all issues of the *Advisory* are accessible on the Authority website, [www.patientsafetyauthority.org](http://www.patientsafetyauthority.org).

Another component of PA-PSRS is the set of analytical tools available to reporting facilities. These tools provide patient safety, quality improvement, and risk managers with detailed reports analyzing data related to their specific facilities. Many reports can also be exported to other software programs for inclusion in facility publications or in reports and presentations to trustees and senior management. In addition, facility personnel have the ability to export all, or any portion, of their facility's data. Managers can use this information for their internal quality improvement and patient safety activities.

These analytical tools are an essential component of patient safety improvement efforts in Pennsylvania. While PA-PSRS allows the Authority to focus on analyzing statewide aggregate data, the analytical tools within the system provide immediate, real-time feedback to individual facility managers that help them identify trends in actual or potential adverse patient outcomes within their institutions.

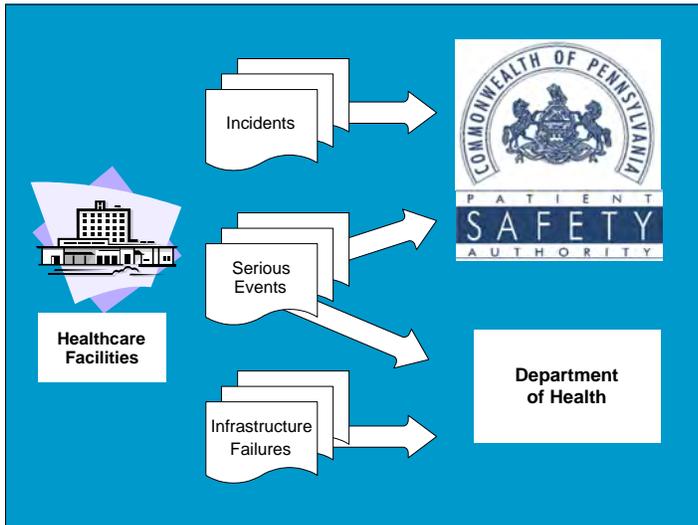


Figure 1. Submission of PA-PSRS Reports

PA-PSRS was developed under contract with ECRI Institute, a Pennsylvania-based independent, nonprofit health services research agency, in partnership with HP, a leading international information technology firm, and the Institute for Safe Medication Practices, also a Pennsylvania-based, nonprofit health research organization.

### Interpreting PA-PSRS Data

Many factors influence the number of reports submitted by any particular facility or any group of facilities, of which safety and quality

are just two. Additional factors include facility size, utilization or volume, patient case mix, severity of illness, differences in facilities' understandings of what occurrences are reportable, differences in facilities' successes in detecting reportable occurrences, and others.

PA-PSRS data is not a "report card" for individual healthcare facilities. For example, if Facility A has substantially more reports than a similar facility (Facility B), this would not mean that Facility A is necessarily less safe than Facility B. In fact, Facility A could be *safer* than Facility B because they may have better systems in place for recognizing and reporting actual and potential adverse events.

Numbers by themselves do not provide complete answers. For example, the number of incorrect medications administered is not meaningful without knowing the total number (known as the "denominator") of all medications administered. In other words, 10 incorrect medications out of a total of 50 administered doses is much different than 10 incorrect medications out of 10,000 administered doses.

Additional considerations when reviewing PA-PSRS data presented in this report include the following:

- Data presented in this report includes only reports of Serious Events and Incidents. While PA-PSRS also collects reports of Infrastructure Failures, these

reports are submitted only to the Department of Health. The Authority does not receive reports of Infrastructure Failures.

- Unless otherwise noted, data presented in this report is based on reports submitted to PA-PSRS between January 1, 2012, and December 31, 2012. Data from acute care facilities is presented in this section. HAI data from acute and long-term care facilities is presented below in Table 1.
- Unless specifically noted, numbers of reports in different categories are actual “raw numbers” and have not been adjusted for any facility- or patient-related factors that may influence differences in report volume among different facilities.
- The data is not adjusted to account for healthcare facility openings, closings, or changes of ownership.

Caution is advised when comparing data contained in this report with data published by other patient safety reporting systems. The PA-PSRS program was developed within the context of Act 13, which has its own unique definitions for what is and what is not reportable to PA-PSRS. It also uses a specific list of event types that may be different than the lists used by other systems. Most important, PA-PSRS is believed to be the only mandatory state program collecting data on “near misses”—events that did not harm patients.

Many factors may influence differences between data from various patient safety reporting systems. The key comparisons to make are those made by individual healthcare facilities, as they monitor their own performance over time and in relation to specific patient safety goals relevant to their healthcare setting.

## Report Volume

### *Reports by Month and Submission Type*

Between January 1 and December 31, 2012, Pennsylvania acute care facilities submitted 235,249 reports through PA-PSRS, bringing the number of reports submitted by these facilities since the program’s inception to 1,783,986. Table 1 shows the distribution of submitted reports by month for calendar year 2012.

**Table 1. Reports Submitted to PA-PSRS in 2012, by Month, Acute Care Facilities**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>Serious Events</b>	680	703	697	625	774	651	663	681	627	691	660	587	8,039
<b>Incidents</b>	17,416	22,449	18,985	20,759	20,804	19,665	17,381	19,070	16,178	19,769	18,040	16,694	227,210
<b>Total</b>	18,096	23,152	19,682	21,384	21,578	20,316	18,044	19,751	16,805	20,460	18,700	17,281	235,249

Approximately 3.4% of submitted reports were Serious Events, while 96.6% were Incidents. In 2012, the Authority received 19,604 reports per month on average, an increase of 2.9% from 2011. The number of Incident reports averaged 18,399 per month, an increase of 2.8% compared with the previous year. The number of Serious Event reports averaged 670 per month, which is a 0.07% decrease from 2011.

## Reports by Facility Type

As shown in Table 2, the total number of reports submitted through PA-PSRS in 2012 was more than a quarter million. The vast majority of reports (86%) were submitted by hospitals. Among acute-level facilities (non-nursing-homes), the majority is even more pronounced (97.8%). Nursing homes submitted 12.1% of the overall total.

**Table 2. Reports through PA-PSRS by Facility Type (2012)**

Facility Type	Hospitals	Ambulatory Surgical Facilities	Birthing Centers/ Abortion Facilities	All Acute-Level Facilities	Nursing Homes (HAIs only)	All Facilities Reporting via PA-PSRS
<b>No. of Reports Submitted</b>	230,017	4,967	265	235,249	32,257	267,506
<b>No. of Facilities Active for Year Ending December 31, 2012</b>	241	292	26	559	711	1,270

Table 2a breaks out the number of reports by hospital type. "All acute level facilities" includes all facility types with the exception of nursing homes.

**Table 2a. Number of Reports Submitted to PA-PSRS, by Hospital Type (2012)**

Hospital Type	No. of Hospitals	Incidents	Serious Events	Total
Acute Care	155	196,843	5,148	201,991
Children's	7	8,013	78	8,091
Behavioral	19	3,022	589	3,611
Rehabilitation	20	7,751	502	8,253
Community	13	2,226	72	2,298
Long-Term Acute Care	27	5,700	73	5,773
<b>Hospital Total</b>	<b>241</b>	<b>223,555</b>	<b>6,462</b>	<b>230,017</b>

The remainder of this data section will focus on acute care facilities; nursing homes will be addressed in the section on HAIs.

Table 3 shows reporting rates among hospital and nonhospital, acute-level facilities—ambulatory surgical facilities (ASFs), birthing centers, and abortion facilities—compared with rates from year to year. An increase in the percentage of reports submitted from nonhospitals is attributable to greater reporting from those facilities. ASFs submitted 17 reports per facility in 2012 compared with 15.8 reports per facility in 2011, a 7.7% increase in per-facility submissions.

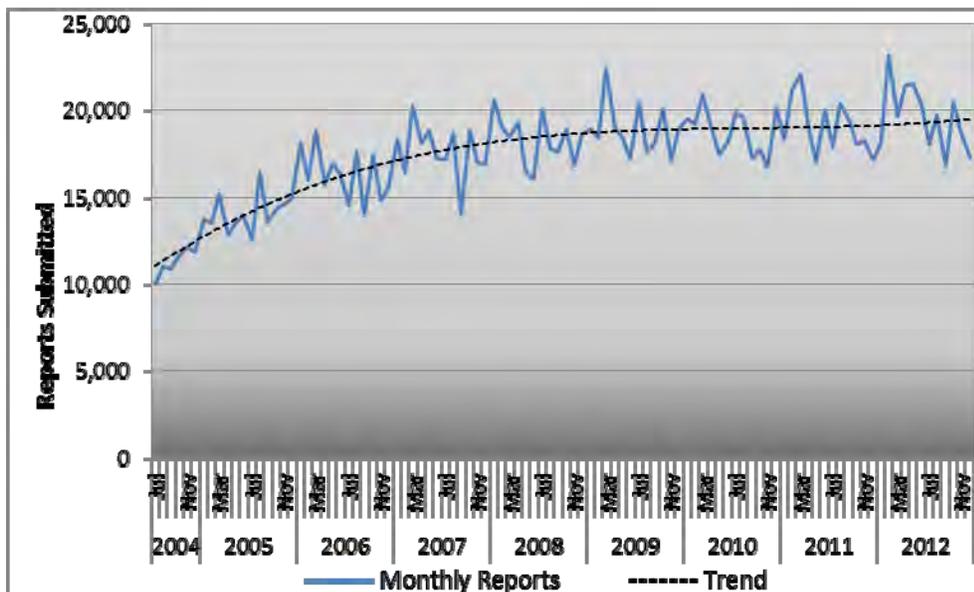
**Table 3. Reports by Acute Facility Types since 2009**

Year	Hospitals		Ambulatory Surgical Facilities, Birthing Centers, and Abortion Facilities		All Facilities Total
	No.	% of Facility Type	No.	% of Facility Type	
2009	223,026	98.39	3,644	1.61	226,670
2010	221,855	98.33	3,769	1.67	225,624
2011	223,995	97.88	4,840	2.12	228,835
2012	230,017	97.78	5,232	2.22	235,249
2004 to 2012*	1,755,096	98.38	28,894	1.62	1,783,986

\*The Pennsylvania Patient Safety Authority began mandatory reporting statewide on June 28, 2004.

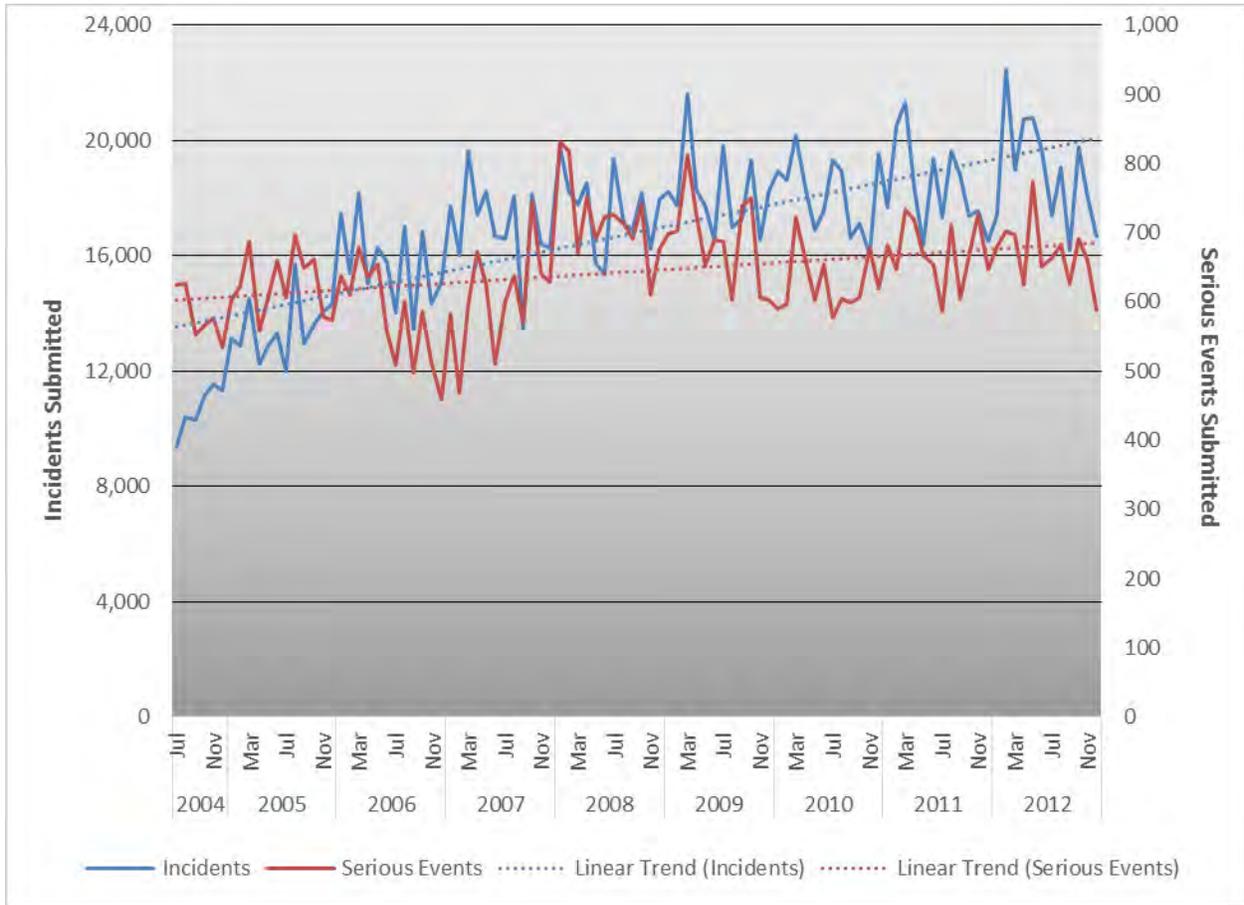
## Report Submission Trends

The trend line superimposed over the actual track of monthly reports in Figure 2 suggests that the volume of reports leveled off entering the ninth full year of the program.



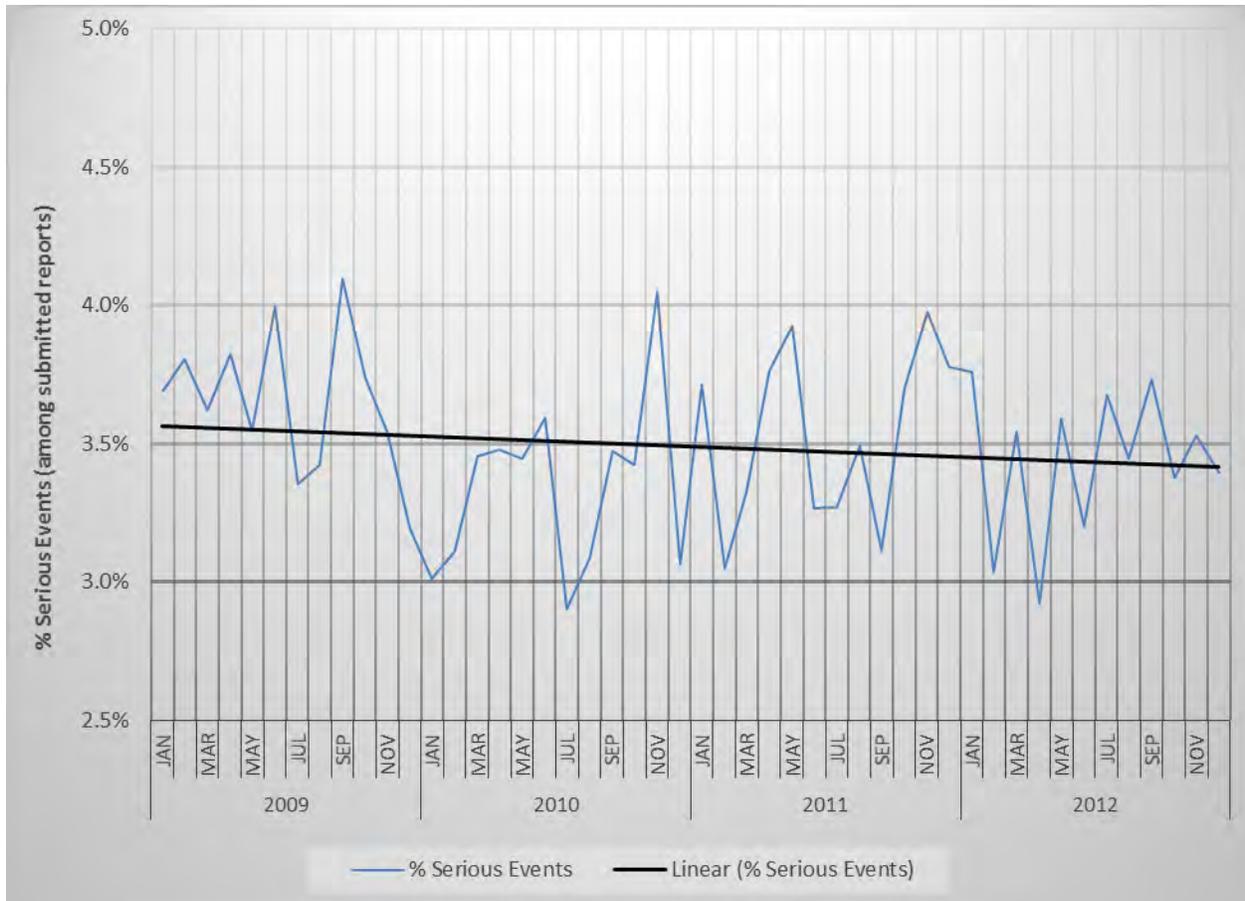
**Figure 2. Number of Submitted Reports since Inception of PA-PSRS, by Month**

Figure 3 supports the proposition of improved reporting and a more consistent level of reporting by facilities. Depicting the volume of Serious Events and Incidents on a relative scale (24:1, given that Serious Events have been consistently about 4% of all submitted reports) shows that the volume of Serious Events has increased somewhat over the long-term, but not as sharply as the volume of Incidents.



**Figure 3. Number of Serious Event and Incident Reports by Month since Inception of PA-PSRS**

Figure 4 illustrates the percentage of Serious Events among all submitted reports since 2009. Despite several months when this percentage rose to 4% or greater, there is a downward trend in the percentage of Serious Events among reports submitted to the Authority during the last four years.



**Figure 4. Percentage of Serious Event Reports by Month (2009 to 2012)**

### Reports by Event Type

When reporting an event through PA-PSRS, a facility uses a classification system to characterize the occurrence they are reporting. This is usually referred to as the “taxonomy.” At the outset, a facility classifies a report by identifying what PA-PSRS defines as the “event type.” The event type essentially answers the most basic question about an occurrence: “What happened?”

At its most basic level, PA-PSRS contains the following nine event types:

- Medication Errors
- Adverse Drug Reactions (not a medication error)
- Equipment, Supplies, or Devices

- Falls
- Errors Related to Procedures, Treatments, or Tests
- Complications of Procedures, Treatments, or Tests
- Transfusions
- Skin Integrity
- Other / Miscellaneous
- These categories are further broken down into second- and third-level subcategories. For example, the category Falls includes a series of subcategories, such as:
  - Falls while Lying in Bed
  - Falls while Ambulating
  - Falls in the Hallways of the Facility
  - Other Types of Falls

The complete event-type dictionary is a three-level, hierarchical taxonomy with 212 distinct event types. This event type dictionary is one way PA-PSRS classifies and looks for patterns and trends in submitted reports.

Table 4 shows the percentage of reports submitted under each top-level event type in 2012. The most frequently reported occurrences were Errors Related to Procedures/Treatments/Tests (22%) and Medication Errors (18%). These two event types account for 40% of all reports submitted. While Errors Related to Procedures/Treatments/Tests was the event type most frequently reported through PA-PSRS, it was not the one most frequently associated with harm to the patient.

Also shown in Table 4, the largest number of Serious Event reports was under the event type category Complications of Procedures/Treatments/Tests, accounting for 44% of all Serious Event reports.

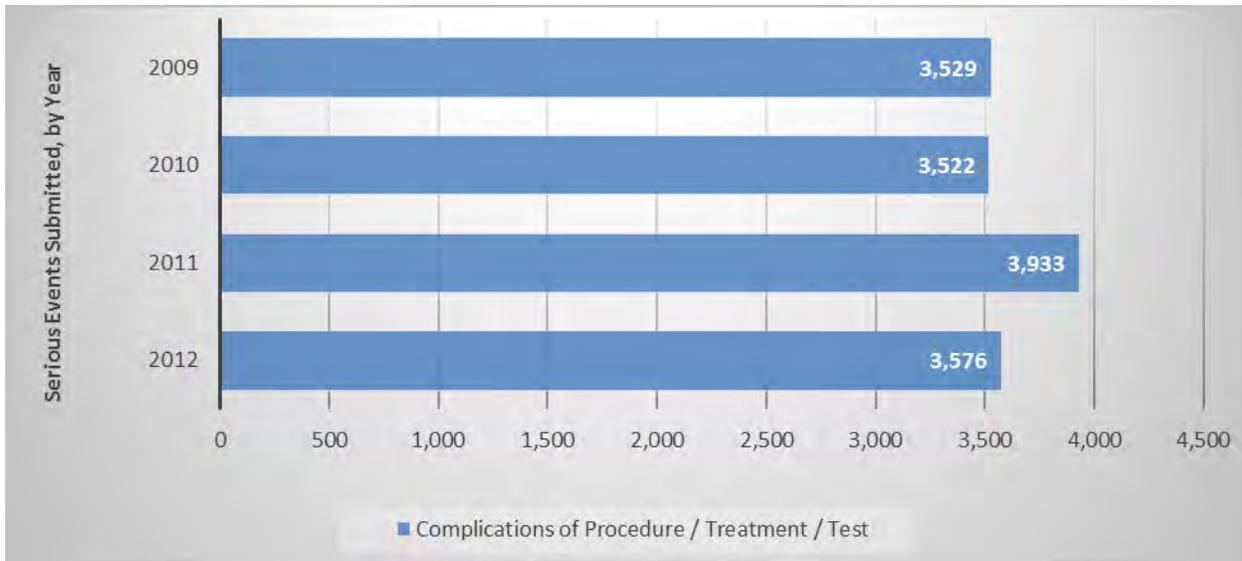
Relative to the overall average of 3.4% of reports indicating harm (see “% of type” in Table 4), harm was significantly less likely to be reported under Medication Errors, Equipment Issues, Transfusion Issues, or Errors Related to Procedures/Treatments/Tests (1% or less).

**Table 4. Reports by Event Type and Submission Type for 2012**

Event Type	Serious Events			Incidents			Total	% of Total
	No. of Reports	% of Type	% of Total	No. of Reports	% of Type	% of Total		
Medication Errors	235	1	3	42,663	99	19	42,898	18
Adverse Drug Reactions (not a medication error)	287	6	4	4,844	94	2	5,131	2
Equipment / Supplies / Devices	42	1	1	4,667	99	2	4,709	2
Falls	1,115	3	14	35,168	97	15	36,283	15
Errors Related to Procedures / Treatments / Tests	658	1	8	50,785	99	22	51,443	22
Complications of Procedures / Treatments / Tests	3,576	10	44	31,874	90	14	35,450	15
Transfusions	26	1	0	3,492	99	2	3,518	1
Skin Integrity	794	2	10	34,072	98	15	34,866	15
Other / Miscellaneous <sup>5</sup>	1,306	6	16	19,645	94	9	20,951	9
<b>Total</b>	<b>8,039</b>	<b>3</b>	<b>100</b>	<b>227,210</b>	<b>9</b>	<b>100</b>	<b>235,249</b>	<b>100</b>

Recalling the above statements that there was a very slight decrease in Serious Events, along with a relatively minor increase in Incidents and overall submissions, leads to an interesting perspective when identifying the event type that contributed to most of the decrease of Serious Events. While the highest category of Serious Events is Complications of Procedures/Treatments/Tests, these events show a 9.1% decrease, as shown in Figure 5. This can help explain why there has been a leveling off of Serious Events as a whole. Note that the first half of 2011 saw a large increase in the event type Unplanned Return to Operating Room. Submissions of this event type, and other third-level event types under the second-level event type Complication following Surgery or Invasive Procedure decreased from 2012 levels, as discussed below.

<sup>5</sup> This is not a single category of completely unclassified reports but rather a category that includes specific subcategories that did not logically fit under other existing top-level headings. Examples of subcategories under Other/Miscellaneous include inappropriate discharge, other unexpected death, and electric shock to the patient.



**Figure 5. Serious Events of Report Type Complications of Procedures/Treatments/Tests, since 2009**

Table 5 below further illustrates the report submission fluctuation relative to harm level by event type. The second-level event type of Complication Following Surgery or Invasive Procedure accounted for 86.8% of the decrease. Within that subtype, four third-level event types accounted for most (95.8%) of the decrease within the subtype: Unplanned Return to Operating Room, Unplanned Transfer to the Intensive Care Unit (ICU), Cardiopulmonary Arrest, and Other.

**Table 5. Report Submission Decreases in Selected Third-Level Event Types**

<b>Complication following Surgery or Invasive Procedure Subevent Types</b>	<b>Decrease in No. of Reports</b>	<b>% Decrease from 2011</b>
Unplanned Return to Operating Room	98	33.2
Unplanned Transfer to ICU	56	19.0
Cardiopulmonary Arrest	16	5.4
Other	125	42.4
<b>Total Decrease in the above Event Types</b>	<b>295</b>	

## Reports by Level of Patient Harm

For every report submitted through PA-PSRS, the healthcare facility applies a 10-item scale to measure whether an event “reached” the patient and, if so, how much harm it caused.<sup>6</sup> This scale ranges from “unsafe conditions” (e.g., look-alike medications stored next to one another) to the death of the patient and can be summarized as follows:

- Unsafe Conditions—Circumstances that could lead to an adverse event (accounting for 13% of all reports)
- Event, No Harm—An event that either did not reach the patient or did reach the patient but did not cause harm (often called a “near miss,” accounting for 83% of all reports)
- Event, Harm—An event that reached the patient and caused temporary or permanent harm (3.3%)
- Event, Death—An event occurred that resulted in or contributed to death (0.11%)

Table 6 shows the reports received during 2012 categorized by the level of harm (as described above) and by Event Type. For the most part, the reports at each level of harm follow a similar distribution by Event Type as they do in the database as a whole. However, there are exceptions. For example, while Complications of Procedures/Treatments/Tests comprise 15% of reports overall in 2012, they comprise 44% of the reports of events involving harm and 57% of all reports of events resulting in or contributing to the patient’s death.

At the other end of the spectrum, while Medication Errors comprise 18% of reports in 2012, they only comprise 3% of events involving harm and 2% of events contributing to or resulting in death. Reports of Errors Related to Procedures/Treatments/Tests were also associated with harm or death at a frequency lower than their representation in the database as a whole. No deaths were associated with Skin Integrity.

A certain portion of the reports could be referred to as examples of “unsafe conditions,” meaning that there was an observed situation in which some harm was a possibility if corrective action was not taken. Unsafe conditions were cited in 13% of the reports submitted in 2012. As shown in Table 6, the event type in which unsafe conditions were most often reported was Skin Integrity (35%). The event type in which unsafe conditions were least reported by percentage was Adverse Drug Reactions. Of all reports of the Adverse Drug Reactions event type, 0.31% were reported as unsafe conditions.

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<sup>6</sup> For example, an event in which a phlebotomist goes to draw blood from the wrong patient but catches the error by checking the patient’s wristband would be an event that did not reach the patient.

**Table 6. Reports by Event Type and Level of Patient Harm (2012)**

Event Type	Unsafe Conditions		Event, No Harm		Harmful Event		Death Event		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Medication Error	2,502	8	40,161	20	230	3	5	2	42,898	18
Adverse Drug Reaction	95	0	4,749	2	283	4	4	2	5,131	2
Equipment / Supplies / Devices	640	2	4,027	2	39	1	3	1	4,709	2
Fall	566	2	34,602	18	1,105	14	10	4	36,283	15
Error Related to Procedure / Treatment / Test	6,153	20	44,632	23	637	8	21	8	51,443	22
Complication of Procedure / Treatment / Test	3,560	12	28,314	14	3,431	44	145	57	35,450	15
Transfusion	349	1	3,143	2	25	0	1	0	3,518	1
Skin Integrity	10,791	35	23,281	12	794	10	0	0	34,866	15
Other / Miscellaneous	6,226	20	13,419	7	1,241	16	65	26	20,951	9
<b>Total*</b>	<b>30,882</b>	<b>13</b>	<b>196,328</b>	<b>83</b>	<b>7,785</b>	<b>3.3</b>	<b>254</b>	<b>0.11</b>	<b>235,249</b>	<b>100</b>

\* Total percentages are out of all reports submitted through PA-PSRS for 2012.

Also, to repeat figures shown previously, only 3.4% of all reports submitted involved harm to the patient, ranging from a simple laceration to a life-threatening situation and death. Figure 6 illustrates that the vast majority of reports do not result in patient harm.

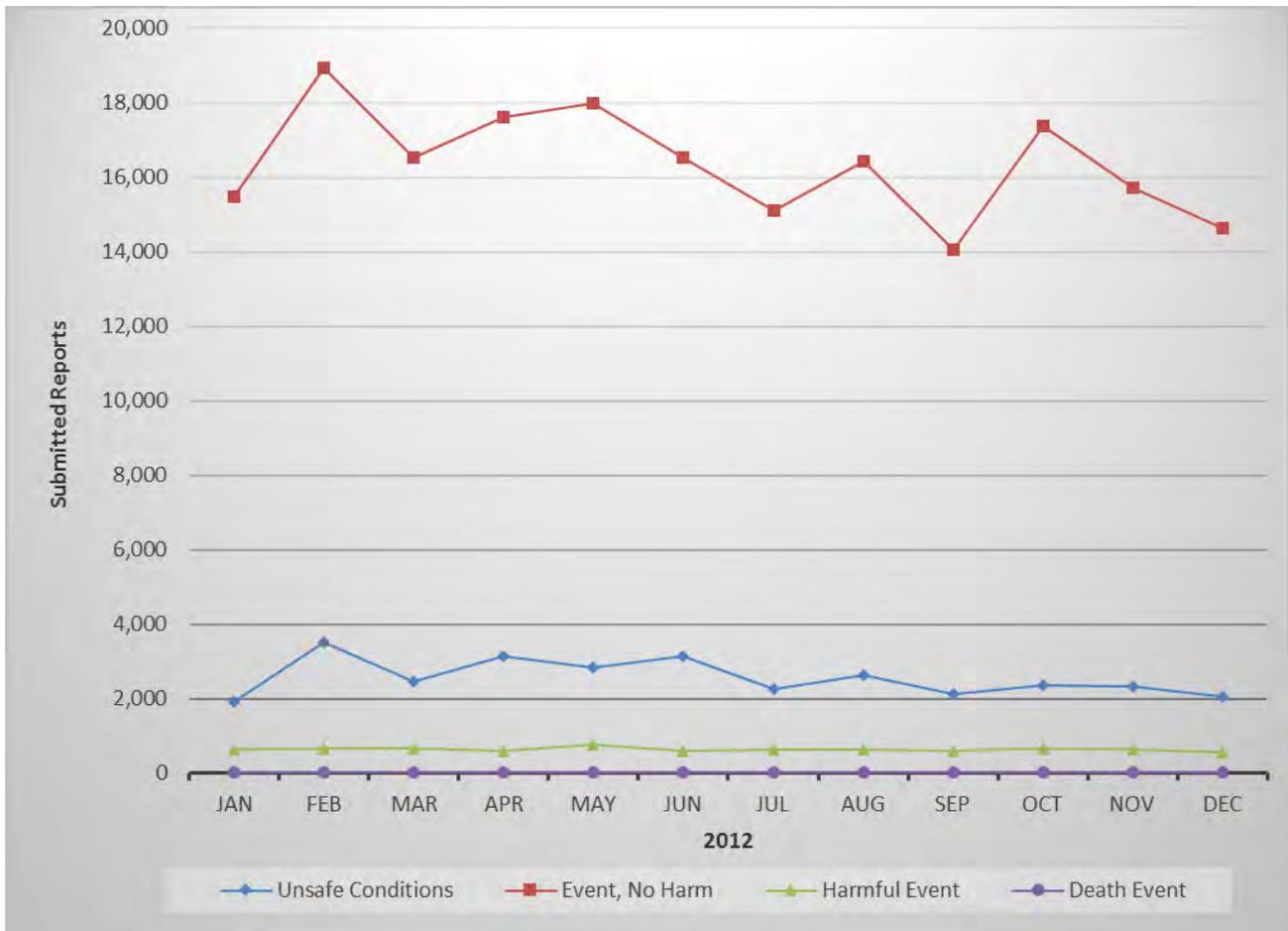


Figure 6. Reports by Level of Harm by Month (2012)

## Reports Involving the Patient's Death

In 2012, the Authority received 254 reports of events that may have contributed to or resulted in the patient's death, an 11.5% decrease from 2011 (see Table 7). Not all of these patient deaths were preventable, and they did not necessarily have to involve an error on the part of a healthcare provider to be reportable under Act 13 of 2002.

**Table 7. Reports Involving the Patient's Death, by Event Type (2012)**

<b>Event Type</b>	<b>No.</b>	<b>%</b>
Medication Error	5	2
Adverse Drug Reaction	4	2
Equipment/Supplies/Devices	3	1
Fall	10	4
Error Related to Procedure/Treatment/Test	21	8
Complication of Procedure/Treatment /Test	145	57
Transfusion	1	0
Skin Integrity	0	0
Other / Miscellaneous	65	26
Total	254	100

Reports involving the patient's death account for 0.11% (less than one-eighth of one percent) of all submitted reports. In terms of particular event types, although 15% of all reports in 2012 were attributed to Complications of Procedures/Treatments/Tests, about 57% of all reports involving patient death were of that event type. Of these reports involving death associated with complications, the majority describe patients who died following surgery or another invasive procedure (56.3%), patients who suffered cardiopulmonary arrest outside the ICU setting (20.1%), or other complications (6.3%).

Many reports involving the patient's death were reported with the primary event type of Other/Miscellaneous. This category in the taxonomy contains a subcategory Other Unexpected Death, which explains the extensive use of this category. Many of these reports involve patients who were found unresponsive, patients who went into respiratory arrest and for whom resuscitation efforts failed, or patients who were admitted to the hospital and died of their disease.

## Patient Demographics

PA-PSRS collects few demographic details about patients because the Authority is not authorized to collect individually identifying information. In general, most reports include only information on patient gender and age. Table 8 presents the number of reports received in 2012 by patient gender and age cohort.

**Table 8. Reports Submitted by Age Cohort and Gender (2012)**

Age Cohort	Female		Male		All Patients		% Patients Female
	No.	%	No.	%	No.	%	
0 to 4	5,369	4.3	6,641	6.0	12,010	5.1	44.7
5 to 14	2,432	1.9	2,842	2.6	5,274	2.2	46.1
15 to 24	7,456	6.0	4,879	4.4	12,335	5.2	60.4
25 to 34	9,681	7.8	5,442	4.9	15,123	6.4	64.0
35 to 44	9,307	7.5	6,818	6.2	16,125	6.9	57.7
45 to 54	14,192	11.4	13,950	12.6	28,142	12.0	50.4
55 to 64	18,364	14.7	19,951	18.1	38,315	16.3	47.9
65 to 74	19,680	15.8	20,367	18.4	40,047	17.0	49.1
75 to 84	21,593	17.3	18,966	17.2	40,559	17.2	53.2
85+	16,662	13.3	10,512	9.5	27,174	11.6	61.3
Unknown	79	0.1	66	0.1	145	0.1	54.5
Total	124,815	100	110,434	100	235,249	100	53.1

## Patient Gender

Of the 235,249 reports submitted in 2012, 124,815 (53.1%) involved female patients, and 110,434 (47.1%) involved male patients. This pattern is consistent with our observations since 2004. During childbearing years, women are more likely than men to have encounters with the healthcare system, and because women have a longer life expectancy than men do, there are simply more women in the general population in the older age cohorts.

The proportion of reports classified as Serious Events differed slightly according to the patient's gender, with 3.5% of reports involving female patients classified as Serious Events compared with 3.3% for reports involving males.

Table 9 shows the distribution of reports by patient gender and event type. Many of the same patterns observed in 2011 are evident this year. Among these observed patterns, the proportion of reports involving female patients was significantly higher among reports of Adverse Drug Reactions. Interestingly, the majority of falls reports involved male patients in 2012, the only category with a male majority.

**Table 9. Reports Submitted by Gender and Event Type (2012)**

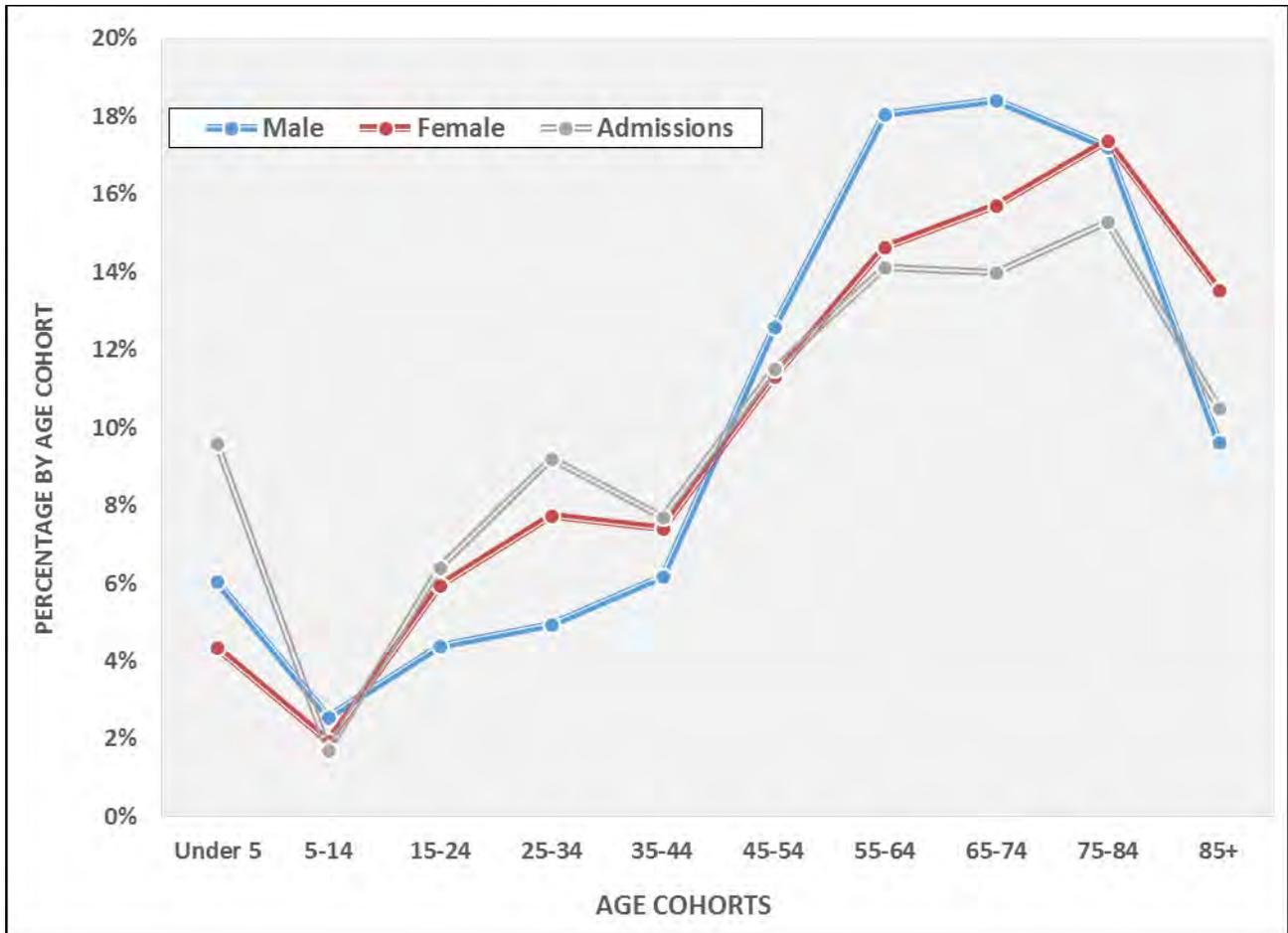
Event Type	Female		Male		All Patients	
	No.	%	No.	%	No.	% of Total
Medication Errors	22,865	53.3	20,033	46.7	42,898	18.2
Adverse Drug Reactions	3,281	63.9	1,850	36.1	5,131	2.2
Equipment / Supplies / Devices	2,463	52.3	2,246	47.7	4,709	2.0
Falls	17,962	49.5	18,321	50.5	36,283	15.4
Errors Related to Procedures / Treatments / Tests	28,001	54.4	23,442	45.6	51,443	21.9
Complications of Procedures / Treatments / Tests	20,032	56.5	15,418	43.5	35,450	15.1
Transfusions	1,930	54.9	1,588	45.1	3,518	1.5
Skin Integrity	17,536	50.3	17,330	49.7	34,866	14.8
Other / Miscellaneous	10,745	51.3	10,206	48.7	20,951	8.9
Total	124,815	53.1	110,434	46.9	235,249	100

## Patient Age

Figure 7 shows the proportion of reports through PA-PSRS, from hospitals only, by gender and by patient age cohort. As noted above, this chart also illustrates that women are more likely than men to have encounters with the healthcare system during childbearing years. Patients age 65 or older account for 46% of all reports from hospitals through PA-PSRS in 2012.

Also shown in this figure is the proportion of hospital inpatient admissions as reported by the Pennsylvania Health Care Cost Containment Council.<sup>7</sup> This shows that patients age 65 or older made up 39.8% of the admissions to hospitals (in 2011). However, this chart does not suggest that older patients are necessarily more likely than younger patients to be involved in a Serious Event or Incident. Rather, older patients' larger representation in the database simply reflects their larger representation in the healthcare system in terms of number of admissions and increased length of stay.

<sup>7</sup> Based on publicly available data from the website of the Pennsylvania Health Care Cost Containment Council ([www.PHC4.org](http://www.PHC4.org)). Estimates were based on statewide inpatient data from 2011.



**Figure 7. Proportion of Hospital Reports through PA-PSRS by Gender and Age Cohort (2012)**

*Note:* The admissions category reflects admissions in 2011 as reported by the Pennsylvania Health Care Cost Containment Council.

## Patients in High or Low Age Cohorts

### *Elderly Patients*

In the Authority's previous annual reports, several patterns of interest in reports involving elderly patients (65 or older) were identified. For example, elderly patients accounted for 64% of Falls in 2004 and 2005. This figure declined steadily to 52% in 2012 (see Table 10).

**Table 10. Percentage of Submitted Reports of Specific Event Types Involving Elderly Patients (65 years or older), by Year (2008 to 2012)**

	2008	2009	2010	2011	2012
% of Falls Events	60.2	57.9	56.2	54.2	52
% of Skin Integrity Events	73.1	71.2	70.6	69.5	68.1
% of Total Reports	51.7	49.8	48.1	46.7	45.8

In another area of interest concerning elderly patients, the percentage in this age group among Skin Integrity reports has dropped to 68.1% in 2012. In 2008, more than half of all reports (51.7%) involved patients 65 or older; this figure dropped to 45.8% in 2012.

### *Perinatal Patients*

There were 5,014 reports involving perinatal patients (those 20 days or younger), an increase of 398 reports (8.6%) from 2011. Less than 2 percent (1.8%) of perinatal reports were classified as Serious Events, noticeably lower than the overall percentage of 3.3%.

Just as in previous years, about two-thirds (66.5%) of reports for these patients were related to Errors or Complications of Procedures/Treatments/Tests. This does not necessarily mean that these patients are more likely to experience errors or complications. Rather, they may not be as prone to other types of events (e.g., falls, problems with skin integrity) as older patient age groups.

Less than one-sixth (15.4%) of reports involving perinatal patients was related to Medication Errors. This is lower than the last three years (18.3% in 2011, 20.1% in 2010, and 19.7% in 2009). Complications of Procedures/Treatments/Tests accounted for 74.4% of the Serious Events in this age group.

### *Children and Adolescents*

Reports submitted through PA-PSRS in 2012 involving children and adolescents (i.e., those age 21 or younger) totaled 25,244, a decrease of 8.9% over the previous year. This follows increases of 14.7% in 2011, 14.8% in 2010, and 16.8% in 2009. Consistent with last year, the top two reports were Medication Errors, accounting for 25.5% of the reports of this population, and Errors Related to Procedures/Treatments/Tests, accounting for 24.7%. However, the event type Other/Miscellaneous made up 48.6% of all Serious Events for this age group. This is quite different from 2011, when Complications of Procedures/Treatments/Tests comprised 56.7% of Serious Events for the age group.

### Reports by Location/Department (Hospitals Only)

PA-PSRS has 155 designated care areas for hospitals. These are the locations or departments of the hospital in which a patient receives care or is exposed to in the process of receiving care. As we see in Figure 8, the care areas that are considered general medical/surgical units and critical care areas were cited as the location for the greatest number of all reports submitted in 2012, each generating over a fifth (21.4%) of the total reports. Other hospital departments with higher report rates were surgical services (8.9%) and intermediate unit (8.8%).

Examples of care areas by department:

- General medical/surgical units
  - General medicine unit
  - Medical/surgical/oncology unit
  
- Critical care
  - Emergency department
  - Burn unit
  - Medical/surgical ICU
  
- Intermediate unit
  - Telemetry
  - Cardiac intermediate unit
  - Respiratory intermediate unit

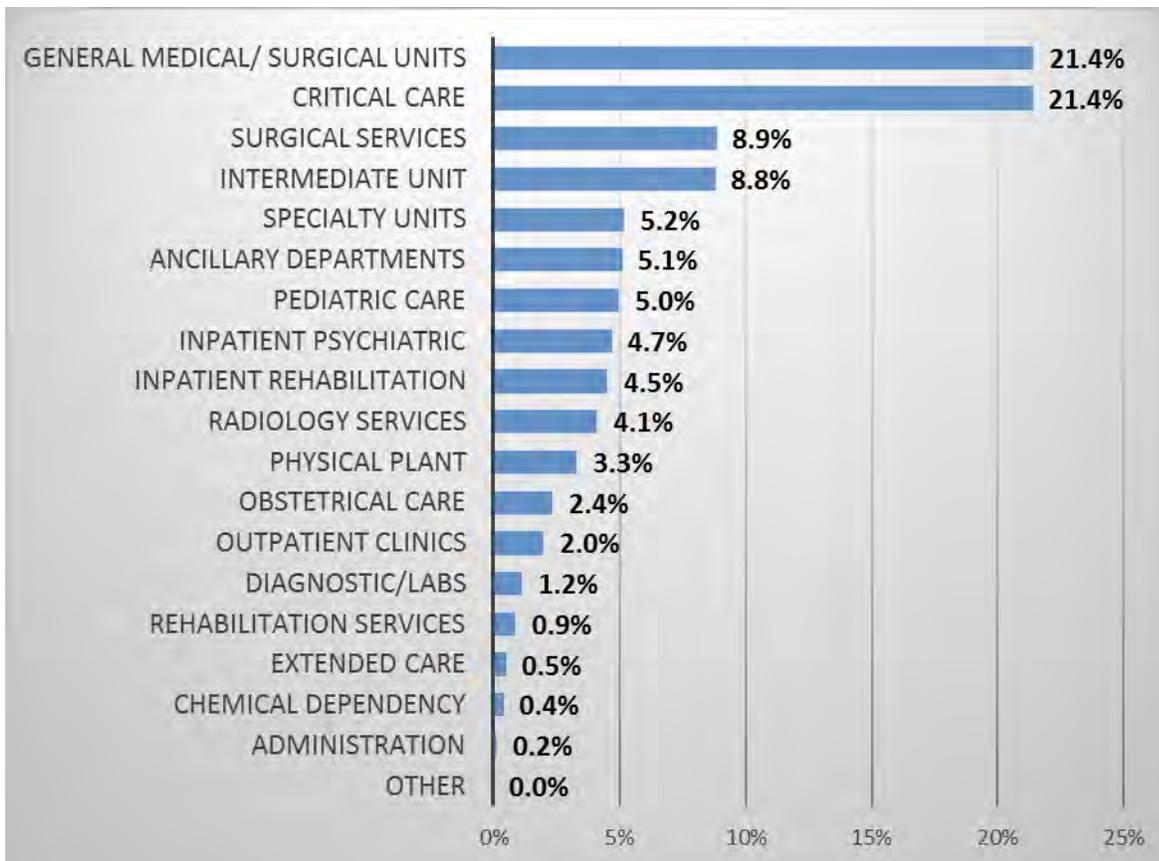


Figure 8. Reports by Location/Department (hospitals only, 2012)

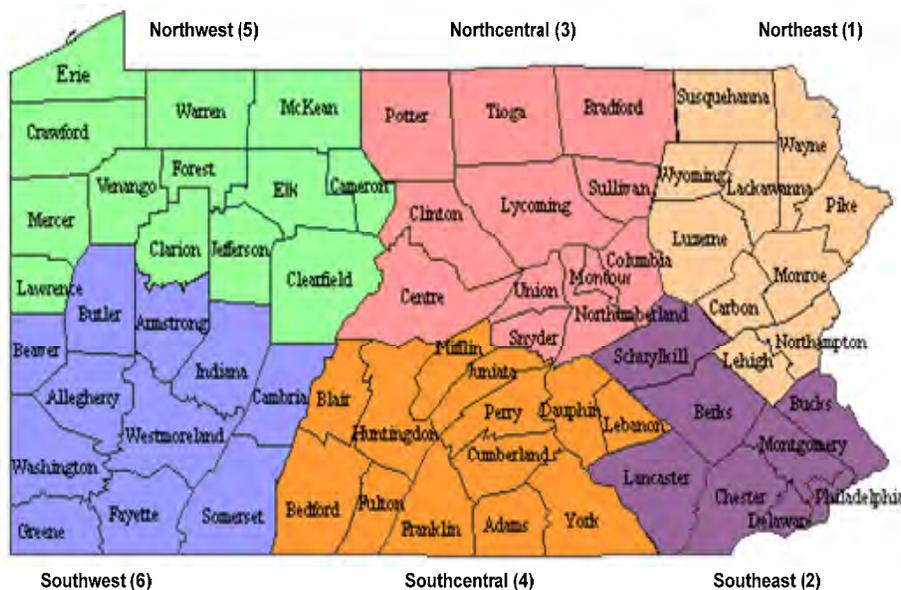
While most hospital reports were submitted from the general medical/surgical and critical care areas, the greatest number of Serious Events came from surgical services, accounting for nearly a quarter of Serious Events from hospitals (23.5%). However, the care area with the highest proportion of Serious Events per submitted report is the diagnostic/labs care group (9.1%). (See Table 11.)

**Table 11. Number and Percentage of Serious Events among all Serious Events and of Submitted Reports, by Care Area Location (hospitals only, 2012)**

Location	Serious Events	Total	% of Serious Events by Group	% of Total Serious Events
Diagnostic/Labs	243	2,670	9.1	3.8
Chemical Dependency	85	960	8.9	1.3
Inpatient Psychiatric	828	10,852	7.6	12.8
Surgical Services	1,519	20,366	7.5	23.5
Inpatient Rehabilitation	523	10,407	5.0	8.1
14 Other Care Groups	3,264	184,764	1.8	50.5
Total	6,462	230,017	2.8	100

For the purposes of this report, the Pennsylvania Patient Safety Authority Board of Directors has adopted a geographic breakdown of the commonwealth into six regions, as shown in Figure 9. This breakdown is based on the Department of Health’s public health districts.

Reports by Region and Submission Type



**Figure 9. Public Health Districts**

The variation in the number of reports submitted through PA-PSRS by geographic region (see Figure 10) is not particularly surprising. One expects more reports to be submitted in regions with larger populations and greater numbers of healthcare facilities. Consistent with this expectation, the regions with the largest number of reports (southeast and southwest) were those with the commonwealth's two largest population centers: Philadelphia and Pittsburgh.

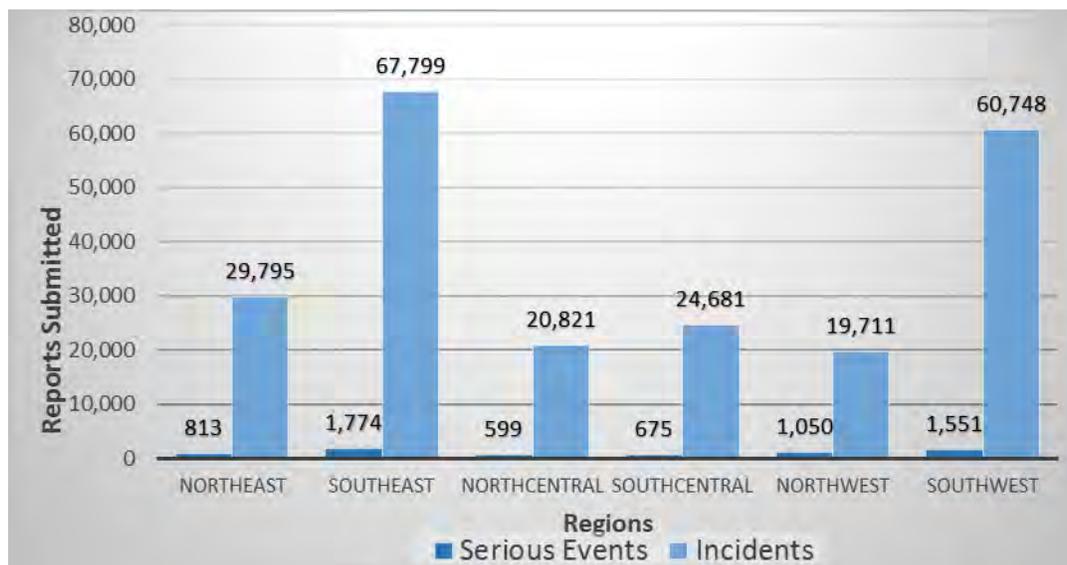


Figure 10. Number of Serious Event and Incident Reports from Hospitals by Region (2012)

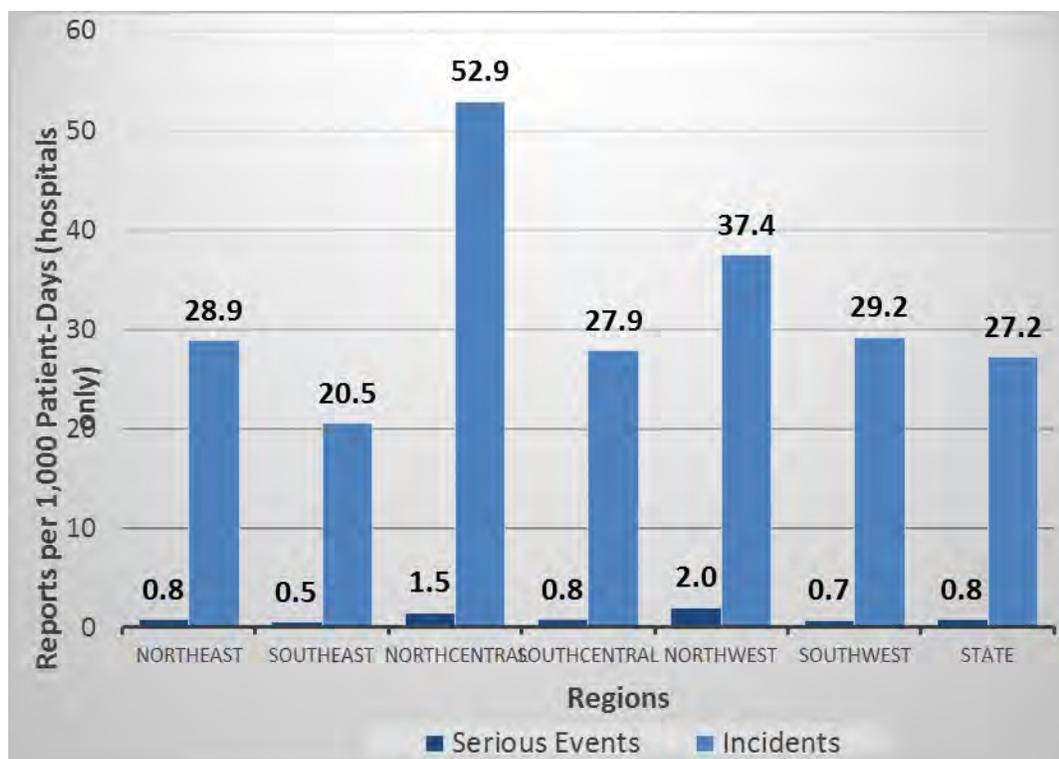
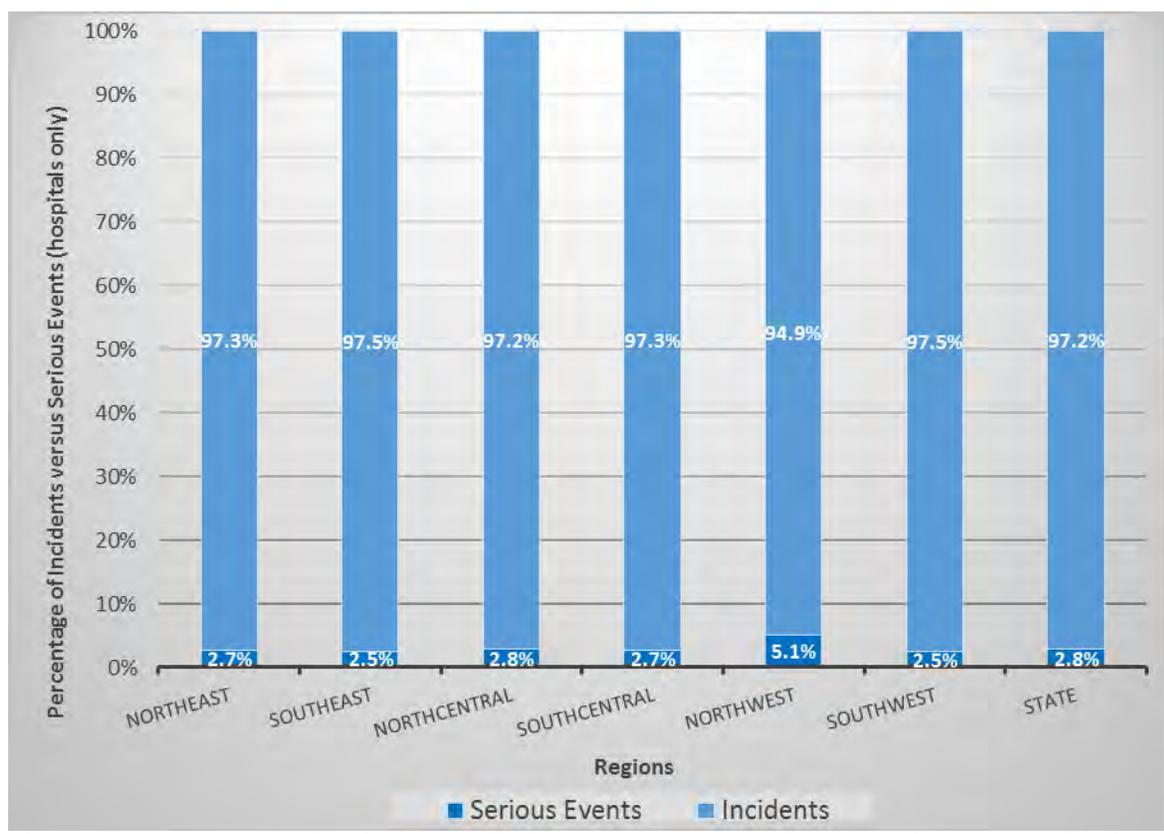


Figure 11. Reports from Hospitals per 1,000 Estimated Patient-Days by Region (2012)

Adjusting the report volume for a measure of healthcare utilization paints a different picture. Figure 11 shows, by region, the number of reports from hospitals per 1,000 patient-days.<sup>8</sup> This figure shows that, after accounting for the differences in the volume of healthcare provided in each region, facilities in the Northcentral region reported 52.9 Incidents per 1,000 patient-days, far more per 1,000 patient-days than any other region. The rest of the regions reported from 20.5 to 37.4 Incidents per 1,000 patient-days.

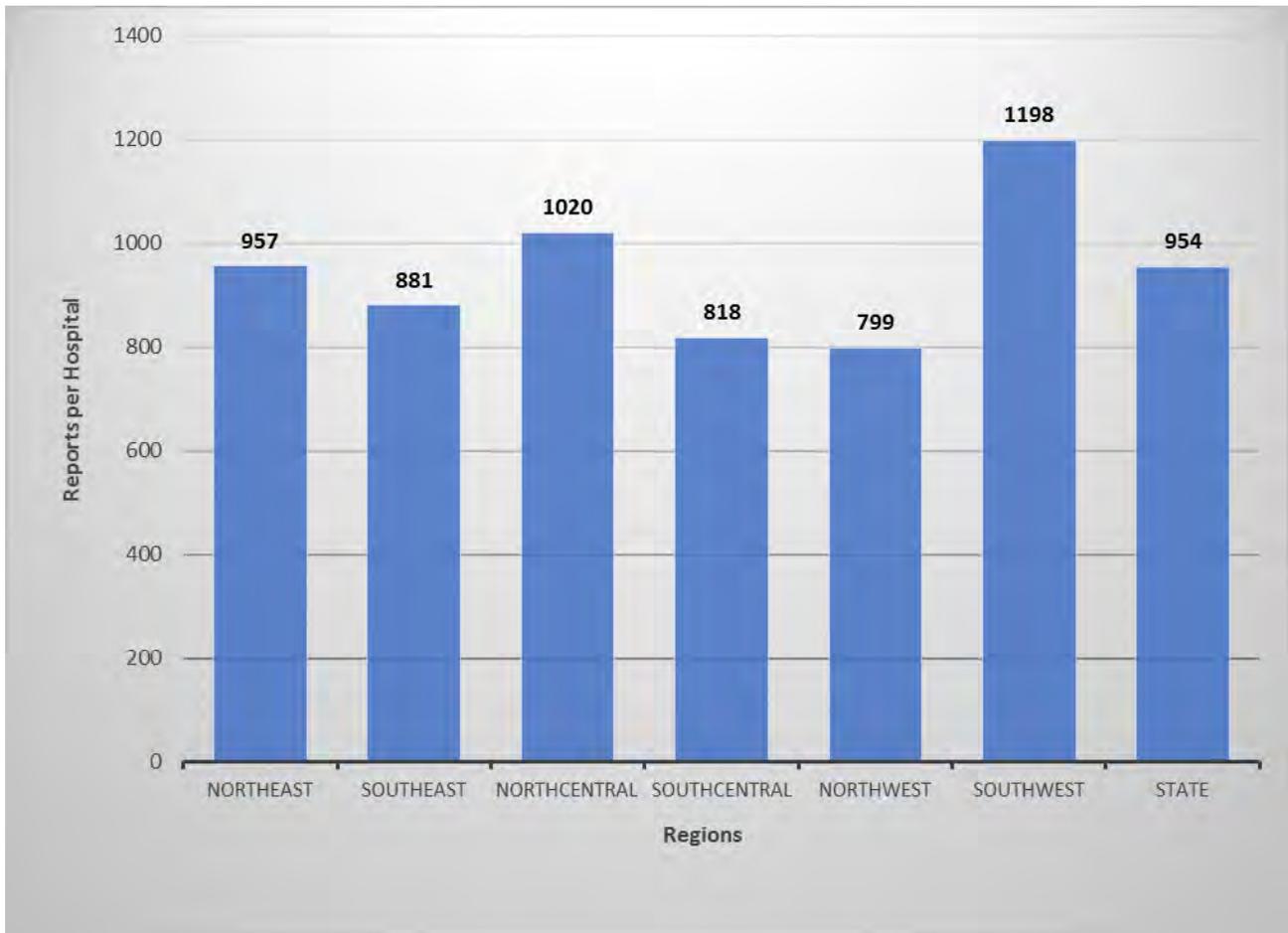


**Figure 12. Percentage of Incident and Serious Event Reports from Hospitals by Region (2012)**

Figure 12 shows that the Northwest region submitted a significantly greater proportion of Serious Events (5.1% of their reports) than the statewide pooled mean (2.8%). Conversely, the Southeast and Southwest regions submitted the highest proportion of Incidents (97.5%), followed closely by the remaining regions.

<sup>8</sup> Based upon publicly available data from the website of the Pennsylvania Health Care Containment Council ([www.PHC4.org](http://www.PHC4.org)). Estimates were based on statewide inpatient data from 2011.

This does not necessarily suggest that facilities in any of the regions were more or less safe than those in other regions. It may mean that the healthcare providers in these facilities were better at identifying and reporting potential patient safety issues. Below, Figure 13 shows that the Southwest region has the largest number of reports submitted per hospital.



**Figure 13. Number of Reports Submitted per Hospital by Region (2012)**

## **ADDENDUM C: Summaries of Select 2012 Advisory Articles**

### **Patient Safety Information Based on Report Analysis and Research**

The *Pennsylvania Patient Safety Advisory* is the primary means through which the Pennsylvania Patient Safety Authority communicates with healthcare facilities about the significant trends identified in events reported through its reporting system. The *Advisory*, a quarterly publication with periodic supplements, is disseminated through e-mail and is also available from the Authority's website at <http://www.patientsafetyauthority.org>. Since the first *Advisory* was issued in March 2004, the Authority has published more than 425 articles on a variety of clinical issues. In 2012, the Authority published four quarterly issues and one supplement, composed of 35 articles. Summaries of select 2012 articles begin on page C2.

As part of an ongoing effort in conjunction with the Authority, the Pennsylvania Medical Society provides web-based continuing medical education (CME) credit to physicians who complete its *Studies in Patient Safety: Online CME Cases*.<sup>9</sup> The articles included in this online publication are first published in the *Advisory*. The Authority selects articles for submission to the society based on the frequency and severity of the patient safety issue, the availability of known solutions to the problem, and the topic's relevance to a physician audience. The Authority develops the CME questions that accompany the articles as posttests.

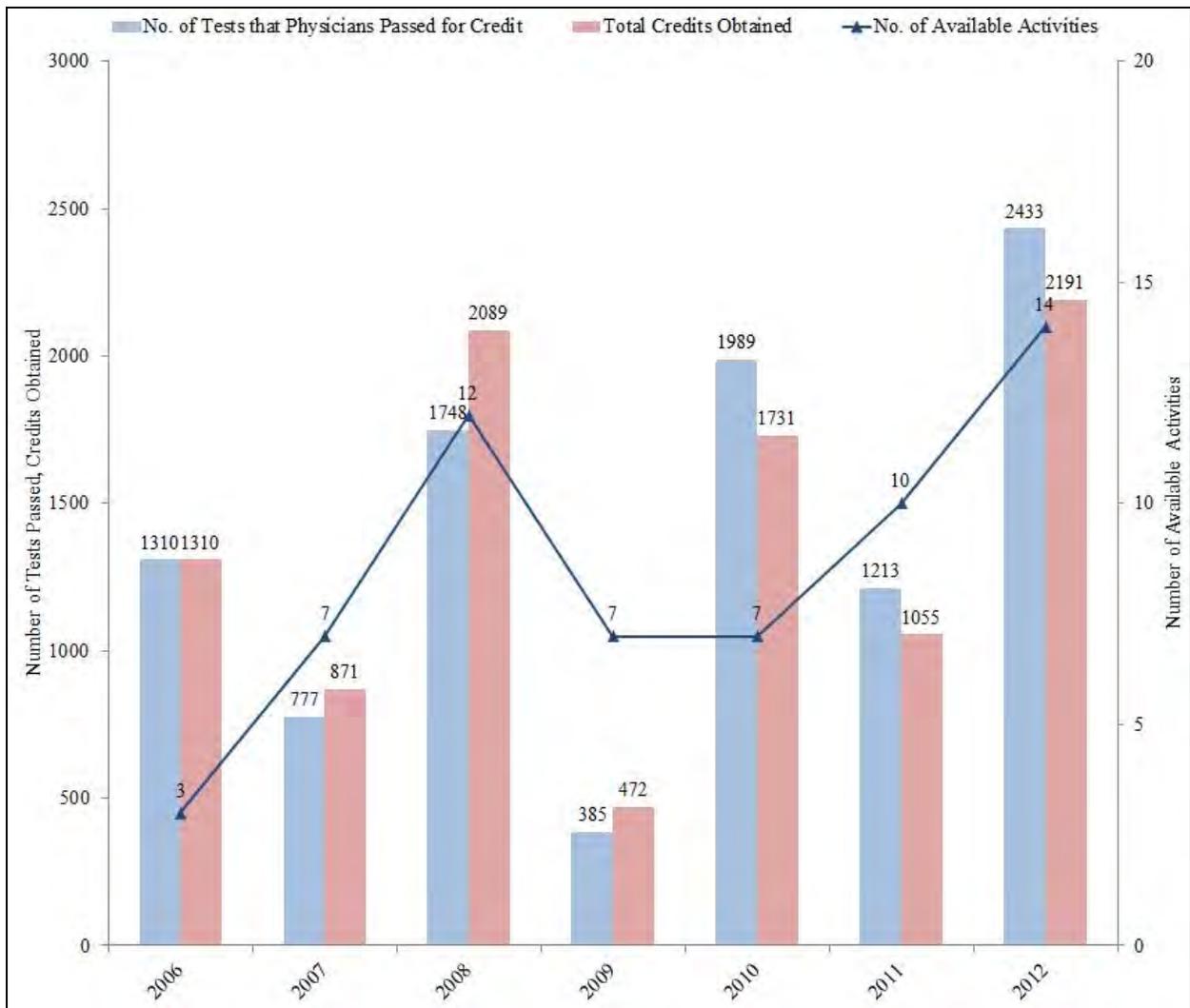
In 2012, 14 *Advisory*-based CME activities were available from the society. Physicians passed a total of 2,433 posttests associated with the 14 activities and obtained a total of 2,191 CME credits as a result.<sup>10</sup> The number of posttests passed by physicians and resulting credits in 2012 represent the greatest, respectively, in a calendar year since the Authority's efforts with the society began in 2006. See Figure 1.

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

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<sup>9</sup> See the *Studies in Patient Safety: Online CME Cases* at <http://www.pamedsoc.org/studies>.

<sup>10</sup> Not all activities equate to 1.0 credits. Credits associated with past CME activities have ranged from 0.75 to 2.0 depending on criteria, including content difficulty and the duration of time to complete the activity. Before 2010, activities of *Studies in Patient Safety: Online CME Cases* were composed of as many as three *Advisory* articles. During 2010, activities began to be composed of only one article to better target areas of need for education about patient safety.



**Figure 1. Summary of Pennsylvania Medical Society Continuing Medical Education Efforts Associated with Articles from the *Pennsylvania Patient Safety Advisory*<sup>11</sup>**

<sup>11</sup> The apparent spike in the even-numbered calendar years may be explained by physician licensure cycles in Pennsylvania ending on December 31 of each even year. The State Board of Medicine regulations state that among items needed for physicians to renew a medical license, a physician will need 12 credit hours in the areas of patient safety or risk management (either Category 1 or Category 2). (Pennsylvania Medical Society. FAQ: state CME licensure requirements for MDs [online]. [cited 2013 Feb 19]. <http://www.pamedsoc.org/AudienceNavigation/Physicians/MD-CME-requirements.html>.)

Following are summaries of select 2012 articles.

### **Responses to the Authority's Potential Recommendations to Prevent Wrong-Site Surgery**

2012 Nov 20;9(Suppl 1):1-15, 16-20

The Pennsylvania Patient Safety Authority sought to identify the barriers to implementation and the strategies used for successful implementation of the Authority's 21 potential recommendations<sup>12</sup> for preventing wrong-site surgery. These recommendations were based on the Authority's 21 Principles for Reliable Performance of Correct-Site Surgery. The Authority sought input from Pennsylvania healthcare facilities and Pennsylvania medical professional societies.

The Authority surveyed the 417 Pennsylvania facilities with operating rooms about the recommendations. The survey divided the 21 recommendations into five groups, with a total of six goals and eight potential measurement standards for the groups. For each of the six goals, respondents were asked to describe barriers to implementation of the recommendations that would prevent the facilities from meeting the standard(s) for the goal. They were asked to describe any strategies for successful implementation. And, they were asked to comment on the feasibility and potential cost impact of implementing the recommendations associated with the standard(s). Seventy facilities responded, for a response rate of 17%. Two-thirds of the responses were from hospitals, and one-third were from ambulatory surgical facilities. Physician behavior was cited most commonly as a barrier to implementation, followed by difficulty accessing accurate information prior to the patient's arrival in the preoperative holding area. Strategies for successful implementation of the recommendations included education, audits, leadership, and empowerment of nurses to "stop the line." All of the recommendations were considered feasible. The recommendation that intraoperative imaging studies of the spine be verified by a second qualified physician was considered costly and was modified accordingly.

Separately, the Authority asked 27 medical professional societies to comment on the acceptability, feasibility, and cost of each of the recommendations. Twelve medical professional societies responded to the request for comments, including seven surgically-related specialty societies and two general medical provider societies. Results are as follows (numbered recommendations correspond to numbered principles in Figure 2):

- No organization commented that any of recommendations 1, 2, 3, 7, 8, 17, and 20 were unacceptable, not feasible, or costly.
- Organizations commented about feasibility and cost, but not acceptability, of recommendations 4, 5, 6, 12, 13, and 14.

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<sup>12</sup> As of the date of publication, all recommendations are to be considered *potential* recommendations to prevent wrong-site surgery.

The following principles for reliable performance of correct-site surgery, identified by the Pennsylvania Patient Safety Authority during its Preventing Wrong-Site Surgery Project, should be consistently followed.

1. The correct site of the operation should be specified when the procedure is scheduled.
2. The correct operation and site should be noted on the record of the history and physical examination.
3. The correct operation and site should be specified on the informed consent.
4. Anyone reviewing the schedule, consent, history and physical examination, or reports documenting the diagnosis should check for discrepancies among all those parts of the patient's record and reconcile any discrepancies with the surgeon when noted.
5. The surgeon should have supporting information uniquely found in the office records at the surgical facility on the day of surgery.
6. All information that should be used to support the correct patient, operation, and site, including the patient's or family's verbal understanding, should be verified by the nurse, anesthesia provider, and surgeon before the patient enters the operating room (OR).
7. All verbal verification should be done using questions that require an active response of specific information rather than a passive agreement.
8. Patient identification should always require two unique patient identifiers.
9. Any discrepancies in the information should be resolved by the surgeon, based on primary sources of information, before the patient enters the OR.
10. The site should be marked by a healthcare professional familiar with the facility's marking policy, with the accuracy confirmed both by all the relevant information and by an alert patient, or patient surrogate if the patient is a minor or mentally incapacitated.
11. The site should be marked by the provider's initials.
12. All information that should be used to support the correct patient, operation, and site, including the patient's or family's verbal understanding, should be verified by the circulating nurse upon taking the patient to the OR.
13. Separate formal time-outs should be done for separate procedures, including anesthetic blocks, with the person performing that procedure.
14. All noncritical activities should stop during the time-out.
15. The site mark should be visible and referenced in the prepped and draped field during the time-out.
16. Verification of information during the time-out should require an active communication of specific information, rather than a passive agreement, and be verified against the relevant documents.
17. All members of the operating team should verbally verify that their understanding matches the information in the relevant documents.
18. The surgeon should specifically encourage operating team members to speak up if concerned during the time-out.
19. Operating team members who have concerns should not agree to the information given in the time-out if their concerns have not been addressed.
20. Any concerns should be resolved by the surgeon, based on primary sources of information, to the satisfaction of all members of the operating team before proceeding.
21. Verification of spinal level, rib resection level, or ureter to be stented should require radiological confirmation, using a stable marker and readings by both a radiologist and the surgeon.

Source: Pennsylvania Patient Safety Authority. Principles for reliable performance of correct-site surgery [online]. 2010 Dec [cited 2012 Jun 25]. <http://patientsafetyauthority.org/EducationalTools/PatientSafetyTools/PWSS/Documents/principles.pdf>.

**Figure 2. Principles for Reliable Performance of Correct-Site Surgery**

- Organizations commented that recommendations 11 and 18 were unacceptable but did not comment specifically about feasibility or cost.
- Organizations commented about acceptability and about feasibility or costs of recommendations 9, 10, 15, 16, 19, and 21.

All of the concerns raised by the societies were addressed by the Authority. One recommendation, also cited by the 70 facilities, was modified as noted above.

The intent of the Authority's 21 recommendations is not to add to the complexity of surgical care; rather, the intent is to improve existing practices to match evidenced-based best practices to prevent wrong-site surgery.

*For the complete articles and associated resources, go to [http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/nov20\\_9\(suppl%201\)/Pages/home.aspx](http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/nov20_9(suppl%201)/Pages/home.aspx)*

### **Surgical Fires: Trends Associated with Prevention Efforts**

2012 Dec;9(4):130-5

Fires on the operating field are dangerous to patients and providers. Pennsylvania Patient Safety Authority analysts identified fires reported to the Authority by Pennsylvania healthcare facilities from July 2004 through June 2011. Seventy events met the analysts' definition of fires that occurred in the operating room on the surgical field and involved combustion resulting from a combination of heat, oxygen, and fuel.

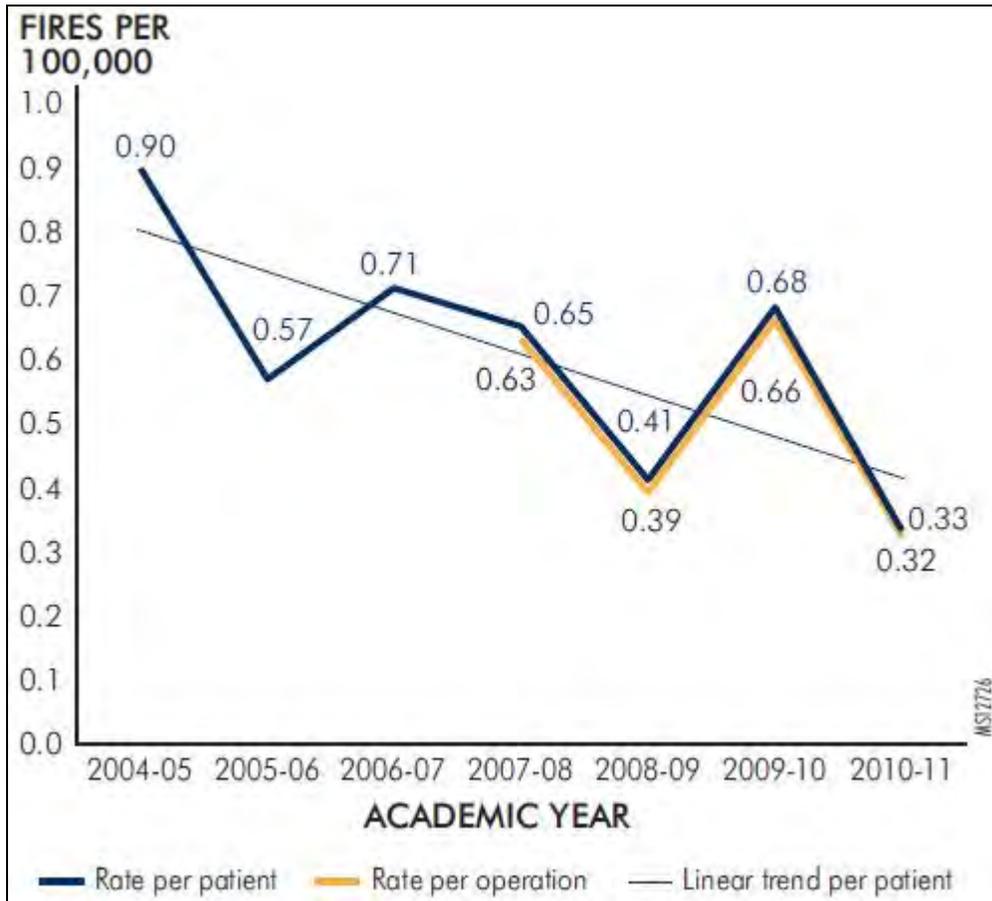
Trends in the number of fires per patient receiving operations over the seven years from the academic year 2004-2005 to 2010-2011 are illustrated in Figure 3. Over the four years for which the more accurate number of operations was available, the rate of surgical fires has varied from 0.63 per 100,000 operations (1 per 157,545 operations) in the academic year 2007-2008 to 0.32 per 100,000 operations (1 per 309,305 operations) in the academic year 2010-2011.

Of the 69 event reports that included information about patient harm, facilities reported patient harm in 23 event reports (33%) and no patient harm in 46 (67%). Three events involved fires in the surgeons' hands, and one event involved a fire on the scrub technician's glove; none of these four events harmed staff members or patients.

Incidence of fires on the operating fields in Pennsylvania hospital operating rooms and ambulatory surgical facilities should be considered in context of the following surgical fire prevention initiatives:

- 2003: Joint Commission Sentinel Event Alert on preventing surgical fires
- 2005 to 2009: Joint Commission National Patient Safety Goal for ambulatory surgery

- 2008 to 2009: American Society of Anesthesiologists' "Practice Advisory for the Prevention and Management of Operating Room Fires"
- 2010: Anesthesia Patient Safety Foundation's fire safety video
- 2011 to present: US Food and Drug Administration Preventing Surgical Fires initiative



**Figure 3. Trends in Surgical Field Fires**

Three elements are necessary for a fire to occur: (1) a heat source, (2) oxygen, and (3) a fuel. A coordinated approach to surgical fire prevention and response by the surgical team is important to eliminate fire hazards and to minimize the time until the fire is extinguished. Surgical fires remain a significant enough risk to justify use of a Fire Risk Assessment Score and adherence to the recommendations of the American Society of Anesthesiologists Task Force on Operating Room Fires and those of the Anesthesia Patient Safety Foundation.

*For the complete article and associated resources, go to [http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Dec;9\(4\)/Pages/130.aspx](http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Dec;9(4)/Pages/130.aspx).*

## The Role of the Electronic Health Record in Patient Safety Events

2012 Dec;9(4):113-21

*(The Office of the National Coordinator for Health Information Technology cited this article in its “Health Information Technology Patient Safety Action & Surveillance Plan for Public Comment,” available at*

<http://www.healthit.gov/sites/default/files/safetyplanhhspubliccomment.pdf>)

As US adoption of health information technology solutions such as electronic health records (EHRs)<sup>13</sup> has increased, the attention to the safety and risk profile of these technologies has likewise grown. A query of the Pennsylvania Patient Safety Authority’s Pennsylvania Patient Safety Reporting System (PA-PSRS) for events related to EHR technologies returned more than 8,003 events reported from June 2, 2004, through May 18, 2012, that contained specific keywords (e.g., “emr,” “ehr,” “electronic health”).

Manual analysis of an approximate 20% random sample of the events (n = 1,567) classified 933 as relevant events involving EHRs. The random sample data set was also divided into training and evaluation data sets for a machine-learning model, with the intent of estimating the probability of relevance of unclassified events using an algorithm trained on the manually reviewed events. The model was applied to the remaining 6,436 events that had not been manually classified and identified 2,500 as relevant. Manual screening of the 2,500 reports confirmed 2,166 (87%) were relevant to EHRs. In sum, 3,099 events were confirmed relevant to EHRs from the overall data set queried from the PA-PSRS database.

The majority of the 3,099 events involved errors in human data entry, such as entry of “wrong data” or the failure to enter data, and a few involved technical failures on the part of the EHR system. Eighty-nine percent of the events were reported as an error with no harm to a patient, and 10% were reported as “unsafe conditions” that likewise did not result in harm. Fifteen events involved temporary harm to a patient, and one event, related to failure to properly document an allergy, resulted in significant harm.

In addition, the Authority analysts determined a difference in the pattern of reported events present in the PA-PSRS database from those that external researchers identified in (1) the US Food and Drug Administration’s Manufacture and User Facility Device Experience database and (2) Australia’s Advanced Incident Management System. The analysts attributed this difference to dissimilarities in the databases, dissimilarities in the people who populate the databases, and limitations in the PA-PSRS data set (e.g., reporting statutes, awareness of EHRs as a contributing factor, query design). See Table 1.

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<sup>13</sup> The term “EHR” is used to denote a family of technologies that includes electronic medical records and electronic medication administration records.

Overall, the analysts identified 3,946 problems in the 3,099 events reported through PA-PSRS and confirmed relevant to EHR. Problem themes include the following:

- Underlying causes of human-related problems (e.g., wrong entry, wrong field) may not be captured in the existing narrative reports. Overall, adding EHR- and health-information-technology-specific event types and taxonomy to PA-PSRS may increase the number and quality of event reports.

**Table 1. Application of Magrabi et al.\* Taxonomy to Queried Reports**

EVENT REPORT TAGS	NO. OF TAGGED REPORTS			% OF TAGGED PROBLEMS		
	Machine-Learning Reports	Random Sample of Reports	PA-PSRS <sup>†</sup> Reports	PA-PSRS Data	Magrabi et al. MAUDE <sup>‡</sup> Data	Magrabi et al. AIMS <sup>§</sup> Data
1.1 Data capture down or unavailable	2	1	3	0	6	2
1.2.1 Wrong input	1,348	519	1,867	47	3	17
1.2.1.1 Wrong input—units error	12	6	18	0	**	**
1.2.1.2 Wrong input—wrong fields	43	22	65	2	**	**
1.2.2 Missing data	22	16	38	1	<1 throughout	6
1.2.3 Fail to update data	490	272	762	18	<1	6
1.2.4 Fail to communicate/carry out task	9	13	22	1	0	0
2.1 Network down or slow	5	6	11	0	<1	10
2.2 System interface issues	34	55	89	2	1	9
3.1 Output device down or unavailable	107	59	166	4	<1	4
3.2 Record unavailable	15	6	21	1	<1	0
3.3 Output/display error	113	30	143	4	28	5
3.4.1 Wrong record retrieved	46	19	65	2	<1	4
3.4.2 Missing data (did not look at complete record)	22	7	29	1	0	0
3.4.3 Didn't look	15	11	26	1	<1	4
3.4.4 Not alerted	10	17	27	1	0	2
3.4.5 Misread/misinterpret	9	1	10	0	**	**
4.1 Computer system down or too slow	29	22	51	1	16	9
4.2 Software not available	1	5	6	0	0	<1
4.3 Unable to login	3	3	6	0	0	5
4.4 Software issue	**	**	**	**	**	7
4.4.1 Software issue—functionality	34	16	50	1	32	**
4.4.2 Software issue—system configuration	48	49	97	2	3	**
4.4.2.1 Software issue—system configuration—default	168	53	221	8	**	**
4.4.3 Software issue—device interface	0	0	0	0	6	**
4.4.4 Software issue—network configuration	2	0	2	0	<1	**
4.5 Data loss	33	28	61	2	2	2
5.1 Contributing factor—staffing/training	30	24	54	1	0	2
5.2.1 Contributing factor—cognitive load—interruption	1	3	4	0	0	<1
5.2.2 Contributing factor—cognitive load—multitasking	1	2	3	0	0	<1
5.3.1 Contributing factor—fail to carry out duty—fail to log off	1	3	4	0	0	3

Note: Sample sizes are as follows: machine-learning reports (2,166 reports); random sample of reports (933 reports); PA-PSRS reports (3,009 reports); PA-PSRS data (3,946 problems from 3,099 reports); Magrabi et al. MAUDE data (712 problems from 436 reports); Magrabi et al. AIMS data (117 problems).

<sup>†</sup> Magrabi F, Ong MS, Runciman W, et al. Using FDA reports to inform a classification for health information technology safety problems. *J Am Med Inform Assoc* 2012 Jan-Feb;19(1):45-53.

<sup>‡</sup> Pennsylvania Patient Safety Authority's Pennsylvania Patient Safety Reporting System

<sup>§</sup> US Food and Drug Administration's Manufacturer and User Facility Device Experience database

<sup>¶</sup> Australia's Advanced Incident Management System

\*\* Tag not used in analysis

- Problems involving dual workflow (i.e., using both paper- and electronic-based records) may warrant further study.
- Configurations of electronic systems may lead to errors in medication orders and documentation. Further study may reveal best practices.

*For the complete article, go to*

[http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Dec;9\(4\)/Pages/113.aspx](http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Dec;9(4)/Pages/113.aspx)

### **Patients Taking Their Own Medications While in the Hospital**

2012 Jun;9(2):50-7

Pennsylvania healthcare facilities have reported events to the Pennsylvania Patient Safety Authority mentioning errors with patients taking their own medications; many indicated staff found medications in a patient's room that were brought from home without the staff's knowledge. Upon querying the Authority's reporting database, analysts identified 879 medication error events reported from July 2004 through January 2011 involving patients taking their own medications while in a hospital.

Predominant types of reported errors included unauthorized drugs (48%), other (23.1%), extra dose (8%), and wrong dose/overdosage (2.3%). Events reached the patient in 77.7% of the event reports, and 2% of events resulted in patient harm. Nearly 300 different medications were mentioned in the total event reports, and in 164 event reports, patients took multiple medications (see Table 2).

Factors stated in the event reports as contributing to patients bringing in and self-administering their own medications included miscommunication between patients and staff and patient dissatisfaction with care (e.g., poorly controlled pain). In 44.5% of the event reports, there was no specific explanation as to why patients took their own medications. In at least 5.1% of the event reports, errors occurred in which organizations were intentionally using the patients' own medications.

Strategies to prevent harm from patients taking their own medications include the following:

- Proactively assessing the risk associated with patients bringing in their own medications
- Developing a screening process for patients admitted to the facility who have a previous history of bringing in their own medications
- Providing patient and family education upon admission to the facility about the facility's policies in regard to patients' use of their own medications
- Reviewing medication administration records
- Reviewing current organization policies and procedures

**Table 2. Top 25 Medications Involved in Medication Errors in Events in which Patients Took Their Own Medications (n = 526, 59.8% of total reports)**

MEDICATION	NUMBER OF REPORTS	PERCENTAGE OF TOTAL REPORTS (N = 879)
OxyCODONE*†	77	8.8%
Clonazepam*	44	5.0
ALPRAZolam*	43	4.9
HYDROcodone*†	41	4.7
LORazepam*	36	4.1
Insulin†	34	3.9
Metoprolol	25	2.8
Methadone*†	21	2.4
Zolpidem*	19	2.2
Diazepam*	19	2.2
Acetaminophen	19	2.2
Propoxyphene with acetaminophen*†	16	1.8
Aspirin	14	1.6
Warfarin†	13	1.5
MetFORMIN†	11	1.3
Morphine*†	11	1.3
Carisoprodol*	11	1.3
DiphenhydrAMINE	10	1.1
FentaNYL*†	10	1.1
Temazepam*	10	1.1
Nitroglycerin	9	1.0
Sertraline	9	1.0
Fioricet®* (i.e., acetaminophen, butalbital, and caffeine)	8	0.9
HYDROmorphine*†	8	0.9
Lisinopril	8	0.9

\* Controlled substance (categories II through V)  
† High-alert medication

For the complete article, go to

[http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9\(2\)/Pages/50.aspx](http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9(2)/Pages/50.aspx)

## The Breadth of Hospital-Acquired Pneumonia: Nonventilated versus Ventilated Patients in Pennsylvania

2012 Sep;9(3):99-105

According to the Centers for Disease Control and Prevention (CDC), hospital-acquired pneumonia (HAP) “has accounted for approximately 15% of all hospital-associated infections,” and in recent decades, a majority of research has targeted ventilator-associated pneumonia (VAP).<sup>14</sup> Other literature has hypothesized that lack of data about nonventilator-HAP (NV-HAP) may partially be the result of hindered surveillance because of case dispersion in hospitals. While Pennsylvania hospitals have demonstrated VAP rate reduction, research demonstrates that additional focus on NV-HAP may be deserved.

Pennsylvania state law requires that all healthcare-associated infections are reported through the CDC’s National Healthcare Safety Network (NHSN). Pennsylvania Patient Safety Authority analysts queried the NHSN database for nosocomial pneumonia data sets from 2009 through 2011. Table 3 shows nosocomial pneumonia and related deaths reported from Pennsylvania.

Table 4 shows estimated costs of NV-HAP and VAP cases.

**Table 3. Pennsylvania Nosocomial Pneumonia and Related Deaths**

YEAR	NO. OF NV-HAP CASES	NO. OF NV-HAP DEATHS	% OF NV-HAP CASES CONTRIBUTING TO DEATH	NO. OF VAP CASES	NO. OF VAP DEATHS	% OF VAP CASES CONTRIBUTING TO DEATH
2009	1,976	363	18.4 (95% CI: 16.5 to 20.3)	922	163	17.7 (95% CI: 15.0 to 20.5)
2010	1,848	366	19.8 (95% CI: 17.8 to 21.8)	737	144	19.5 (95% CI: 16.3 to 22.7)
2011	1,773	315	17.8 (95% CI: 15.8 to 19.7)	640	127	19.8 (95% CI: 16.4 to 23.3)
<b>Total</b>	<b>5,597</b>	<b>1,044</b>	<b>18.7 (95% CI: 17.5 to 19.8)</b>	<b>2,299</b>	<b>434</b>	<b>18.9 (95% CI: 17.1 to 20.7)</b>

Note: NV-HAP refers to nonventilator-hospital-acquired pneumonia and VAP refers to ventilator-associated pneumonia.

**Table 4. Estimated Costs of NV-HAP and VAP Cases**

YEAR	NO. OF NV-HAP CASES	COST FOR NV-HAP CASES	NO. OF VAP CASES	COST FOR VAP CASES
2009	1,976	\$55,343,808	922	\$34,521,524
2010	1,848	\$51,758,784	737	\$27,594,754
2011	1,773	\$49,658,184	640	\$23,962,880
<b>Total</b>	<b>5,597</b>	<b>\$156,760,776</b>	<b>2,299</b>	<b>\$86,079,158</b>

Note: NV-HAP refers to nonventilator-hospital-acquired pneumonia and VAP refers to ventilator-associated pneumonia. The estimated average cost per NV-HAP case is \$28,008. The estimated average cost per VAP case is \$37,442. Average costs derived from the following study: Kalsekar J, Amsden J, Kothari S, et al. Economic and utilization burden of hospital-acquired pneumonia (HAP): a systematic review and meta-analysis. *Chest* 2010 Oct;138(4\_MeetingAbstracts):739A.

<sup>14</sup> Hospital-acquired pneumonia taxonomy distinguishes between events in which patients require mechanical ventilation (i.e., ventilator-acquired pneumonia) and in which patients do not require ventilator support (i.e., nonventilator hospital-acquired pneumonia).

Furthermore, Authority analysts tabulated NV-HAP by NHSN location type reported in Pennsylvania, available in the complete article, which is referenced below.

If external research is accurate, incidence of NV-HAP may be underestimated. NV-HAP cases may become more costly if prevention efforts continue to focus on VAP. Facilities can target interventions on NV-HAP populations by identifying affected patient populations. Important facility interventions include focusing care on reservoirs and the portal of entry, as well as improving oral hygiene and collaborating with a dental professional.

*For the complete article and associated resources, go to [http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Sep;9\(3\)/Pages/99.aspx](http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Sep;9(3)/Pages/99.aspx)*

**Falls Risk Assessment: A Foundational Element of Falls Prevention Programs**  
2012 Sep;9(3):73-81

In 2011, Pennsylvania healthcare facilities reported 32,802 patient falls events to the Pennsylvania Patient Safety Authority. Analysts evaluated these events to determine whether the patients who fell had a completed falls risk assessment, were identified as at risk for a fall, and had prevention strategies in place. See Table 5.

**Table 5. Prevention Strategy or Protocol Implementation According to Risk Assessment and Risk for Fall as Reported to the Pennsylvania Patient Safety Authority, 2011**

PREVENTION STRATEGIES OR PROTOCOLS IN PLACE	ALL PATIENTS WHO FELL, % (NO.)	PATIENTS WHO FELL WHO HAD A COMPLETED RISK ASSESSMENT, % (NO.)	PATIENTS WHO FELL WHO HAD A COMPLETED RISK ASSESSMENT AND FALLS RISKS IDENTIFIED, % (NO.)
Yes	65.2 (21,390)	82.2 (17,590)	87.4 (14,672)
No	15.0 (4,928)	10.0 (2,148)	9.5 (1,590)
Unknown	19.8 (6,484)	7.8 (1,652)	3.1 (519)
<b>Total</b>	<b>100 (32,802)</b>	<b>100 (21,390)</b>	<b>100 (16,781)</b>

Next, Authority analysts determined the percentage of falls events reported for patients who were identified as at risk for falls. Of the resulting 21,117 events, 77.2% (n = 16,302) were reported for patients who were identified as at risk for falls, 18.5% (n = 3,907) were reported for patients who were identified as not at risk for falls, and 4.3% (n = 908) were reported for patients with risk statuses labeled as unknown. Finally, the analysts evaluated whether implementation of prevention strategies or protocols differed when risk assessments were completed and falls risks were identified. Less than half (44.7%, 14,672 of 32,802) of the reported events indicated that all these activities had been implemented and documented.

The Authority has partnered with the Hospital and Healthsystem Association of Pennsylvania in a collaboration of more than 80 hospitals as part of Pennsylvania Hospital Engagement Network Falls Reduction and Prevention Collaboration. As part of this collaboration, the Authority reviewed falls risk assessment tools. Available medical literature indicates that falls risk assessment tools accurately identify patients who will fall or those who are at high risk of falling with a sensitivity and specificity of greater than 70%.

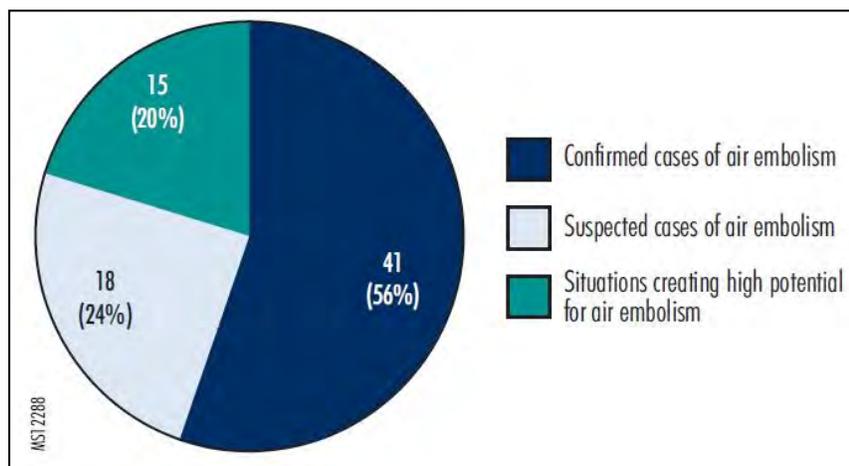
Those risk assessment tools currently in use in the Pennsylvania collaboration include the Morse Fall Scale, the Hendrich II Fall Risk Model, and the Johns Hopkins Fall Risk Assessment Tool (see a side-by-side comparison of the tools in the complete article, referenced below).

In general, pairing risk assessment with functional assessment tests and injury risk assessments shows promise of further delineating patients at highest risk of falls and falls-with-injury events. Initial screening for falls risk using these tools forms the basis for further risk assessment and formulation of a multifactorial falls prevention plan with interventions targeted to the risk factors identified. Additional risk reduction strategies include the following:

- Screen all patients for risk of falling.
- Select a risk assessment tool that targets risk factors most predictive of falls.
- Assess and periodically reassess the accuracy of the tool.
- Provide ongoing education to staff about the proper use of selected tools.

For the complete article and associated resources, go to <http://www.patientsafetyauthority.org/EducationalTools/PatientSafetyTools/falls/Pages/home.aspx>

### Reducing Risk of Air Embolism Associated with Central Venous Access Devices 2012 Jun;9(2):58-64



**Figure 4. Air Embolism Reports to the Pennsylvania Patient Safety Authority, June 2004 through December 2011**

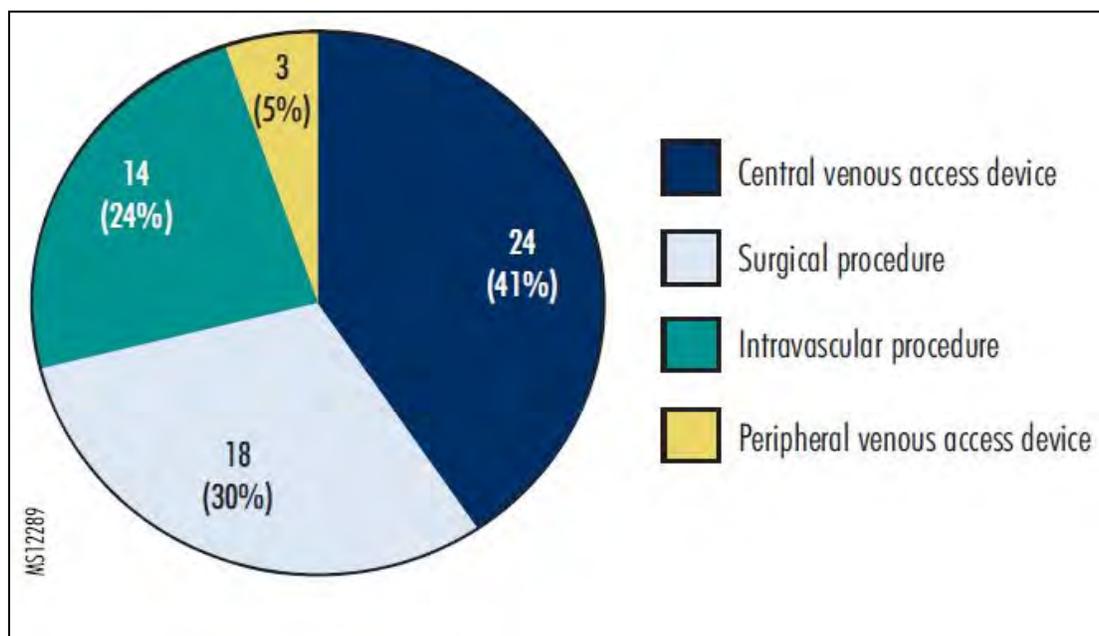
Air embolism is a preventable hospital-acquired condition that can result in serious harm. The Centers for Medicare and Medicaid Services has labeled it a serious reportable event with nonpayment for harm. Between June 2004 and December 2011, Pennsylvania

healthcare facilities reported to the Pennsylvania Patient Safety Authority 74 events related to air embolism. The majority of confirmed or suspected air embolisms were attributed to central venous access devices (CVADs). See Figure 4 and Figure 5 for the breakdown of reports by classification and associated clinical feature, respectively.

The widespread use of CVADs, along with a high mortality rate attributed to air embolisms related to CVADs, warrants attention. Hospitals can decrease the risk for air embolism by establishing policies and procedures that contain specific air embolism prevention protocols for CVAD insertion, management, and removal.

Other system-level risk reduction strategies include the following:

- Ensure education and competency certification for staff.
- Consider the use of standardized insertion bundle kits, carts, and removal kits.
- Do not purchase nonintravenous equipment that can be connected to needleless intravenous ports.
- Employ equipment safety controls.
- Consider establishing a vascular access nurse team.



**Figure 5. Confirmed and Suspected Air Embolism Reports to the Pennsylvania Patient Safety Authority, by Associated Clinical Feature, June 2004 through December 2011**

For the complete article, go to

[http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9\(2\)/Pages/58.aspx](http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Jun;9(2)/Pages/58.aspx)

## **Survey of Ambulatory Surgical Facility Preoperative Screening Processes in Pennsylvania**

2012 Mar;9(1):18-22

In January 2012, the Pennsylvania Patient Safety Authority initiated a regional ambulatory surgical facility (ASF) collaboration to examine presurgical screening and assessment practices and the frequency of transfers and cancellations. A statewide survey of ASFs was conducted to help inform the collaboration, focusing on ASF activities that occurred during 2010. Questions pertained to organization characteristics, patient characteristics, history and physical documentation, cancellations, preoperative screening, and transfers. About 46.5% (n = 115 of 247) of ASFs responded.

Not all respondents answered all questions, so nonresponses were removed from the analysis, with percentages calculated based on the actual responses for each question. Results include the following:

- Approximately 37.4% of ASFs have implemented an electronic health record, and 41.7% receive medical forms electronically.
- Secretaries and schedulers are the primary contact person 11.7% of the time for preoperative screening and 20.5% of the time for preoperative instructions.
- The transfer rate was 1.16 per 1,000 completed procedures, and cardiac conditions were the most frequent reason for a transfer. (See Table 6 for reasons for transfers.)
- The cancellation rate was 18.09 per 1,000 completed procedures, and medical conditions were the most frequent reason for a cancellation. (See Table 7 for reasons for cancellations.)

**Table 6. Ambulatory Surgical Facility Transfers to Hospitals**

<b>MOST FREQUENT REASON FOR TRANSFERS</b>	<b>FACILITY RESPONSES</b>	<b>PERCENTAGE</b>
Cardiac (e.g., arrhythmias, chest pain)	37	52.9%
Uncontrolled pain	11	15.7%
Unspecified surgical complications	6	8.6%
Perforations	5	7.1%
Respiratory	4	5.7%
Anesthesia difficulties	3	4.3%
Bleeding	2	2.9%
Hypertension	1	1.4%
Procedural complication	1	1.4%
<b>Total</b>	<b>70</b>	<b>100%</b>

**Table 7. Ambulatory Surgical Facility Cancellations**

<b>MOST FREQUENT REASON FOR ASF CANCELLATIONS</b>	<b>FACILITY RESPONSES</b>	<b>PERCENTAGE</b>
Medical	44	44%
Patient (e.g., no show, changed mind about surgery)	27	27%
Failure to follow protocol (e.g., incomplete history and physical, failure to maintain nothing by mouth status, failure to stop medications, no ride home)	24	24%
Other (e.g., unsuccessful completion of all conditions for the procedure, no one main reason (i.e., multiple reasons), no cancellations, unsure, data unavailable)	5	5%
<b>Total</b>	<b>100</b>	<b>100%</b>

The baseline ASF prescreening activities, transfer rates and reasons, and cancellation rates and reasons obtained in this survey were incorporated into the Authority's ASF collaboration.

*For the complete article, go to*

[http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Mar;9\(1\)/Pages/18.aspx](http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Mar;9(1)/Pages/18.aspx)

### **Medication Errors: When Pharmacy Is Closed**

2012 Mar;9(1):11-7

When pharmaceutical services are not available, the medication-use process can be more vulnerable to errors, especially if nonpharmacists have complete access to the pharmacy

after hours. While an estimated 41.2% of US hospitals provide 24-hour inpatient pharmaceutical services, such provision varies according to hospital bed size; for example only 8.8% of hospitals with fewer than 50 staffed beds provide this service, whereas 98.4% of hospitals with 600 or more staffed beds provide this service.

Between June 2004 and September 2010, Pennsylvania hospitals reported to the Pennsylvania Patient Safety Authority 519 medication error events that implied an event occurred while the pharmacy department was closed. Analysis of the event reports revealed that 450 events (86.7%) reached the patient and that 2 (0.4%) resulted in harm significant enough to require additional treatment. The top five event types include wrong drug (30.4%), drug omission (28.9%), prescription/refill delay (11.0%), wrong dose/underdosage (6.7%), and extra dose (5.8%).

Table 8 lists the 10 medications most frequently involved in the events, including four high-alert medications.

Analysis of the involved medications reveals that while it is unlikely that each and every medication ordered and administered while the pharmacy was closed was a critical medication that required immediate administration, the lack of detail in the event reports makes definitive determination impossible. When pharmaceutical services are not available, there is one less check to prevent an error from reaching the patient. Thirty-two events were identified as originating in the prescribing node. More than 62% involved a patient who was prescribed a medication to which he or she had a documented allergy; all but one of these reached the patient.

Pennsylvania healthcare facilities can strive to identify system-based causes of the medication errors that occur when on-site pharmaceutical services are not available. Strategies to prevent harm to patients include the following:

- Explore the possibility of establishing on-site 24-hour pharmaceutical services. If this is not possible, investigate the concept of remote, or off-site, pharmacy order entry services.
- Provide access to a *limited* supply of medications to be used for urgent medication orders.
- Standardize processes for accessing medications when the pharmacy is closed to reduce variability and opportunity for error.
- Establish a forcing function error reduction strategy to make the allergy “reaction” selection a mandatory entry in the organization’s order entry systems for prescribers and pharmacists.

**Table 8. Top 10 Medications Involved in Events That Occurred after the Pharmacy Was Closed (166 of 519) from June 2004 through September 2010**

<b>RANK</b>	<b>MEDICATION NAME</b>	<b>NUMBER</b>	<b>% OF TOTAL EVENTS (N = 519)</b>
1	Warfarin sodium*	23	4.4%
2	Hydration solution	20	3.9
3	Insulin*	19	3.7
4	GuaiFENesin	18	3.5
	Vancomycin hydrochloride	18	3.5
6	Potassium chloride*	14	2.7
7	CefTRIAxone sodium	9	1.7
	MethylPREDNISolone	9	1.7
9	CeFAZolin sodium	8	1.5
10	Carbidopa/levodopa	7	1.4
	Levofloxacin	7	1.4
	Metoprolol	7	1.4
	Morphine sulfate*	7	1.4

\* A high-alert medication

For the complete article, go to

[http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Mar;9\(1\)/Pages/11.aspx](http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Mar;9(1)/Pages/11.aspx)

# ADDENDUM D: Detailed Description of Regional Education Programs

## Educational Programs 2012

The Pennsylvania Patient Safety Authority’s educational programs have grown substantially, not only in the number of courses given but also in the number of healthcare personnel from all disciplines who attend them. In 2012, the Authority conducted a total of 165 educational sessions. Over 7,360 individuals attended the sessions in 2012. That’s a 70% increase in attendance from 2011, in which there were 191 sessions attended by 4,327 individuals (see Figure 1). Moreover, the number of individuals in attendance per session has nearly doubled, from 23 per session in 2011 to 45 per session in 2012 (see Figure 2).

Total Educational Programs Attendance

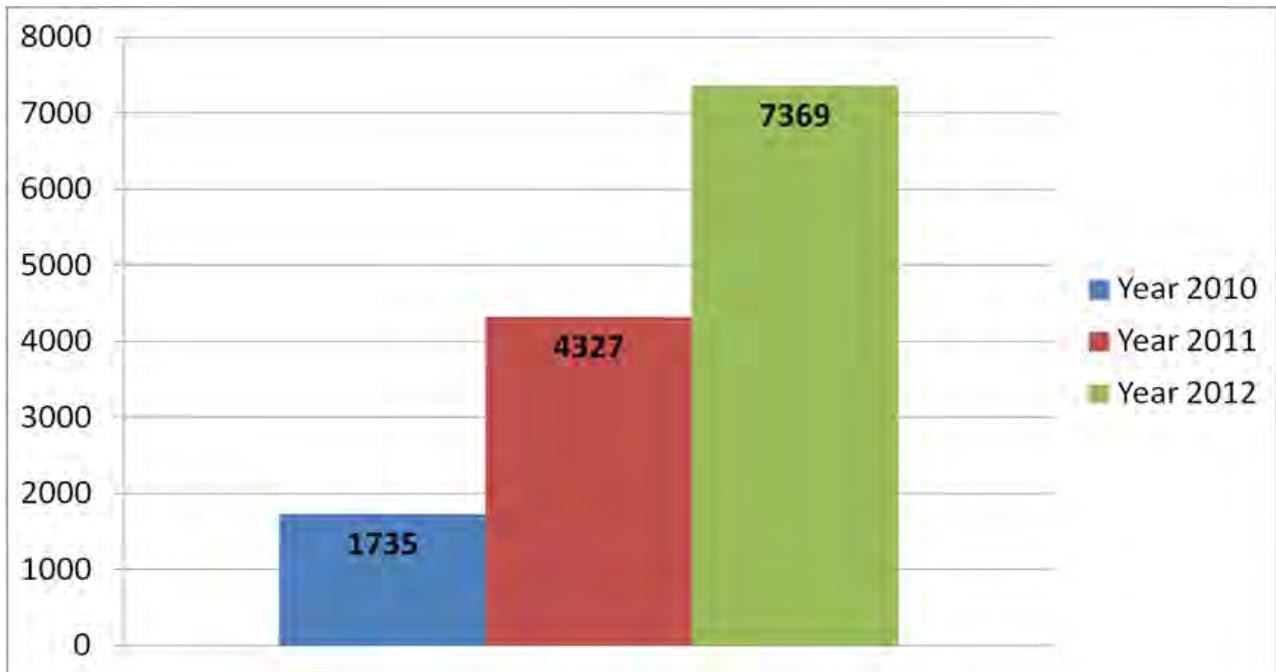


Figure 1. Total Educational Programs Attendance

## Attendance per Educational Event

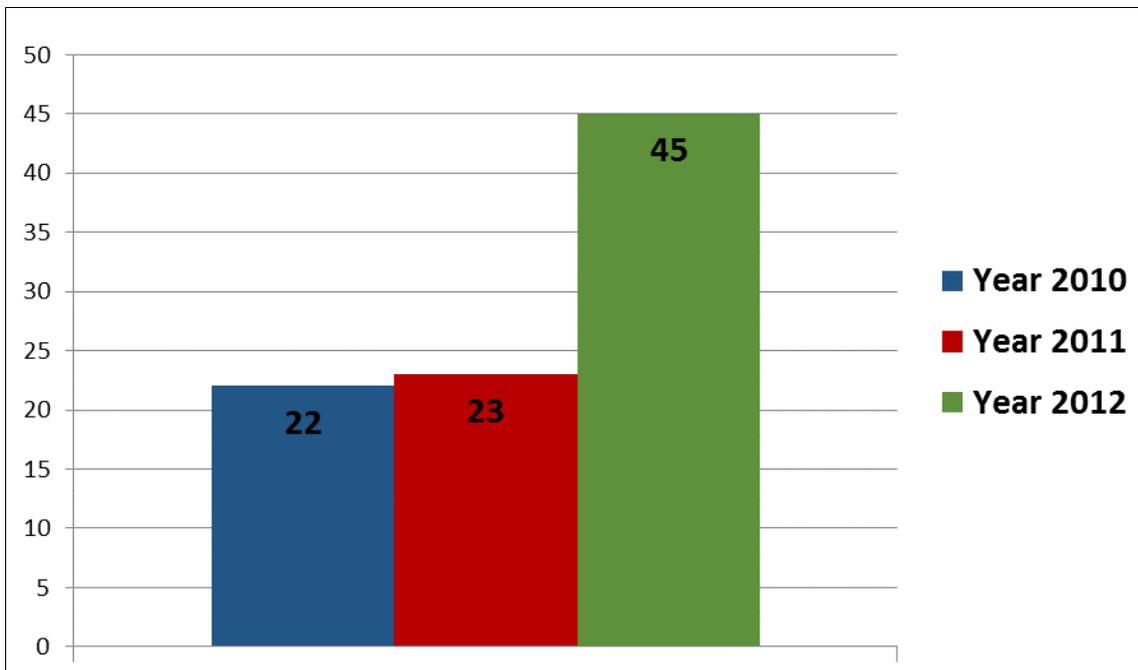


Figure 2. Attendance per Educational Event

Interest in the Authority's educational programs has been influenced by many factors. The Authority conducts annual needs assessments (in the form of formal program evaluations, verbal feedback from facilities, and statewide annual surveys) to identify educational opportunities. The types of programs offered in 2012 included education on the Medical Care Availability and Reduction of Error (Mcare) Act, new patient safety officer (PSO) training, patient safety foundation concepts, specific clinical topics (e.g., infection prevention, medication safety), and collaboration-specific programs (e.g., falls, wrong-site surgery, adverse drug events). A partnership between the Authority, the Hospital and Healthsystem Association of Pennsylvania (HAP), and the American Hospital Association has also resulted in a large number of hospital boards of trustees members learning about patient safety and its effect on quality in their healthcare facilities.

Sixty hospitals in Pennsylvania have participated in the program since its inception. The program is supported by several healthcare organizations and agencies that provide pay-for-performance incentives and grant subsidies for participation in the program. They include: Blue Cross of Northeastern Pennsylvania, Capital BlueCross, CHART Risk Retention Group, Highmark, Independence Blue Cross, and the Pennsylvania Office of Rural Health.

Foundational concepts of patient safety provide a base for providers to learn more about how the application of key principles can influence a culture that supports patient safety. Since the inception of the Authority's educational programs, these key elements have been a mainstay of patient safety curriculums and continue to this day. Over time, the breadth and depth of these programs have changed in order to meet the learning needs of the audience.

Deeper dives into specific topics have garnered interest from not only patient safety officers (PSOs) but also from quality improvement professionals, risk managers, infection preventionists, healthcare executives, physicians, nurses, pharmacists, clinical leaders, and frontline staff.

### Statewide Offering

In 2012, the Authority developed and offered a statewide program titled Patient Safety You Design. This was a full-day conference that provided attendees the opportunity to select from four different curriculums (root-cause analysis, data analysis, teamwork, and just culture). Those in attendance represented patient safety officers, quality directors, and other clinical and administrative leaders from hospital, ambulatory surgery, and abortion facilities. An overwhelming majority of the evaluations indicated that the attendees were satisfied with the program. Some comments were “I thought this was a great opportunity; a lot of information and resources were provided” and “Thank you for this program.”

### Networking

Regionally throughout the state, networking sessions are offered routinely to patient safety officers and their delegates through the Patient Safety Liaison (PSL) program. Networking is a forum to share information about both barriers and successes to individual facility patient safety efforts. Networking is also a place to support one another in our efforts to improve patient safety by changing processes and maintaining those process improvements in the name of patient safety. As part of these programs, either PSLs and/or patient safety analysts provide an update on patient safety topics of interest to that group (hospital or ambulatory surgical facility [ASF]). Drug shortages, emergency department violence prevention, ASF survey results on cancellations and transfers, providing safe care for bariatric patients, falls prevention, teamwork, and communication are just a few of the topics presented on at these networking forums.

### Teamwork and Communication

The value of teamwork and communication as a patient safety principle has been recognized by healthcare organizations within Pennsylvania. Implementing programs such as TeamSTEPPS™ has improved patient safety by producing highly effective medical teams that optimize the use of information, people, and resources to achieve the best clinical outcomes for patients. The Authority has worked with large healthcare systems to implement TeamSTEPPS. Additional TeamSTEPPS training for Pennsylvania healthcare organizations continues in 2013.

## ASF Infection Prevention

In the fall of 2012, one of the Authority's infection prevention analysts conducted a presentation that was offered at the Pennsylvania Ambulatory Surgery Association's annual conference. The presentation, "Infection Control Update for Ambulatory Surgery," was a generalized infection prevention overview specific to ASFs.

A sequel to the 2011 foundational ASF infection prevention program is expected to be offered regionally throughout the state in the spring of 2013. Materials will focus on a more in-depth review of general infection prevention practices, including sterilization and safe injection practices. The program will involve didactic and interactive exercises to reinforce safe practices.

## Academic Institutions

Leaders of entry-level and advanced-degree nursing programs have requested education from the Authority to learn how to incorporate patient safety into their classroom curriculum. Authority programs have focused on the basic tenets of patient safety. Upon specific request, an advanced session was offered on how to make a business case for patient safety.

The director of educational programs is scheduled to speak in spring 2013 at an annual educational event for nurses from northeastern Pennsylvania. The collaboration is a combination of Sigma Theta Tau chapters from the nursing programs in northeastern Pennsylvania and the Pennsylvania State Nurses Association districts 3 and 4. The collaborative network provides an annual program to a diverse audience of educators, staff nurses, administrators, advanced practice nurses, community/agency/office nurses, and students in area nursing programs.

## Professional Organizations

Professional organizations on a regional, state, and national level have asked the Authority to speak on various patient safety topics throughout 2012 and into 2013. Leaders in healthcare are recognizing their role as patient safety change agents. They are looking for information about basic patient safety concepts and skills needed to be successful.

Nationally, the Authority has spoken at annual conferences and provided information on topics such as basic patient safety concepts, the importance of medical event reporting, transparency, and patient engagement. The Authority PSLs share the information learned at the patient safety events with Pennsylvania healthcare organizations.

The Authority partnered with HAP to provide an educational session on patient safety and leadership for a risk retention group's annual conference. The session focused on how

leadership is required for a culture of patient safety to exist within an organization, and resources were provided to foster leadership.

The session was well attended by a diverse group of individuals from quality, risk, and patient safety areas and included representation by physicians, chief executive officers, nurses, and attorneys.

In response to a request from a state-based not-for-profit healthcare quality improvement agency, the director of educational programs and the senior PSL for education presented a full-day educational session on patient safety concepts. This program focused on organizational leadership, identification and management of risk, patient safety culture, teamwork, and communication. Those in attendance represented fields of risk, quality, and patient safety.

Regionally, several professional organizations of clinical leaders have asked the Authority's director of educational programs and PSLs to speak about topics such as culture of safety in the operating room, drug shortages, leadership and patient safety, and patient safety teamwork.

Through formal evaluations and informal conversations at these events, the Authority has learned that the subject matter is well received. Attendees have verbally expressed interest in the topics presented, and there has been thoughtful exchange of ideas either during or immediately following the programs. It is not uncommon for attendees to ask Authority educators to speak at their individual healthcare organizations about patient safety. Typically, the program is tailored to meet the needs of the audience, whether for executive leadership; clinical leadership; quality, patient safety, and risk management; and/or frontline staff.

### Next Steps

The Authority will continue to develop, coordinate, and offer educational programs that focus on identified patient safety education needs of healthcare providers. The ongoing goal is to reach out to all clinical and nonclinical staff, leadership and frontline staff, patients, and others who are part of the healthcare team in an effort to provide learning opportunities that will help them reduce and eliminate medical errors.

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## **ADDENDUM E: Collaborative Efforts to Improve Patient Safety**

The Pennsylvania Patient Safety Authority has done a significant amount of work in Pennsylvania to engage facilities in projects to improve patient safety. The outcomes of these collaborations are shared statewide through articles in the *Pennsylvania Patient Safety Advisory* to allow all healthcare facilities to learn from the patient safety improvement efforts of Pennsylvania healthcare facilities.

The Authority's collaborative learning model has five components:

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

### Ambulatory Surgical Facility Preoperative Screening and Assessment Collaboration

In January 2012, the Ambulatory Surgical Facility (ASF) Preoperative Screening and Assessment Collaboration began. This collaboration was developed from a 2011 statewide needs assessment of ASFs that identified potential contributing factors for same-day cancellation procedures and unexpected transfers to acute care. This information was used to help develop a collaborative project in northeastern Pennsylvania.

There are 11 ASFs working on this collaboration intended to strengthen and improve patient safety by improving the preoperative screening and assessment of patients in ASFs. The project is expected to conclude in June 2013.

The goals of this collaboration are to:

- Identify potential contributing factors to the rate of day-of-surgery cancellations and unexpected transfers to acute care facilities in the ASF setting
- Develop and implement a preoperative assessment tool derived from a statewide review of current literature, research, and collaboration members' input
- Develop and pilot a standardized transfer and day-of-surgery cancellation data collection tool

- Decrease rates of cancellations of procedures on the day of surgery and decrease rates of unexpected transfer or admission to an acute care hospital
- Publish in the *Advisory* deidentified results and increase awareness of safety concerns in the ambulatory setting
- The collaborative has developed and is implementing a strategic and cohesive program that provides education, tools, technical assistance, resources, and an interactive forum to demonstrate an improvement in the screening and assessment of patients undergoing ambulatory surgery by showing a decrease in the rate of procedure cancellations and unexpected transfers and admissions to acute care facilities. Appropriate patient screening and selection for preoperative planning have been shown to decrease cancellations and unexpected transfers.

ASF collaboration participants have analyzed their screening and assessment processes and assisted in the development of an evidenced-based checklist intended to standardize and improve the screening and assessment process. The Authority is collecting outcome and process measure data from the ASFs, which include the following:

- Outcome measures
  - The rate of procedure cancellations
  - The rate of unexpected transfers and admissions to acute care facilities
- Process measure
  - The use of an evidenced-based preoperative checklist and assessment process

For the outcome measures, the event investigation data will identify contributing factors and patient conditions related to the need to cancel a procedure or transfer a patient to an acute care facility.

The quarterly and monthly ASF reports are used to identify trends and distinguish between controllable and noncontrollable factors accounting for cancellations and unexpected transfers. The participants will use the information surrounding the controllable factors as areas for further opportunities for improvement. Results of the collaboration will be published in the *Advisory* so that other facilities throughout the state may benefit from the collaborative findings.

### Surgical Site Infection Prevention Collaborative

The Authority and the Pennsylvania National Surgical Quality Improvement Program (PA-NSQIP) are collaborating on a program to reduce surgical site infections (SSIs) among the nine PA-NSQIP member hospitals. Their successful strategies and lessons learned will be published for other Pennsylvania hospitals to implement. This collaboration has included development of a best-practice survey tool and on-site visits with a survey team consisting of a nurse, physician, and Authority representative. This collaboration team is specifically focusing on two types of surgical procedures: colectomy and bariatric surgery.

The principal outcome measure that will indicate the success of this project is a reduction in the SSI rate at the institutions selected for the initial intervention. Secondary measures will include process metrics known to have an impact on SSI reduction, as identified during the on-site visits. The consortium's goal is to demonstrate improvement by reducing the ratio of observed-to-expected SSIs based on risk-adjusted data published by the American College of Surgeons NSQIP. The consortium will track these outcomes prospectively for all participating facilities.

The collaborative on-site visits revealed the potential of multiple process measures that the hospitals with low colorectal and bariatric surgical site infection rates are doing differently than the hospitals with high rates of infection. The facilities identified as needing improvement in preventing bariatric or colorectal SSIs selected new process improvement measures. Initial outcome data will be available in the NSQIP semiannual report, which is expected in 2013.

#### Bariatric measures:

- Numerator
  - Number of patients who had a HgbA1C drawn prior to surgery
  - Number of patients with a HgbA1C over eight who had surgery
  - Number of patients who received both chlorhexidine gluconate wipes and a Peridex swish the morning of the procedure
- Denominator
  - Number of patients who underwent bariatric surgery during the month

#### Colorectal measures:

- Numerator
  - Number of patients who have documentation that the surgical bundle was fully implemented
  - Number of patients who had skin edge protection used during surgery
  - Number of patients who had an antibiotic redosed
- Denominator
  - Number of patients who underwent a colectomy during the month
  - Number of colectomy patients who had a procedure time greater than four hours

Detailed information on site assessment findings and selected process measures are outlined in the December 2012 *Advisory* article “Multifaceted Differences in Implementation of Practices for Prevention of Colorectal and Bariatric Surgical Site Infections,” available at [http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Dec;9\(4\)/Pages/136.aspx](http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Dec;9(4)/Pages/136.aspx).

### Pennsylvania Hospital Engagement Network (PA-HEN)

In 2012, many of the collaborative efforts to improve patient safety were part of the Hospital Engagement Network’s (HEN) Partnership for Patients (PfP) campaign. The PfP campaign focuses on reducing healthcare-acquired conditions. The two goals of this partnership are to:

- *Keep patients from getting injured or sicker.* By the end of 2013, decrease preventable hospital-acquired conditions by 40 percent compared with 2010.
- *Help patients heal without complication.* By the end of 2013, decrease preventable complications during a transition from one care setting to another so that hospital readmissions are reduced by 20 percent compared with 2010.

The Hospital and Healthsystem Association of Pennsylvania is the primary contractor, and they have partnered with the Authority, the Health Care Improvement Foundation, Pennsylvania Health Care Quality Alliance, and Quality Insights of Pennsylvania in developing a Pennsylvania HEN. This group was awarded a two-year contract to work with hospitals to reduce healthcare-acquired conditions. Healthcare-acquired conditions include adverse drug events, catheter-associated urinary tract infections, central-line-associated bloodstream infections, injuries from falls and immobility, obstetric adverse events, pressure ulcers, surgical-site infections, venous thromboembolism, ventilator-associated pneumonia, and preventable readmissions. Approximately 130 Pennsylvania hospitals are participating in these HEN collaborative projects.

Under the contract, the Authority is responsible for three specific patient safety event types: wrong-site surgery, patient falls, and the incorrect use of opioids. In addition, the Authority is responsible for providing initial and ongoing patient safety education to all participating facilities. This education will convey patient safety philosophies, principles, and strategies to ensure the best chance of success for new and seasoned patient safety leaders.

### Culture of Safety Core Curriculum

An important activity that was included in the HEN was the development and offering of a foundational Culture of Safety Core Curriculum. All PA-HEN hospitals were expected to participate in a one-day education and training session that focused on a core set of principles that all organizations should include in their daily operations to produce a culture of safety within their facility. The Culture of Safety Core Curriculum enhances the

knowledge of safety-related concepts and conveys a patient safety philosophy, principles, and strategies to ensure the best chance of success in reducing harm.

Education was provided on the risks associated with errors and the potential for reducing those risks within their own organizations. In order to determine the element of risk, hospital participants received education on the difference between proactive and reactive risk assessment. The curriculum was designed to help participants identify opportunities to continue to develop patient safety strategies for increasing awareness of patient safety and risk assessment within their organizations. The core safety curriculum included the following:

- Integrating Safety into Work Practices/Organizational Patient Safety
- Teamwork
- Human Factors
- Communication
- Patient Engagement
- Strategies to Increase Awareness of Patient Safety and Risk Assessment

HEN participation in the Culture of Safety Core Curriculum program was high. These sessions were conducted in four regions and offered nine times at different venues in April and May 2012. The evaluations of the curriculum were extremely positive. Out of 133 PA-HEN facilities, 128 hospitals (96%) attended these education training sessions.

### Preventing Adverse Drug Events: Management of Opioids

Opioid drugs are a necessary component of pain management for many patients. When used inappropriately, or in error, they present serious risks that can lead to patient harm. For example, in 2004, among medication error reports submitted to PA-PSRS, approximately one out of four reports involved high-alert medications; of those reports, 44% involved opioids. According to 2007 data from the Institute for Safe Medication Practices (ISMP), opioids are among the most frequent medications to cause patient harm.

Coupled with the lack of formalized and standardized process and outcome measures for evaluating safety in relation to opioid use, PA-HEN felt that it was important to implement a statewide adverse drug event (ADE) project aimed at reducing and preventing harm related to the use of opioids based on the PA-PSRS and ISMP data. There are 29 PA-HEN hospitals participating in this project.

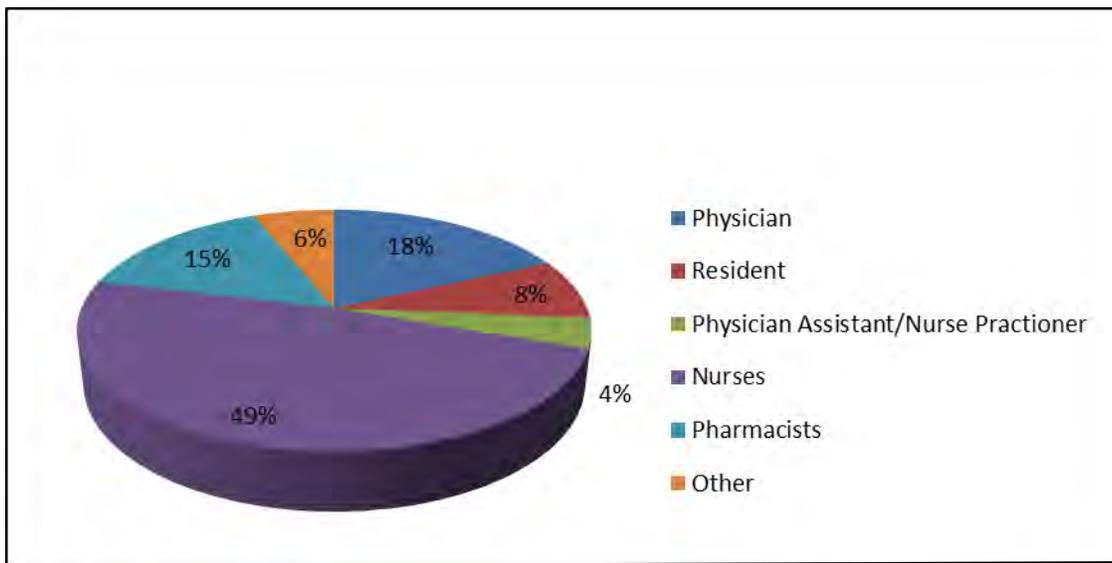
The goals of this project are to decrease the number of harmful events with the use of opioids by December 2013 by doing the following:

- Increasing awareness of patient harm occurring from the use of opioids within organizations
- Improving the knowledge of and processes associated with the use of opioids within organizations

- Assisting facilities in the identification of risks currently present within their organizations and proactively reducing potential harm to patients
- Decreasing the number of harmful events with the use of opioids within the HEN participants, by quarter, compared with concurrent and historical controls

The project activities in 2012 included the development, dissemination, and analysis of an opioid knowledge assessment tool and an opioid organizational assessment. The project also included webinar-based education programs, one-on-one coaching calls, and implementation of a collaborative workspace for monthly data collection.

Of the 29 hospitals that signed up for PA-HEN’s ADE opioid project, 24 hospitals had clinical practitioners who took the opioid knowledge assessment. Over 2,200 practitioners from these hospitals initiated the online survey tool, with 1,758 individuals (79%) completing the 11-question assessment (see Figure 1). This tool was provided as an online, multiple-choice knowledge assessment in which practitioners entered their organization’s unique four-digit code to assign their results to their facility.



**Figure 1. Overall Responses to the Opioid Knowledge Assessment (n = 2,170)**

The facilities were provided their aggregate results and a comparison with the average statewide results. The results of this assessment showed a general low level of knowledge in regard to certain clinical situations with the use of opioids. For example, the lowest scoring types of questions in the assessment included topics involving the following:

- Selecting the most important predictor of respiratory depression in patients receiving intravenous opioids, which revealed that only 22.4% of respondents answered correctly
- Defining what constitutes an opioid-tolerant patient, where only 29% of all practitioners correctly answered the question

- Choosing which medication could potentiate the effects of HYDRomorphone on ventilation, showing that 51.5% of practitioners answered correctly

These results were shared with two state medical associations, the Pennsylvania Medical Society and Pennsylvania Society of Anesthesiologists, which helped to raise their level of awareness in regard to the deficiencies in the knowledge of opioids among all practitioners, particularly all levels of prescribers. The PA-HEN intends to work with the professional groups to help participating facilities and *all* Pennsylvania healthcare facilities improve their knowledge of using opioids.

To establish a baseline as well as continually monitor and measure the progress of this project, two outcome measures were established:

- **Naloxone reversal related to opioid use:** The numerator is the number of patients receiving naloxone to reverse adverse effects from opioids, and the denominator is the total number of patients prescribed opioids.
- **Rapid response team (RRT) calls related to intravenous opioid use:** The numerator is the number of RRT calls due primarily to opioid use, and the denominator is the total number of RRT calls.

Baseline outcome measures have been established based on the first month's submitted results for all organizations. A three-month data submission period has allowed organizations to develop a standardized approach to obtain and document the measures to attain consistent and accurate data among participating hospitals.

The process measures for this project have been established. PA-HEN used the results of the opioid organization assessment to determine the most appropriate measures for all facilities involved in the ADE project. They include:

- Documentation of assessment of opioid status/patients prescribed opioids in the PACU (20 random charts)
- Documentation of assessment of opioid status/patients prescribed long-acting opioids (20 random charts)
- Documentation of reassessment of respiratory rate, quality of respirations, level of sedation, and blood pressure/patients on a medical-surgical unit, with PRN (pro re nata or as needed) orders for and administered IM (intramuscular) or intravenous opioids (20 random charts)

To date, of the 29 hospitals that signed up for the HEN ADE opioid project, 17 hospitals completed and entered their organization assessment results into an online survey tool in PassKey. The major benefit from this assessment for organizations, based on one-to-one coaching calls, has been the identification of "opportunities for improvement" based on their

internal investigations and having physicians, nurses, and pharmacists work together as a team.

In 2013, the PA-HEN ADE opioid project will include process measures, recruitment of organizations to present monthly webinars, a repeat of the opioid knowledge and organization assessment, and offering more collaborative opportunities between hospitals within the project.

## Preventing Patient Falls and Reducing Harm

Patient falls are one of the most frequent healthcare-associated events. The National Quality Forum has included falls prevention as one of its 34 Safe Practices for Better Healthcare. In 2011, Pennsylvania facilities reported 35,640 falls events into PA-PSRS. Of these, 1,210 are classified as Serious Events. Because falls with injury represent the most frequently reported hospital-acquired condition and are one of the most frequently reported Serious Events in Pennsylvania, they continue to represent a patient safety challenge for many hospitals.

The project goal is to achieve a 20% reduction in the rate of falls with harm in participating facilities and units by December 2013. Analysis of 2010 PA-PSRS falls data identified an average of 0.154 falls with harm per 1,000 patient-days, which would make the project goal 0.124 falls with harm per 1,000 patient-days. The Authority did not collect patient-days information in 2010 and relied on the use of patient-days data from the Pennsylvania Health Care Cost Containment Council to create the 2010 rates. It is also important to note that the 2010 data does not reflect the use of a standardized falls definition.

- There are 82 hospitals formally enrolled in the PA-HEN falls reduction and prevention project. The project includes 74 acute care hospitals, 6 rehabilitation hospitals, and 2 long-term acute care hospitals.

In order to ensure the project has consistent data, the definition of patient falls and patient falls with harm were standardized. This was done using feedback obtained from stakeholders and a survey of all Pennsylvania hospitals. The definitions that were adopted are as follows:

- A **“fall”** is defined as any unplanned descent to the floor (or other horizontal surface, such as a chair or table) with or without injury to the patient.
  - *This definition of falls includes the following:*
    - Assisted falls, in which a caregiver sees a patient about to fall and intervenes, lowering them to a bed or the floor
    - Therapeutic falls, in which a patient falls during a physical therapy session with a caregiver present specifically to catch the patient in case of a fall
    - Physiological falls, in which a patient falls as a result of a seizure or syncope

- *This definition of falls excludes the following:*
  - Failures to rise, in which a patient attempts but fails to rise from a sitting or reclining position
- A **“fall with harm”** is defined as any fall that requires more than first-aid care. Treatment beyond first-aid care *includes* a laceration that requires physician intervention (e.g., sutures), more serious injury (e.g., fracture), or death.

In order to support the standardized definitions, modifications were made to PA-PSRS, including the introduction of denominator fields to support the capture of patient-days or other data for outpatient units that provide care to patients. The modifications to PA-PSRS also include standard reports that hospitals can access that provide them with peer and state comparisons. The PA-PSRS modifications began in December 2011 and were completed in November 2012.

This project has also provided enrolled hospitals with educational offerings, coaching calls, and regional meetings to encourage program participation and collaboration among peers.

The Authority provided a self-assessment tool to hospitals participating in the project. Adapted from an existing questionnaire,<sup>15</sup> the falls self-assessment survey was designed to evaluate the current structure and content of hospital falls prevention programs compared with evidence-based best-practice guidelines, and to identify opportunities for improvement.

The falls survey was completed by 80 HEN facilities. HEN facilities reported full implementation for the majority of best practices in falls prevention. The average distribution of responses across the survey revealed 71% of best practices with full implementation (range of 22% to 93%), 13% with partial implementation (range of 0% to 54%), and 15% with no implementation (range of 1% to 61%).

In addition, an audit tool for falls prevention process measures was used to assess compliance with falls prevention practices most commonly included in hospitals’ falls prevention plans. Individual facility falls prevention teams were advised that this audit tool should not be interpreted as a prescription of falls prevention practices that must be implemented. Rather, it is a tool designed to monitor which falls prevention practices are being implemented and to measure changes in levels of implementation of these practices over time, which may be shown to correlate with changes in falls and falls-with-injury rates.

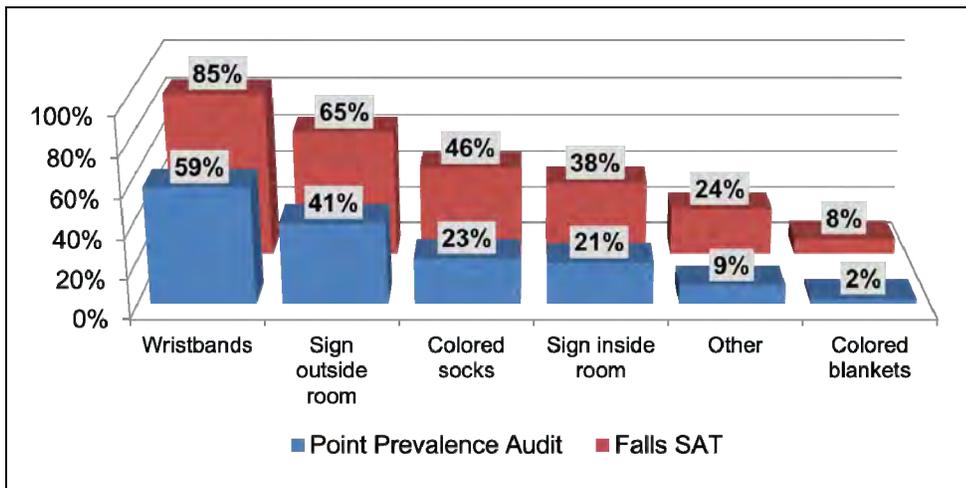
Facilities were asked to complete an audit on the unit or units where they are piloting small tests of change as part of the PA-HEN collaborative. The audit consists of documentation review and visual observation of patients and the environment. Sixty-three out of 83 hospitals have completed baseline audits for the quarter ending September 30, 2012, and have submitted their data for analysis.

Analysis of the point-prevalence data collection using the falls prevention process measures audit tool revealed a noticeable gap between levels of full implementation of best

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<sup>15</sup> ECRI Institute. Falls [self-assessment questionnaire]. *Health Risk Control* 2012 May;1:Self-assessment questionnaires 1.

practices reported on the falls self-assessment tool and compliance with falls prevention practices observed during the audit process (see Figure 2). A total of 1,919 patients were audited at 63 hospitals, with 1,301 (68%) being identified as at risk to fall. The total number of audited patients with falls risk identifiers in place was divided by the number of falls risk patients to calculate a compliance percentage (blue bars). This was compared with the percentage of facilities reporting full implementation of each of these specific falls risk indicators (red bars).



**Figure 2: Compliance with Use of Fall Risk Indicators**

Increases in adoption of best practices in falls prevention across all categories will be measured through repeat administration of the falls self-assessment tool in the summer of 2013. Compliance with prevention practices will be measured through quarterly completion of the point-prevalence audit tool.

The project has two process measures and one outcome measure, as follows:

- Process measures:
  - Completion of falls risk assessment
  - Falls risk assessment completed on patients who fall and have a prevention strategy in place
- Outcome measure:
  - Falls with harm per 1,000 patient-days.

In 2013, the falls reduction and prevention team continues to work with the facilities in the project to reduce falls with harm. The team will continue to offer support to the facilities by meeting face-to-face with hospitals, reviewing data for validity and reliability, and providing educational resources. A number of facilities in the project have experienced no falls with harm since the project began, and there are a few that have reduced their falls with harm and maintained that reduction for at least three months.

## Preventing Wrong-Site, Wrong-Person, Wrong-Procedure Surgery Project Summary

Since July 2004, more than 500 wrong-site surgery (WSS) events have been reported through PA-PSRS and analyzed by the Authority. Over an eight-year period, Pennsylvania data indicates that WSS events are reported at a rate of one event per week.

As a partner in the PA-HEN, the Authority collaborates with 25 Pennsylvania hospitals and two ambulatory surgery centers to prevent the occurrence of WSS. The Authority developed and implemented a strategic and cohesive program that provided education, tools, technical assistance, resources, and interactive forums to facilitate participants' efforts to achieve an overall 20% improvement with identified process and outcome measures for preventing WSS.

A shared collaborative website (PassKey) hosted all necessary assessment and monitoring documents, reference materials for educational sessions, and other resources, including automated benchmarking tools, a monthly newsletter, prevention tips, a team leader contact list, workshop materials, audio conference recordings and transcriptions, monthly process and outcome measure results, and references to the medical literature, including that of the Authority.

Following collaboration launch sessions in April and May of 2012, the Authority collected baseline data of operating room policies and procedures that prevent WSS and results of direct operating room observations to monitor compliance with policies. The data was collected, aggregated, and analyzed, and results were shared with participating facilities.

Based on results of the collected and analyzed baseline data, the following measures were identified for the project:

- Process measure:
  - Implementation of policies and procedures that require the operating surgeon to verify the accuracy of the site mark with the following five components:
    - Patient's or surrogate's understanding of the procedure
    - Consent
    - Schedule
    - History and physical examination
    - Pathology reports, radiology reports, and/or radiographs, as applicable
- Outcome measure:
  - Number of WSS events reported from each participating facility through PA-PSRS during the collaboration period.

## Educational Programs

Two regionalized workshops were conducted for surgical leaders and their teams in July 2012. The workshop agenda included a review of the evidence-based best practices for preventing WSS, with references to the medical literature and the Authority's database. A presentation on the results of the analyzed baseline data and a series of interactive group exercises were facilitated to encourage discussion about best-practice implementation.

Coaching audio conferences were conducted over three months to provide surgical leaders and their teams the opportunity to discuss problems, ask questions, and share insights. These sessions reviewed the following:

- Preoperative verification (i.e., management of information and verification of documents in the preoperative holding area on day of surgery)
- Surgical site marking
- Verification and time-out in the operating room

Surgical leaders who successfully implemented prevention strategies within their organizations served as mentors and worked with the Authority to facilitate discussions about successes and barriers to best-practice implementation.

In addition to educational programs, surgical teams were apprised of collaboration activities, new resources, and any added features made to the PassKey collaboration website through a monthly electronic newsletter.

## Project Highlights and Achievements

- Engagement in the collaboration has been apparent. On average, 80% of collaborative facilities have attended webinars and audio conferences, and nearly 100% participated in baseline data collection and attended on-site workshops.
- Team leaders who successfully implemented best practices for preoperative verification, site marking, or time-out mentored peers and shared implementation experiences.
- An aggregated data set summarizing the baseline results of the data collection tools was compiled, automated, and posted on the PassKey website. This tool facilitated benchmarking efforts to implementation and sustainment of policies and procedures that prevent WSS. Some leaders reported using the baseline data analysis tools to share results with their surgical committees, and many continued surgical compliance monitoring as a result of the baseline assessments.
- As part of the collaboration, the Authority's WSS team performed on-site operating room observations and conducted educational sessions for surgical teams, including surgeons and anesthesiologists. Facilities will continue to be offered on-site visits in 2013, especially those that continue to experience barriers to best-practice implementation.

# **ADDENDUM F: 2012 Pennsylvania Patient Safety Authority Strategic Plan**

## Background and Methodology

### *A Brief Overview of the Pennsylvania Patient Safety Authority*

The Pennsylvania Patient Safety Authority is an independent state agency established under Act 13 of 2002, the Medical Care Availability and Reduction of Error (Mcare) Act. It is charged with taking steps to reduce and eliminate medical errors through the collection of data, identification of problems, and recommendation of solutions that promote patient safety in hospitals, ambulatory surgical facilities (ASFs), birthing centers, and abortion facilities. In June 2009, in compliance with additional laws passed by the legislature, the Authority began collecting healthcare-associated infection (HAI) reports from nursing homes. The Authority's role is nonregulatory and nonpunitive.

The Authority initiated statewide mandatory reporting in June 2004, making Pennsylvania the only state in the nation to require the reporting of Serious Events and Incidents (near misses). The Authority also collects Infrastructure Failure reports for the Department of Health (DOH) and forwards all Serious Event reports to DOH. Reports are submitted by facilities through the Pennsylvania Patient Safety Reporting System (PA-PSRS), which is a web-based electronic data reporting application. All reports are confidential and nondiscoverable, and they do not include any patient or provider names.

## 2007 Strategic Plan

Prior to 2007, the Authority was primarily focused on the development and implementation of PA-PSRS, data collection, analysis of collected reports, and guidance provided through the *Pennsylvania Patient Safety Advisory*. The Authority board wanted to build on those successes and have a greater impact on patient safety in Pennsylvania. Input was solicited from primary stakeholders and national patient safety experts. The Authority received valuable feedback from Pennsylvania healthcare facilities, government entities, patient safety organizations and healthcare membership organizations. Based on this information, the Authority developed a set of objectives and initiatives that were incorporated into a comprehensive strategic plan that addressed the patient safety needs of Pennsylvania's healthcare community to better protect patients.

It is important to note that the initiatives incorporated in the 2007 strategic plan did not replace the Authority's then current activities involving data collection, data analysis, and providing guidance through the *Advisory*. The 2007 initiatives were intended to build upon these successful activities to increase the Authority's role and presence in Pennsylvania patient safety. However, the board believed the Authority could make a significantly greater impact on patient safety in Pennsylvania by branching out through broader programs. Therefore, education, training, collaboration, and communications were featured more prominently in the new initiatives.

The strategic plan was approved in May 2007. The plan provided direction by identifying eleven new initiatives, most significantly resulting in the Patient Safety Liaison (PSL) program and in a large increase in educational programs. The Authority began fulfilling its mission of educating its stakeholders not only through its *Advisory* but also through its outreach and collaboration efforts. The PSL pilot program, which began in 2008, has allowed one-on-one visits to individual facilities to help tailor patient safety improvement programs. Along with the PSL program, the Authority began educating boards of trustees and top-level management through another pilot program developed in partnership with the Hospital and Healthsystem Association of Pennsylvania (HAP) and the American Hospital Association (AHA). The Authority also reached out to several state associations to provide continuing education credits for physicians, nurses, and pharmacists.

In addition, the 2007 strategic plan addressed the challenges of Act 52 of 2007 with programmatic commitments to infection awareness and reduction both in acute care and long-term care facilities. Also, the Patient Safety Knowledge Exchange (PassKey) was initiated, which created a private forum for Pennsylvania patient safety professionals and also established a common platform for nearly every statewide patient safety collaborative since that time.

Since the 2007 initiatives, the Authority has increased the number of healthcare providers trained from approximately 100 per year to over 7,300 in 2012. In total, the Authority has now published 426 *Advisory* articles, 40 patient safety toolkits, and 29 Consumer Tips reports.

## 2012 Strategic Planning

In preparing for the 2012 strategic plan, the Authority first developed the format, time frame, and location for a planning retreat. Significant effort was made to identify and retain a consultant to manage and moderate the executive retreat. Out of this process, John Deadwyler and his staff from Bernard Consulting Group LLC of Kansas City, Missouri, were selected and retained based on his substantial and highly recommended national experience with health system retreat planning.

Prior to the retreat, the consultants worked with the Authority to conduct an online survey involving members of the board, staff, and selected external stakeholders. This was performed over several weeks, and the results were summarized. Additionally, in-depth one-on-one phone interviews were conducted with 18 key stakeholders, from which the Bernard consultants transcribed notes and developed summaries. The assessment data from the surveys and interviews were developed into an executive summary of findings for use in guiding the retreat.

The retreat was held November 8 to 9, 2011, at the Radisson Hotel and Conference Center in Camp Hill, Pennsylvania. The participants included the following individuals:

Members of the Authority Board:

Stanton Smullens, MD, Acting Chair  
Gary A. Merica  
Anita Fuhrman  
Joan M. Garzarelli  
Terry Hyman, Esq.  
Lorina L. Marshall-Blake  
Cliff Rieders, Esq.  
Marshall W. Webster, MD

Hospital Association of  
Pennsylvania (HAP)  
Kelly Thompson, Esq., HAP  
Deborah Donovan, Highmark  
Inc.  
Jane Montgomery, VP of  
Clinical Services and  
Quality, Hospital Council  
of Western Pennsylvania

Authority Staff:

Michael Doering  
Fran Charney  
Laurene Baker  
Howard Newstadt  
Chris Hunt  
Megan Shetterly  
Teresa Plesce

Bernard Consulting Group:

John Deadwyler  
Denise Knight

General Counsels:

Greg Dunlap  
David Chick

ECRI Institute Staff Members:

John Clarke, MD  
Bill Marella  
Theresa Arnold  
Sharon Bradley

Stakeholder Representatives:

Kate Flynn, President, Health Care  
Improvement Foundation  
Mary Ellen Mannix, Patient Advocate  
Allen Vaida, PharmD, Exec. VP,  
Institute for Safe  
Medication Practices  
Daniel Glunk, MD, President,  
Pennsylvania Medical  
Society (PMS)  
Amy Green, PMS  
Carolyn Scanlan, President and  
CEO, Healthsystem and

In addition, there were three featured speakers:

Ronni Solomon, Esq., ECRI Institute executive vice president and counsel, presented “The Federal Landscape in Patient Safety” and “Getting to the Root: It’s the Why, not the What.”

John O’Brien, field director at the Centers for Medicare and Medicaid Services (CMS), presented on CMS quality initiatives, including hospital readmission charges, raising the floor, raising the bar, and smooth transitions between care centers.

Diane Pinakiewicz, president, National Patient Safety Foundation and the Lucien Leape Institute, gave an enlightening talk on the value proposition of the accountable care organization movement.

The remainder of the two-day retreat was spent developing the critical issues and strategic directions that will be discussed in the following sections.

### **Critical Issues**

The primary output from the strategic planning exercises was the identification and development of critical issues facing the Authority and strategic directions that should be taken by Authority staff to address the critical issues. The critical issues and their associated strategic directions follow.

#### **CI-1: How can we best measure the Authority’s effectiveness in improving safety?**

Current Situation: Since launching its reporting program in 2003, the Authority has sought reliable means of measuring the safety of Pennsylvania healthcare facilities. Reporting patient safety events is not a goal in its own right. Rather, it is a means to an end: we report and analyze these events in order to reduce or prevent patient harm. We also recognize that reporting, by itself, is not sufficient to improve safety. Analysis of the reports must lead to actionable guidance that will improve the safety of the healthcare system if it is adopted and executed by healthcare providers. Gauging the Authority’s effectiveness in meeting its ultimate goal of improving patient safety requires the monitoring of safety-related measures that are valid and reliable.

SD 1-1 Demonstrate the progress of the Authority in improving patient safety.

#### **CI-2: How do we bring consistency to reporting among the Authority, DOH, and healthcare facilities?**

Current Situation: Since healthcare facilities began using PA-PSRS to submit reports to the Authority and DOH, the volume of reports submitted has varied considerably among facilities even after adjusting for the type of facility and the volume of healthcare services delivered. Even among hospitals of similar size and type, there can be a 40-fold difference in reporting volume. We believe this reflects more on the facilities’ cultures than on actual

differences in their safety of this magnitude. The Authority has documented this variation in its annual reports and in communications with the healthcare facilities. The sources of this variation include legitimate differences of opinion about the meaning of “unanticipated injury” in the Serious Event definition, confusion over when complications should be considered unanticipated, and conflicting guidance from DOH surveyors. Because DOH, as the regulator of these facilities, is responsible for enforcing Mcare Act reporting requirements, the Authority is more likely to succeed with clarifying the reporting requirements with DOH’s agreement and cooperation.

SD2-1 Renew efforts with new leadership at DOH to resolve issues around reporting consistency and recommendations.

SD2-2 Examine existing Authority processes and tools for enhancing consistency.

SD2-3 Ensure reliability of HAI data reported into PA-PSRS from nursing homes.

### CI-3: How do we mutually engage patients and providers in patient safety?

Current Situation: The Authority’s mission is to reduce and eliminate medical errors to improve patient safety. To the extent the Authority achieves this mission, patients and their families are the principal beneficiaries of its efforts. The activities that the Authority is charged with under the Mcare Act, however, focus on interaction with healthcare providers and healthcare facilities. The board of directors has determined the Authority can improve its effectiveness by making patients influential stakeholders, by giving patients an active voice in its priorities, and by incorporating patient perspective into its activities. We will seek to build on our existing efforts to encourage patients to be more active participants in their care.

SD3-1 Increase the level of patient involvement in how the Authority carries out its mission.

### CI-4: How do we strategically align ourselves with healthcare priorities and trends critical to patient safety?

Current Situation: While the Authority collects a broad range of patient safety data as mandated by our authorizing legislation, the Authority places special emphasis on selected topic areas based on patterns and trends in the reports we receive from Pennsylvania facilities but also based on issues raised in the broader health industry and the national patient safety community. Our educational and collaborative projects are informed by the frequency and severity of events reported to us, but we also try to align with national priorities such as the National Quality Forum Serious Reportable Events, payer policies of nonpayment for selected adverse events, and the CMS Hospital Engagement Network (HEN).

SD4-1 Position the Authority as a recognized resource for patient safety issues supported by data.

SD4-2 Determine the Authority’s role in identifying patient safety opportunities associated with new care trends through our reports and related research.

SD4-3 Identify opportunities to supplement Authority data with other data sets that capture rates.

**CI-5: How do we learn to effectively influence facilities and providers to implement our recommendations?**

Current Situation: The Authority is charged with reducing medical errors by collecting reports of adverse events and publishing the results of our analyses. These analyses include guidance from the peer-reviewed clinical literature, relevant professional societies, and healthcare facilities themselves regarding the best practices to implement, where these are known, and how to implement them. Our guidance was initially provided solely through the *Advisory*, and we later developed the PSL program, modeled after the practice of academic detailing, to encourage adoption of that guidance. We further expanded our activities into voluntary, multifacility collaboratives to leverage facilities' own native interests to reduce certain types of events.

SD5-1 Identify barriers to implementation of best practices to prevent patient safety events.

SD5-2 Develop and implement strategies based on information obtained to encourage behavioral change that sustains preventing wrong-site surgeries.

SD5-3 Incorporate business case methodology and value analysis into implementing our guidance.

SD5-4 Consider partnering with others (those who also have levers) to develop effective implementation mechanisms. This might include payers, regulators, facility boards' quality chairs, and provider educators.

SD5-5 Mature our system for recommendations as stipulated under Act 13.

SD5-6 Evaluate the effectiveness of our implementation strategies.

SD5-7 Encourage transparent collaboration.

It is important to note that the results of the board's strategic planning effort do not drastically modify the current direction of the Authority. In addition, the board does not wish to curtail the Authority's current programs that were approved by the board in the 2007 strategic plan, and which the board and strategic planning participants believe have proven to be valuable to patient safety in Pennsylvania's patient safety community. The results of the strategic planning exercise appear to be additive to the Authority's current work and direction. The critical issues, strategic direction, and the initiatives identified in this plan, to a large degree, optimize the current activities. As pictured in Table 1, the critical issues apply to the Authority's primary areas of emphasis as identified in the 2007 strategic plan.

**Table 1. Intersection of Current Activities and New Strategic Direction**

<b>Critical Issue</b>	<b>Data Collection and Guidance</b>	<b>Education</b>	<b>Collaboration</b>
1. How can we best measure the Authority’s effectiveness in improving safety?	Yes		Yes
2. How do we bring consistency to reporting among the Authority, DOH, and healthcare facilities?	Yes	Yes	
3. How do we mutually engage patients and providers in patient safety?	Yes	Yes	Yes
4. How do we strategically align ourselves with healthcare priorities and trends critical to patient safety?	Yes	Yes	Yes
5. How do we learn to effectively influence facilities and providers to implement our recommendations?	Yes	Yes	Yes

**New Initiatives and Projects Descriptions**

Based on the critical issues and strategic direction identified by the board, Authority staff have outlined nine initiatives, or projects, that will be pursued to implement the board’s strategic direction.

1. Work with DOH to Clarify Reporting Standards and Develop Recommendations Protocols
2. Standardize Specific Patient Safety Events in Selected Clinical Areas and Monitor Low-Volume Reporters
3. Measure Progress and Quantify Benefits
4. Validate and Analyze Nursing Home HAI Data, and Develop and Implement Improvement Strategies
5. Review National Patient Safety Priorities, Common Formats, and Health Information Technology (IT)
6. Increase Integration of Patient Voice into Authority Activities
7. Develop Strategic Partnerships
8. Execute HEN Collaboratives
9. Design PA-PSRS Data Warehouse to Improve Data Accessibility

Table 2 represents how the strategic directions align with the projects identified by staff. Detailed descriptions of each project follow.

**Table 2. Intersection of Strategic Directions and Projects**

Project	Strategic Directions															
	1.1	2.1	2.2	2.3	3.1	4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	5.6	5.7	
1 – Work with DOH		X	X				X						X			
2 – Standardize Events	X	X	X	X		X		X								
3 – Measure Progress	X		X	X		X		X			X		X			
4 – Nursing Home HAI Improvement	X	X	X	X		X	X	X	X		X	X				
5 – National Priorities	X		X		X	X	X	X				X				
6 – Patient Voice			X		X		X		X			X				
7 – Strategic Partnerships					X	X	X	X		X	X	X	X			
8 – HEN Collaboratives	X		X				X		X	X		X	X	X	X	
9 – Data Warehouse			X	X		X		X						X		

Project 1: Work with DOH to Clarify Reporting Standards and Develop Recommendations Protocols

**Strategic Directions**

SD 1.1	SD 2.1	SD 2.2	SD 2.3	SD 3.1	SD 4.1	SD 4.2	SD 4.3	SD 5.1	SD 5.2	SD 5.3	SD 5.4	SD 5.5	SD 5.6	SD 5.7
	X	X				X						X		

Objectives

1. Improve patient safety event reporting standardization
2. Foster similar interpretation of reporting requirements for all constituencies, including:
  - a. Facilities
  - b. DOH surveyors
  - c. Authority PSLs and analysts
3. Promote improved/appropriate use of reported data
4. Review requirements of Act 13 of 2002, which address recommendations to DOH and determine appropriate methodology and protocol
5. Comply with Act 52 of 2007 regarding hospital-acquired infection duties and responsibilities

Structure

The overall collaborative project will be led by Anna Marie Sossong of DOH and Mike Doering of the Authority. They will convene a meeting of key project staff at least monthly to discuss project direction and to review progress.

The collaboration will begin with a patient safety data summit. The objective of this summit will be to identify the goals and objectives of the collaboration, identify data uses and needs, and get collaboration participants on the same page.

Work will be divided into several subprojects. Objectives and activities will be assigned to each subproject team. A project work plan will be developed for each subproject team. The work plan will identify activities, responsibilities, project milestones, and timing. Teams will be given overall guidance regarding expected results and priorities but will be free to develop appropriate project work plans. Teams may include representatives from other organizations or facilities, when appropriate and with consent of overall project leaders. Progress will be determined through assessment of whether project milestones are being reached in timely manner.

Individual sub-projects will be segregated as follows:

1. Data Summit and Project Kickoff
2. Reporting and Standardization
3. Education and Training
4. Facility Reporting, Including Nursing Home HAI Reporting
5. Recommendations Policy and Process
6. IT Development

## Activities and Responsibilities

### *Data Summit and Project Kickoff*

This meeting will serve as a project kickoff and set the stage for the ongoing collaboration project. Specific activities to be conducted in this meeting include the following:

1. Review of PA-PSRS's current state
  - a. Data fields
  - b. Data flow
  - c. Data uses
    - i. Authority
    - ii. DOH
2. Describe objectives for future data use
  - a. DOH
    - i. Act 13
    - ii. Act 52
  - b. Authority
3. Identify potential PA-PSRS modifications that would assist DOH and the Authority with data analysis
4. Identify other applications or processes that would enable DOH and the Authority to perform appropriate analysis
5. Provide an overview of collaboration project objectives and preliminary timelines
6. Lay out objectives for ongoing project teams

## Reporting Standardization

The reporting standardization team will focus on the following activities:

1. Review of the 12 principles for Serious Event reporting, suggesting changes, and confirming final
2. Review of Infrastructure Failure reporting and development of detailed guidance regarding what should be categorized and submitted by facilities as an Infrastructure Failure

3. Work on any other initiatives that may improve reporting standardization (e.g., review the Authority's process for low-reporting-volume facilities)

### Education and Training Team

The education and training team will focus on the following activity:

1. Based on the output of the reporting standardization team, develop and conduct education program to synchronize reporting standards between DOH surveyors, Authority PSLs and analysts, and reporting facilities

### Facilities Reporting Team

This project team will focus on the following activities:

1. Support nursing home reporting
  - a. Modify PA-PSRS to improve reporting accuracy (currently, the Authority is planning an upgrade to include business rules for limiting and identifying reporting errors based on requests by DOH)
  - b. Determine what data should be provided to nursing homes, appropriate media for content delivery, and sources (DOH or Authority)
  - c. Monitor federal plans to require nursing home HAI reporting, determine impact on Pennsylvania, and suggest appropriate action to minimize the burden on nursing home facilities
2. Appropriately use the statewide HAI advisory panel managed by the Authority
3. Address special issues created by National Healthcare Safety Network (NHSN) reporting requirements

### Recommendations Policy and Process Team

The recommendations team will focus on the following activity:

1. Develop policies and processes related to Act 13 of 2002 referring to recommendations

### IT Development

Depending on the outcome of the data summit and other subprojects, there may be modifications to make to PA-PSRS so that DOH and the Authority can optimally use the system. This will become clearer as the project progresses.

**Project Timeline**

	2013												2014											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Data Summit and Project KO			X																					
Reporting Standardization																								
12 Principles																								
IF Definition Etc.																								
Others																								
Education and Training																								
HAI Reporting																								
Recommendations Pol & Proc																								
IT Development																								

**Project Resource Requirements—Staffing**

It is estimated that all work can be completed with the current complement of Authority staff. The training and education component may require a significant amount of time during the first three months of 2014 as staff and reporting facilities are trained regarding the updated reporting expectations. Staff time requirements will depend on the extent of electronic distance learning used as opposed to in-person regional training. The Authority anticipates a combination of learning modalities at this time.

**Project Resource Requirements—Additional Funds**

Additional funds requirements related to the subprojects are as follows:

1. Data Summit and Project Kickoff—The Authority may experience minimal additional costs associated with meeting support.
2. Reporting and Standardization—The Authority may experience minimal additional costs associated with meeting support and travel.
3. Education and Training—Funding requirements will depend on the extent of electronic distance learning used as opposed to in-person regional training. The Authority anticipates a combination of learning modalities at this time.
4. HAI Reporting—Additional funding is already included in FY 12-13 budget.
5. Recommendations Policy and Process—No anticipated costs are associated with this subproject.
6. IT Development—Significant costs could be associated with this subproject. Initial estimates show a range of \$200,000 to \$350,000. However, these costs will not be clarified until after the data summit/project kickoff has been conducted and the other subprojects are under way.

Project 2: Standardize Specific Patient Safety Events in Selected Clinical Areas and Monitor Low-Volume Reporters

**Strategic Directions**

1.1	2.1	2.2	2.3	3.1	4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	5.6	5.7
X	X	X	X		X		X							

Objectives

1. Standardize reporting criteria
  - a. Identify a minimum of seven common patient safety issues for which reporting to the Authority can be/has been standardized
  - b. Use denominators/rates (where appropriate)
  - c. Give priority to areas in which PSRS reports can be relied on for valid measures of improvement
  - d. Develop report outlining findings and next steps
2. Monitor and provide feedback to low-volume reporters
  - a. Follow process annually to identify facilities meeting criteria
  - b. Issue letters providing feedback
  - c. Provide PSL intervention

Structure

This project will be led by the manager, clinical analysis, and draw on the expertise and effort of the director of education, PSLs, and analysts. This project will be pursued with guidance from the committee on reporting standardization developed with DOH and with input from Pennsylvania healthcare facility representatives.

Activities and Responsibilities

*Standardizing the Interpretation of Mcare Act Reporting Requirements*

The Authority will work with the committee on reporting standardization to develop a consensus on principles of interpretation for the Mcare Act reporting requirements. These principles will be based on a set of principles adopted by the Authority board and may be refined and augmented by the process outlined here. After agreeing on a set of principles, the Authority and DOH will jointly promulgate them through education of both healthcare facility officials and DOH surveyors. The Authority will take the lead on this educational effort. The Authority will continue to monitor the variation in reporting among facilities to determine the impact of adopting these principles.

### *Standardizing Reporting in Selected Clinical Areas*

The Authority is deeply invested in its mission of reducing medical errors but acknowledges the limitations of reporting systems on their own as reliable indicators of improvement. While no system of measurement is perfect, the Authority believes it is possible to improve the reliability of PA-PSRS reporting in selected clinical areas where consensus definitions of the adverse event are available and their occurrence is objective. For example, the clinical criteria for infections have been standardized, and the Authority has enlisted the support of half of the hospitals in the state who have voluntarily agreed to standardize their definition of falls and falls with harm.

This project will expand on this work by:

1. Identifying criteria for good candidate areas for standardization
2. Developing a list of candidate topics and preliminary definitions
3. Obtaining staff and stakeholder feedback
4. Summarizing the results and next steps in a brief report

Other areas amenable to standardization will be considered for incorporation into a statewide patient safety measurement strategy that will attempt to provide a summary view of the extent to which patient safety is improving in Pennsylvania healthcare facilities.

### Monitor Low-Reporting-Volume Facilities

The Authority has established an annual process for identifying facilities whose reporting patterns suggest disengagement or ignorance of the reporting requirements. The Authority provides feedback to the patient safety officer on their reporting rates compared with those of other facilities like theirs and offers assistance from their PSL. The results of this outreach are analyzed and communicated to the board.

## Project Timeline

	2013												2014												2015											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Standardize interpretation of MCARE Requirements																																				
- Refine reporting principles with committee																																				
- Develop notification and training curriculum																																				
- Provide education																																				
- Monitor changes in reporting patterns																																				
Standardize reporting in selected clinical areas																																				
- Identify criteria for good candidate areas																																				
- Develop list of candidate topics and definitions																																				
- Consult with staff and stakeholders																																				
- Summarize results and next steps																																				
Monitor low-volume reporting facilities																																				

## Project Resource Requirements—Staffing

While monitoring low-reporting-volume facilities can be accomplished with existing staff, standardizing reporting and developing and executing a measurement strategy for the state will require additional dedicated resources of a patient safety analyst and a data analyst (2.0 FTEs). Dependent on how the measurement strategy takes form, additional IT resources will be required as well to modify PA-PSRS to collect different data and to develop a mechanism for reporting on results. The director of education and PSLs will participate in the educational program.

## Project Resource Requirements—Additional Funds

The additional analyst staffing resources described above are included in Project 3. Additional IT resources required to modify PA-PSRS for standardized events is estimated to be \$150,000 to \$250,000 per year.

### *Project 3: Measure Progress and Quantify Benefits*

#### Strategic Directions

1.1	2.1	2.2	2.3	3.1	4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	5.6	5.7
X		X	X		X		X			X		X		

## Objectives

1. Develop and implement a dashboard to communicate whether Pennsylvania is making progress in improving patient safety

2. Draw on multiple data sources to measure safety over time, including PA-PSRS and NHSN where reporting can be standardized (see project 2)
3. Consider the outcomes of Authority-sponsored multifacility collaboratives and administrative data from CMS and the Pennsylvania Health Care Cost Containment Council (PHC4)
4. Develop quantitative measures that communicate the human and economic impact of safety improvements made in Pennsylvania healthcare facilities

## Structure

This project will be led by a dedicated patient safety analyst who will work with a data analyst; their work will be informed by input from internal and external stakeholders throughout the process.

## Activities and Responsibilities

### *Define criteria for good candidate measures:*

While the field of healthcare quality measurement has matured substantially over the past two decades, the subset of measures related to safety are more controversial. Areas of disagreement include the reliability and validity of different data sources, whether different types of adverse events are preventable, and whether appropriate risk adjustment models are available. Any measures must be evaluated for reliability, validity, feasibility of collection, and applicability to a broad patient population. Other considerations may include whether PA-PSRS or NHSN can collect the required information, whether appropriate denominator information can be obtained, whether reporting in that area can be standardized, and whether the measure is already in use among Pennsylvania healthcare facilities.

### *Develop list of candidate measures and preliminary specifications:*

Conduct searches of relevant measure repositories, including the National Quality Measures Clearinghouse, and databases from major measure promulgators, such as the National Quality Forum, Joint Commission, CMS, and others. Consider measures available from existing public data sources, such as Hospital Compare, Nursing Home Compare, Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicators, and PHC4. Consider whether necessary data can be or already is collected in PA-PSRS or NHSN. Consider other safety measurement programs and tools, such as The Leapfrog Group, the Medicare Patient Safety Monitoring System, the National Healthcare Quality and Disparities Report, and Institute for Healthcare Improvement Global Trigger Tools. Consider measures used in existing Authority collaborative or educational efforts, including HAIs, wrong-site surgery, falls, and others. Develop a catalog of candidate safety measures identifying the

measure, basic specifications, measure developer and endorsers, and sources of necessary data. Evaluate candidate measures along the dimensions defined in the previous task.

*Obtain staff and stakeholder feedback:*

Conduct a review of the candidate measures with the Authority board and staff and external stakeholders, including relevant provider associations and facility representatives, external patient safety and/or quality measure experts, and other agencies.

*Develop measurement strategy:*

Incorporate reviewers' feedback into a safety measurement plan. This plan should address measures that could be implemented quickly and others that might be phased in over time. Develop a prototype safety dashboard incorporating measures based on readily available data. Identify significant changes to processes, staffing, activities, or infrastructure that would be necessary to implement recommended measures (e.g., statistical consultants for complex risk adjustment, changes to PA-PSRS to collect new data). This includes schedules and work plans for accomplishing these changes. Present this plan to the Authority board.

*Operationalize measurement strategy:*

Subject to the board's agreement, implement and maintain the measurement strategy outlined in the plan above.

**Project Timeline**

The timeline presented here depends on the timely completion of predecessor tasks in project 2 and the hiring of a dedicated patient safety analyst and data analyst.

	2013				2014				2015														
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N
Define criteria for candidate measures																							
Develop list/specifications for candidate measures																							
Obtain staff & stakeholder feedback																							
Develop measurement strategy																							
Operationalize measurement strategy																							

## Project Resource Requirements—Staffing

Standardizing reporting and developing and executing a measurement strategy for the state will require additional dedicated resources of a patient safety analyst and a data analyst (2.0 FTEs).

## Project Resource Requirements—Additional Funds

The additional analyst staffing resources described above are estimated to cost \$400,000 per year.

### Project 4: Validate and Analyze Nursing Home HAI Data, and Develop and Implement Improvement Strategies

#### Strategic Directions

1.1	2.1	2.2	2.3	3.1	4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	5.6	5.7
X	X	X	X		X	X	X	X		X	X			

## Objectives

1. Develop approach for adapting to federal HAI surveillance goals
2. Identify areas for improvement in nursing homes' infection prevention plans, policies, and procedures; infection surveillance; reporting; and other areas; and develop an HAI reduction initiative for long-term care
3. Work with DOH Healthcare Associated Infection Prevention (HAIP) Section to improve nursing home data quality

## Activities and Responsibilities

### *Adapt to federal HAI surveillance goals:*

When Act 52 of 2007 charged the Authority and DOH with implementing HAI reporting in nursing homes, there were no large-scale HAI commercial or public surveillance systems capable of meeting the law's requirements. The Authority met these requirements by developing a nursing home module for PA-PSRS. Recently, the Centers for Disease Control and Prevention released a nursing home module for their NHSN system, which is used by acute care facilities nationwide for HAI surveillance. Forms for only two infection types have been released, but others will follow in the coming years. Concurrently, the national panel responsible for developing consensus standards for HAI criteria for long-term care has issued revisions to the McGeer criteria. The Authority, in conjunction with DOH and the HAI advisory panel, must determine how to adapt to these developments.

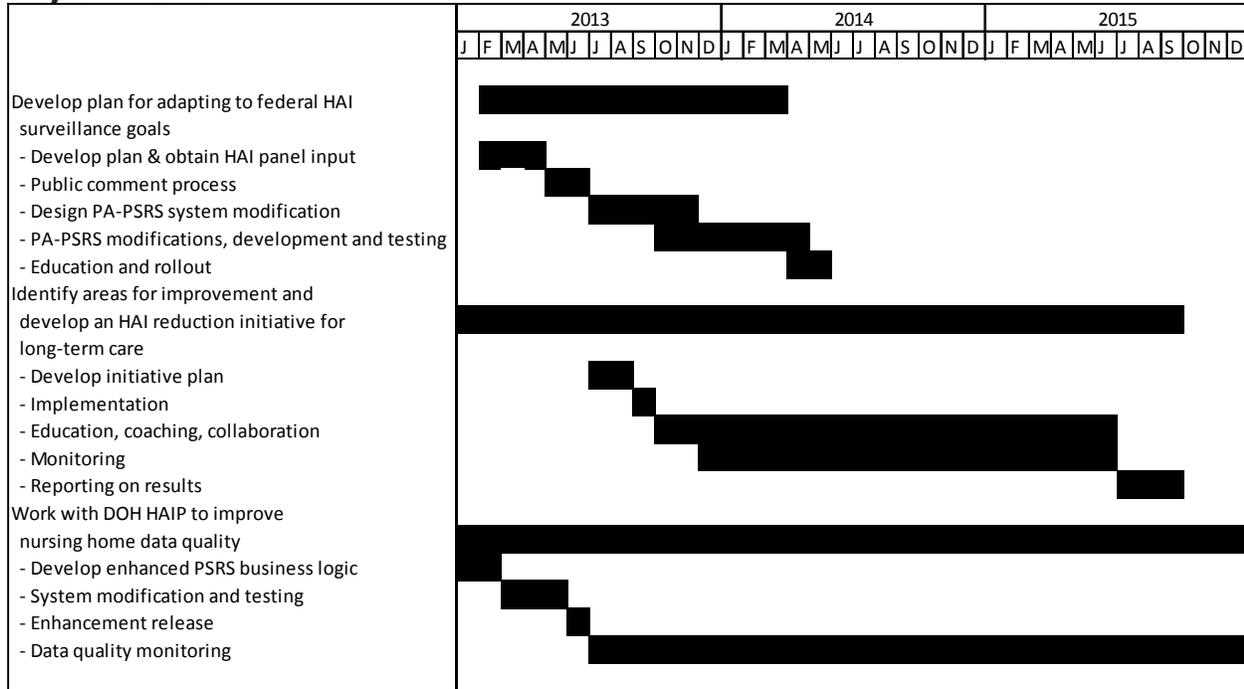
*Identify areas for improvement, and develop HAI reduction initiative for long-term care:*

The Authority will develop a collaborative and coaching program for nursing homes to reduce infections by adopting or improving many of the practices identified in its recent study, "[Impact of Implementation of Evidence-Based Best Practices on Nursing Home Infections](#)." The targeted infection type will be selected based on the frequency and severity of infections reported in long-term care and the availability of evidence-based practices to make measurable improvement. Leaders from among the long-term care community will be enlisted as expert faculty in helping the Authority to spread best practices, and we will also work with DOH to leverage synergies between both agencies' efforts.

*Work with DOH HAIP on nursing home data quality:*

The Authority and DOH have already initiated discussions on how to improve nursing home data quality, and this will be taken up by the interagency HAI work group. Over the past year, the Authority conducted a pilot study among nursing homes with high and low infection rates and found a number of differences in HAI prevention practices contributed to differences in observed infection rates, and there was no evidence of systematic under-reporting among nursing homes with low rates. This project will continue work on ensuring data quality by developing business logic in PA-PSRS that prevents nursing home users from making definite data entry errors and provides them with warnings about possible errors and omissions. DOH has been performing this work manually, sending nursing homes periodic data integrity and validation (DIV) reports. The Authority will automate this process, building the DIV criteria into PA-PSRS, preventing some errors and highlighting others. Nursing homes will be able to run their own DIV reports from within PA-PSRS in real time, enabling them to check immediately that their changes have eliminated identified problems.

## Project Timeline



## Project Resource Requirements—Staffing

The projects outlined above will require the addition of at least one infection preventionist (1.0 FTE) in order to accomplish the nursing home collaborative project while continuing existing HAI activities. The two PA-PSRS system modification efforts can be supported by existing clinical and IT staff provided there are no other concurrent IT development efforts. If other IT development efforts must be pursued concurrently, this will necessitate the addition of a business analyst at HP.

## Project Resource Requirements—Additional Funds

Additional funding will be required to hire a third infection preventionist and to bring on additional IT staff, if necessary. This cost is estimated to be approximately \$130,000 per year.

### *Project 5: National Patient Safety Priorities, Common Formats, and Health IT*

#### Strategic Directions

1.1	2.1	2.2	2.3	3.1	4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	5.6	5.7
X		X		X	X	X	X				X			

## Objectives

1. Commission independent evaluation to determine degree of alignment between Authority initiatives and national patient safety priorities
2. Identify any gaps in Authority's portfolio compared with other state patient safety programs and HHS-certified patient safety organizations
3. Identify what roles Authority could play with respect to patient safety problems with health IT
4. Evaluate the pros and cons associated with the Authority adopting and transitioning to or mapping to the AHRQ Common Formats for Patient Safety Data Collection and Event Reporting and estimate resource and/or schedule requirements
5. Identify opportunities to use the Authority's research and expertise to provide the "how" on areas covered by federal and accreditation initiatives

## Structure

The purpose of this project is to determine the extent to which the Authority's focus and activities are aligned with national patient safety priorities and broader trends in the healthcare industry and in healthcare delivery. In particular, the evaluation will address both positive and negative considerations for whether the Authority should transition PA-PSRS to adopt the AHRQ Common Formats. The evaluation will also address what roles the Authority might play in improving the safety of health IT. The Authority's initial study of health-IT-related adverse events from PA-PSRS was cited in the Office of the National Coordinator's (ONC) recent [Health Information Technology Patient Safety Action and Surveillance Plan](#), and the Authority spoke with ONC about the potential for future collaboration. We will also explore how PA-PSRS might be modified to collect information about health IT. While the board and staff aim to keep the agency aligned with national priorities, it is advisable to seek an independent evaluation from an objective third party.

## Activities and Responsibilities

### *Develop scope of work and identify potential bidders*

ECRI Institute will lead the development of the scope of work, identify potential contractors, and identify the format of the procurement. ECRI Institute will issue a request for proposals (RFP).



Project 6: Increase Integration of Patient Voice into Authority Activities

**Strategic Directions**

1.1	2.1	2.2	2.3	3.1	4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	5.6	5.7
		X		X		X		X			X			

Objectives

1. Increase the level of patient involvement in how the Authority carries out its mission
2. Create a diverse patient-centered advisory council
3. Identify and test targeted strategies to engage providers and patients to implement recommendations of the Authority
4. Utilize information derived from the patient advisory council to guide future direction and initiatives for the Authority to improve patient safety
5. Seek out funding opportunities (within our statutory obligations) to expand our reach (e.g., grants)

Structure

The Authority will develop and manage a patient-centered advisory council. The advisory council could consist of representatives of the following:

1. Facilities or systems that have demonstrated a deep commitment to the patient voice
2. Patient advocacy groups
3. Patient advocacy individuals
4. Existing patient organizations (e.g., disease management organizations)
5. Other Pennsylvania state agencies such as DOH and or PHC4
6. Pennsylvania and or federal insurers
7. AHRQ
8. Facility-based associations

The advisory council will also include Authority staff, including:

1. Director of educational programs
2. Director of communications
3. PSL
4. ECRI-based patient safety analyst

The first order of business for the advisory council will be to develop a mission and framework that is consistent with the board’s objectives. Ongoing activities of the advisory council could consist of the following:

1. Kickoff meeting to develop understanding of the role of the advisory council and to fully understand the current activities of the Authority
2. Review of current Authority activities and identify potential enhancements
3. Identification of specific projects that could be undertaken by the Authority
4. Assisting HEN projects with understanding and implementing patient voices
5. Providing feedback on specific topical areas of interest to the Authority
6. Providing an annual update to the Authority board

**Project Timeline**

	2013												2014											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Program Development																								
Populate Advisory Council																								
Advisory Council Kick-off																								
Develop Plan																								
Review Current Activities																								
Identify potential enhancements																								
Identify potential additional projects																								
Develop final plan																								
Assist PA HEN projects																								
Update Authority Board																								
Assist with implementation																								
Evaluate improvement																								
Repeat process																								

Project Resource Requirements—Staffing

It is estimated that some of the work can be completed with the current complement of Authority staff. However, it is estimated that management of the advisory council will require Authority resources that exceed that of the resources required to manage the HAI advisory panel. The director of educational programs, director of communications, PSLs, administrative staff, and ECRI-Institute-based patient safety analysts will all have roles with the advisory council. Staff estimates additional time will represent approximately 0.25 FTE annually.

## Project Resource Requirements—Additional Funds

Additional funds requirements related to the project are as follows:

1. Kickoff and ongoing meetings for Authority staff and advisory council members. In addition to conference rooms and supplies, the majority of costs will be associated with travel for advisory council members who may be domiciled throughout Pennsylvania. Costs are anticipated to be approximately \$25,000 per year.

### *PROJECT 7: DEVELOP STRATEGIC PARTNERSHIPS*

#### **Strategic Directions**

<b>1.1</b>	<b>2.1</b>	<b>2.2</b>	<b>2.3</b>	<b>3.1</b>	<b>4.1</b>	<b>4.2</b>	<b>4.3</b>	<b>5.1</b>	<b>5.2</b>	<b>5.3</b>	<b>5.4</b>	<b>5.5</b>	<b>5.6</b>	<b>5.7</b>
				X	X	X	X		X	X	X	X		

### Objectives

1. Use partnerships to effectively advance the Authority's mission

### Structure

The Authority is currently in formal and informal partnership with many other entities. However, there has been no strategic focus placed on the partnership portfolio. Before additional activities can be conducted, the Authority must identify all current partnerships. Authority staff will perform an inventory and analysis of the current partnership relationship. Ensuing board discussion will identify continued activities related to this project.

### Activities

- Develop inventory of current relationships
- Identify potential gaps
- Report findings to the board

**Project Timeline**

	2013												2014											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Inventory and document current partnerships																								
Develop report																								
Review with PSA Board																								
Determine further action																								

**Project Resource Requirements—Staffing**

This project can be conducted using current Authority and contract staff.

**Project Resource Requirements—Additional Funds**

No additional funds are required, as work can be completed using current staffing complement, and there are no foreseen expenses associated with this project.

*PROJECT 8: EXECUTE HEN COLLABORATION PROJECTS*

**Strategic Directions**

SD 1.1	SD 2.1	SD 2.2	SD 2.3	SD 3.1	SD 4.1	SD 4.2	SD 4.3	SD 5.1	SD 5.2	SD 5.3	SD 5.4	SD 5.5	SD 5.6	SD 5.7
X		X				X		X	X		X	X	X	X

Special note: The Pennsylvania HEN projects were just getting under way when the Authority conducted the strategic planning sessions. However, the board determined the HEN projects were a significant new portion of the ongoing operation and fit nicely with the board’s strategic direction. The HEN projects are the first instance in which the Authority is receiving revenue from a third party not connected with facility assessments. The Authority operates the HEN projects as a subcontractor to HAP, which is the primary contractor to CMS.

**Objectives**

1. The overall objective for the HEN project is to reach a 40% decrease in preventable hospital-acquired conditions and a 20% reduction in readmissions.

2. Achieve 20% reduction in falls with harm for hospitals participating in the HEN falls immersion initiative.
3. Achieve 20% reduction in wrong-site surgery for facilities participating in the wrong-site surgery HEN immersion project.
4. Achieve significant reduction in adverse drug events associated with opioids.
5. Provide a patient safety education program to all HEN hospitals that choose to attend.
6. Support all HEN projects with educational opportunities.
7. Support all HEN projects through use of PassKey as the project's collaboration and sharing application (currently supporting approximately 1,800 project participants).

## Structure

The Pennsylvania HEN is funded by CMS with HAP as the primary contractor. There are 10 projects representing hospital-acquired conditions identified by CMS and wrong-site surgery. The Authority manages projects for falls, wrong-site surgery, and opioids. In addition, the Authority provides educational opportunities for all HEN hospitals. Currently, there are 137 hospitals in the HEN. There are 131 facilities participating in the Authority's three projects.

The Authority's program is managed by the executive director. A significant number of Authority staff have been assigned to the projects.

Activities conducted by the individual project teams are numerous and diverse, and they include, but are not limited to, the following:

1. Modify PA-PSRS to allow for standardized falls reporting and provide a new set of specific falls user reports
2. Participate in facility recruitment
3. Maintain PassKey sites
4. Conduct organizational assessments
5. Conduct knowledge assessments
6. Conduct point-prevalence assessments
7. Determine process and outcome measures and rates
8. Conduct training and education
9. Conduct in-person learning and collaboration events
10. Provide toolkits and educational materials
11. Conduct numerous webinars and conference calls
12. Develop and submit monthly, quarterly, and annual status reports to CMS through HAP
13. Update the Authority board periodically

## Project Timeline

The work plans for the HEN projects are complex and very detailed to a level that goes beyond what has been presented in this plan. The planned activities are far too numerous to present here. The projects will continue as planned.

## Project Resource Requirements—Staffing

Staffing resources for the HEN projects are significant. However, these resources are, to a large extent, covered by revenues the Authority receives from CMS by way of HAP. The current funding stream will continue through December 2013. If HAP is able to secure a third year of funding from CMS, the projects will continue through 2014. If a third year of funding is not received, the Authority will direct resources to other project areas and may be forced to decrease staffing to some degree. However, the majority of the staff working on the project has been assigned to the project in lieu of other Authority activities.

## Project Resource Requirements—Additional Funds

Please see section immediately above.

### *PROJECT 9: PA-PSRS DATA WAREHOUSE TO IMPROVE DATA ACCESSIBILITY*

#### **Strategic Directions**

1.1	2.1	2.2	2.3	3.1	4.1	4.2	4.3	5.1	5.2	5.3	5.4	5.5	5.6	5.7
		X	X		X		X						X	

## Objectives

1. Perform additional analyses to more finely identify and communicate the benefits of a PA-PSRS data warehouse that would allow facilities, PSLs, PA-PSRS analysts, and potentially DOH to do more sophisticated analyses of data
2. Develop high-level system requirements
3. Develop plan for data warehouse development, including detailed schedule and resource needs
4. Perform complete development, testing, deployment, and operations/maintenance

## Structure

This project will be led by the IT development team at HP, will have oversight by the PA-PSRS program director, and will have input from multiple internal and external stakeholders. Stakeholders in the PA-PSRS data warehouse include Authority PSLs, analysts, administrative staff, DOH staff, facility patient safety officers, and other facility users. This project will focus on developing a data warehouse for events from acute-care facilities, though a data mart for nursing homes may be evaluated in the future.

## Activities and Responsibilities

### *Obtain stakeholder input and develop more detailed needs assessment*

While internal Authority and DOH users will benefit from the development of the data warehouse, we want to further investigate the potential use of the data warehouse by facilities. Electronic patient safety reporting systems are now widespread among hospitals, and those that have them may perform these types of analyses in their local system. However, we also are aware that a significant number of facilities utilize PA-PSRS as their sole patient safety data repository. We also need to determine how the facilities believe they would utilize the new capabilities. Input should be solicited through structured interviews and surveys of potential end users.

### *Develop high-level requirements and obtain Authority approval to proceed*

Preliminary functional requirements will be developed by stakeholder groups. Different groups may warrant different functionality; for example, it may not be necessary to deidentify reports in a data mart used by Authority staff, while this would be a requirement for facility users. The requirements will address use case scenarios, features to be supported (including free-text searching), and security requirements unique to each user group. Preliminary system functional requirements will be accompanied by detailed resource requirements, effects on staffing and budget, and a finalized schedule. Authority approval will be obtained before proceeding.

### *Future tasks*

Assuming Authority approval is granted after design review and resource requirements are addressed, HP will begin system development, testing, and implementation. Documentation will be developed including user instructions and an online training curriculum. Once implemented, the system will require its own dedicated support and maintenance resources.





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## **ADDENDUM G: The Authority's Annual Survey of Patient Safety Officers and Infection Prevention Designees**

In November 2012, the Pennsylvania Patient Safety Authority invited registered healthcare facilities in the commonwealth to participate in an online survey. Participants included acute care patient safety officers (PSOs) and nursing home infection prevention designees (IPDs). The intent of the survey was to solicit feedback on the Authority's services, including performance of the Pennsylvania Patient Safety Reporting System (PA-PSRS). The opinions and comments received on the following topics will be used by the Authority to develop programs and services for the coming year:

- Infection control efforts of acute care facilities
- Infection control efforts of nursing homes
- Opinions of the quality of the *Pennsylvania Patient Safety Advisory*
- Impressions of the Patient Safety Liaison (PSL) program

Responses were collected over a 21-day period. Of the 1,189 invitees, PSOs and IPDs from 98 hospitals, 97 ambulatory surgery facilities (ASFs), 2 birthing centers, 7 abortion facilities, and 270 nursing homes responded, resulting in a 39.9% response rate. For purposes of data analysis, the birthing centers and abortion facilities were grouped with the ASFs when comparing responses from the different types of facilities.

### **Infection Control Efforts of Acute-Care Facilities**

Act 52 of the Medical Care Availability and Reduction of Error Act was signed into law in July 2007 to help reduce and eliminate healthcare-associated infections (HAIs) in Pennsylvania. The Authority surveyed facilities at that time about their readiness to act on HAIs through surveillance and reporting. After five years, the same questions were asked to compare responses between the two time periods. Each infection control effort was rated from very challenging (5) to not challenging (1). As evidenced in the chart below, infection control activities were perceived to be somewhat less challenging in 2012 as compared with 2007.

**Table 1. Five-Year Comparison of Infection Control Efforts in Acute Care Facilities**

Infection Control Efforts	2007		2012	
	No. of Responses	Weighted Average of Responses	No. of Responses	Weighted Average of Responses
Control of resistant organisms	100	3.64	190	2.61
Mandated reporting	101	3.28	197	2.65
Measuring hand hygiene compliance	101	3.42	199	2.84
Tracking infections across the entire facility	99	3.02	193	2.47
Managing funding/budget constraints	100	3.7	184	2.95
Adequate staffing for infection prevention	102	3.04	197	2.69
Support of administration	100	1.56	195	2.02
Support/compliance from clinical staff (e.g., doctors, nurses, technicians)	99	2.52	199	2.58

Note: Each response is given the weight associated with its position (i.e., very challenging = 5). The weighted average rating is calculated for each question by adding the total number of responses with the weighted sums of each response set, divided by the total number of responses for the question.

Acute care facilities were also asked if antibiotic stewardship programs were in place. About 34% responded that they had a program in place, and 37% responded that they wanted to learn more about implementing an antibiotic stewardship program.

### Infection Control Efforts of the Nursing Homes

Using the same question set, nursing homes were also asked about their infection control efforts.

**Table 2. Nursing Home Survey Responses to Infection Control Efforts in 2012**

Infection Control Efforts	No. of Responses	Weighted Average of Responses
Control of resistant organisms	259	2.75
Mandated reporting	265	2.28
Measuring hand hygiene compliance	261	2.74
Tracking infections across the entire facility	260	2.62
Managing funding/budget constraints	194	2.83
Adequate staffing for infection prevention	258	2.62
Support of administration	259	1.97
Support/compliance from clinical staff (e.g., doctors, nurses, technicians)	265	2.57

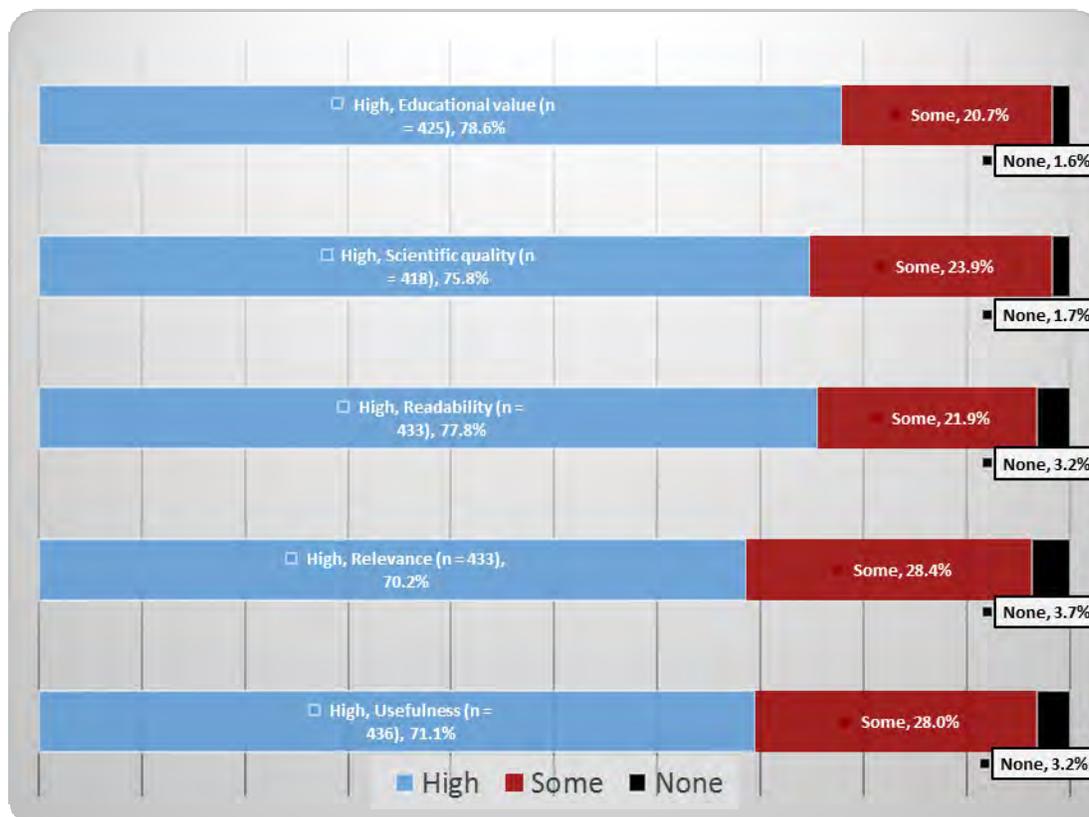
Note: Each response is given the weight associated with its position (i.e., very challenging = 5). The weighted average rating is calculated for each question by adding the total number of responses with the weighted sums of each response set, divided by the total number of responses for the question.

When nursing homes were asked about antibiotic stewardship, approximately 20% responded that a program was in place and more than 81% indicated that they wanted to learn more about implementing an antibiotic stewardship program.

Nursing homes were also surveyed about the presence of a preseason norovirus preparedness program. More than 48% responded that a program was in place and 65% responded that they wanted to learn more about implementing such a program. Similarly, when asked about a norovirus rapid response program, about 44% indicated that they had a program and 64% said they would like to learn more about implementing one.

### Pennsylvania Patient Safety Advisory

As in previous surveys, PSOs and IPDs collectively rated the *Advisory* very favorably. Using the same weighted average calculations as noted above (i.e., maximum score of 5), the *Advisory* scored well in the areas of usefulness (3.96), relevance (3.92), readability (4.08), scientific quality (4.00) and educational value (4.07). Figure 1 details the response ratings for the *Advisory* among all facility types.



**Figure 1. Responses by Percentage in Quality Categories of the Pennsylvania Patient Safety Advisory (n = number of responses)**

## Patient Safety Liaisons

The Authority's PSLs directly interact with PSOs and educate healthcare providers and administrators. A majority (70.6%) of those who responded to the survey highly rated the program.

**Table 3. Rating of the PSL Program by Weighted Average Responses**

	<b>No. of Responses</b>	<b>Weighted Average of Responses</b>
Educational one-on-one sessions	65	4.11
Just-in-time assistance	55	3.91
Networking opportunities	69	3.97
Regional patient safety education	66	4.18

*Note:* Each response is given the weight associated with its position (i.e., very challenging = 5). The weighted average rating is calculated for each question by adding the total number of responses with the weighted sums of each response set, divided by the total number of responses for the question.

The following comments were received from the survey and demonstrate the overall perception of the PSL program:

*"Our PSL instructed us on: use of analysis and creating an action plan for evaluating incidents and serious events; instituting a Patient Safety Committee agenda structure; and the inclusion of data at patient safety committee meetings."*

*"[Our PSL] completed education sessions for managers and physicians. It has increased awareness of reportable events so we are able to track and trend. Process changes were made as result of tracking and trending."*

*"[We are] looking at rapid response teams, improving medication safety, revamping falls program, increased reporting with the help of our PSL."*

*"Our PSL held classes on 'Just Culture' and 'Safety Culture'; we, in turn, had a national expert come to talk about Just Culture and have begun implementation."*

*"Updated facility pre-procedure checklist identifying blood thinners as a result of the PSL's knowledge of new blood thinner."*

*"We appreciate all of the help from our PSL. It is very reassuring to know they are an email or a phone call away."*

## **ADDENDUM H: Healthcare-Associated Infections**

Healthcare-associated infection (HAI) refers to an infection occurring while a patient is receiving healthcare (acute or long-term) or as a result of that care. Infections are caused by bacteria, fungi, viruses, and parasites. When the patient's natural defenses are compromised because of illness, treatment, or use of advanced care, there is an increased risk of HAI. According to the Centers for Disease Control and Prevention, "approximately 1 out of every 20 hospitalized patients will contract an HAI."<sup>16</sup>

Infections related to healthcare can be devastating for the patient. For example, when an artificial joint becomes infected, it may have to be removed, leaving the patient unable to walk. The Pennsylvania Patient Safety Authority works with clinicians to better comprehend how infections related to healthcare delivery are acquired. The Authority's access to infection event reports provides valuable insight into the systems of care that cause harm. The Authority's analysis of HAI events helps to identify trends and signals to direct infection prevention activities and to develop appropriate interventions on behalf of the patient.

Pennsylvania is a recognized leader in HAI reduction. Through addressing the challenges presented by HAIs, patient harm and excess treatment costs may be avoided. The Authority provides frontline staff, managers, infection preventionists, and administrators with data to help direct their infection prevention activities. Integration with current clinical practice through collaboration gives the Authority the ability to develop resources and tools designed for overall prevention of HAIs.

In order to leverage the unique resources and strengths of different organizations, the Authority works closely with the Pennsylvania Department of Health (DOH), the Pennsylvania Health Care Cost Containment Council, the Hospital and Healthsystem Association of Pennsylvania (HAP), the Association for Professionals in Infection Control and Prevention (APIC), the Health Care Improvement Foundation, the Pennsylvania Health Care Quality Alliance, and other government agencies and professional associations across the spectrum of healthcare delivery.

The Authority analyzes HAI data from the Pennsylvania Patient Safety Reporting System (PA-PSRS) and the National Healthcare Safety Network (NHSN). PA-PSRS data is utilized to generate rates for long-term care, while NHSN data is primarily utilized by the Authority for the analysis of trends in hospitals. This addendum presents the Authority's rate tables for long-term care. Rate tables and benchmarks for hospitals are published in the DOH's annual report and are available at:

[http://www.portal.state.pa.us/portal/server.pt/community/healthcare\\_associated\\_infections](http://www.portal.state.pa.us/portal/server.pt/community/healthcare_associated_infections).

This addendum also presents the results of the Authority's HAI activities—and in some cases, the status of its work in progress. Another HAI-related analysis is presented in

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<sup>16</sup> Centers for Disease Control and Prevention (CDC). Healthcare-associated infections (HAIs): the burden [website]. [cited 2012 Feb 7]. Atlanta (GA): CDC. <http://www.cdc.gov/HAI/burden.html>.

**Addendum C**, which summarizes select articles from the *Pennsylvania Patient Safety Advisory*.

### Assessment of HAI Prevention Practices in Pennsylvania Nursing Homes

The ongoing number of deficiency citations for infection control problems and reports of variability to implementing infection control practices suggest the need for additional emphasis and research focusing on identifying barriers to infection control best-practice implementation in long-term care facilities. In fall 2010, the Authority launched the Long-Term Care Best-Practice Assessment Project to do the following:

- Identify best practices in nursing homes demonstrating successful infection prevention efforts
- Collaborate with facilities with high infection rates to remove barriers to implementation of evidence-based practices
- Provide education and best-practice strategies to nursing homes reporting high infection rates
- Study the impact and correlation of various levels of implementation of infection control best practices on nursing homes' infection rates
- Assess patterns of care that could be targeted for improved quality

Authority infection prevention analysts designed the Long-Term Care Best-Practice Assessment Tool to assess the structure and function of nursing home infection control programs by measuring the level of implementation of current best practices in seven domains: hand hygiene, environmental infection control, outbreak control, prevention of urinary tract infections, prevention of respiratory infections, prevention of skin and soft-tissue infections, and prevention of gastrointestinal and multidrug-resistant organism infections. Questions in each category are based on their consistency with the current evidence-based guidelines and on the following elements:

- Infection control goals are consistent with the facility infection control written plan and are updated at least annually.
- Infection control policies and procedures are up to date and reviewed annually.
- Education on infection control goals and policies is in place and documented.
- Standard documentation methods are in place.
- Process and outcome measures are evaluated.
- Accountability is assigned for administrative support, resources, and implementation of best-practice strategies.

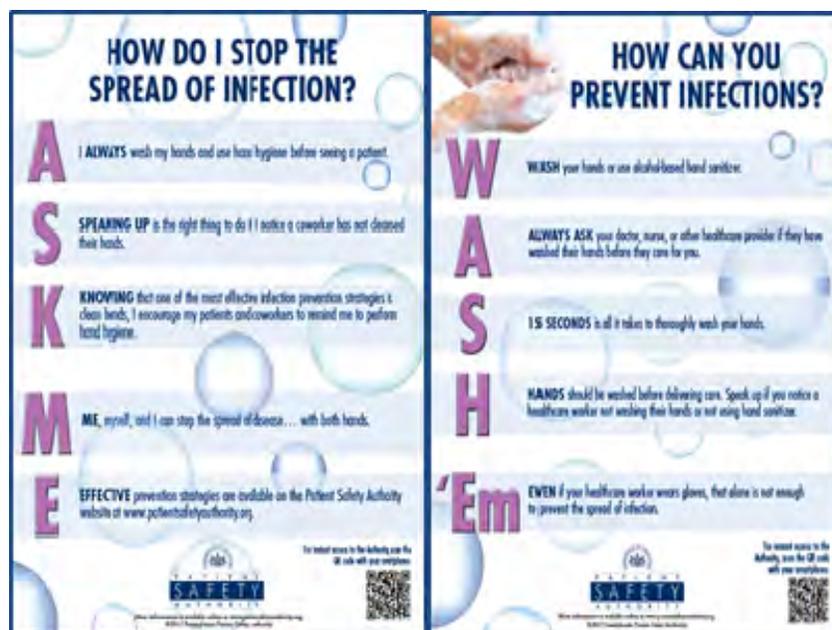
On-site visits to 10 nursing homes with high infection rates and 10 nursing homes with low infection rates were completed by October 2011. Infection prevention analysts conducted

the assessment visits utilizing the Long-Term Care Best-Practice Assessment Tool, interviews, clinical observations, and record reviews to identify best-practice compliance or opportunities for improvement. The analysts developed a formal report for each nursing home containing the results of the assessment, opportunities for improvement, and information on follow-up activities. The interviews and observations identified multidisciplinary implementation barriers in nursing homes with high HAI rates at the leadership, physician, clinical, and support staff levels and recognized patterns of care that nursing homes could target for improvement. Results of the study were published in the September 2012 issue of the *Advisory*. The Long-Term Care Best-Practice Assessment Tool is published on the Authority's website with the *Advisory*. For the complete article and tool, go to [http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Sep;9\(3\)/Pages/89.aspx](http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Sep;9(3)/Pages/89.aspx).

Follow-up interviews with staff from the nursing homes with high HAI rates were conducted in 2012 to determine application of the Authority's suggestions for improvement from the initial visit, assess the potential impact on the facility's HAI rates, and provide continued guidance and education to remove barriers to HAI prevention best practices. The findings from these assessments will be published in an upcoming 2013 issue of the *Advisory* and will provide the focus for future nursing home infection control educational programs.

## Education

During International Infection Prevention Week, the Authority made available free hand hygiene safety posters for consumers and for healthcare workers in acute care, long-term care, and ambulatory settings. The Authority sent posters to all hospitals, ambulatory surgery centers, nursing homes, birthing centers, and abortion facilities. At the facilities' request, the Authority printed additional posters (2,000) for Patient Safety Awareness Week. These posters are available for download from the Authority website at <http://patientsafetyauthority.org/NewsAndInformation/Brochures/Pages/Home.aspx>



At the request of a regional hospital association, the Authority presented an educational webinar to clinicians and administration titled “Implementing Strategies to Target Zero Hospital-Acquired Catheter-Associated Urinary Tract Infections.”

As the result of a December 2011 *Advisory* article, the Authority was invited to present “Targeted Methods to Improve Outcomes in Nursing Home Residents: Modifiable Risk Factors for Respiratory Tract Infections” at the June 2012 APIC international conference, as well as the September 2012 APIC Delaware Valley long-term care focus group. The presentation discussed assessing the effect of modifiable risk factors that increase the potential for respiratory tract infections in nursing home residents, translating evidence-based interventions into actionable facility practices, and applying key components of an effective oral hygiene program.

In response to the national implementation of the Centers for Medicare and Medicaid Services (CMS) Infection Control Surveyor Worksheet, the Authority presented “Infection Control Update for Ambulatory Surgery” at the October 2012 Pennsylvania Ambulatory Surgery Association Annual Meeting and Educational Seminar. This educational program focused on the minimum infection prevention expectations for preparing ambulatory surgical facilities for a CMS infection control survey and improving overall patient safety.

In January 2012, at the request of a hospital health system, the Authority presented for grand rounds “The Clinical Impact of Central Venous Catheter Insertion Date to Date of Infection Interval, and the Role of Process Control at the Bedside.”

An *Advisory* article in March 2012 focused on the comprehensive unit-based safety program (CUSP), noting that the second progress report on the national On the CUSP: Stop Blood Stream Infection project states that the pre- and post-CUSP implementation safety culture survey showed little change upon comparison. Instead, CUSP’s success has been measured by a surrogate outcome (infection rate). Authority analysts demonstrated when central venous catheters are in use, safe culture is evident in direct measurement of compliance with best practices, as well as in device utilization ratio (DUR). Furthermore, the article highlighted that implementation of CUSP, in cohort 2 of Pennsylvania units, has resulted in improved compliance with best practices and an 8% decrease in DUR from baseline.

## Colorectal and Bariatric Surgical Practice Assessment

The Authority’s collaborative work with the National Surgical Quality Improvement Program (NSQIP) resulted in its surgical site infection (SSI) prevention assessment tools. These tools assimilated the American College of Surgeons’ comprehensive list of practices and processes most relevant for the focus areas of bariatric and colorectal surgery. The assessment tools provided a detailed comparison of the levels and methods of implementation of SSI prevention practices of high-performing and outlier NSQIP hospitals at the preoperative, intraoperative, and postoperative levels with respect to prevention of postoperative bariatric and colorectal SSI. It also highlighted the significant role of culture and standardization in prevention of SSIs. For more information on the collaboration, see

the annual report section discussing Authority collaborations. For a copy of the assessment tools, see the December 2012 *Advisory* article “Multifaceted Differences in Implementation of Practices for Prevention of Colorectal and Bariatric Surgical Site Infections” on the Authority’s website at [http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Dec;9\(4\)/Pages/136.aspx](http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2012/Dec;9(4)/Pages/136.aspx).

## Partnership for Patients

Through its Partnership for Patients initiative, CMS initiated the Hospital Engagement Network (HEN) projects. The HEN was formed by CMS contracting with state and national organizations with the goal of promoting practices and strategies through collaboration with hospitals in order to enhance the culture of safety. The collaboration offers opportunities for participating hospitals to take part in projects aimed at decreasing adverse events. In partnership with HAP, Authority analysts develop content and consult on programs that focus on the prevention of HAIs and mitigation of associated risks. The overall goal is a 40 percent reduction in preventable harm. Authority analysts are working with HAP directly on reduction of central-line-associated bloodstream infection (CLABSI), SSI, and infection-related ventilator-associated complications.

## HAI Advisory Panel

Act 52 of 2007 required the Authority to establish an external advisory committee comprising experts in HAI from throughout the state. Participants on this committee include hospital and nursing home infection preventionists, infectious-disease physicians, and geriatricians.

The HAI advisory panel met in December 2012 and reviewed program updates for PA-PSRS and Authority activities for hospitals, as well as nursing home reporting and analysis, educational programs, collaborations, and dissemination of HAI reduction strategies. Representatives from DOH and the Authority presented on the impact of changes to NHSN long-term care reporting; healthcare vaccination reporting; CMS requirements for methicillin-resistant *Staphylococcus aureus* and *Clostridium difficile* reporting in 2013; and NHSN definition changes to ventilator-acquired pneumonia, CLABSI, catheter-associated urinary tract infection (CAUTI), and SSI.

The panel was complimentary of the HAI prevention efforts undertaken by the Authority, DOH, and their partners. Based on the amount of feedback from the long-term care community and the publishing of updated McGeer long-term care HAI definitions, the panel agreed with a proposal to align current PA-PSRS HAI reporting criteria with the current McGeer criteria published in 2012.<sup>17</sup>

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<sup>17</sup> Stone ND, Ashraf MS, Calder J, et al. Surveillance definitions of infections in long-term care facilities: revisiting the McGeer criteria. *Infect Control Hosp Epidemiol* 2012 Oct;33(10):965-77.

The HAI advisory panel also made a motion to create a subcommittee that would be tasked with the specific issues that will face the long-term care community in the future related to HAI in that specific population of patients.

## Nursing Home HAI Data Analysis

Nursing homes in Pennsylvania submitted a total of 32,257 infection reports through PA-PSRS in 2012; a 1.5% decrease from the 32,761 submitted in 2011.

### *Analysis Method*

A major focus in 2012 was the analysis of the 32,257 HAI events reported by Pennsylvania nursing homes. Of the active 711 facilities, 553 (77.8%) spanning five care areas met validation criteria.

The Authority excluded facilities for analysis based on the following:

1. Resident-days not entered for every month of 2012; 97 nursing homes were excluded.
2. Any month during which occupancy was above 100% or below 50%. Occupancy is calculated by dividing the number of resident-days by the number of beds listed for each facility. The quotient is then divided by the number of days in each month. In the 2012 data, 61 nursing homes were excluded.
3. Infections reported without accompanying resident-days at the unit level. Zero nursing homes were excluded in the 2012 data.
4. CAUTI without accompanying catheter-days. Zero nursing homes were excluded for analysis for this infection type in the 2012 data.

The overall infection rate for 2012, based on data validated using these methods, was 1.19 (95% CI: 1.17 to 1.20) infections per 1,000 resident-days. Table 1 below shows the overall infection rate since 2009. At this time, additional data points are necessary to determine whether an actual rise or fall in overall infection rates constitutes a notable trend.

Table 1. Other Infections, Pooled Mean Rates, by Subcategory and Care Unit, 2009-2012

Pooled Infection Rate† (95% CI)	2009	2010	2011	2012	Trend
	1.18 (1.16 - 1.19)	1.24 (1.22 - 1.25)	1.17 (1.16 - 1.18)	1.19 (1.17 - 1.20)	

## HAI Data: Review and Analysis

Summary tables of pooled mean rates by infection type and care unit are provided for 2012 in Tables 2 through 6, and pooled mean rates by infection type and care unit for 2009 to 2012 are provided in Tables 7 through 11.

### Urinary Tract Infections

In 2012, the CAUTI rate rose from 0.91 per 1,000 urinary-catheter-days in 2011 to 1.10 (see Tables 2 and 7). The urinary catheter device utilization ratio (DUR) has remained constant at 0.05 since 2009, as did reports of symptomatic urinary tract infections without an indwelling urinary catheter.

Authority CAUTI prevention resources are available at <http://www.patientsafetyauthority.org/searchcenter/Pages/Results.aspx?k=cauti>.

Table 2. Urinary Tract Infection Pooled Mean Rates, by Subcategory and Care Unit, 2012					
Unit Name (n)	No. of Infections	Resident-Days	Catheter-Days	Device Utilization Rate*	Pooled Infection Rate <sup>†‡</sup> (95% CI)
CAUTI—Resident with Indwelling Urinary Catheter					
Dementia Unit (18)	27	1,983,393	29,313	0.015	0.92 (0.57 to 1.26)
Mixed Unit (110)	364	6,813,725	313,214	0.046	1.16 (1.04 to 1.28)
Nursing Unit (104)	336	6,970,843	303,925	0.044	1.10 (0.98 to 1.22)
SN/STR Unit <sup>§</sup> (131)	460	7,761,009	421,852	0.054	1.09 (0.99 to 1.19)
Vent Unit <sup>**</sup> (8)	30	136,246	34,443	0.253	0.87 (0.55 to 1.18)
Total (329)	1,217	23,665,216	1,102,747	0.047	1.10 (1.04 to 1.16)
UTI—Resident without Indwelling Urinary Catheter					
Dementia Unit (63)	181	1,983,393			0.09 (0.08 to 0.10)
Mixed Unit (119)	809	6,813,725			0.12 (0.11 to 0.13)
Nursing Unit (120)	552	6,970,843			0.08 (0.07 to 0.09)
SN/STR Unit (167)	778	7,761,009			0.10 (0.09 to 0.11)
Vent Unit (5)	17	136,246			0.12 (0.07 to 0.18)
Total (361)	1,543	23,665,216			0.10 (0.09 to 0.10)

Note: Table rows indicating totals show the number of nursing homes reporting for the given type of infection. This is not to be confused with the sum of the unit types for that infection, because there may be overlap of unit types reporting at any given facility.

\* Device utilization rate = number of urinary catheter-days ÷ number of resident-days

† UTI rate calculation = number of UTI ÷ number of resident-days x 1,000

‡ CAUTI rate calculation = number of CAUTI ÷ number of catheter-days x 1,000

§ SN/STR Unit = skilled nursing or short-term rehabilitation unit

\*\* Vent Unit = ventilator-dependent unit

## Respiratory Tract Infections

Lower respiratory tract infections accounted for 98% of all respiratory tract infections reported in 2012. The infection rate for lower respiratory tract infections slightly decreased from 0.43 per 1,000 resident-days in 2011 to 0.42 in 2012 (see Tables 3 and 8). The rate of influenza-like illness remained constant at 0.01 per 1,000 resident-days.

The Authority responded to the potential seasonal increase in lower respiratory tract infections by providing nursing homes with a preseason electronic reminder of the Authority's prevention resources, which are available at <http://www.patientsafetyauthority.org/searchcenter/Pages/Results.aspx?k=influenza>.

Table 3. Respiratory Tract Infection Pooled Mean Rates, by Subcategory and Care Unit, 2012			
Unit Name (n)	No. of Infections	Resident-Days	Pooled Infection Rate* (95% CI)
Lower Respiratory Tract Infection (pneumonia/bronchitis/tracheobronchitis)			
Dementia Unit (121)	669	1,983,393	0.34 (0.31 to 0.36)
Mixed Unit (169)	3,269	6,813,725	0.48 (0.46 to 0.50)
Nursing Unit (174)	2,741	6,970,843	0.39 (0.38 to 0.41)
SN/STR Unit† (240)	3,241	7,761,009	0.42 (0.40 to 0.43)
Vent Unit‡ (10)	127	136,246	0.93 (0.77 to 1.09)
Total (492)	10,047	23,665,216	0.42 (0.42 to 0.43)
Influenza-Like Illness			
Dementia Unit (4)	12	1,983,393	0.01 (0.00 to 0.01)
Mixed Unit (21)	50	6,813,725	0.01 (0.01 to 0.01)
Nursing Unit (24)	48	6,970,843	0.01 (0.00 to 0.01)
SN/STR Unit (23)	45	7,761,009	0.01 (0.00 to 0.01)
Vent Unit (0)		136,246	0 (0 to 0)
Total (65)	155	23,665,216	0.01 (0.01 to 0.01)
Total Respiratory Tract Infections			
Dementia Unit (122)	681	1,983,393	0.34 (0.32 to 0.37)
Mixed Unit (170)	3,319	6,813,725	0.49 (0.47 to 0.50)
Nursing Unit (174)	2,789	6,970,843	0.40 (0.39 to 0.41)
SN/STR Unit (242)	3,286	7,761,009	0.42 (0.41 to 0.44)
Vent Unit (10)	127	136,246	0.93 (0.77 to 1.09)
Total (484)	10,202	23,665,216	0.43 (0.42 to 0.44)

Note: Table rows indicating totals show the number of nursing homes reporting for the given type of infection. This is not to be confused with the sum of the unit types for that infection, because there may be overlap of unit types reporting at any given facility.

\* Rate calculation = number of infections ÷ number of resident-days x 1,000

† SN/STR Unit = skilled nursing or short-term rehabilitation unit

‡ Vent Unit = ventilator-dependent unit

## Skin and Soft-Tissue Infections

Reports of device-associated skin and soft-tissue infections remained consistent from the 2011 rate of 0.01 per 1,000 resident-days to 0.01 in 2012 (see Tables 4 and 9). Total reports of skin and soft-tissue infections rose slightly from 0.21 per 1,000 resident-days in 2011 to 0.22 in 2012.

Authority resources for the prevention of infections and complications associated with skin and soft tissue are available at

<http://www.patientsafetyauthority.org/searchcenter/Pages/Results.aspx?k=skin>.

<b>Table 4. Skin and Soft-Tissue Infection Pooled Mean Rates, by Subcategory and Care Unit, 2012</b>			
<b>Unit Name (n)</b>	<b>No. of Infections</b>	<b>Resident-Days</b>	<b>Pooled Infection Rate* (95% CI)</b>
Vascular or Diabetic Ulcer (chronic/nonhealing)			
Dementia Unit (12)	13	1,983,393	0.01 (0.00 to 0.01)
Mixed Unit (46)	73	6,813,725	0.01 (0.01 to 0.01)
Nursing Unit (40)	63	6,970,843	0.01 (0.01 to 0.01)
SN/STR Unit† (42)	69	7,761,009	0.01 (0.01 to 0.01)
Vent Unit‡ (1)	1	136,246	0.01 (0.00 to 0.02)
<b>Total (130)</b>	<b>219</b>	<b>23,665,216</b>	<b>0.01 (0.01 to 0.01)</b>
Decubitus Ulcer (pressure-related)			
Dementia Unit (7)	9	1,983,393	0.00 (0.00 to 0.01)
Mixed Unit (55)	87	6,813,725	0.01 (0.01 to 0.02)
Nursing Unit (50)	76	6,970,843	0.01 (0.01 to 0.01)
SN/STR Unit (57)	109	7,761,009	0.01 (0.01 to 0.02)
Vent Unit (4)	4	136,246	0.03 (0.00 to 0.06)
<b>Total (160)</b>	<b>285</b>	<b>23,665,216</b>	<b>0.01 (0.01 to 0.01)</b>
Burn-Associated			
Dementia Unit (0)		1,983,393	0 (0 to 0)
Mixed Unit (1)	2	6,813,725	0 (0 to 0)
Nursing Unit (0)		6,970,843	0 (0 to 0)
SN/STR Unit (4)	4	7,761,009	0 (0 to 0)
Vent Unit (0)		136,246	0 (0 to 0)
<b>Total (5)</b>	<b>6</b>	<b>23,665,216</b>	<b>0 (0 to 0)</b>
Device-Associated			
Dementia Unit (1)	1	1,983,393	0 (0 to 0)
Mixed Unit (33)	49	6,813,725	0.01 (0.01 to 0.01)
Nursing Unit (20)	24	6,970,843	0 (0 to 0)
SN/STR Unit (38)	47	7,761,009	0.01 (0.00 to 0.01)
Vent Unit (1)	1	136,246	0.01 (0.01 to 0.02)
<b>Total (87)</b>	<b>122</b>	<b>23,665,216</b>	<b>0.01 (0.00 to 0.01)</b>

Unit Name (n)	No. of Infections	Resident-Days	Pooled Infection Rate (95% CI)
Cellulitis			
Dementia Unit (80)	183	1,983,393	0.09 (0.08 to 0.11)
Mixed Unit (139)	777	6,813,725	0.11 (0.11 to 0.12)
Nursing Unit (140)	731	6,970,843	0.10 (0.10 to 0.11)
SN/STR Unit (188)	861	7,761,009	0.11 (0.10 to 0.12)
Vent Unit (6)	15	136,246	0.11 (0.05 to 0.17)
Total (409)	2,567	23,665,216	0.11 (0.10 to 0.11)
Other			
Dementia Unit (54)	145	1,983,393	0.07 (0.06 to 0.09)
Mixed Unit (129)	625	6,813,725	0.09 (0.08 to 0.10)
Nursing Unit (133)	638	6,970,843	0.09 (0.08 to 0.10)
SN/STR Unit (140)	582	7,761,009	0.07 (0.07 to 0.08)
Vent Unit (8)	24	136,246	0.18 (0.11 to 0.25)
Total (371)	2,014	23,665,216	0.09 (0.08 to 0.09)
Total Skin and Soft-Tissue Infections			
Dementia Unit (99)	351	1,983,393	0.18 (0.16 to 0.20)
Mixed Unit (159)	1,613	6,813,725	0.24 (0.23 to 0.25)
Nursing Unit (167)	1,532	6,970,843	0.22 (0.21 to 0.23)
SN/STR Unit (222)	1,672	7,761,009	0.22 (0.21 to 0.23)
Vent Unit (9)	45	136,246	0.33 (0.23 to 0.43)
Total (471)	5,213	23,665,216	0.22 (0.21 to 0.23)

Note: Table rows indicating totals show the number of nursing homes reporting for the given type of infection. This is not to be confused with the sum of the unit types for that infection, because there may be overlap of unit types reporting at any given facility.

\* Rate calculation = number of infections ÷ number of resident-days x 1,000

† SN/STR Unit = skilled nursing or short-term rehabilitation unit

‡ Vent Unit = ventilator-dependent unit

## Gastrointestinal Tract Infections

The rate reported for total gastrointestinal tract infections increased slightly from 0.33 per 1,000 resident-days in 2011 to 0.37 in 2012; gastroenteritis not associated with *C. difficile* accounted for 73% of the total number of gastrointestinal infections (see Tables 5 and 10).

The Authority responded to the potential seasonal increase in gastrointestinal tract infections and norovirus by providing nursing homes with a pre-season electronic reminder of the Authority's prevention resources available at <http://www.patientsafetyauthority.org/searchcenter/Pages/Results.aspx?k=norovirus>.

Table 5. Gastrointestinal Infection Pooled Mean Rates, by Subcategory and Care Unit, 2012			
Unit Name (n)	No. of Infections	Resident-Days	Pooled Infection Rate* (95% CI)
Gastrointestinal Infections Reported with Associated <i>Clostridium difficile</i>			
Dementia Unit (50)	99	1,983,393	0.05 (0.04 to 0.06)
Mixed Unit (142)	672	6,813,725	0.10 (0.09 to 0.11)
Nursing Unit (128)	479	6,970,843	0.07 (0.06 to 0.07)
SN/STR Unit† (223)	1,049	7,761,009	0.14 (0.13 to 0.14)
Vent Unit‡ (12)	53	136,246	0.39 (0.28 to 0.49)
Total (424)	2,352	23,665,216	0.10 (0.10 to 0.10)
Gastrointestinal Infections Reported without Associated <i>C. difficile</i>			
Dementia Unit (80)	669	1,983,393	0.34 (0.31 to 0.36)
Mixed Unit (114)	2,060	6,813,725	0.30 (0.29 to 0.32)
Nursing Unit (110)	1,646	6,970,843	0.24 (0.22 to 0.25)
SN/STR Unit (161)	2,097	7,761,009	0.27 (0.26 to 0.28)
Vent Unit (4)	11	136,246	0.08 (0.03 to 0.13)
Total (335)	6,483	23,665,216	0.27 (0.27 to 0.28)
Total Gastrointestinal Infections Reported			
Dementia Unit (99)	768	1,983,393	0.39 (0.36 to 0.41)
Mixed Unit (168)	2,732	6,813,725	0.40 (0.39 to 0.42)
Nursing Unit (154)	2,125	6,970,843	0.30 (0.29 to 0.32)
SN/STR Unit (261)	3,146	7,761,009	0.41 (0.39 to 0.42)
Vent Unit (12)	64	136,246	0.47 (0.35 to 0.58)
Total (488)	8,835	23,665,216	0.37 (0.37 to 0.38)

Note: Table rows indicating totals show the number of nursing homes reporting for the given type of infection. This is not to be confused with the sum of the unit types for that infection, because there may be overlap of unit types reporting at any given facility.

\* Rate calculation = number of infections ÷ number of resident-days x 1,000

† SN/STR Unit = skilled nursing or short-term rehabilitation unit

‡ Vent Unit = ventilator-dependent unit

## Other Infections

Primary bloodstream infection reports demonstrate a consistently low rate since 2009, with a current rate of 0.01 per 1,000 resident-days (see Tables 6 and 11). Many of the infection types shown in Table 6 below have effective rates of zero.

Table 6. Pooled Mean Rates of Other Infections, by Subcategory and Care Unit, 2012			
Unit Name (n)	No. of Infections	Resident-Days	Pooled Infection Rate* (95% CI)
Intra-abdominal Infection (peritonitis/deep abscess)			
Dementia Unit (0)		1,983,393	0 (0 to 0)
Mixed Unit (9)	9	6,813,725	0 (0 to 0)
Nursing Unit (1)	1	6,970,843	0 (0 to 0)
SN/STR Unit <sup>†</sup> (3)	3	7,761,009	0 (0 to 0)
Vent Unit <sup>‡</sup> (0)		136,246	0 (0 to 0)
Total (12)	13	23,665,216	0 (0 to 0)
Meningitis			
Dementia Unit (0)		1,983,393	0 (0 to 0)
Mixed Unit (0)		6,813,725	0 (0 to 0)
Nursing Unit (0)		6,970,843	0 (0 to 0)
SN/STR Unit (0)		7,761,009	0 (0 to 0)
Vent Unit (0)		136,246	0 (0 to 0)
Total (0)	0	23,665,216	0 (0 to 0)
Viral Hepatitis			
Dementia Unit (0)		1,983,393	0 (0 to 0)
Mixed Unit (1)	1	6,813,725	0 (0 to 0)
Nursing Unit (1)	1	6,970,843	0 (0 to 0)
SN/STR Unit (1)	1	7,761,009	0 (0 to 0)
Vent Unit (0)		136,246	0 (0 to 0)
Total (3)	3	23,665,216	0 (0 to 0)
Osteomyelitis			
Dementia Unit (2)	2	1,983,393	0 (0 to 0)
Mixed Unit (16)	23	6,813,725	0 (0 to 0)
Nursing Unit (24)	32	6,970,843	0.00 (0.00 to 0.01)
SN/STR Unit (14)	19	7,761,009	0 (0 to 0)
Vent Unit (0)		136,246	0 (0 to 0)
Total (55)	76	23,665,216	0 (0 to 0)
Primary Bloodstream Infection			
Dementia Unit (2)	2	1,983,393	0 (0 to 0)
Mixed Unit (38)	60	6,813,725	0.01 (0.01 to 0.01)
Nursing Unit (28)	49	6,970,843	0.01 (0.01 to 0.01)
SN/STR Unit (42)	70	7,761,009	0.01 (0.01 to 0.01)
Vent Unit (7)	21	136,246	0.15 (0.09 to 0.22)
Total (106)	202	23,665,216	0.01 (0.01 to 0.01)

Unit Name (n)	No. of Infections	Resident-Days	Pooled Infection Rate (95% CI)
Total Other Infections Reported			
Dementia Unit (4)	4	1,983,393	0 (0 to 0)
Mixed Unit (58)	93	6,813,725	0.01 (0.01 to 0.02)
Nursing Unit (45)	83	6,970,843	0.01 (0.01 to 0.01)
SN/STR Unit (56)	93	7,761,009	0.01 (0.01 to 0.01)
Vent Unit (7)	21	136,246	0.15 (0.09 to 0.22)
Total (153)	294	23,665,216	0.01 (0.01 to 0.01)

*Note:* Table rows indicating totals show the number of nursing homes reporting for the given type of infection. This is not to be confused with the sum of the unit types for that infection, because there may be overlap of unit types reporting at any given facility.

\* Rate calculation = number of infections ÷ number of resident-days x 1,000

† SN/STR Unit = skilled nursing or short-term rehabilitation unit

‡ Vent Unit = ventilator-dependent unit

The summary tables below represent comparison data for each infection type by calendar year. The data is presented in this way to show the overall changes in rates over time. The trend-line graphic helps visualize rate performance data over time by care area, and combined totals for each infection type are provided. The majority of the infection rates for 2012 are <0.50 per 1,000 resident-days (catheter-days for CAUTI).

An area of particular interest is CAUTI, for which there is an upward trend in four of the five care areas in 2012. With CAUTI in particular, one must consider the DUR, which plateaued in three of the five care areas (dementia, mixed, and nursing), dropped in skilled nursing/short-term rehabilitation units, and is on the rise in the ventilator-dependent units but not higher than the previous plateau. When this situation exists, a few reported infections by any number of facilities may make it seem like the rate has risen sharply.

Another point of interest is that ventilator-dependent units seem to be experiencing an upward trend in the majority of reported infection types. This increase may be related to increasing acuity related to this constellation of patients, as acute care facilities are pushing for decreased length of stay and long-term ventilator-dependent units are increasingly able to care for more complex patients. Ventilator-dependent units may want to investigate delivery of bundled care and infection prevention initiatives that target these niche patients. Of particular note is the small number of ventilator-dependent units reporting.

For all infection types listed, additional data points are necessary to determine whether an actual rise or fall in overall infection rates constitutes a notable trend.

Table 7. Urinary Tract Infections, Pooled Mean Rates, by Subcategory and Care Unit, 2009-2012

Unit Name	2009*		2010		2011		2012		Trend
	No. of NHs Reporting	Pooled Infection Rate <sup>† ‡</sup> (95% CI)	No. of NHs Reporting	Pooled Infection Rate <sup>† ‡</sup> (95% CI)	No. of NHs Reporting	Pooled Infection Rate <sup>† ‡</sup> (95% CI)	No. of NHs Reporting	Pooled Infection Rate <sup>† ‡</sup> (95% CI)	
CAUTI—Resident with Indwelling Urinary Catheter									
Dementia Unit	NA	0.75 (0.31 to 1.20)	20	1.62 (1.07 to 2.16)	24	1.22 (0.83 to 1.61)	18	0.92 (0.57 to 1.26)	
Mixed Unit	NA	1.50 (1.33 to 1.67)	105	1.27 (1.14 to 1.40)	106	0.99 (0.89 to 1.09)	110	1.16 (1.04 to 1.28)	
Nursing Unit	NA	1.31 (1.14 to 1.47)	92	1.11 (0.99 to 1.23)	111	0.87 (0.77 to 0.97)	104	1.10 (0.98 to 1.22)	
SN/STR Unit**	NA	1.32 (1.18 to 1.46)	148	1.07 (0.97 to 1.17)	155	0.88 (0.79 to 0.96)	131	1.09 (0.99 to 1.19)	
Vent Unit <sup>††</sup>	NA	1.19 (0.68 to 1.70)	6	0.93 (0.60 to 1.26)	9	0.69 (0.44 to 0.94)	8	0.87 (0.55 to 1.18)	
Total	NA	1.35 (1.26 to 1.44)	484	1.15 (1.08 to 1.21)	339	0.91 (0.86 to 0.96)	329	1.10 (1.04 to 1.16)	
DUR—Device Utilization Rate Associated with Indwelling Urinary Catheter <sup>§</sup>									
Dementia Unit		0.01		0.01		0.01		0.01	
Mixed Unit		0.05		0.05		0.05		0.05	
Nursing Unit		0.04		0.04		0.04		0.04	
SN/STR Unit**		0.06		0.06		0.06		0.05	
Vent Unit <sup>††</sup>		0.26		0.26		0.23		0.25	
Total		0.05		0.05		0.05		0.05	
UTI—Resident without Indwelling Urinary Catheter									
Dementia Unit	NA	0.15 (0.13 to 0.17)	63	0.11 (0.10 to 0.13)	67	0.09 (0.08 to 0.10)	63	0.09 (0.08 to 0.10)	
Mixed Unit	NA	0.15 (0.14 to 0.17)	116	0.15 (0.14 to 0.16)	121	0.12 (0.11 to 0.12)	119	0.12 (0.11 to 0.13)	
Nursing Unit	NA	0.14 (0.13 to 0.15)	124	0.12 (0.11 to 0.12)	137	0.09 (0.08 to 0.1)	120	0.08 (0.07 to 0.09)	
SN/STR Unit**	NA	0.14 (0.13 to 0.15)	156	0.10 (0.09 to 0.11)	178	0.1 (0.09 to 0.1)	167	0.1 (0.09 to 0.11)	
Vent Unit <sup>††</sup>	NA	0.06 (0.00 to 0.12)	3	0.06 (0.02 to 0.11)	5	0.05 (0.02 to 0.08)	5	0.12 (0.07 to 0.18)	
Total	NA	0.14 (0.14 to 0.15)	353	0.12 (0.11 to 0.12)	394	0.1 (0.1 to 0.1)	361	0.1 (0.09 to 0.10)	

\*Infection data collection for nursing homes began in July 2009, as a result, rates given are based on 6 months of data collection and the number of nursing homes are not given because they are not equally comparable to subsequent years.

<sup>†</sup>UTI rate calculation: number of UTI ÷ number of resident days x 1000

<sup>‡</sup>CAUTI rate calculation: number of CAUTI ÷ number of catheter days x 1000

<sup>§</sup>Device utilization rate: number of urinary catheter days ÷ number of resident days

\*\*SN/STR Unit = Skilled Nursing/ Short-Term Rehabilitation Unit

<sup>††</sup>Vent Unit = Ventilator Dependent Unit

**Table 8. Respiratory Infections, Pooled Mean Rates, by Subcategory and Care Unit, 2009-2012**

Unit Name	2009*		2010		2011		2012		Trend
	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	
Lower Respiratory Tract Infection (pneumonia/ bronchitis/ tracheobronchitis) (LRTI)									
Dementia Unit	NA	0.38 (0.34 to 0.41)	117	0.36 (0.34 to 0.39)	130	0.35 (0.33 to 0.38)	121	0.34 (0.31 to 0.36)	
Mixed Unit	NA	0.48 (0.45 to 0.5)	171	0.48 (0.46 to 0.49)	199	0.49 (0.47 to 0.50)	169	0.48 (0.46 to 0.50)	
Nursing Unit	NA	0.45 (0.43 to 0.47)	169	0.44 (0.42 to 0.45)	200	0.39 (0.38 to 0.41)	174	0.39 (0.38 to 0.41)	
SN/STR Unit ‡	NA	0.44 (0.42 to 0.46)	234	0.42 (0.41 to 0.44)	272	0.43 (0.41 to 0.44)	240	0.42 (0.40 to 0.43)	
Vent Unit§	NA	0.79 (0.58 to 1.00)	7	0.60 (0.47 to 0.74)	12	0.43 (0.33 to 0.52)	10	0.93 (0.77 to 1.09)	
Total	NA	0.45 (0.44 to 0.46)	484	0.44 (0.43 to 0.45)	562	0.43 (0.42 to 0.44)	492	0.42 (0.42 to 0.43)	
Influenza-like Illness (ILI)									
Dementia Unit	NA	0.01 (0.00 to 0.01)	6	0.00 (0.00 to 0.01)	23	0.02 (0.01 to 0.03)	4	0.01 (0.00 to 0.01)	
Mixed Unit	NA	0.01 (0.00 to 0.01)	11	0.00 (0.00 to 0.00)	37	0.01 (0.01 to 0.02)	21	0.01 (0.01 to 0.01)	
Nursing Unit	NA	0.01 (0.00 to 0.01)	16	0.00 (0.00 to 0.00)	32	0.01 (0.01 to 0.01)	24	0.01 (0.00 to 0.01)	
SN/STR Unit ‡	NA	0.01 (0.00 to 0.01)	12	0.00 (0.00 to 0.00)	50	0.01 (0.01 to 0.02)	23	0.01 (0.00 to 0.01)	
Vent Unit§	NA	0.03 (0.00 to 0.07)	0	0.00 (0.00 to 0.00)	0	0.00 (0.00 to 0.00)	0	0.00 (0.00 to 0.00)	
Total	NA	0.01 (0.01 to 0.01)	42	0.00 (0.00 to 0.01)	121	0.01 (0.01 to 0.01)	65	0.01 (0.01 to 0.01)	
Total Respiratory Tract Infections									
Dementia Unit	NA	0.38 (0.35 to 0.42)	117	0.37 (0.34 to 0.39)	131	0.37 (0.35 to 0.40)	122	0.34 (0.32 to 0.37)	
Mixed Unit	NA	0.48 (0.46 to 0.50)	171	0.48 (0.46 to 0.50)	199	0.50 (0.48 to 0.52)	170	0.49 (0.47 to 0.5)	
Nursing Unit	NA	0.45 (0.43 to 0.47)	169	0.44 (0.42 to 0.45)	201	0.40 (0.39 to 0.42)	174	0.40 (0.39 to 0.41)	
SN/STR Unit ‡	NA	0.45 (0.43 to 0.47)	234	0.43 (0.41 to 0.44)	275	0.44 (0.43 to 0.46)	242	0.42 (0.41 to 0.44)	
Vent Unit§	NA	0.82 (0.60 to 1.03)	7	0.60 (0.47 to 0.74)	12	0.43 (0.33 to 0.52)	10	0.93 (0.77 to 1.09)	
Total	NA	0.46 (0.44 to 0.47)	484	0.44 (0.43 to 0.45)	565	0.44 (0.43 to 0.45)	494	0.43 (0.42 to 0.44)	

\*Infection data collection for nursing homes began in July 2009, as a result, rates given are based on 6 months of data collection and the number of nursing homes are not given because they are not equally comparable to subsequent years.

†Rate calculation: number of infections ÷ number of resident days x 1000

‡SN/STR Unit = Skilled Nursing/ Short-Term Rehabilitation Unit

§Vent Unit = Ventilator Dependent Unit

Table 9. Skin and Soft Tissue Infections, Pooled Mean Rates, by Subcategory and Care Unit, 2009-2012

Unit Name	2009*		2010		2011		2012		Trend
	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	
Vascular or Diabetic Ulcer (Chronic/Non-healing)									
Dementia Unit	NA	0.01 (0.00 - 0.01)	6	0.00 (0.00 - 0.01)	8	0.00 (0.00 - 0.01)	12	0.01 (0.00 - 0.01)	
Mixed Unit	NA	0.01 (0.01 - 0.02)	43	0.01 (0.01 - 0.02)	49	0.01 (0.01 - 0.02)	46	0.01 (0.01 - 0.01)	
Nursing Unit	NA	0.02 (0.01 - 0.02)	43	0.01 (0.01 - 0.01)	48	0.01 (0.01 - 0.01)	40	0.01 (0.01 - 0.01)	
SN/STR Unit ‡	NA	0.01 (0.01 - 0.02)	62	0.01 (0.01 - 0.01)	62	0.01 (0.01 - 0.01)	42	0.01 (0.01 - 0.01)	
Vent Unit§	NA	0.01 (0.00 - 0.04)	0	0 (0 - 0)	0	0 (0 - 0)	1	0.01 (0.00 - 0.02)	
Total	NA	0.01 (0.01 - 0.02)	142	0.01 (0.01 - 0.01)	155	0.01 (0.01 - 0.01)	130	0.01 (0.01 - 0.01)	
Decubitus Ulcer (Pressure-related)									
Dementia Unit	NA	0.01 (0.01 - 0.02)	14	0.01 (0 - 0.01)	16	0.01 (0.01 - 0.01)	7	0.00 (0.00 - 0.01)	
Mixed Unit	NA	0.02 (0.02 - 0.03)	63	0.02 (0.02 - 0.02)	71	0.01 (0.01 - 0.02)	55	0.01 (0.01 - 0.02)	
Nursing Unit	NA	0.02 (0.02 - 0.03)	48	0.01 (0.01 - 0.02)	53	0.01 (0.01 - 0.01)	50	0.01 (0.01 - 0.01)	
SN/STR Unit ‡	NA	0.02 (0.02 - 0.02)	71	0.02 (0.02 - 0.02)	75	0.01 (0.01 - 0.02)	57	0.01 (0.01 - 0.02)	
Vent Unit§	NA	0.01 (0.00 - 0.04)	2	0.02 (0.00 - 0.05)	1	0.03 (0.00 - 0.05)	4	0.03 (0.00 - 0.06)	
Total	NA	0.02 (0.02 - 0.02)	175	0.02 (0.01 - 0.02)	195	0.01 (0.01 - 0.01)	160	0.01 (0.01 - 0.01)	
Burn-associated									
Dementia Unit	NA	0 (0 - 0)	1	0 (0 - 0)	1	0 (0 - 0)	0	0 (0 - 0)	
Mixed Unit	NA	0 (0 - 0)	1	0 (0 - 0)	2	0 (0 - 0)	1	0 (0 - 0)	
Nursing Unit	NA	0 (0 - 0)	0	0 (0 - 0)	2	0 (0 - 0)	0	0 (0 - 0)	
SN/STR Unit ‡	NA	0 (0 - 0)	3	0 (0 - 0)	1	0 (0 - 0)	4	0 (0 - 0)	
Vent Unit§	NA	0 (0 - 0)	0	0 (0 - 0)	0	0 (0 - 0)	0	0 (0 - 0)	
Total	NA	0 (0 - 0)	5	0 (0 - 0)	6	0 (0 - 0)	5	0 (0 - 0)	
Device-associated									
Dementia Unit	NA	0.00 (0.00 - 0.01)	5	0.00 (0.00 - 0.01)	1	0.00 (0.00 - 0.01)	1	0 (0 - 0)	
Mixed Unit	NA	0.01 (0.01 - 0.01)	43	0.01 (0.01 - 0.01)	31	0.01 (0.01 - 0.02)	33	0.01 (0.01 - 0.01)	
Nursing Unit	NA	0.01 (0.00 - 0.01)	35	0.01 (0.00 - 0.01)	27	0.01 (0.01 - 0.01)	20	0 (0 - 0)	
SN/STR Unit ‡	NA	0.01 (0.01 - 0.01)	47	0.01 (0.01 - 0.01)	39	0.01 (0.01 - 0.01)	38	0.01 (0.00 - 0.01)	
Vent Unit§	NA	0.04 (0.00 - 0.09)	3	0.03 (0.00 - 0.06)	4	0 (0 - 0)	1	0.01 (0.01 - 0.02)	
Total	NA	0.01 (0.01 - 0.01)	104	0.01 (0.01 - 0.01)	98	0.01 (0.01 - 0.01)	87	0.01 (0.00 - 0.01)	
Cellulitis									
Dementia Unit	NA	0.12 (0.10 - 0.14)	77	0.11 (0.09 - 0.12)	87	0.09 (0.08 - 0.11)	80	0.09 (0.08 - 0.11)	
Mixed Unit	NA	0.14 (0.13 - 0.15)	133	0.13 (0.12 - 0.14)	157	0.12 (0.11 - 0.13)	139	0.11 (0.11 - 0.12)	
Nursing Unit	NA	0.13 (0.12 - 0.14)	140	0.11 (0.10 - 0.12)	159	0.08 (0.08 - 0.09)	140	0.10 (0.10 - 0.11)	
SN/STR Unit ‡	NA	0.13 (0.12 - 0.14)	186	0.11 (0.10 - 0.11)	204	0.09 (0.09 - 0.10)	188	0.11 (0.10 - 0.12)	
Vent Unit§	NA	0.15 (0.06 - 0.24)	4	0.10 (0.05 - 0.16)	8	0.12 (0.07 - 0.17)	6	0.11 (0.05 - 0.17)	
Total	NA	0.13 (0.13 - 0.14)	409	0.11 (0.11 - 0.12)	456	0.10 (0.09 - 0.10)	415	0.11 (0.10 - 0.11)	
Other									
Dementia Unit	NA	0.10 (0.08 - 0.12)	52	0.06 (0.05 - 0.07)	66	0.07 (0.06 - 0.08)	54	0.07 (0.06 - 0.09)	
Mixed Unit	NA	0.10 (0.09 - 0.11)	119	0.10 (0.09 - 0.10)	148	0.09 (0.08 - 0.09)	129	0.09 (0.08 - 0.10)	
Nursing Unit	NA	0.11 (0.10 - 0.12)	122	0.09 (0.08 - 0.09)	146	0.08 (0.08 - 0.09)	133	0.09 (0.08 - 0.10)	
SN/STR Unit ‡	NA	0.10 (0.09 - 0.10)	163	0.07 (0.07 - 0.08)	167	0.07 (0.06 - 0.07)	140	0.07 (0.07 - 0.08)	
Vent Unit§	NA	0.13 (0.05 - 0.22)	8	0.09 (0.04 - 0.14)	7	0.09 (0.05 - 0.13)	8	0.18 (0.11 - 0.25)	
Total	NA	0.10 (0.10 - 0.11)	361	0.08 (0.08 - 0.09)	417	0.08 (0.07 - 0.08)	371	0.09 (0.08 - 0.09)	
Total Skin and Soft Tissue Infections									
Dementia Unit	NA	0.24 (0.21 - 0.27)	155	0.19 (0.17 - 0.21)	110	0.18 (0.17 - 0.20)	99	0.18 (0.16 - 0.20)	
Mixed Unit	NA	0.29 (0.27 - 0.30)	402	0.27 (0.26 - 0.28)	183	0.25 (0.24 - 0.26)	159	0.24 (0.23 - 0.25)	
Nursing Unit	NA	0.28 (0.26 - 0.30)	388	0.22 (0.21 - 0.24)	190	0.20 (0.19 - 0.21)	167	0.22 (0.21 - 0.23)	
SN/STR Unit ‡	NA	0.27 (0.26 - 0.29)	532	0.22 (0.21 - 0.23)	256	0.20 (0.19 - 0.20)	222	0.22 (0.21 - 0.23)	
Vent Unit§	NA	0.35 (0.21 - 0.49)	17	0.25 (0.16 - 0.34)	10	0.23 (0.16 - 0.30)	9	0.33 (0.23 - 0.43)	
Total	NA	0.28 (0.27 - 0.29)	471	0.23 (0.23 - 0.24)	526	0.21 (0.20 - 0.22)	471	0.22 (0.21 - 0.23)	

\*Infection data collection for nursing homes began in July 2009, as a result, rates given are based on 6 months of data collection and the number of nursing homes are not given because they are not equally comparable to subsequent years.

†Rate calculation: number of infections ÷ number of resident days x 1000

‡SN/STR Unit = Skilled Nursing/ Short-Term Rehabilitation Unit

§Vent Unit = Ventilator Dependent Unit

Table 10. Gastrointestinal Infections, Pooled Mean Rates, by Subcategory and Care Unit, 2009-2012

Unit Name	2009*		2010		2011		2012		Trend
	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	No. of NHs Reporting	Pooled Infection Rate† (95% CI)	
Gastrointestinal Infections Reported with Associated Clostridium difficile									
Dementia Unit	NA	0.04 (0.02 - 0.05)	35	0.03 (0.02 - 0.04)	50	0.04 (0.03 - 0.05)	50	0.05 (0.04 - 0.06)	
Mixed Unit	NA	0.10 (0.09 - 0.11)	133	0.09 (0.09 - 0.10)	165	0.10 (0.09 - 0.11)	142	0.10 (0.09 - 0.11)	
Nursing Unit	NA	0.10 (0.09 - 0.11)	127	0.06 (0.06 - 0.07)	142	0.07 (0.07 - 0.08)	128	0.07 (0.06 - 0.07)	
SN/STR Unit ‡	NA	0.14 (0.13 - 0.15)	217	0.13 (0.12 - 0.14)	245	0.14 (0.14 - 0.15)	223	0.14 (0.13 - 0.14)	
Vent Unit§	NA	0.77 (0.56 - 0.98)	5	0.30 (0.21 - 0.40)	14	0.32 (0.23 - 0.40)	12	0.39 (0.28 - 0.49)	
Total	NA	0.11 (0.10 - 0.12)	412	0.09 (0.09 - 0.10)	472	0.10 (0.10 - 0.11)	424	0.1 (0.1 - 0.1)	
Gastrointestinal Infections Reported without Associated Clostridium difficile									
Dementia Unit	NA	0.16 (0.14 - 0.19)	77	0.35 (0.32 - 0.38)	92	0.30 (0.28 - 0.33)	80	0.34 (0.31 - 0.36)	
Mixed Unit	NA	0.10 (0.09 - 0.11)	102	0.29 (0.28 - 0.30)	135	0.28 (0.27 - 0.29)	114	0.30 (0.29 - 0.32)	
Nursing Unit	NA	0.09 (0.08 - 0.10)	107	0.25 (0.24 - 0.26)	134	0.22 (0.21 - 0.24)	110	0.24 (0.22 - 0.25)	
SN/STR Unit ‡	NA	0.10 (0.09 - 0.11)	158	0.30 (0.29 - 0.31)	175	0.27 (0.26 - 0.28)	161	0.27 (0.26 - 0.28)	
Vent Unit§	NA	0.06 (0.00 - 0.12)	1	0.03 (0.00 - 0.06)	5	0.06 (0.02 - 0.09)	4	0.08 (0.03 - 0.13)	
Total	NA	0.10 (0.10 - 0.11)	315	0.29 (0.28 - 0.29)	382	0.26 (0.26 - 0.27)	335	0.27 (0.27 - 0.28)	
Total Gastrointestinal Infections Reported									
Dementia Unit	NA	0.20 (0.17 - 0.22)	95	0.38 (0.35 - 0.41)	118	0.34 (0.32 - 0.36)	99	0.39 (0.36 - 0.41)	
Mixed Unit	NA	0.19 (0.18 - 0.21)	158	0.38 (0.37 - 0.40)	193	0.38 (0.36 - 0.39)	168	0.40 (0.39 - 0.42)	
Nursing Unit	NA	0.19 (0.18 - 0.20)	157	0.32 (0.30 - 0.33)	186	0.30 (0.28 - 0.31)	154	0.30 (0.29 - 0.32)	
SN/STR Unit ‡	NA	0.24 (0.23 - 0.26)	246	0.43 (0.42 - 0.45)	287	0.42 (0.40 - 0.43)	261	0.41 (0.39 - 0.42)	
Vent Unit§	NA	0.83 (0.62 - 1.05)	6	0.34 (0.24 - 0.44)	14	0.37 (0.28 - 0.46)	12	0.47 (0.35 - 0.58)	
Total	NA	0.21 (0.21 - 0.22)	471	0.38 (0.37 - 0.39)	552	0.36 (0.36 - 0.37)	488	0.37 (0.37 - 0.38)	

\*Infection data collection for nursing homes began in July 2009, as a result, rates given are based on 6 months of data collection and the number of nursing homes are not given because they are not equally comparable to subsequent years.

†Rate calculation: number of infections ÷ number of resident days x 1000

‡SN/STR Unit = Skilled Nursing/ Short-Term Rehabilitation Unit

§Vent Unit = Ventilator Dependent Unit

Table 11. Other Infections, Pooled Mean Rates, by Subcategory and Care Unit, 2009-2012

Unit Name	2009*		2010		2011		2012		Trend
	No. of NHs Reporting	Pooled Infection Rate <sup>†</sup> (95% CI)	No. of NHs Reporting	Pooled Infection Rate <sup>†</sup> (95% CI)	No. of NHs Reporting	Pooled Infection Rate <sup>†</sup> (95% CI)	No. of NHs Reporting	Pooled Infection Rate <sup>†</sup> (95% CI)	
Intra-abdominal infection (Peritonitis/deep abscess)									
Dementia Unit	NA	0 (0 - 0)	35	0 (0 - 0)	1	0 (0 - 0)	0	0 (0 - 0)	
Mixed Unit	NA	0 (0 - 0)	133	0 (0 - 0)	4	0 (0 - 0)	9	0 (0 - 0)	
Nursing Unit	NA	0 (0 - 0)	127	0 (0 - 0)	1	0 (0 - 0)	1	0 (0 - 0)	
SN/STR Unit <sup>‡</sup>	NA	0 (0 - 0)	217	0 (0 - 0)	2	0 (0 - 0)	3	0 (0 - 0)	
Vent Unit <sup>§</sup>	NA	0 (0 - 0)	5	0 (0 - 0)	1	0 (0 - 0)	0	0 (0 - 0)	
Total	NA	0 (0 - 0)	412	0 (0 - 0)	9	0 (0 - 0)	12	0 (0 - 0)	
Meningitis									
Dementia Unit	NA	0 (0 - 0)	77	0 (0 - 0)	0	0 (0 - 0)	0	0 (0 - 0)	
Mixed Unit	NA	0 (0 - 0)	102	0 (0 - 0)	0	0 (0 - 0)	0	0 (0 - 0)	
Nursing Unit	NA	0 (0 - 0)	107	0 (0 - 0)	0	0 (0 - 0)	0	0 (0 - 0)	
SN/STR Unit <sup>‡</sup>	NA	0 (0 - 0)	158	0 (0 - 0)	0	0 (0 - 0)	0	0 (0 - 0)	
Vent Unit <sup>§</sup>	NA	0 (0 - 0)	1	0 (0 - 0)	0	0 (0 - 0)	0	0 (0 - 0)	
Total	NA	0 (0 - 0)	315	0 (0 - 0)	0	0 (0 - 0)	0	0 (0 - 0)	
Viral hepatitis									
Dementia Unit	NA	0 (0 - 0)	95	0 (0 - 0)	1	0 (0 - 0)	0	0 (0 - 0)	
Mixed Unit	NA	0 (0 - 0)	158	0 (0 - 0)	0	0 (0 - 0)	1	0 (0 - 0)	
Nursing Unit	NA	0 (0 - 0)	157	0 (0 - 0)	0	0 (0 - 0)	1	0 (0 - 0)	
SN/STR Unit <sup>‡</sup>	NA	0 (0 - 0)	246	0 (0 - 0)	1	0 (0 - 0)	1	0 (0 - 0)	
Vent Unit <sup>§</sup>	NA	0 (0 - 0)	6	0 (0 - 0)	0	0 (0 - 0)	0	0 (0 - 0)	
Total	NA	0 (0 - 0)	471	0 (0 - 0)	2	0 (0 - 0)	3	0 (0 - 0)	
Osteomyelitis									
Dementia Unit	NA	0 (0 - 0)	35	0 (0 - 0)	4	0 (0 - 0)	2	0 (0 - 0)	
Mixed Unit	NA	0 (0 - 0)	133	0 (0 - 0)	17	0 (0 - 0)	16	0 (0 - 0)	
Nursing Unit	NA	0 (0 - 0)	127	0 (0 - 0)	21	0.00 (0.00 - 0.01)	24	0.00 (0.00 - 0.01)	
SN/STR Unit <sup>‡</sup>	NA	0.01 (0.00 - 0.01)	217	0.00 (0.00 - 0.01)	24	0 (0 - 0)	14	0 (0 - 0)	
Vent Unit <sup>§</sup>	NA	0.01 (0.00 - 0.04)	5	0 (0 - 0)	1	0 (0 - 0)	0	0 (0 - 0)	
Total	NA	0 (0 - 0.01)	412	0 (0 - 0)	63	0 (0 - 0)	55	0 (0 - 0)	
Primary bloodstream infection									
Dementia Unit	NA	0 (0 - 0)	77	0 (0 - 0)	7	0 (0 - 0)	2	0 (0 - 0)	
Mixed Unit	NA	0.01 (0.01 - 0.02)	102	0.01 (0.01 - 0.02)	38	0.01 (0.01 - 0.01)	38	0.01 (0.01 - 0.01)	
Nursing Unit	NA	0.01 (0.01 - 0.01)	107	0.01 (0.01 - 0.01)	23	0.01 (0.00 - 0.01)	28	0.01 (0.01 - 0.01)	
SN/STR Unit <sup>‡</sup>	NA	0.02 (0.02 - 0.02)	158	0.01 (0.01 - 0.02)	52	0.01 (0.01 - 0.01)	42	0.01 (0.01 - 0.01)	
Vent Unit <sup>§</sup>	NA	0.22 (0.11 - 0.33)	1	0.07 (0.03 - 0.12)	9	0.12 (0.07 - 0.17)	7	0.15 (0.09 - 0.22)	
Total	NA	0.01 (0.01 - 0.02)	315	0.01 (0.01 - 0.01)	121	0.01 (0.01 - 0.01)	106	0.01 (0.01 - 0.01)	
Total Other Infections Reported									
Dementia Unit	NA	0 (0 - 0)	95	0 (0 - 0)	13	0 (0 - 0)	4	0 (0 - 0)	
Mixed Unit	NA	0.02 (0.01 - 0.02)	158	0.02 (0.01 - 0.02)	48	0.01 (0.01 - 0.01)	58	0.01 (0.01 - 0.02)	
Nursing Unit	NA	0.02 (0.01 - 0.02)	157	0.02 (0.01 - 0.02)	42	0.01 (0.01 - 0.01)	45	0.01 (0.01 - 0.01)	
SN/STR Unit <sup>‡</sup>	NA	0.03 (0.02 - 0.03)	246	0.02 (0.01 - 0.02)	69	0.01 (0.01 - 0.01)	56	0.01 (0.01 - 0.01)	
Vent Unit <sup>§</sup>	NA	0.23 (0.12 - 0.35)	6	0.07 (0.03 - 0.12)	10	0.12 (0.07 - 0.17)	7	0.15 (0.09 - 0.22)	
Total	NA	0.02 (0.02 - 0.02)	471	0.02 (0.01 - 0.02)	170	0.01 (0.01 - 0.01)	153	0.01 (0.01 - 0.01)	

\*Infection data collection for nursing homes began in July 2009, as a result, rates given are based on 6 months of data collection and the number of nursing homes are not given because they are not equally comparable to subsequent years.

†Rate calculation: number of infections ÷ number of resident days x 1000

‡SN/STR Unit = Skilled Nursing/ Short-Term Rehabilitation Unit

§Vent Unit = Ventilator Dependent Unit

## Providing a Business Case for Infection Prevention

In order to enhance infection prevention activities at the long-term care facility level, the Authority notes the importance of making a business case for infection prevention. As shown in Table 12, a modest 5% reduction in verified 2012 infections by type could potentially save Pennsylvania long-term care facilities \$611,096.70 collectively.

Using the figures presented in Table 12, frontline infection preventionists and designees are able to calculate the savings attributable to current or future infection prevention activities.

The figures used for comparison were chosen as a best fit for the types of infections that are reported to the Authority through PA-PSRS. The figures given are meant to serve as a guide for financial projections and are not absolute.

Authority resources for making a business case for infection prevention are available at [http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2010/Sep7\(3\)/Pages/102.aspx](http://www.patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2010/Sep7(3)/Pages/102.aspx).

Table 12. Potential Cost Savings Based on a 5% Reduction in Verified 2012 Long-Term Care Infections

Infection Type	Mean HAI Cost 1999 US dollars*	HAI Cost 2012 CPI Adjusted US Dollars	Number of Infections 2012	5% Reduction	Δ +/- Infections	Cost Savings (Δ +/- Infections X 2012 Dollars)
<b>CAUTI (UTI)</b>	186	256	1217	1156	-61	15,577.60
<b>UTI</b>	186	256	1543	1466	-77	19,750.40
<b>LRTI (Pneumonia)</b>	575	792	10047	9545	-502	397,861.20
<b>ILI (URI)</b>	229	315	155	147	-8	2,441.25
<b>SST</b>	131	180	5213	4952	-261	46,917.00
<b>GI</b>	211	291	8835	8393	-442	128,549.25
<b>Total</b>			27010	25660	-1351	611,096.70

\* Source: Alessi CA, Ouslander JG, Maldague S, et al. Incidence and costs of acute medical conditions in long-stay incontinent nursing home residents. *J Am Med Dir Assoc* 2003 Mar-Apr;4(2 Suppl):S4-18.



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