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P A T I E N T
S A F E T Y
A U T H O R I T Y

Surgical Site Infection Prevention Utilizing Patient Screening and Decolonization: The PA-HEN SSI Prevention Collaboration

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Patient Safety Authority Background

Act 13 of 2002 (Chapters 3 and 4 of MCARE)

- 11-member Board appointed by the Governor and General Assembly
- Independent Agency
- Non-regulatory
- Dedicated Funding Stream
- Contract with outside entity to collect, analyze and evaluate reports of Serious Events and Incidents and identify trends
- Advise and issue recommendations for changes and improvements in healthcare practices (Advisories)
- Focused education, collaboration, and guidance



Authority Activities

- The Pennsylvania Patient Safety Authority (Authority) improves patient safety through data analysis and collaboration.
- In December 2013, the number of Serious Events and Incidents reached over two million events.
- Our aggregate data shows a 12 percent decline of Serious Event reports (2008-2013).
- Efforts to improve patient safety continues through collaborations with The Hospital and Healthsystem Association of Pennsylvania (HAP) and with other organizations through local, state, and federal programs.



Targeting Focus Areas

Table 1. Prevalence Analysis of Pennsylvania National Healthcare Safety Network 2010 Data for Selected Procedures

PROCEDURE	NO. OF INFECTIONS	NO. OF CLEAN WOUNDS*	NO. OF MRSA [†] (% OF TOTAL INFECTIONS)	NO. OF MSSA [‡] (% OF TOTAL INFECTIONS)
Breast surgery	156	90	26 (16.7)	55 (35.3)
Hip prosthesis	321	313	83 (25.9)	88 (27.4)
Knee prosthesis	345	341	55 (15.9)	92 (26.7)
Laminectomy	193	155	31 (16.1)	86 (44.6)
Limb amputation	70	21	16 (22.9)	12 (17.1)
Open reduction of fracture	299	165	67 (22.4)	78 (26.1)
Pacemaker surgery	93	53	25 (26.9)	32 (34.4)
Spinal fusion	370	295	69 (18.6)	143 (38.6)

* Wounds classified as “clean” according to the National Healthcare Safety Network definition

† Methicillin-resistant *Staphylococcus aureus*

‡ Methicillin-susceptible *Staphylococcus aureus*

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Screening and Decolonization: Overview

- Preoperative screening of the elective surgical patient is to be performed via the anterior nares for the presence of MRSA and MSSA.
- Patients are to bathe daily with 4% chlorhexidine gluconate (CHG) or 2% cloths the night before and the morning of the day of surgery.
- Patients who screened positive for MSSA or MRSA will apply mupirocin 2% nasal two times a day for five days before surgery.
- Patients are to receive a day-of-surgery cleansing of the surgical site with 4% CHG applied by a healthcare worker or 2% cloths.
- Patients are to receive prepping of the surgical site in the operating room suite with an alcohol-based product designated as a surgical skin preparation.



Office Visit

- If the planned procedure is one of the procedures that is eligible for the decolonization intervention (elective/nonemergent):
- Patient education is to be provided related to screening and the intervention (verbally).
- The patient is to be screened for *S. aureus* if there is no preadmission testing policy.
- Written patient educational materials are provided to the patient.
- Preadmission (preoperative) appointment is optimally scheduled at least seven days before surgery.



Preadmission/Preoperative Visit Scheduled at Least Seven Days Prior to Surgery

- The patient is to be informed by phone of the screening result.
- Education, both written and verbal, is to be provided related to the screening result.
- The patient is then assigned to a decolonization protocol.
- Written and verbal education is provided related to the protocol, data collection, and expectations.



Preadmission/Preoperative Visit

- Prescriptions and any other materials are then provided or called into the pharmacy for the patient.
- If MRSA-positive, ensure staff consults with infection prevention.
- The patient has the overall responsibility to comply with the protocol assigned to him or her based on the screening result.
- The patient will have access to a professional if questions arise or if there are concerns related to the decolonization process.



Preadmission/Preoperative Visit

- The patient needs to have access to the decolonization supplies.
- Either prescriptions or supplies are provided by the facility.
- The patient should be informed of the importance of compliance and documentation of compliance using the provided forms.
- If the patient is unable to comply for any reason, staff may consult with family or other services.



Acute Care

- During patient admission, patient compliance data forms are collected and forwarded to the appropriate department by the healthcare worker.
- Application of infection control measures by staff may be considered as per facility policy (for example, contact precautions).
- Day-of-surgery preoperative CHG wipe of surgical site is done by the healthcare worker.
- Screening results are communicated to operating room staff.



Operating Room

- Application of infection control measures is to be implemented by staff as per facility policy (e.g., contact precautions).
- Operating room decolonization checklist is then completed by healthcare staff.
- Completed decolonization checklist is forwarded to the appropriate department.
- Patient's surgical site is prepped in the surgical suite with alcohol-based surgical skin prep by the operating room team.
- Immediate preoperative incision site skin prep is allowed to dry prior to procedure start.



Results

Table 2. Pennsylvania Hospital Engagement Network Immersion Group SIRs by National Healthcare Safety Network Surgical Procedure Code, by Year

PROCEDURE CODE	2010			2011			2012			2013			SIR TREND LINE
	# Proc	# Inf	SIR	# Proc	# Inf	SIR	# Proc	# Inf	SIR	# Proc	# Inf	SIR	
CARD	2,610	9	1.010	2,454	9	1.081	2,740	10	1.104	2,814	6	0.640	
CBGB	1,963	21	0.887	1,789	16	0.729	1,737	20	0.960	1,713	17	0.837	
CBGC	280	2	0.559	248	2	0.639	303	2	0.525	273	2	0.577	
COLO	677	43	2.069	769	41	1.747	3,117	55	0.605	3,273	74	0.729	
CSEC	284	3	1.796	399	7	2.896	4,326	13	0.593	4,273	18	0.800	
HER	95	15	9.836	100	21	13.444	676	11	1.401	592	16	1.919	
HPRO	5,587	58	1.143	5,889	53	0.983	5,903	54	1.023	5,765	34	0.664	
HYST	3,756	24	0.828	3,365	30	1.143	3,304	20	0.731	3,047	20	0.775	
KPRO	10,169	65	1.000	10,579	45	0.677	10,972	48	0.688	10,351	28	0.432	
LAM	716	19	5.001	556	13	4.206	1,192	10	1.504	1,502	14	1.743	
PACE	76	7	46.053	110	9	40.909	80	5	31.250	86	3	17.442	
Total	26,213	266	1.274	26,258	246	1.167	34,350	248	0.797	33,689	232	0.735	

Note: # Proc = number of procedures; # Inf = number of infections; SIR = standardized infection ratio; CARD = cardiac surgery; CBGB = coronary artery bypass graft with both chest and donor site incisions; CBGC = coronary artery bypass graft with chest incision only; COLO = colon surgery; CSEC = cesarean section; HER = herniorrhaphy; HPRO = hip prosthesis; HYST = abdominal hysterectomy; KPRO = knee prosthesis; LAM = laminectomy; PACE = pacemaker surgery

Results

- Baseline SIR aggregates in 2010 and 2011 were 1.274 and 1.167, respectively, and the SIR aggregates postintervention in 2012 and 2013 were 0.797 and 0.735, respectively.
- The greatest reductions in SIR from baseline to the end of 2013 were in the following procedure categories: colon, cesarean section, hip replacement, knee replacement, and laminectomy (NHSN procedure codes COLO, CSEC, HPRO, KPRO, and LAM, respectively).



Results

- Reductions were also noted in HPRO and KPRO despite the fact that the majority of the orthopedic literature supports screening and decolonization.
- This intervention in most cases stretched out the decolonization process and may warrant further investigation, as it seems that (at least in this study) orthopedic replacement SIRs are able to be reduced.



Article Link / Reference

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