CDC's Role in Infection Surveillance and Partnership with the ASC Quality Collaboration on Quality Measurement

Infection Prevention Strategies for Ambulatory Surgery Centers:
Excellentia Advisory Group Annual Conference
Red Rock Casino Resort and Spa
Las Vegas, NV
October 6, 2016

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion

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Daniel Pollock is a medical epidemiologist at the Centers for Disease Control and Prevention (CDC). He joined CDC in 1984 and has worked in the agency's infectious diseases, informatics, injury prevention and control, and environmental health programs. In 2004 he moved to his current position as chief of the branch at CDC that is responsible for national surveillance of healthcare-associated infections and antimicrobial use and resistance. Dr. Pollock's clinical background is in internal medicine and emergency medicine. He served as a Clinical Associate Professor of Emergency Medicine in Emory University's Department of Emergency Medicine and worked part-time as an emergency physician at Grady Memorial Hospital in Atlanta from 1986 through 2007.

Objectives

- Provide some context-setting observations about CDC and the priority the agency places on combatting healthcare-associated infections and antimicrobial resistance
- Describe CDC's National Healthcare Safety Network (NHSN) and plans for increasing NHSN's surveillance coverage of ambulatory surgery centers (ASCs)
- Present and discuss the ASC Quality Collaboration – CDC breast procedure surgical site infection (SSI) measure with an overview of the measure and its intended uses
- Describe current and future ASC SSI practice
- Review the CDC's SSI definitions

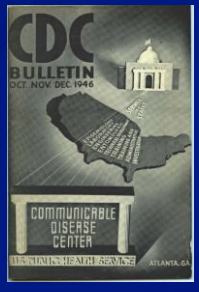
CDC Turned 70 on July 1, 2016 – The Communicable Disease Center Succeeded the Federal Office of Malaria Control in the War Areas (MCWA)

MCWA had worked to control malaria around military bases in the South during WWII

CDC first occupied the old MCWA offices in downtown Atlanta

Post-World War II Malaria Control: CDC and States Join Forces on National Surveillance

- CDC's first post-war mission was to spearhead a large-scale campaign to eradicate malaria
- CDC and States launched national surveillance in 1950, several years after the eradication program began
- Data revealed that malaria had quietly disappeared prior to eradication efforts but then spiked in 1951-52 among returning Korean War veterans
- Malaria experience was the impetus for national surveillance of polio (1955), influenza (1957), and then dozens of other diseases



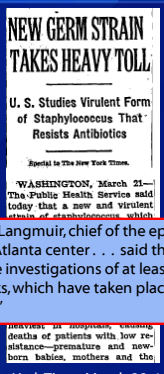
CDC's Initial Foray into Healthcare-Associated Infection Surveillance: Outbreaks of Antibiotic Resistant Staphylococci in 1957-58


DEATH FROM THE HOSPITAL NURSERY

"A new, virulent organism, breeding in nurseries for the newborn, is rocking the medical world. Babies, tragically lacking in resistance to the disease, are its chief victims. Many infants are also carriers, infecting mothers, other adults"

Ladies' Home Journal, February 1959, pages 60-61, 178-80

Langmuir



NEW GERM STRAIN TAKES HEAVY TOLL

U. S. Studies Virulent Form of Staphylococcus That Resists Antibiotics

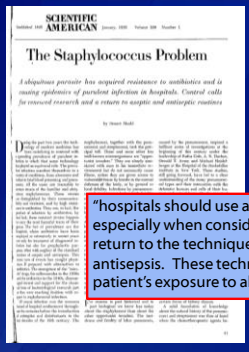
Special to The New York Times.

WASHINGTON, March 21— The Public Health Service said today that a new and virulent strain of staphylococcus, which

...nervient in hospitals, causing deaths of patients with low resistance—premature and newborn babies, mothers and the

"Dr. Alexander Langmuir, chief of the epidemiological branch of the Atlanta center . . . said the center had made intensive investigations of at least a dozen of these outbreaks, which have taken place in all parts of the country."

The New York Times March 22, 1958



SCIENTIFIC AMERICAN

The Staphylococcus Problem

A ubiquitous parasite has acquired resistance to antibiotics and is causing epidemics of purulent infection in hospitals. Control calls for renewed research and a return to aseptic and antiseptic routines

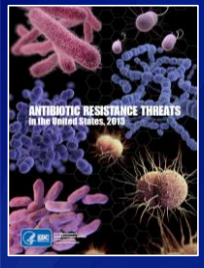
by Stuart Mudd

Stuart Mudd

"hospitals should use antibiotics with greater discrimination, especially when considered for prophylactic purposes, and return to the techniques of strict asepsis and vigorous antisepsis. These techniques are designed to minimize a patient's exposure to all microorganisms."

Scientific American 1959:200:41-45

CDC Report: On the Brink of the Post-Antibiotic Era



- Each year, at least 2 million people in the U.S. are infected with antibiotic resistant bacteria
- Core responses:
  - Prevent infections from occurring
  - Prevent resistant infections from spreading
  - Track resistant bacteria
  - Improve antibiotic use
  - Promote new antibiotic development and new diagnostic tests for resistant bacteria

http://www.cdc.gov/drugresistance/pdf/ar-threats-2013-508.pdf

CDC's National Healthcare Safety Network (NHSN) – A Surveillance System With Multiple Users and Uses

Healthcare facilities: (1) Join NHSN, (2) complete an annual survey of their care capacities, (3) submit process and outcome data manually or electronically to one or more NHSN components, and (4) use their own data and NHSN benchmarks for analysis and action

- Patient Safety Component
- Healthcare Worker Safety Component
- Dialysis Component
- Blood Safety Component
- Long Term Care Component
- Outpatient Procedure Component (Planned)
- Neonatal Component (Planned)

CDC: Collects, analyzes, summarizes, and provides data on healthcare associated infections (HAIs), other adverse healthcare events, antimicrobial use and resistance, adherence to prevention practices, and use of antimicrobial stewardship programs

Surveillance Priorities for Ambulatory Surgery Centers

- Monitor adherence to clinical practice guidelines for infection control and antimicrobial use
- Track incidence of surgical site infections and other adverse healthcare outcomes
- Enable use of surveillance data for:
  - Measuring clinical quality and benchmarking performance
  - Exerting positive changes in patient care practices
  - Public reporting and other accountability purposes
- Minimize reporting burden for ASCs while assuring data are validated, credible, and actionable

A Healthcare Surveillance System That Serves Multiple Uses and Users

- Participation in NHSN has increased from ~300 hospitals when the system was launched (2005) to ~19,000 healthcare facilities (2016). CDC analyzes data and reports aggregate results.
- Since 2011, the Centers for Medicare and Medicaid Services (CMS) has added 8 HAI measures reported via NHSN to its quality measurement reporting programs
- Beginning with Vermont in 2006, 34 states and Washington, DC, have required healthcare facilities in their jurisdictions to report to NHSN, including 6 states that require ASCs to report surgical site infection (SSI) data
- Facilities use NHSN's tools to analyze their own data, compare with national benchmarks, and target prevention efforts

Collaborative Activities in ASC Surveillance: An Ongoing Project

- Builds on complementary missions of the ASC QC and CDC in healthcare quality and patient safety
- Draws upon distinct areas of national leadership and expertise at each organization and combines them in ways that can yield benefits that surpass solo initiatives
- Initiated in 2013 with joint work on a new Outpatient Procedure component for NHSN
- Gathered momentum in 2014 -16 with collaborative development of an Ambulatory Breast Procedure Surgical Site Infection (SSI) measure

NHSN's Outpatient Procedure Component

- Scheduled for launch as part of NHSN's annual release in December 2017 or January 2018
- Initial participation will be limited to ASCs; plans call for hospital outpatient departments (HOPDs) to be added in the future
- Initial scope of surveillance options: (1) timing of antibiotic prophylaxis on the day of the operative procedure, (2) same day adverse events, and (3) post-procedure SSIs
- Same day adverse event surveillance:
  - Patient burn
  - Patient fall
  - Wrong site, wrong side, wrong patient, wrong procedure, wrong implant
  - Hospital transfer or hospital admission

NHSN Outpatient Procedure Component – Initial SSI Surveillance Options

- ☐ Breast procedures
- ☐ Colon surgeries
- ☐ Gallbladder surgeries
- ☐ Hip arthroplasties
- ☐ Herniorrhaphies
- ☐ Hysterectomies
- ☐ Knee arthroplasties
- ☐ Laminectomies
- ☐ Open reduction of fractures

Ambulatory Breast Procedure SSI Measure – Collaborative Development

- CDC and the ASC QC developed the measure specifications and worked with the Colorado Department of Public Health and Environment (CDPHE) to field test the measure
- Breast procedures chosen because they are the highest volume and highest SSI risk among all ASC surgical procedures reported to NHSN
- NHSN's breast procedure and SSI definitions used to specify data collection requirements, and NHSN's analytic methods used for risk adjustment and statistical summarization
- ASC QC tested measure validity and feasibility via a questionnaire administered to ASC nurses and surgeons
- CDPHE tested measure reliability via a record review of breast procedures and SSIs reported by Colorado ASCs to NHSN

Ambulatory Breast Procedure SSI Measure - Specifications

Numerator – SSIs during the 30-day (superficial SSI) and 90-day (deep and organ/space SSI) postoperative periods following breast procedures in ASCs

Denominator – All procedures among patients 18 – 108 years that qualify as an NHSN breast procedure, as defined by CPT codes

Statistical summarization – Ratio of observed to predicted SSIs, i.e., Standardized Infection Ratio (SIR)

Predictive model – Multivariable logistic regression model using all breast procedures that ASCs reported to NHSN from 2010 – 2014 (N = 37,673) leading to a final model in which patient age and ASA score are the predictors

Ambulatory Breast Procedure SSI Measure – Measure Testing Results

Validity – ASC QC questionnaire responses (11 respondents)
9/11 agree with conceptual validity of the measure
8/11 agree that measure accurately reflects performance

Reliability – CDPHE record review (715 records; 5 SSIs)
No under-reported SSIs
1 over-reported SSI

Predictive model performance – CDC statistical analysis
Model discrimination – C-index = 0.675
Model calibration – Hosmer-Lemeshow p = 0.6626

Ambulatory Breast Procedure SSI Measure – Initial, Intended Uses

- [x] Public health/disease surveillance
- [x] Quality improvement (internal to the specific organization)
- [x] Quality improvement (external benchmarking involving multiple organizations)
- [x] Public reporting
- [ ] Payment program
- [ ] Regulatory and accreditation programs
- [ ] Professional certification or recognition program

Ambulatory Breast Procedure SSI Measure – Current Status

NQF - Measure proposal submitted in May 2016 to the National Quality Forum (NQF) for endorsement consideration. NQF's Patient Safety Committee reviewed the measure specifications in July 2016 and unanimously recommended NQF endorsement.

HHS - Measure specifications submitted in June 2016 to the U.S. Department of Health and Human Services' Measures Under Consideration (MUC) Project

Donna Slosburg, RN, BSN, LHRM, CASC

Executive Director

ASC Quality Collaboration

As executive director of the ASC Quality Collaboration, Donna Slosburg, RN, helps ASCs improve healthcare quality and safety by developing standardized quality measures, publically reporting quality data and assembling tools for infection prevention. The ASC QC recently introduced a campaign providing ASCs with assessment tools, implementation aids, training materials, monitoring tools and workplace reminders designed to help prevent infection.

Ms. Slosburg is active in fostering a positive relationship between the ASC industry and the federal government. She said in a news release from the ASC QC, "As ASCs provide exceptionally high quality and value to Medicare beneficiaries as well as to the Medicare program, the ASC Quality Collaboration looks forward to working in close partnership with CMS to implement quality measurement that leads to improved patient care in all outpatient surgical settings."

Ms. Slosburg has worked in the healthcare industry for over 30 years and joined the ASC industry in 1987. As a leader in the ASC industry, she has served as a nurse manager, administrator and regional operations coordinator, as well as a senior vice president of surgery operations and national surgery specialist for HealthSouth, one of the nation's largest healthcare services providers.

SURGICAL SITE INFECTION SURVEILLANCE AND REPORTING IN AMBULATORY SURGERY CENTERS

CMS Conditions for Coverage Interpretive Guidelines Appendix L

- **§416.51 Condition: Infection Control**
  "The ASC must maintain an infection control program that seeks to minimize infections and communicable diseases."
- **§416.51(b) Standard: Infection control program.**
  "The ASC must maintain an ongoing program designed to prevent, control, and investigate infections and communicable diseases…."
  Identifying Infections
  "The ASC must conduct monitoring activities throughout the entire facility in order to identify infection risks or communicable disease problems. The ASC should document its monitoring/tracking activities, including the measures selected for monitoring, and collection and analysis methods. Activities should be conducted in accordance with recognized infection control surveillance practices, such as, for example, those utilized by the CDC's National Healthcare Safety Net (NHSN). Monitoring includes follow-up of patients after discharge, in order to gather evidence of whether they have developed an infection associated with their stay in the ASC. "

Collection of Surgical Site Infection Data Currently Practiced in ASCs

- ASCs monitor SSI through post discharge surveillance
- SSI data is typically collected through
  - Physician surveys by mail
  - Patient surveys by mail or telephone

Collection of Surgical Site Infection Data Currently Practiced in ASCs

- Collect SSI data by physician
  - Send list of patients to each physician for that month
  - Send January list out on the 5th of February
  - 30 days has not passed for patients who had procedures on the 30th of the month
- Resend data to non responding physicians
- Take total number of admissions
- Divide by number of SSIs

Surgical Site Infection (SSI) Surveillance National Healthcare Safety Network (NHSN) Requirements

- Implants are no longer followed for one year
- 30 Day surveillance requirement procedure specific and are followed for superficial, deep, and organ/space SSIs
- 90 Day surveillance requirement procedure specific and are followed for deep incisional or organ/space

Current NHSN Requirements

Table 2 of the NHSN, SSI Event chapter, Jan 2016 version at http://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf

30-day Surveillance

Code	Operative Procedure
AAA	Abdominal aortic aneurysm repair
AMP	Limb amputation
APPY	Appendix surgery
AVSD	Shunt for dialysis
BILI	Bile duct, liver or pancreatic surgery
CEA	Carotid endarterectomy
CHOL	Gallbladder surgery
COLO	Colon surgery
CSEC	Cesarean section
GAST	Gastric surgery
HTP	Heart transplant
HYST	Abdominal hysterectomy
KTP	Kidney transplant

Current NHSN Requirements

Table 2 of the NHSN, SSI Event chapter, Jan 2016 version at http://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf

30-day Surveillance

Code	Operative Procedure
LAM	Laminectomy
LTP	Liver transplant
NECK	Neck surgery
NEPH	Kidney surgery
OVRY	Ovarian surgery
PRST	Prostate surgery
REC	Rectal surgery
SB	Small bowel surgery
SPLE	Spleen surgery
THOR	Thoracic surgery
THYR	Thyroid and/or parathyroid surgery
VHYS	Vaginal hysterectomy
XLAP	Exploratory Laparotomy

Current NHSN Requirements

Table 2 of the NHSN, SSI Event chapter, Jan 2016 version at http://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf

90-day Surveillance

Code	Operative Procedure
BRST	Breast surgery
CARD	Cardiac surgery
CBGB	Coronary artery bypass graft w/ both chest & donor site incisions
CBGC	Coronary artery bypass graft with chest incision only
CRAN	Craniotomy
FUSN	Spinal fusion
FX	Open reduction of fracture
HER	Herniorrhaphy
HPRO	Hip prosthesis
KPRO	Knee prosthesis
PACE	Pacemaker surgery
PVBY	Peripheral vascular bypass surgery
VSHN	Ventricular shunt

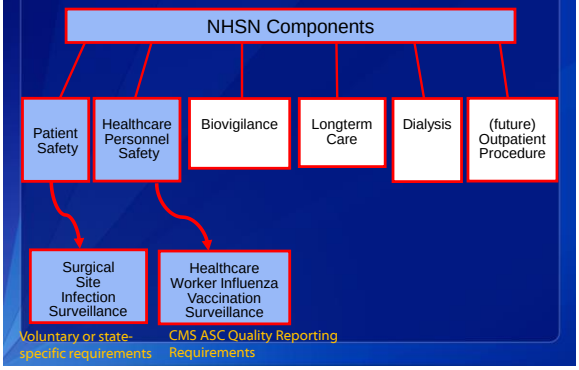
Collection of Surgical Site Infection Data in NHSN

- Collect SSI data by physician
  - Send list of patients to each physician for that month
  - For January send list out on the 1st of March
  - This allows 30 days to pass for patients who had procedures on the 30th of the previous month
- Resend data to non responding physicians
- Take total number of procedures for the SSI
- Divide by number of SSIs

CDC's National Healthcare Safety Network (NHSN)

- NHSN SSI reporting is currently optional for ASCs, except in the states with mandatory reporting requirements
- There is no mandatory measure in the CMS ASC Quality Reporting Program at this time for SSI reporting
- The CMS ASC Quality Reporting Program requires reporting on ASC 8 "Flu Vaccination for Healthcare Personnel" measure via NHSN Healthcare Personnel Safety Component
- If your facility is reporting ASC 8 via NHSN Healthcare Personnel Safety Component than your facility is already enrolled

ASCs Current Use of NHSN



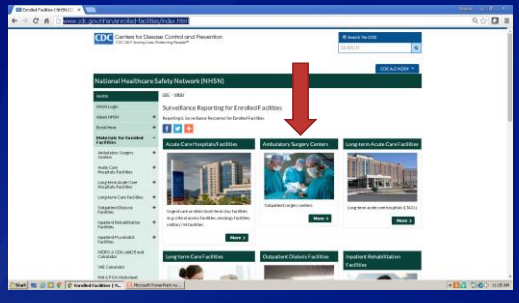
CDC's National Healthcare Safety Network (NHSN)

- It is *optional* to participate reporting SSI's into NHSN
- Click on the Patient Safety Component at http://www.cdc.gov/nhsn/enrolled-facilities/index.html

Current NHSN Requirements

- Six states have mandatory Surgical Site Infection reporting by ASCs into NHSN:
  - Colorado,
  - Massachusetts,
  - Nevada,
  - New Hampshire,
  - New Jersey, and
  - Texas.
- Missouri also requires reporting by ASCs using NHSN SSI definitions, but to a separate, state-based database.

http://www.cdc.gov/nhsn/enrolled-facilities/index.html



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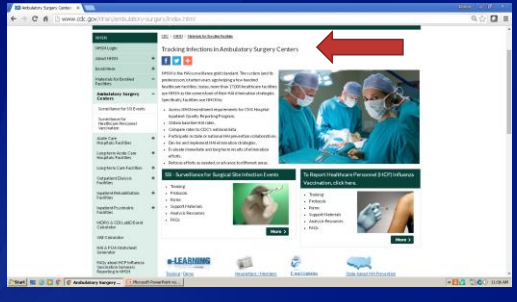

Current NHSN Surgical Site Infection Criteria

Table 1 Surgical Site Infection Criteria of the NHSN, SSI Event chapter, Jan 2016 version http://www.cdc.gov/nhsn/pdfs/pscmanual/9pscssicurrent.pdf

Superficial Incisional SSI

Deep Incisional SSI

Organ/Space SSI

Superficial Incisional SSI

Must meet the following criteria

- Infection occurs within 30 days after any NHSN operative procedure (where day 1 = the procedure date)
  AND
- involves only skin and subcutaneous tissue of the incision
  AND
- patient has at least ***one of the following:***
  a. purulent drainage from the superficial incision.
  b. organisms identified from an aseptically-obtained specimen from the superficial incision or subcutaneous tissue by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST).
  c. superficial incision that is deliberately opened by a surgeon, attending physician** or other designee and culture or non-culture based testing is not performed.
  AND
  patient has at least ***one of the following signs or symptoms:***
  pain or tenderness; localized swelling; erythema; or heat.
  A culture or non-culture based test that has a negative finding does not meet this criterion.
  d. diagnosis of a superficial incisional SSI by the surgeon or attending physician** or other designee.

Deep Incisional SSI

Must meet the following criteria

- Infection occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2
  AND
- involves deep soft tissues of the incision (e.g., fascial and muscle layers)
  AND
- patient has at least ***one of the following:***
  a. purulent drainage from the deep incision.
  b. a deep incision that spontaneously dehisces, or is deliberately opened or aspirated by a surgeon, attending physician** or other designee and organism is identified by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST) or culture or non-culture based microbiologic testing method is not performed
  AND
  patient has at least ***one of the following signs or symptoms:***
  Fever (>38°C); localized pain or tenderness. A culture or non-culture based test that has a negative finding does not meet this criterion.
  c. an abscess or other evidence of infection involving the deep incision that is detected on gross anatomical or histopathologic exam, or imaging test

Organ/Space SSI

Must meet the following criteria:

- Infection occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2

  AND

- infection involves any part of the body deeper than the fascial/muscle layers, that is opened or manipulated during the operative procedure

  AND

- patient has at least ***one of the following:***

  a. purulent drainage from a drain that is placed into the organ/space (e.g., closed suction drainage system, open drain, T-tube drain, CT guided drainage)

  b. organisms are identified from an aseptically-obtained fluid or tissue in the organ/space by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST).

  c. an abscess or other evidence of infection involving the organ/space that is detected on gross anatomical or histopathologic exam, or imaging test

  AND

  meets at least ***one criterion*** *for a specific organ/space infection site listed in Table 3. These criteria are found in the Surveillance Definitions for Specific Types of Infections chapter.*

In Summary

- It is *optional* to participate reporting SSI's into NHSN
- Become familiar and start using CDC definitions for SSI's
- Continue to follow up on your SSI's and look for trends
- Outpatient Procedure Component (OPC) is in development

Thank You!

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