Surgical Site Infection Reporting Requirements

August 4, 2011—Web Seminar

Welcome & Program Overview

Liz Mekjavich
California Hospital Association
Debby Rogers, RN, is vice president for Quality and Emergency Services for CHA. Debby oversees legislative and regulatory initiatives for California hospitals related to quality and ED services. She also has many years of experience as a registered nurse, base hospital coordinator, emergency clinical nurse specialist and nurse manager. Debby is also a Fellow in the Academy of Emergency Nursing.

Overview of the Law—Where We Stand Now

Debby Rogers
California Hospital Association
SB 1058 Reporting Requirements

Hospitals are required to:

- Report data quarterly
- All HAI SSI of deep- or organ-space, orthopedic, cardiac and gastrointestinal procedures

CDPH is required to:

- Publicly report SSI by January 2012
- Follow risk adjustment process consistent with NHSN methods

AFL 11-23 Beginning April 2011

March 11, 2011

TO: General Acute Care Hospitals

SUBJECT: Senate Bill 1058: Changes in Method for Reporting Surgical Site Infections

AUTHORITY: Health and Safety Code (HSC) Section 1288.55

The purpose of this letter is to notify California general acute care hospitals (GACHs) of new California Department of Public Health (CDPH) instructions for reporting of surgical site infections as mandated by Senate Bill (SB) 1058 [enacted by Health and Safety Code (HSC) Section 1288.55]. Commencing with surgeries performed on or after April 1, 2011, the Department will accept data for surgical site infections (SSI) only if reported to the Department through the Centers for Disease Control and Prevention National Healthcare Safety Network (NHSN).
AFL 11-23 Requirements

Required SSI Reporting as of April 1, 2011

- **Must** follow CABG and hip prosthesis procedures if your hospital performs those surgeries

<table>
<thead>
<tr>
<th>Description</th>
<th>Operative Procedure</th>
<th>ICD-9-CM Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arthroplasty of hip</td>
<td>Hip prosthesis (HPRO)</td>
<td>00.70-00.73, 00.85-00.87, 81.81-81.53</td>
</tr>
<tr>
<td>Chest procedure to perform direct revascularization of the heart; includes obtaining suitable vein from donor site for grafting.</td>
<td>Coronary artery bypass graft with both chest and donor site incisions and Coronary artery bypass graft with chest incision only (CBCB, CBGC)</td>
<td>36.10-36.14, 36.19, 36.15-36.17, 36.2</td>
</tr>
</tbody>
</table>

*Note: typo in original AFL; correction (CBGB, CBGC)*

AFL 11-23

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AFL 11-23 Requirements

Required SSI Reporting as of April 1, 2011

- If not performing CABG or hip prosthesis surgeries, select procedure(s) from list*
- Every hospital must report SSI for 2 procedures
- Selection based on hospital risk assessment, considering
  - Volume per year (>25)
  - Rate of infection
- Guidance on procedure selection available through the HAI Liaison Program**

*AFL 11-23, Appendix A: NHSN Operative Procedures
**Designated Liaison IP list found at www.cdph.ca/HAI
AFL 11-32 Beginning June 2011

State of California—Health and Human Services Agency
California Department of Public Health

April 27, 2011

AFL 11-32
(ATTACHMENT A REVISED)

TO: General Acute Care Hospitals

SUBJECT: Requirements for Reporting Surgical Site Infections

AUTHORITY: Health and Safety Code (HSC) Section 1288.55

The purpose of this letter is to notify California general acute care hospitals (GACHs) of new California Department of Public Health (CDPH) guidance for reporting surgical site infections (SSIs) as mandated under HSC Section 1288.55. The statute does not allow for phased-in implementation for reporting of all surgical site infections; therefore, this letter amends the guidance provided in AFL 11-23.

AFL 11-32 Procedures

- Abdominal aortic aneurysm repair
- Appendix surgery
- Bile duct, liver or pancreatic surgery
- Cardiac surgery
- Coronary artery bypass graft with both chest and donor site infections
- Coronary artery bypass graft with chest incision only
- Gallbladder surgery
- Colon surgery
- Cesarean section
- Spinal fusion
- Open reduction of fracture
- Gastric surgery
- Hip prosthesis
- Heart transplant
- Abdominal hysterectomy
- Knee prosthesis
- Kidney transplant
- Laminectomy
- Liver transplant
- Kidney surgery
- Ovarian surgery
- Pacemaker surgery
- Rectal surgery
- Refusion of spine
- Small bowel surgery
- Spleen surgery
- Thoracic surgery
- Vaginal hysterectomy
- Abdominal surgery
Legal Challenge: Where Do We Go From Here?

- Courts did not enjoin the 29 SSI procedures required by AFL 11-32
- Courts enjoined the monthly reporting required by AFL 11-32 and allows for quarterly reporting

Thank you

**Debby Rogers**
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**Presenter: Lynn Janssen**

**Lynn Janssen, MS, CIC** is the HAI liaison coordinator for Healthcare-Associated Infections Program at the Center for Health Care Quality within CDPH. Since joining CDPH in 2010 she has implemented the launch of the HAI Liaison Program that positioned nine experienced infection preventionists (IPs) regionally throughout the state to provide onsite and phone consultation to California’s acute care hospitals for activities related to HAI prevention, surveillance, and reporting. Lynn has been an epidemiologist and infection preventionist for nearly 20 years.

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**NHSN SSI Surveillance and Reporting**

CHA Webinar
August 4, 2011

Lynn Janssen
HAI Liaison Program
Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health
Objectives

• Describe NHSN’s procedure-associated SSI surveillance and reporting methods
• Review NHSN key terms, SSI surveillance definitions, and data requirements
• Discuss data entry and data import options (e.g. CSV file upload)
• Provide hospital “tips” to successful implementation

National Healthcare Safety Network (NHSN)
SSI Surveillance and Reporting via NHSN

For consistency and to enable risk adjustment, follow NHSN protocols for identifying and reporting SSI and procedures.

NHSN Monthly Reporting Plan

- Enables NHSN (and CDPH) to know what data to expect
- Of the 29 procedure categories (AFL 11-32), add each procedure you anticipate performing anytime during the year
- In an update to NHSN coming later this year, hospitals will be able to indicate “zero” for any specific procedures not performed in a given month
NHSN Procedure-specific SSI Surveillance

• Each NHSN operative procedure category consists of a group of ICD-9-CM codes
  
  Example: Hip prosthesis (HPRO) include 00.70, 00.71, 00.72, 00.73, 00.85, 00.86, 00.87, 81.51, 81.52, 81.53

• SSI surveillance for each NHSN operative procedure category must include **ALL** the listed ICD-9 codes

• Refer to AFL 11-32 for complete list of operative procedures and associated ICD-9 codes

Interpreting SSI Surveillance

Requires

• Consistent use of standard methods and definitions for identifying SSI cases

• Capture of sufficient risk factor data for each procedure performed

• Application of risk adjustment methods for meaningful comparisons (i.e. over time within your hospital or to national referent data)
Superficial Incisional SSI

Surveillance Definition
- Infection occurs within 30 days after surgical procedure
  \[\text{AND}\]
- Involve only skin and subcutaneous tissue of the incision
  \[\text{AND}\]
  
  Patient has at least 1:
  - Purulent drainage from incision
  - Organism isolated from incision culture or fluid (obtained aseptically)
  - Pain or tenderness
  - Localized swelling,
  \[\text{AND}\]
  - Incision opened by surgeon and found to be culture positive or was not cultured
  - Diagnosis of superficial SSI by surgeon or attending physician

Deep Incisional SSI

Surveillance Definition
- Infection occurs within 30 days after surgical procedure if no implant or within 1 year if implant
  \[\text{AND}\]
- Involves deep soft tissues of the incision, e.g. fascial & muscle layers
  \[\text{AND}\]
  
  Patient has at least 1:
  - Purulent drainage from deep incision but not from the organ/space of the surgical site
  - Deep incision spontaneously dehisces or opened by surgeon \[\text{AND}\] is culture positive or not cultured \[\text{AND}\] fever \[>38^\circ\text{C},\] localized pain, or tenderness
  - Abscess or evidence of deep infection found on direct exam, during reoperation, by histopathologic or radiologic exam
  - Diagnosis of deep SSI by surgeon or attending physician
Organ Space SSI

Surveillance Definition

- Infection occurs within 30 after surgical procedure if no implant or within 1 year if implant
- Involves any part of body that is opened or manipulated during the surgical procedure; excludes skin, fascia, or muscle layers, and subcutaneous tissue of the incision

Patient has at least 1:
- Purulent drainage from drain placed through stab wound into organ/space
- Organism isolated from incision culture or fluid (obtained aseptically)
- Abscess or evidence of organ/space infection found on direct exam, during reoperation, by histopathologic or radiologic exam

Classifying Organ/Space SSI

- When SSI occurs in an organ or organ space related to the procedure, specific infection sites are assigned to further identify the location of the infection

- Examples
  - Hip Prosthesis (H PRO) with subsequent osteomyelitis would be reported as SSI-BONE
  - CBGB with mediastinitis would be reported as SSI-MED
Procedure Risk Factor Data Elements

**For all procedures**
- Gender
- Date of birth
- Date of procedure
- NHSN procedure code
- Wound class
- ASA score
- Duration (hours/minutes)

**Yes/No fields**
- Emergency
- Trauma
- Endoscope
- Implant
- Non-autologous transplant
- General anesthesia
- Outpatient

Additional data for specific procedures

**C-section**
- Height
- Weight
- Duration of labor
- Est. blood loss

**Hip prosthesis**
- Total or partial
- Primary or revision

**Knee prosthesis**
- Primary or revision

**Spinal fusion/ refusion**
- Spinal level (e.g. cervical)
- Diabetes Y/N
- Approach (e.g. anterior)
Duration

- Hours and minutes between skin incision and skin closure
- Not anesthesia time
- If patient goes to OR within 24 hours of the original incision, report combined duration of operation for both procedures

Wound Classification

- **Clean I (C)**
  Uninfected wound, no inflammation; respiratory, alimentary, genital, or uninfected urinary tracts not entered; primarily closed; closed drainage if needed

- **Clean contaminated II (CC)**
  Respiratory, alimentary, genital, or urinary tracts entered under controlled conditions and without unusual contamination; include operations on biliary tract, appendix, vagina, oropharynx.

- **Contaminated III (CO)**
  Open, fresh, accidental wounds; major breaks in sterile technique or gross spillage from GI tract; includes incisions into acute, nonpurulent inflamed tissue.

- **Dirty / Infected IV (D)**
  Old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera.
ASA* Score

Used to proxy patient co-morbidities or underlying disease

1 = Normally healthy patient
2 = Patient with mild systemic disease
3 = Patient with severe systemic disease that is not incapacitating
4 = Patient with an incapacitating systemic disease that is a constant threat to life
5 = Moribund patient not expected to survive for 24 hours with or without operation

*American Society of Anesthesiologists

Endoscope – Yes/No

• Indicate yes if the entire operative procedure was performed using an endoscope/laparoscope

• Exception: For CBGB, if the donor vessel was harvested using a laparoscope, select “Yes”
### Implant – Yes/No

- A nonhuman-derived implantable foreign body (e.g., prosthetic heart valve, hip prosthesis) permanently placed during an NHSN operative procedure and not routinely manipulated for diagnostic or therapeutic purposes

- Screws, wires, and mesh that are left in place ARE considered implants

### Non-autologous Transplant – Yes/No

- Transplant: Human cells, tissues, organs, or cellular- or tissue-based products that are placed in a human recipient via grafting, infusion, or transfer
  - Examples include: heart valves, organs, ligaments, bone, blood vessels, skin, corneas, and bone marrow cells

- Autologous or “autograft” are products that originate from the patient’s own body

- Non-autologous or “allografts” are tissues or other products derived from another human body, either a donor cadaver or a live donor

Select “Yes” ONLY for Non-autologous transplants
Other Yes/No Fields

- **Emergency**
  “Yes” if non-elective, unscheduled operative procedure

- **Trauma**
  “Yes” if operative procedure performed because of blunt or penetrating injury to patient

- **General anesthesia**
  “Yes” for administration of drugs or gasses that enter the general circulation and affect the central nervous system to render the patient pain-free, amnesic, unconscious, and often paralyzed with relaxed muscles

Surgeon Code

- **Optional** field
- Select the hospital-assigned code of the surgeon who performed the principal operative procedure

*Why monitor by surgeon?*

*Feedback of surgeon-specific data has been demonstrated to lower SSI rates*
SSI Risk Adjustment: Standardized Infection Ratio (SIR)

For SSI comparisons, NHSN now applying the SIR

- Risk models developed for each procedure
- Model includes only those factors associated with increased risk of infection for that specific procedure
- Allows risk factors to be weighted based on contribution to SSI risk

Risk Stratification vs. Risk Adjustment

- NHSN legacy: Used a 0-3 Risk Index to stratify risk for all procedures
  Based on ASA, Wound class, Duration >75th percentile
- NHSN new method: Adjusts for individual patient risk using only those variables found to be associated with SSI risk for each procedure type (determined by logistic regression models)

  *Example:* SSI risk factors for HPRO
  Age, Anesthesia type, ASA score, surgical duration, HPRO type, medical school affiliation, number of beds, trauma status
Standardized Infection Ratio (SIR)

- Driven by need for a **summary measure** (replacing multiple rate comparisons)
  - SIR calculations added to NHSN Oct 2010
- SIR **adjusts for differences in levels of infection risk** in your patients
- SIR compares # HAI s reported by your hospital with the expected or “predicted” # based on NHSN data
  - NHSN data (2006-08) used for national predicted values
- SIR **value of 1.0** means your hospital is observing HAI s as national data predict (i.e. **not different**)

Interpreting SIR for SSI

The **value 1.0** indicates the number of SSI observed in your hospital is the **same as predicted** number of SSIs as seen in the national baseline data

- A **value less than 1.0** means there are fewer SSIs observed than predicted
- A **value greater than 1.0** means **more SSIs** than predicted

SIR will only be calculated for your hospital if the expected number of SSIs is >1
  - (because can’t have less than a whole person infected!)
Your Guide to the Standardized Infection Ratio (SIR)

What is a standardized infection ratio (SIR)?
The standardized infection ratio (SIR) is a summary measure used to track HAIs at a national, state, or local level over time. The SIR adjusts for patients of varying risk within each facility. The method of calculating an SIR is similar to the method used to calculate the Standardized Mortality Ratio (SMR), a summary statistic widely used in epidemiology.

SIR = \frac{\text{Observed HAIs}}{\text{Predicted HAIs}}

Examples:

If your hospital has 4 SSI per 100 Hip prosthesis procedures and national data predict 2.5 SSI for a similar surgical population:

\[
\text{SIR} = \frac{4}{2.5} = 1.6
\]
The intercept represents underlying infection risk when none of the risk factors in the model are present.

Factors in this model that add to SSI risk are:
- Age equal to or younger than 44 years
- ASA score of 3, 4, or 5
- Duration of surgery longer than 100 minutes (incision to close time)
- Procedure done at hospital affiliated with a medical school (from Annual Facility Survey)

### Logistic Regression Model

This table lists the risk factors found to be significant for a particular NHSN operative procedure category. Note that each risk factor’s contribution varies, as represented by the parameter estimate for each factor.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Parameter Estimate</th>
<th>OR</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-5.445</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age (≤44 vs &gt;44)</td>
<td>0.520</td>
<td>1.659</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>ASA (≥6/6 vs ≤1/2)</td>
<td>0.425</td>
<td>1.528</td>
<td>0.0415</td>
</tr>
<tr>
<td>Duration (&gt;100 vs ≤100)</td>
<td>0.501</td>
<td>1.650</td>
<td>0.0019</td>
</tr>
<tr>
<td>Med school affiliation (Y vs N)</td>
<td>1.069</td>
<td>2.912</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>
Interpreted as a 5.0% risk of SSI for procedure 1

Probability of SSI is calculated for each procedure

SSI SIR is not different than predicted
• 3 SSI observed
• 2.9 SSI expected

The SSI probabilities are added together to get the predicted (expected) number of SSI for this surgical population

“Systems” Approaches to Identify SSI

Work with surgical services and surgical unit staff to develop process for alerting to possible SSI

• Evaluate surgical patients during same admission
• Monitor surgical patients for re-admission
• Develop screens to identify and evaluate positive wound cultures
• Perform post-discharge surveillance
“Systems” Approaches for Procedure Data

- Operating room staff and data systems
- Anesthesia
- Medical records
- OB staff and data systems
- Information technology
- Administration
- Hospital epidemiology & infection control

Options for Entering Procedure Data

- Electronically via vendor-enabled Clinical Document Architecture (CDA) standards
- Electronically via hospital-developed Comma Separated Variable (CSV) file format
- Manually
Developing a CSV File to Import Procedure Data

1. Identify where (in what existing systems) the required data fields reside
2. Work with your IT department, OR data system manager, medical records supervisor, and/or others
3. Determine how data elements might be made electronic if not already
4. Learn or seek assistance on how to develop the CSV file (or convert from an excel spreadsheet).

CSV files can be uploaded directly to NHSN

Importing Patient Safety Procedure Data

The NHSN will allow importation of procedure data in an ASCII comma delimited text file format. You can generate the import files from different external sources, such as databases or hospital information systems. The default import option allows the importation of procedures where the procedure date occurs in a month for which a Monthly Reporting Plan exists and the Plan specifies the procedure code in the import file record. If you wish to import records for procedures not in the Plan, you must specify which procedures to include.

Custom procedures can also be imported if they are first created on the custom options page.

Available on the NHSN website under Patient Safety Component “Related Material”
Give this information to your IT department and/or surgical data manager.
Available on CDPH HAI Program website under "NHSN Guidance Specific to California Hospitals"
CSV file ready for import to NHSN
Importing Your CSV Procedure Data File

Log into NHSN and click on Import/Export function

Importing Procedure Data into NSHN

Select your .csv import file (it will appear in gray box)

Click “Submit”
Importing Procedure Data into NSHN

Records will appear under "Inserts" or "Bad Data" tabs

"Inserts" list contains the Procedure records ready for import

Click on "Bad Data" tab
Records listed have errors that need to be corrected prior to import
When there is no “Bad Data” tab, Procedure records from your .csv file are ready to import into NHSN.

Click the “Update” button, then “OK” to complete the import.
Importing Procedure Data into NSHN

Import/Export Data

The data file has been successfully imported.

Import/Export Type: Procedures

Procedures

For information on the accepted file formats and content, click HELP.

By default, records in the import file will be accepted under the following conditions:

1. The procedure date occurs in a month for which a Monthly Reporting Plan exists, and
2. That Plan specifies the procedure code in the import file record.

If you wish to import records for procedures not in the Plan, you must specify which procedures to

Implementation Success Stories in California Hospitals

- IP staff negotiated to get needed data by purchasing new Anesthesia data system (part of existing system “suite” of products)
- Medical records staff took lead in CSV file development, process similar to OSHPD reporting
- Made OR and/or OB technical staff NHSN users to enter data directly (need training and secure data access)
- Developed simple MS Excel spreadsheets for use by OR, MS Access to correlate data points
Implementation Success Stories in California Hospitals continued

• Each hospital’s situation is unique depending on EMR and other existing data systems and interfaces
  Solutions found using/incorporating many systems: Showcase, Centricity, Midas, Quality Compass, Pisces, Cerner, GE, Meditech, EPIC, SAS (LIST NOT INCLUSIVE; EXAMPLES ONLY)

• Collaborative discussions with administration, OR, surgery, anesthesia, quality, medical records, infection prevention, and IT staff appear to be necessary for successful implementation

Resources

• CDPH HAI Program  www.cdph.ca.gov/HAI

• Under “NHSN Guidance Specific to California Hospitals”
  o SSI training materials, slide sets
  o SSI Data Entry GUIDE
  o SSI Procedure Import WORKBOOK

• AFL’s

• CDC NHSN Program  www.cdc.gov/NHSN

• “!HELP” on each NHSN data entry screen

• One-on-one consultations with HAI Liaison Program regional IPs
Questions?

**HAI Liaison Program**

InfectionControl@cdph.ca.gov

More information can be found on the [Healthcare-Associated Infections Program website](http://www.cdph.ca.gov/HAI)
Thank you

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Questions

Online questions:
Type your question in the Q & A box, hit enter

Phone questions:
To ask a question hit *1
To remove a question hit *2
Upcoming Programs

- **Principles of Consent & Advance Health Care Directives**  
  *September 8, 2011, Web Seminar*

- **Disaster Planning for California Hospitals Conference**  
  *September 19-21, 2011, Sacramento*

- **Post-Acute Care Fall Seminar**  
  *October 25, 2011, Pasadena*

- **Behavioral Health Care Symposium**  
  *December 5-6, 2011, Huntington Beach*

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Evaluation

Thank you for participating in today’s seminar. An online evaluation will be sent to you shortly.

For questions relating to SSI reporting, contact Debby Rogers at (916) 552-7537 or drogers@calhospital.org.

For education questions, contact Liz Mekjavich at (916) 552-7500 or lmekjavich@calhospital.org.