

KEY FINDINGS AND PUBLIC HEALTH ACTIONS

Surgical Site Infections in California Hospitals, 2011

Introduction

A surgical site infection (SSI) is an infection that occurs after surgery in the part of the body where the surgery took place. Many SSIs are superficial infections involving the skin only. Other surgical site infections are more serious and involve tissues under the skin (“deep”), organs (“organ space”), or implanted material (such as following hip or knee replacement surgery), and usually result in continued or rehospitalization. SSIs are the second most common type of healthcare associated infection (HAI) in U.S. hospitals (290,000 per year) and account for the greatest additional healthcare cost, between \$3.5 and 10 billion per year. SSIs may be preventable by measures such as administration of an antibiotic and proper preparation of the skin prior to surgery.

Effective April 1, 2011 every hospital that performed surgical procedures in the categories specified by the California Department of Public Health (CDPH) was required to start reporting data on 2 surgical procedure categories (including coronary artery bypass graft and hip prosthesis if performed). Information on surgical procedures in these categories and any subsequent infections were reported to CDPH via the Center for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN). The number of surgical procedure categories to be reported was increased from 2 to a total of 29 effective June 1, 2011. CDPH notified hospitals of their reporting responsibility in All Facilities Letters (AFL) issued March 11, 2011 (AFL 11-23) [<http://www.cdph.ca.gov/programs/hai/Documents/AFL-11-23SurgicalSiteInfectionReporting.pdf>] and April 27, 2011 (AFL 11-32) [<http://www.cdph.ca.gov/programs/hai/Documents/LNC-AFL-11-32.pdf>]. Therefore this first annual release of the SSI represents 7 to 9 months of reporting.

California law requires that CDPH publicly report each hospital's rates of deep and organ space surgical site infections, and to adjust these rates using NHSN risk adjustment methodology. The NHSN risk adjustment process for SSIs is a standardized infection ratio (SIR) adjusted for individual patient risk factors for infection following surgery, such as age and underlying illness. The SIR is a comparison of the observed number of infections to the predicted number, based on the national average for that surgical procedure category. Hospitals can differ significantly in their mix of patients with different risk factors, with some having more high risk patients and others having more low risk patients. Adjusting for these factors provides for a more fair comparison of hospitals' infection rates. NHSN provides an SIR only when there are sufficient numbers of surgical procedures reported by the hospital.

Currently, NHSN does not risk-adjust the SIR for 5 of the 29 reportable surgical procedure categories. So in accordance with the law, we do not report SIRs for these categories: heart transplant, kidney surgery, ovarian surgery, pacemaker surgery and spleen surgery. Tables 25 through Table 29 show the data for these 5 surgical procedure categories. We do not report data for any hospital that reported fewer than 20

procedures for a surgical procedure category because the numbers are too small to be meaningful and the need to protect confidential health information.

For the 24 risk-adjusted surgical procedure categories, if an SIR was generated for a hospital, we performed a statistical analysis to determine if the observed number of infections was significantly different from predicted. Based on our statistical analysis we labeled each SIR as indicating either: n.d. (no difference in number of observed and predicted infections), high (more infections than predicted), or low (fewer infections than predicted) in Tables 1 through 24. This statistical analysis allows comparison of the SIRs among hospitals for that surgical procedure category. However, it is important to keep in mind that the NHSN risk adjustment method may not take into account all of the differences in risk of infection for patients in those hospitals.

Furthermore, all statistics based on small numbers of procedures, including SIRs, are unstable; they can change dramatically with just one additional procedure or infection. Because this report represents 7-9 months of data and many California hospitals perform small numbers of procedures, many hospitals do not have an SIR reported at this time for many of their procedure categories, but may have in the future.

SSI information for the 8 long term acute care (LTAC) hospitals and 1 rehabilitation hospital that reported SSI data is listed separately in Tables 30-32; NHSN does not currently provide an appropriately risk adjusted SIR for these hospitals.

Key Findings

- For the reporting period April 1, 2011 through December 31, 2011, 342 of 346 (99%) licensed California hospitals known to be subject to the SSI reporting requirements reported data on one or more of the 29 surgical procedure categories. Table 33 lists the 42 additional hospitals reporting that none of the 29 surgical procedure categories were performed, indicating that they were not subject to the reporting requirements. The 2 hospitals not reporting any information to CDPH are listed in Table 34. Table 35 lists the 2 hospitals whose data was received after the submission deadline due to technical difficulties that have since been corrected. In reporting 404,131 procedures and 2042 SSIs, California hospitals demonstrated broad commitment to fulfilling the new NHSN-based SSI reporting requirements.
- 193 of the 342 hospitals had a risk-adjusted SIR for at least one surgical procedure category. Among these, 47 hospitals had one or more surgical procedure categories with significantly different numbers of infections than predicted: 33 hospitals had at least one surgical procedure category with fewer SSIs than predicted (lower SIRs), 11 hospitals had at least one surgical procedure category with more SSIs than predicted (higher SIRs), and 3 had both. Most of these were only modestly higher or lower than predicted, so that any evaluations or comparisons should be made with caution.

Public Health Actions

In follow-up to this report, CDPH will:

- With increased data, explore the risk-adjustment procedures used by NHSN and possible expansion of this methodology.
- Work with hospitals to improve their use of the NHSN reporting features.

All hospitals should review these data and consider:

- Reviewing their SSI data to determine if all required operative procedures and resultant infections were submitted to NHSN for this reporting period. If not, they should be corrected as soon as possible.
- Confirming that their surveillance systems and processes are sufficiently robust and adequately resourced to ensure complete and accurate reporting of all SSIs for the 29 required surgical procedure categories.
- Reviewing CDPH's SSI quality control reports upon receipt in order to confirm that the hospital's current data are correctly and completely recorded.
- Reviewing their SSI data in conjunction with SSI prevention to identify opportunities for improvement.

The public should consider:

- Asking your healthcare providers about SSI rates and the implementation of measures to prevent these infections.