Surgical Site Infection Prevention Policies and Adherence in California Hospitals, 2010

Surgical site infections (SSIs) are common, costly, and preventable; 55% may be prevented with current evidence-based strategies.[1] SSIs occur at a rate of more than 290,000 infections per year and cost approximately $25,500 per infection, and US hospitals could therefore save more than $4 billion and prevent thousands of deaths annually by implementing SSI prevention strategies.[2] We sought to describe the presence of and adherence to SSI prevention policies in California hospitals. Specifically, we examined the adoption of policies for the following 5 practices that are strongly recommended in guidelines[3] and promoted by the Surgical Care Improvement Project (SCIP)[4]: appropriate hair removal, selection of antimicrobial agents on the basis of surgical procedure, discontinuation of antimicrobials within 24 hours after surgery, adequate control of postoperative serum glucose levels, and normothermia for colorectal surgery patients.

Data were collected as part of a large study that examined the impact of federal and state policy changes on California hospitals.[5] The institutional review board of Columbia University Medical Center approved all procedures. All nonfederal general acute care hospitals in California with an adult intensive care unit (ICU) were eligible to participate in the Web-based survey. Staff at the Association for Professionals in Infection Control and Epidemiology recruited one member of each hospital's infection control department via email, newsletters, or mailed letters using a modified Dillman technique.[6] The survey was open for 8 weeks during spring 2010.

The survey was modified from an instrument developed by an expert panel for use nationally. A paper version was pilot tested in 13 different settings and took a mean (± standard deviation [SD]) of 27 ± 11 minutes to complete. The instrument showed adequate test-retest reliability (mean [± SD] item κ, 0.88 ± 0.24). No discrepancies were found between survey responses and institutional policies or data validated during site visits.

For each of the 5 strategies, respondents were asked whether their hospital had a written policy in place and what proportion of time the policy was correctly implemented, with the following options: all of the time (95%–100% adherence), usually (75%–94% adherence), sometimes (25%–74% adherence), rarely or never (<25% adherence), adherence is monitored but the respondent does not know the level, or no monitoring of adherence. Respondents were also asked whether a system was in place to provide feedback to surgeons in the event of an SSI. Descriptive statistics, including frequencies and percentages, were computed using SPSS, version 19 (SPSS).

The response rate was 64% (213 of 331 eligible hospitals). Hospitals in our sample were similar with respect to bed size (mean [± SD] number of beds, 222 ± 183) to nonfederal, short-term, acute care hospitals in the state overall (mean [± SD] number of beds, 237 ± 162). The percentages of hospitals in our sample that had <200 beds (56.7%) and >500 beds (7.5%) were similar to findings for California hospitals overall (50.2% and 6.7%, respectively).[7] The majority of hospitals in the sample were nonteaching hospitals (114 hospitals; 74.3%), and 180 hospitals provided data on SSI prevention policies.

Most hospitals surveyed had written policies in place for SSI prevention (Table 1). The most commonly adopted policy was appropriate hair removal (86.1%); the least common policy was postoperative glucose control (61.8%). Except for perioperative hair removal, correct implementation of any single policy >95% of the time was infrequently reported (56.3% of hospitals achieved >95% adherence to antibiotic selection policy, and 35.6% achieved >95% adherence to glucose control policy). Moderate levels of adherence were more frequently reported. Appropriate hair removal and selection and discontinuation of antibiotics were correctly implemented >75% of the time in 88% of hospitals, whereas postoperative normothermia and glucose control policies were correctly implemented >75% of the time in 77% and 72% of hospitals, respectively. Between 8.2% and 22.2% of respondents did not monitor adherence or monitored adher-

TABLE 1. Surgical Site Infection Prevention Policies and Adherence in California Hospitals, 2010

Policy	Proportion (%) of hospitals with policy in place	Adherence to policy,[a] proportion (%) of hospitals			
		Always (>95%)	Usually (75%–95%)	Sometimes (25%–75%)	No monitoring or unknown
Appropriate hair removal	155/180 (86.1)	95/128 (74.2)	18/128 (14.1)	1/128 (0.8)	14/128 (10.9)
Discontinue prophylactic antibiotics within 24 h after surgery	150/180 (83.3)	51/122 (41.8)	56/122 (45.9)	5/122 (4.1)	10/122 (8.2)
Selection of appropriate prophylactic antibiotics	137/180 (76.1)	67/119 (56.3)	37/119 (31.1)	4/119 (3.4)	11/119 (9.2)
Postoperative normothermia for colorectal surgery patients	110/174 (63.2)	42/87 (48.3)	25/87 (28.7)	2/87 (2.3)	18/87 (20.7)
Postoperative glucose control	110/178 (61.8)	32/90 (35.6)	33/90 (36.7)	5/90 (5.6)	20/90 (22.2)

[a] No participant reported adherence as rarely or never (<25%).

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ence but did not know the proportion of time that their SSI policies were correctly implemented. A majority of hospitals (142; 79%) had a system in place to provide feedback to surgeons in the event of a SSI. Most often, feedback was given in meetings (71 hospitals; 51%) rather than in letters (27 hospitals; 19%), in person (22 hospitals; 16%), or via email (8 hospitals; 6%).

The study may be limited by self-report bias. However, healthcare-associated infection rates reported in a separate section of the survey corresponded closely to national rates, leading us to believe that the policy implementation questions were also answered frankly. Because any bias is likely to be in the direction of overreporting, our results are conservative. Data on nonrespondents were not available, so we were unable to compare their characteristics with those of respondents. Instead, we compared our participants with all nonfederal California hospitals and found them to be of similar size distribution. Thus, bias is unlikely, insofar as hospital size reflects factors that might influence policy adoption, such as resources and implementation priorities. The fact that the majority of the hospitals in our sample had <200 beds does limit the generalizability of our findings.

We speculate that policies for appropriate hair removal are the most commonly adopted policies and are associated with the greatest adherence because such recommendations are longstanding, consistent, generic, and uncontested. In contrast, the definition of what constitutes appropriate antibiotic prophylaxis is evolving, postoperative glucose control was initially targeted at cardiac surgery patients, and the value of normothermia for colorectal surgery patients has been challenged. In summary, we found that, although SSI prevention policies are widespread, they are not universal, and consistent implementation has not been achieved. Our findings in California reflect national performance on SCIP measures; in 2009, adherence to the core antibiotic administration measures was 88.4%.[8] The Department of Health and Human Services has targeted 95% adherence to SCIP performance measures as one of its goals for 2013.[2] Additional efforts are needed to ensure adherence to evidence-based practices.

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