BACKGROUND

- The reported incidence of surgical site infections (SSIs) in the United States ranges from 0.5% to 20% (1,2).
- An infection preventionist at a Critical Access Hospital (CAH) contacted the healthcare associated infections (HAI) program at Nebraska DHHS to report a concern that one surgeon, Dr. X, had a SSI rate of 29% over the prior 6 months.

METHODS

- The EIS officer and HAI infection preventionist visited the CAH and reviewed the facility’s log for all types of surgical procedures, performed an in-depth chart review of a subset of cases using the CDC’s Healthcare Associated Infections Outbreak Toolkit, interviewed key staff, and performed an on-site inspection of the operating facilities.
- 15 of the 17 infections in 2016 for this CAH were orthopedic in nature (2 procedures associated with an SSI were C-sections).
- The other commonly formed procedures at the facility were urologic resection, appendectomies, cholecystectomies, hernia repairs, wound I&Ds, lump excisions, CL placements, and tendon releases. No SSIs occurred among these procedures.
- The SSI rates for all 3 orthopedic surgeons were further evaluated by reviewing the surgical log for dates, locations, and personnel.
- Chart review was performed for all 7 surgical site infections among case-patients operated on by Dr. X.
- Nine control cases were selected who were also operated on by Dr. X who underwent similar procedures and with similar comorbidities in the same year but did not develop surgical site infections.
- A step-wise regression model set to 0.15 significance was used to compare cases and controls for differences in bone graft usage, hardware, OR location, and number of people in the OR.

RESULTS

- There were 452 surgical procedures performed in 2016 with 17 SSIs for an overall rate of 3.8%.
- Chart review on the 7 surgical site infections among patients operated on by Dr. X found:
  - 3/7 organisms IDed: 1 P. aeruginosa, 1 S.aureus, 1 Enterococcus
  - 0 deaths
  - Onset 2-18 days post surgery, 1 dural tear
  - All patients with at least 2 comorbidities
  - OR temp 61-72 degrees Fahrenheit
  - OR humidity 28-54%
  - Average duration of procedure 1-5 hours
  - Appropriate antibiotic prophylaxis within 60 min prior to cut time was noted in all cases.
- Figure 1. Graph of SSIs Among Procedures at CAH in 2016

Operating Room Tour

- Visual inspection and interview with OR and infection prevention staff revealed that construction next to one of the ORs was ongoing at the time of these SSIs. This required staff to use the 3 ORs as a conduit to reach surgical supply storage.

Data Analysis

- The only variable that met significance criteria for the model at the 0.15 level was the number of people in the OR.
- Among cases there was an average of 9.6 people in the operating room (median = 12) while among controls there was an average of 6.6 people in the operating room (median = 7).
- The logistic regression yielded an odds ratio of 1.799 and a 95% confidence interval of 0.991 to 3.264.

CONCLUSIONS

- The review of cases of all 3 orthopedists cases revealed that overall, these were sicker patients with greater comorbidities. The procedures were in generally longer and more complicated.
- The date of occurrence of SSIs almost all occurred during June through December, similar to the timing of the construction requiring increased transit through all 3 ORs.
- The conclusions reached were that the patients who developed surgical site infections were sicker, had more extensive surgical procedures, and were operated on during the same time period. The only factor that was significant at the 0.15 level in the model was the number of people in the OR, which has been noted a risk factor for SSIs in the past (3,4).
- Recommendations to reduce OR transit along with close reporting of SSIs to surgeons were made. No further orthopedic SSIs were noted on the 6-month follow-up.

REFERENCES