

Impact of Surgical Dressings on Coronary Artery Bypass Graft Surgery with Resultant Influence on Patient Safety

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ABSTRACT

Background/Objective: Surgical site infections (SSI) are the second most common healthcare associated infection. Prevention of these infections presents an active hospital-wide goal, providing for the safety and well being of patients. The Center for Disease Control and Prevention (CDC) reports 2.7% of surgeries are complicated by a surgical site infection resulting in increased morbidity, increased length of stay, increased litigation and increased cost. This facility is a 331 licensed bed acute care hospital with approximately 73,650 patient days per year. The scope of surgeries cover orthopedic, cardiac, vascular, neurological, OB/GYN, general and others. The goal of this study was to determine the effect of an antimicrobial dressing on the prevention of surgical site infection in Coronary Artery Bypass Graft (CABG) surgery.

Methods: The facility replaced the plain gauze dressings with the crossover antimicrobial gauze dressings (AMD) where available. Since the packaging was the same with the exception of the color of printing on the package, a minimum of education to staff and physicians was required. Product was provided to all involved areas before trial was implemented. Comparative studies were done between the baseline period (01/01/07 through 06/30/07) and the evaluation period (10/01/07 through 12/31/07) to determine the impact of the dressing. SSIs were identified by: review of microbiology reports, hospital readmissions, emergency hospital visits, return to surgery, and Home Health notification. SSI rates had previously been impacted by the Surgical Infection Prevention Program (SIP) and the Surgical Care Improvement Project (SCIP). There was no change in Infection Prevention and Control personnel during this period. Case definition includes all inpatients with Class I and Class II surgical wounds who developed infection at the surgery site. Targeted procedure was CABGs. CDC definitions were used to identify SSI cases.

Results: During the baseline period, 5 CABG SSIs per 118 CABG surgeries were identified with a rate of 4.24%. During

the evaluation period, 1 CABG SSI was identified per 57 CABG surgeries with a rate of 1.75%. These rates yield a rate reduction of 58.73%. Using a 2005 cost figure of \$25,546¹, to calculate the cost benefits from using the new antimicrobial dressings, the SSIs occurring during the baseline period would have cost the hospital \$25,546 X 10 SSIs (extrapolated for 12 months) = \$255,460 + \$24,202 (cost of traditional gauze dressings for 12 months) = \$279,662. During the evaluation period, the one CABG SSI would extrapolate to 4 infections X \$25,546 = \$102,184 + \$37,447 (cost of antimicrobial dressings for 12 months) = \$139,631. Thus a cost benefit of \$140,031 was realized from the reduction in the number of SSIs.

Conclusion: With patient safety being the foremost important aspect in the prevention of SSIs, during the evaluation period there were 6 people who did not have to suffer pain, increased length of stay, exposure to additional antibiotics and lost productivity. In addition there was a 59% rate reduction in CABG SSIs and a cost savings of \$140,031 was realized.

INTRODUCTION

Surgical site infections (SSI) are the second most common healthcare associated infection. Prevention of these infections presents an active hospital wide goal, providing for the safety and well-being of patients. The Center for Disease Control and Prevention (CDC) reports 2.7% of surgeries are complicated by a surgical site infection resulting in:

- Increased Morbidity
- Increased Length of Stay
- Increased Litigation
- Increased Cost

The St. Edward Mercy Medical Center in Fort Smith, AR is a 331 licensed bed acute care hospital with approximately 73,650 patient days per year. The scope of surgeries covers orthopedic, cardiac, vascular, neurological, OB/GYN, general and others.

PURPOSE

The goal of this study was to determine the effect of an antimicrobial dressing on the prevention of surgical site infection in Coronary Artery Bypass Graft (CABG) surgery.

METHODS

Infection Prevention and Control (IPC) through continuous surveillance of laboratory reports, readmission summaries, Home Health admissions, physician's reports, surgery schedules, and other sources of data collection noted an increase in the rate of infections following a CABG in 2007. This study focused on Mediastinitis following CABG surgeries. "Mediastinitis is associated with marked increase in mortality during the first year post-CABG and a threefold increase during a 4-year follow-up period."²

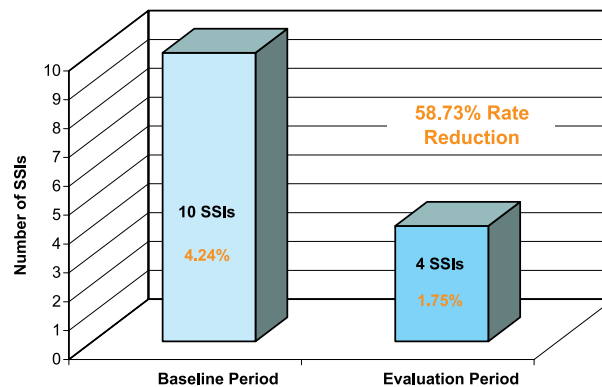
SSIs were identified by:

- Review of Microbiology Reports
- Hospital Readmissions
- Emergency Hospital Visits
- Return to Surgery
- Home Health Notification

The facility replaced the plain gauze dressings with the crossover antimicrobial gauze dressings (AMD) where available. The antiseptic impregnated gauze dressing was used as the primary dressing applied after surgery. Dressings were changed when each physician determined. Since the packaging was the same with the exception of the color of printing on the package, a minimum of education to staff and physicians was required.

Comparative studies were done between the baseline period (1/1/07 – 6/30/07) and the evaluation period (10/1/07 – 12/31/07) to determine the impact of the dressing. The results of the findings in the baseline and evaluation periods were extrapolated to a 12 month time period to allow for the comparison between the two periods.

Comparison of SSI Rate in CABG Surgery



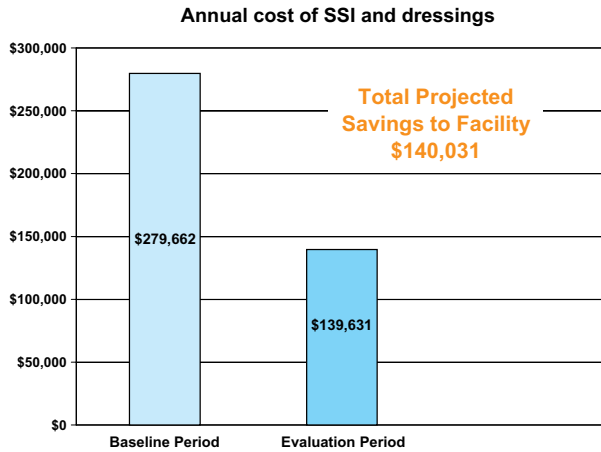
RESULTS

Making no change in, but continuing the use of SIP and SCIP measures during the evaluation period made these initiatives a constant. Any change in rates would be attributed to the new initiative, the implementation of the antimicrobial gauze. The study demonstrated the impact of the antiseptic impregnated gauze on the prevention of mediastinal infections following CABG surgery.

Baseline Period – in a 6 month period, 5 SSIs were identified in 118 CABG surgeries. This represents a 4.24% SSI rate.

Evaluation Period – in a 3 month period, 1 SSI was identified in 57 CABG surgeries. This represents a rate of 1.75%. The rate was reduced by 58.73%.

In 2005, Stone 1 indicated each SSI cost \$25,546. This figure was used to calculate the cost benefits from using the new microbial dressings. Extrapolating the 5 SSIs identified in 6 months to a 12 month period ($5 \times 2 = 10$), the SSIs occurring during the baseline period would have cost the hospital $(10) \times \$25,546 = \$255,460$. Add the cost of traditional gauze dressings for 12 months (\$24,202) for a total of \$279,662.



During the evaluation period 1 SSI was identified in 3 months. Extrapolating that SSI to 12 months (1 x 4= 4), the SSIs occurring in the evaluation period would cost the hospital (4) x \$25,546 = \$102,184. Adding the cost of the antimicrobial dressings for 12 months \$37,477 = \$139,631. The difference represents a cost benefit of \$140,031.

CONCLUSIONS

There was a 59% rate decrease in the number of SSIs observed between the baseline period and the evaluation period. Fewer surgical site infections represent a decrease in patient suffering, a decrease in length of stay, a decrease in exposure to additional antibiotics and a decrease in lost productivity.

REFERENCES

- 1 Stone, P.W., Braccia D., Larson E., Systematic Review of Economic Analyses of Health Care Associated Infections, American Journal Infection Control 2005;33:501-9
- 2 Braxton, J.H.,Marrin. C.A.S., McGrath, P. Mediastinitis and long-term survival after coronary artery bypass graft surgery. The Annals of Thoracic Surgery, Sec 2000;70:2004-2007

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