

Process Improvement Project:
Reduction of Surgical Site Infections
Utilizing Antimicrobial Dressings

Process Improvement Project: Reduction of Surgical Site Infections Utilizing Antimicrobial Dressings

Margaret Comstock, RN, MSHCA - Parkview Medical Center, Pueblo, CO

ABSTRACT

BACKGROUND/OBJECTIVES: Surgical Site Infections (SSIs) accounted for 46.46% of the total Hospital-Associated Infections (HAIs) in this facility during 2005. Because of this high percentage, SSIs were targeted for a process improvement project.

METHODS: The study was conducted in a private non-profit organization licensed for 305 beds, 196 staffed acute care beds, including a level II certified trauma center. This facility delivers comprehensive medical, surgical, psychiatric and behavioral health services. The rate reductions achieved through the Surgical Infection Prevention (SIP) and the Surgical Care Improvement Project (SCIP) initiatives occurred prior to this study. Matched surveillance compared the baseline period of 6/1/05 thru 11/30/05 to the evaluation period of 6/1/06 thru 11/30/06. The targeted procedures included: back surgeries (laminectomy and fusions), cardiac (valves, coronary artery bypass grafts [CABG]), exploratory laparotomy, herniorrhaphy, total hip replacement (THR), total knee replacement (TKR) and vascular surgeries. The infections were identified using Centers for Disease Control and Prevention (CDC) definitions. Potential records warranting review were selected from laboratory records of positive wound cultures, return to surgery reports, post-discharge letters sent to surgeons, information gathered from homecare and wound care nurse reports. For brevity of the study, patients with procedures requiring implants were monitored only for the first 30 days after the procedure. The numerator reflects the number of HAI SSIs only in the targeted patient populations. The denominator reflects the total number of targeted procedures. Staff education was not provided during the evaluation period when traditional plain gauze dressings, being used as surgical dressings, were replaced with an antimicrobial gauze dressing impregnated with 0.2% concentration of a mild antiseptic polyhexamethylene biguanide (PHMB). The exchange included surgical dressings in procedure packs and distribution carts. For this study the cost of \$15,646 was assigned per SSI¹.

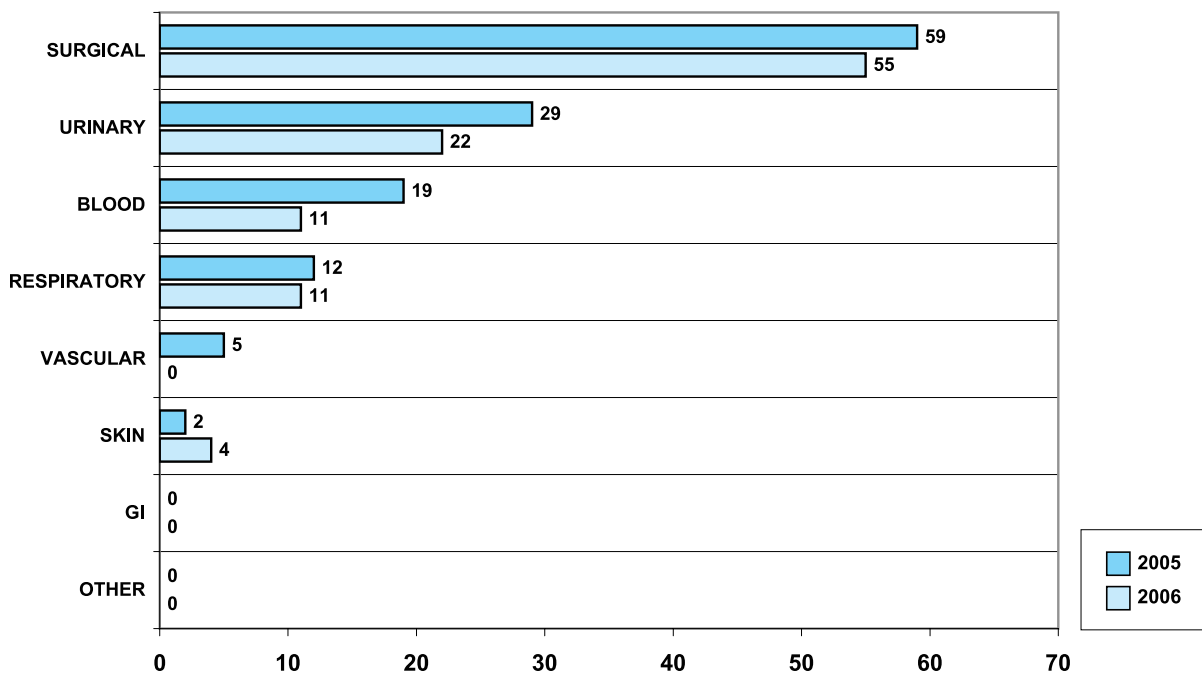
RESULTS: During the baseline period 16 SSIs per 578 cases yielded a rate of 2.77% with a Standard Infection Ratio (SIR) of 1.29. During the evaluation period 9 SSIs per 607 cases yielded a rate of 1.48% with an SIR of 0.69, producing a rate reduction of 46.57%. The annualized cost of SSIs for 2005 using plain gauze dressing was 32 SSIs X \$15,646 + \$24,108 (cost of plain gauze dressing/year) = \$524,780. The annualized cost of SSIs for 2006 using antimicrobial dressings was 18 SSIs X \$15,646 + \$50,145 (cost of antimicrobial dressings/year) = \$331,773. This produced a net cost savings of \$193,007.

CONCLUSIONS: During the baseline period targeted SSIs accounted for 25.81% of the total HAI in this facility. The process improvement project reflects a reduction in targeted SSIs to 17.64% of the total HAI in this facility. The baseline targeted SSI rate of 2.77% decreased to 1.48% during the evaluation period. Although the SSI rate did not achieve zero, a 46.57% rate reduction was realized. The impact of this intervention has contributed to a safer surgical environment, increased quality of patient care thus increasing customer satisfaction. An annualized cost savings of \$193,007 resulted from a reduction of 14 SSIs.

INTRODUCTION

Parkview Medical Center in Pueblo, CO is a private non-profit organization licensed for 305 beds, 196 staffed acute care beds, including a level II certified trauma center. The facility delivers comprehensive medical, surgical, psychiatric, and behavioral health services to the people of southeastern Colorado. As in healthcare facilities around the country, our goal is to provide economical care as well as to increase patient satisfaction and safety. The Standard Infection Ratio (SIR) compares the hospital infection rate against the national infection rate. In this way, it provides a powerful statistic for comparing infection rates among hospitals. Although a value of less than 1.0 indicates a lower than average infection rate, our hospital strives to further reduce our SIR by continuously examining and improving our infection control practices.

ACUTE CARE HOSPITAL ASSOCIATED INFECTIONS BY TYPE 2005 – 2006



PURPOSE

Surgical Site Infections (SSI) accounted for 46.46% of the total Hospital-Associated Infections (HAI) in this facility during 2005. The rate of HAI was highest in the surgical area so that was our area of focus for this study.

There had been rate reductions achieved through the Surgical Infection Prevention (SIP) and the Surgical Care Improvement Project (SCIP) initiatives prior to this study. Our goal was to see an even greater reduction in the rate of SSI by making one additional change to the usual practice. That change identified was to replace the traditional plain gauze dressing with an antimicrobial gauze dressing.

METHODS

Matched surveillance was conducted for the baseline period of 6/1/05 through 11/30/05 and compared to the evaluation period of 6/1/06 through 11/30/06.

Targeted procedures included:

- Back Surgeries (laminectomy and fusions)
- Cardiac (valves, coronary artery bypass grafts [CABG])
- Exploratory Laparotomy
- Herniorrhaphy
- Total Hip Replacement (THR)
- Total Knee Replacement (TKR)
- Vascular Surgeries

Infections were identified using Center for Disease Control and Prevention (CDC) definitions. Cases were identified for review from the following sources:

- Selected laboratory records of positive wound cultures
- Return to surgery reports
- Post-discharge letters sent to surgeons
- Information gathered from home care and wound care nurse reports

Because a change in staff behavior could potentially impact the study conduct, no inservice was performed to educate staff on the change to antimicrobial gauze dressing. Inventory control measures were put in place during the evaluation period by exchanging the dressings in procedure packs and distribution carts.

RESULTS

The assigned cost of each SSI was determined to be \$15,646¹. Number of infections in the baseline period and the evaluation period were extrapolated to a 12 month time period for analysis.

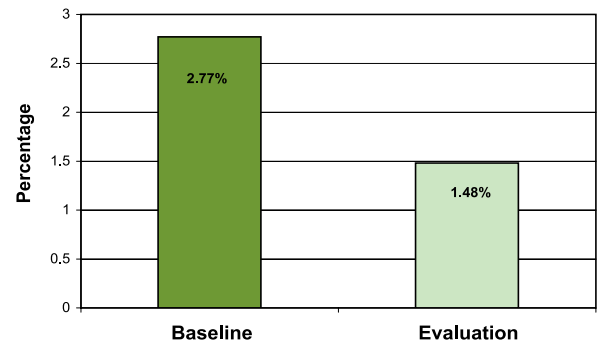
Baseline - 16 SSIs per 578 cases yielded a rate of 2.77% with a SIR of 1.29. The annualized cost of SSIs for 2005 using plain gauze dressing was 32 SSIs x \$15,646 plus \$24,108 (cost of plain gauze per year) = \$ 524,780.

Evaluation - 9 SSIs per 607 cases yielded a rate of 1.48% with an SIR of 0.69 producing a rate reduction of 46.57%. The annualized cost of SSIs for 2006 using antimicrobial dressing was 18 SSIs x \$15,646 plus \$50,145 (cost of antimicrobial dressing per year) = \$331,773. The projected savings between 2005 and 2006 was \$193,007.

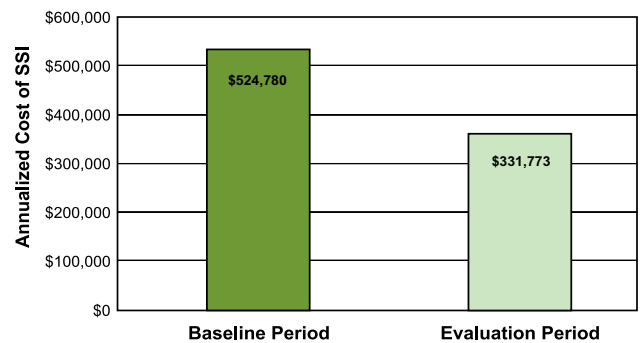
CONCLUSIONS

During the baseline period, targeted SSIs accounted for 25.81% of the total HAIs in this facility. The change to antimicrobial dressing reflects a reduction in targeted SSIs to 17.64% of the total HAI in this facility. The baseline

Rate Reduction in Surgical Site Infections (SSIs)



Reduction in Cost for Facility



targeted SSI rate of 2.77% decreased to 1.48% during the evaluation period. Although the SSI rate did not achieve zero, a 46.57% rate reduction was seen. The impact of this process improvement has contributed to a safer surgical environment, increased quality of patient care thus increasing customer satisfaction, a projected annual savings of \$193,007, and a projected reduction of surgical site infections by 14.

REFERENCES

- 1 Stone P.W., Larson, E., Kawar, L.N., A Systematic Audit of Economic Evidence Linking Nosocomial Infections and Infection Control Interventions, 1990-2000, Am J Infect Control 2002; 30:145-52

This study was sponsored by Tyco Healthcare Group LP
d/b/a Covidien, Mansfield, MA, 02048, USA.



COVIDIEN, COVIDIEN with logo and TM marked brands are trademarks of Covidien AG or an affiliate. ©2008 Covidien AG or an affiliate. All rights reserved.

H6328 10M 09/08