Of the possible surgical complications, postoperative surgical site infection (SSI) is the main contributor to patient injury, mortality, and healthcare costs. SSI is the third most common hospital-acquired infection and patients who develop SSIs are more likely to spend time in an ICU, have 5 times the readmission rate, and have twice the mortality. Approximately 500,000 SSIs occur annually in the US. Rates of SSIs following orthopaedic surgery can be as high as 7.9% for high-risk patients undergoing spinal fusion. It is estimated that up to 365,000 patients each year have SSIs following orthopedic and orthopedic SSIs increase healthcare costs by more than 300%. For instance, the cost of a single SSI for prosthesis removal, antibiotics, and reimplantation of prostheses can approach $64,000; a lower back fusion with infection, $100,666.6.

SSI following hip replacement surgery

SIs are largely preventable and are the result of damage to host barrier mechanisms induced by the trauma of a surgical incision. Endogenous microorganisms implicated in SSIs come chiefly from patients’ skin—Staphylococcus aureus, coagulase-negative staphylococci, Enterococcus spp., and Escherichia coli are the most frequently isolated pathogens. Yet, despite advances in infection control practices, SSIs remain a substantial cause of morbidity and mortality among hospitalized patients. This may be partly due to the emergence of antimicrobial-resistant pathogens, increased numbers of surgical patients who are elderly and/or have comorbidities, and increased numbers of prosthetic implant and organ transplant surgeries.

Choosing an effective skin preparation product can mean the difference between an uneventful surgical recovery and a multi-drug-resistant SSI for your patient. Chlorhexidine is effective against gram-positive and negative bacteria, fungi, as well as encapsulated viruses. Chlorhexidine’s action includes its ability to bind to the skin, a high level of antibacterial activity, and its residual effects. Even in the highly contaminated skin of the feet, when compared to chloroxylenol and iodine during ankle and foot surgery, chlorhexidine is proven to be the most effective agent for eliminating bacteria. Recent studies have shown persistent antimicrobial effects and reduced rates of colonization and SSIs using newly available 2% chlorhexidine no-rinse cloths for pre-surgical skin preparation.

METHODS

In our facility, the existing presurgical skin preparation protocol for total joint surgery patients was a betadine scrub the night before the surgery and a repeat betadine scrub in the holding area just before surgery. After high SSI rates were noted, an internal audit revealed that these preservative scrubs were not being conducted consistently and an alternative protocol using a 2% CHG impregnated no-rinse cloth (Sage® 2% CHG Cloth, Sage Products Inc, Cary, IL; equivalent to 0.5 mg chlorhexidine gluconate per cloth) was implemented. All patients undergoing orthopaedic surgery for a joint procedure were included in the protocol (736 patients). Many of these hospitalized patients were nursing home patients who were admitted to the hospital for treatment of hip fractures and were therefore at high risk for SSI. Prior to the 2% CHG cloth intervention, patients were provided with betadine solution and a scrub brush and instructed to prepare the surgical area of their skin the night before surgery. A second betadine preparation was performed in the holding area prior to surgery. The existing protocol was revised to use prepackaged 2% CHG no-rinse cloths instead of betadine. Patients were instructed to conduct a site-specific preparation using the 2% CHG cloths the night before the surgery, and a repeat site-specific prep with the cloths was done in the holding area prior to surgery. In our facility, the existing presurgical skin preparation protocol for total joint surgery patients was a betadine scrub the night before the surgery and a repeat betadine scrub in the holding area just before surgery. After high SSI rates were noted, an internal audit revealed that these preservative scrubs were not being conducted consistently and an alternative protocol using a 2% CHG impregnated no-rinse cloth (Sage® 2% CHG Cloth, Sage Products Inc, Cary, IL; equivalent to 0.5 mg chlorhexidine gluconate per cloth) was implemented. All patients undergoing orthopaedic surgery for a joint procedure were included in the protocol (736 patients). Many of these hospitalized patients were nursing home patients who were admitted to the hospital for treatment of hip fractures and were therefore at high risk for SSI. Prior to the 2% CHG cloth intervention, patients were provided with betadine solution and a scrub brush and instructed to prepare the surgical area of their skin the night before surgery. A second betadine preparation was performed in the holding area prior to surgery. The existing protocol was revised to use prepackaged 2% CHG no-rinse cloths instead of betadine. Patients were instructed to conduct a site-specific preparation using the 2% CHG cloths the night before the surgery, and a repeat site-specific prep with the cloths was done in the holding area prior to surgery. SSI rates were measured as a simple percentage and compared to prior (historical infection rates). Statistical analyses were not done and historical values were used as the control.

RESULTS

50% reduction in SSI rate

Once the CHG preoperative preparation protocol was implemented (in the 2nd quarter of FY06), there was a reduction in SSI rates.

When compared to an average SSI rate of 3.19% in the 3 quarters prior to instituting the new protocol (Q3 FY05-Qr 1 FY06), the SSI rate for 3 quarters after implementing the use of 2% CHG cloths (Qrs 2-4 FY06) was an average of 1.59%. This represents a 50.16% difference in the rate of SSIs.

Improved compliance

Under the old (betadine) protocol, it was found that patients were not prepping themselves the night before surgery and often times, unless there was a physician standing order, the preoperative preparation was not taking place. That lack of compliance could likely explain Lakeview’s increasing SSI rates in the period prior to the 2% CHG cloth intervention.