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EDITORIAL COMMENTARY

An ounce of prevention is worth a pound of cure

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See related article on pages 2381-8.

Surgical site infection remains an unfortunate occurrence of cardiac surgery with deep sternal wound infection (eg, mediastinitis) being the most feared. The good news is that the prevalence is low, around 0.5% to 5%; the bad news is that the associated mortality may be high, around 40%. The financial cost must also be considered; the attributable cost for a procedure complicated by deep sternal wound infection may be as much as 3 times greater than that of an uncomplicated procedure. It is no longer acceptable to view surgical site infection as a possible risk and unfortunate outcome of a surgical procedure, especially because implementation of effective infection prevention programs, such as those presented here, may significantly reduce the occurrence of infection.^{1,2}

In this article of the *Journal of Thoracic and Cardiovascular Surgery*, Miyahara and colleagues² report a significant reduction in the prevalence of deep sternal wound infection after the implementation of a specific set of simple multidisciplinary prevention measures (the bundle).² The success of the bundle lies in that it recognizes that multiple factors contribute to deep sternal wound infection and that multiple modalities of treatment are essential to prevent it. The factors that contribute to infection and the modalities of treatment may be collected into 2 simple and convenient assemblages: patient characteristics and operative issues.³

In cardiac surgery, patient characteristics possibly associated with an increased risk of surgical site infection include coincident remote site bacterial colonization, diabetes, systemic steroid use, obesity, and the extremes of age. The most modifiable of these risk factors is that of coincident preoperative nares colonization with *Staphylococcus aureus*. Such carriage is a powerful independent risk factor for surgical site infection after cardiac operations. Mupirocin ointment is an effective topical agent against this hazard, and treatment is indicated for all patients. Current consensus is that broad use of the antibiotic is unlikely to result in mupirocin resistance because treatment courses are brief.³

Operative issues may be further categorized into interventions that occur during specific periods: intraoperative and postoperative. The intraoperative infection control measures recommended by the Centers for Disease Control and Prevention include hair clipping immediately before the operation, antimicrobial prophylaxis in accordance with evidence-based standards and guidelines, and use of appropriate antiseptic agents and techniques for skin preparation.³ Miyahara and colleagues² add to the list additional maneuvers that include the use of an iodophor-impregnated drape, double-gloving for all surgical team members, scheduled glove changes, minimization of intraoperative steroids, pericardial irrigation, and secure sternal closure with at least 6 wires.

Best practices of postoperative infection control include measures nicely outlined by the Centers for Disease Control and Prevention³ and Miyahara and colleagues.² These include the restoration of normothermia, maintenance of control of serum blood glucose levels at less than 140 mg/dL, administration of greater than 80% inspired oxygen for 2 hours, continuation of antibiotics according to evidence-based standards and guidelines, and wound coverage with a sterile, dry dressing for at least 48 hours.^{2,3} Miyahara and colleagues² go further to recommend changing the wound dressing to a transparent hydrocolloid dressing for the next 5 days.

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Miyahara and colleagues² point out that in the area of infection control the Centers for Disease Control and Prevention guidelines are recognized as the global standard. Many of these recommendations, however, have not been individually validated as influencing the rate of surgical site infection, and frankly some are controversial. The main focus of the bundle strategy is that although individual interventions may not directly decrease the rate of surgical site infections, implementation of multiple strategies as bundled interventions may reduce the incidence of infection. In this study by Miyahara and colleagues,² the prevalence of deep sternal infection decreased from 1.9% to 0.14% (a 93% reduction) after implementation of the bundle. It is hard to argue with the successful outcome.

The key to reducing surgical site infection is the complete implementation of simple, multidisciplinary prevention

measures. Miyahara and colleagues² demonstrate that the bundle concept provides the framework in which to incorporate the measures effectively.

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