

whether the patient required hospital readmission and to what facility.

Surgical wound surveillance is becoming more important in the current situation of increasing antibiotic resistance by organisms. Whatever system is used needs to be able to accurately and quickly detect significant changes in infection rates. A common experience is that an outbreak of SSI may be detected by those caring for the patient before it is evident in the surveillance data. This underscores the importance of having infection control practitioners in regular contact with the surgical wards and the surgeons' offices. It also means that the system used must include simple indicators that are easily evaluated. Hospital readmission and surgical procedures for infection are two easily monitored indicators.

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Frederick J. Roberts, MD, FRCPC
British Columbia Cancer Agency
Vancouver, British Columbia, Canada

The authors reply.

We agree with Dr. Roberts that the current classification system based on the *International Classification of Diseases, 9th Revision, Clinical Modifications* (ICD-9-CM), adjustments by the National Nosocomial Infections Surveillance (NNIS) System for length of procedures, and American Society of Anesthesiologists scores have limitations for the surveillance of surgical-site infections (SSIs) for most surgical procedures.

Our study¹ involved a detailed and extensive surveillance of SSIs associated with coronary artery bypass grafts. We compared our rates with those reported by the NNIS System and found that we had a higher rate of SSIs because of our comprehensive program for postdischarge surveillance for SSIs. However, most of the deep infections were diagnosed before discharge and other serious infections related to the chest or harvest sites required readmission.

Dr. Roberts suggests classifying SSIs into those treated out of the hospital and those requiring readmission. He reasons that because superficial wound infections rarely cause significant sequelae, we should focus our limited resources on identification of infections that may result in morbidity and mortality (ie, infections that are identified during hospitalization and those that result in readmission). Our study confirmed that a great deal of time was expended by dedicated infection control practitioners in the collection and analysis of data including infections postdischarge. We agree with Dr. Roberts that such expenditure of time and money might not be justified for one surgical procedure, and that a system should be developed to quickly detect significant changes in the rates of infection. He suggests a system that includes simple indicators that can be easily monitored, such as hospital readmission and surgical procedures performed because of infection. Even with his suggested system, each institution will need to make prudent decisions to allocate its limited resources to a few surgical procedures at one time, especially procedures that are associated with a higher risk of SSIs.

Improving communications be-

tween infection control practitioners and surgeons in all disciplines in conjunction with the simple indicators would certainly help to identify clusters of infections earlier so that interventions could be instituted to reduce morbidity and mortality.

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Joan L. Avato, MPH
Kwan Kew Lai, DMD, MD
University of Massachusetts
Medical School
Worcester, Massachusetts

A Risk Index for Sternal Wound Infection After Cardiovascular Surgery

To the Editor:

I really enjoyed reading the article by Kohli et al. in the January 2003 issue of *Infection Control and Hospital Epidemiology*.¹ The authors have provided a neat study of risk factors for sternal wound infection at the largest center for cardiac surgery in the province of Ontario. A huge data set was tackled, hard work ensued, and the findings are going to stimulate useful discussions among surgeons and non-surgeons alike. I am nonetheless disappointed that the authors made no mention of our study, which was published in 1993 in peer-reviewed cardiac surgery literature.²

The epidemiologic study in Minneapolis spanned 15 years of cardiac surgery practice in a system that enjoys the benefits of an aggressive and rigid global surgical infection surveillance program that has been operational since 1977. Detailed microbiology data have always been garnered in that effort as well. In setting the predicate for their study design, Kohli et al. cited four prior studies of risk factors for sternal wound infections, three of which were from 6 to 10 years older than ours. It is no doubt linguistically accurate to state, as they did, that "numerous studies of the risk factors of sternal surgical wound infection exist," but there certainly have not been numerous regression analyses performed with a mainstream

approach to sternal infection risk modeling and the observance of orthodox epidemiology maneuvers. Our work was clearly planned to intentionally occupy the second category, and subsequent workers in other centers have cited it without attacking its focus, conclusions, or methods.

The authors have produced what can only be called a blockbuster study; it is going to be widely quoted in the future. Simultaneously, I would plead for more vigorous bibliographic scrutiny when writing in a subject area that is receiving increasing attention during the current enthusiasm for "medical error reduction." Sophisticated studies will continue to appear at a steady pace and contradictory reports will probably emerge. We have an incomplete grasp of the detailed phenomenology of this puzzling, expensive, and potentially lethal outcome flaw.

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James T. Lee, MD, PhD, FACS
Department of Veterans Affairs Medical
Center
Minneapolis, Minnesota

The authors reply.

We would like to thank Dr. Lee for bringing his study to our attention. We highlighted several studies that have also identified diabetes as a risk factor, but neglected to cite the study by Slaughter et al.¹ The study was based on a sample of more than 2,000 patients who underwent coronary artery bypass procedures and coronary artery bypass plus valve replacement procedures at the Minneapolis Veterans Affairs Hospital. Of the 14 variables tested in their analysis, only diabetes and steroid use emerged as statistically significantly associated with sternal wound infection. Reoperation, an important risk factor in our study, was not statistically significant in their analysis. A comparison

of the two studies provides an example of how risk factors may vary in different institutions due to case mix, hospital practices, and the number of procedures used in the denominator. Their study highlights the importance of wound infection surveillance systems and it was an oversight that we did not reference it in our article.

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Michele Kohli, MSc
Lilian Yuan, MSc, MD
Michael Escobar, PhD
Department of Public Health Sciences
Tirone David, MD
Division of Cardiovascular Surgery
Toronto General Hospital
University Health Network
Grant Gillis, BSc, BComm
Marta Garcia, BSN, MEd
John Conly, MD
Infection Prevention and Control Unit
Toronto General Hospital
University Health Network
University of Toronto
Toronto, Ontario, Canada