



# Clinical Update

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## Reducing Infection Risk in Chest Surgery

In November 2010, infection prevention experts from a number of organizations (see [On the Web](#)) published a white paper call to action to eliminate healthcare-associated infections (HAI).<sup>1</sup> These experts believe that concepts and plans used to eliminate polio, tuberculosis and syphilis can be adapted to HAIs.

### Key Elements to Reduce HAI

The call to action identifies the need for constant action and vigilance in 4 key areas.<sup>1</sup>

- Adhere to evidence-based practices to reduce infection
- Align financial incentives so that they support these practices and invest in success
- Conduct basic, translational, and epidemiological research to fill knowledge gaps and respond to new threats
- Collect, analyze, and share data to identify focus areas and measure progress

HAIs are one of the leading causes of death in the US; yet, research and implementation funding has not been prioritized to address this growing problem.<sup>1</sup>

### Many Challenges

There are many challenges to reducing HAI. Despite an abundance of evidence and evidence-based guidelines, those practices are not being implemented at the bedside. While there are many reports of success in more controlled environments such as self-contained ICUs, it is much more complicated to implement bundles throughout an organization. A Saudi Arabia study found good compliance with antibiotic choice and timing (at anesthesia induction), removing hair with clippers, and preop glucose management. Clinicians fell short in stopping antibiotics within 24 hours of surgery and maintaining tight glucose control postoperatively.<sup>2</sup>

### HAI in Cardiac Surgery

Superficial, deep tissue, and organ space infections complicate cardiac surgery regardless of age. In a pediatric study, 6.3% of patients had postoperative wound infections.<sup>3</sup> Of these, 48% were superficial, 37% were in the organ space and 15% were deep tissue infections. *S. aureus* was the most common pathogen, in 23% of patients. Independent risk factors for infection included: age younger than 30 days, hypoplastic left heart, preoperative gastrostomy tube, intraoperative femoral catheter or epicardial wire and postoperative total parenteral nutrition. Of note, 37% of infections were detected after hospital discharge in this study and in another study of adults.<sup>4</sup>

In adults, rates for major infection after cardiac surgery decreased from 5.4% in 2000 to 2.6% by the end of 2004.<sup>4</sup>

Superficial infections occurred in 47% of patients, and complex infections in 54%. Risk factors for infection include: BMI>40, emergent surgery, immunosuppression, and comorbidities of diabetes, renal impairment and peripheral or cerebrovascular disease. Patients who developed major infection stayed in the hospital more than twice as long and 30-day mortality was significantly increased. As with the children, *S. aureus* was the most common pathogen. These researchers noted the absence of standard methods for post-discharge surveillance, making outpatient infection rate variable and hard to track.<sup>4,5</sup>

An initiative that reduced cardiac surgical site infections in adults from 2.3% to 0.4% and saved more than \$400,000 included a comprehensive MRSA program in which every patient received nasal mupirocin to reduce colonization.<sup>6</sup> The hospital has a weekly multidisciplinary team meeting with members from nursing, pharmacy, laboratory, respiratory care, anesthesia, infection prevention, surgery, and care management led by the chief of cardiothoracic surgery. This way, information is easily and quickly disseminated to all team members for consistency. Turning data into real-time, immediate feedback also increases the opportunities to identify problems and solutions quickly.

Researchers also found that being able to identify cost savings when infection rates decrease was essential for administrative buy-in to support preventive measures.<sup>6</sup> Starting with the cardiothoracic team was particularly helpful to the organization because there were fewer surgeons and units involved in the patients' care. The successes in this population could then be transferred to other services.<sup>6</sup>

### Surgical Site Infections

A multicenter randomized study of surgical skin prep found a significant reduction in surgical site infection (SSI) in patients whose skin was disinfected with chlorhexidine-alcohol compared with aqueous povidone-iodine.<sup>7</sup> Infection risk was reduced by 41%. Authors believe this effect can be attributed to the more rapid action, residual effect, and continued activity despite exposure to body fluids with chlorhexidine-alcohol.

Unfortunately, a November 2010 survey of hospital-based health care professionals reveals that 33% do not follow evidence-based guidelines for skin prep.<sup>8</sup> Practitioners with less than 20 years in practice ranked skin antisepsis as more important to preventing SSI than those with more experience. The data also noted a marked difference in practice area, with 77% of infection prevention specialists using chlorhexidine products versus 53% of other professionals.

### Prevention is Possible

Cardiac surgical patients' wound infection rates can be close to zero. Since they are usually treated by a consistent team in

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## In The Literature

### Reevaluating Your Practice

Mary Bylone has written a terrific piece in the current issue of *AACN Advanced Critical Care*. She has long been a proponent of AACN's Healthy Work Environments initiative, and writes about her personal experiences facilitating a work group examining their own work environments. She learned that believing in a management philosophy isn't enough if that belief is not reflected in day-to-day priorities.

Source: Bylone M: Authentic leadership: lessons learned undercover. *AACN Advanced Critical Care* 2010;21(4):341-344. [PubMed Citation](#)

### Get the TIGER by the Tail

A recent issue of *Nursing Economic\$* provides a great summary of the TIGER initiative. The Technology Informatics Guiding Education Reform group was formed when nursing informatics leaders attended the first Health Information Technology (HIT) summit in 2004 and discovered that nurses were not mentioned in any of the presentations about HIT's future. In 2005, these leaders formed TIGER to assure that nurses' voices would be heard as this transformation in health care delivery occurs. Assuring nurses' role has become even more critical with the HITECH Act, a part of the American Resources and Recovery Act that provides financial incentives for organizations that show "meaningful use" of electronic health records. This article will get you up to speed and provide resources you can use.

Source: Walker PH: The TIGER initiative: a call to accept and pass the baton. *Nursing Economic\$* 2010;28(5):352-355.

### Patient Cost: More Than Money

A fascinating study of patient experiences in the current issue of *AJIC* found sudden, severe pain at home occurred in 86% of patients with deep SSI. Patients further reported that they had no frame of reference for what a healing wound should look like so they were unable to identify early warning signs. They were frightened by uncertainty as their symptoms were being worked up and distressed when physicians could not make an immediate diagnosis. Patients also felt isolated in many cases and worried that the infection might not ever clear. This study guides nurses in teaching patients about their condition and explaining diagnostic tests, setting expectations for when results will be available, and being advocates helping patients get their questions answered and ensuring adequate resources for pain management.

Source: Andersson AE et al.: Patients' experiences of acquiring a deep surgical site infection: an interview study. *American Journal of Infection Control* 2010;38:711-717. [PubMed Citation](#)

### Reducing Infection Risk (cont. from front page)

dedicated units, changes can be implemented and monitored more easily. Key elements include consistent practice among all team members, with strict attention to evidence-based bundles of care. Standardized kits for chest tube insertion that contain chlorhexidine-alcohol prep applicators and similar surgical prep standardization make compliance with guidelines a simple part of routine work flow. As one researcher noted, "It's not a matter of choice [or preference]. These are the evidence-based practices we must follow." <sup>6</sup>

## On the World Wide Web



### Organizations Involved in the HAI Call to Action

[Association for Professionals in Infection Control \(APIC\)](#)

[Society for Healthcare Epidemiology of America \(SHEA\)](#)

[Infectious Disease Society of America \(IDSA\)](#)

[Association of State and Territorial Health Officials \(ASTHO\)](#)

[Council of State and Territorial Epidemiologists \(CSTE\)](#)

[Pediatric Infectious Disease Society \(PIDS\)](#)

[Centers for Disease Control and Prevention \(CDC\)](#)

[Fifth Decennial International Conference on Healthcare-Associated Infections 2010](#)

#### Sources

1. Cardo D et al: Moving toward elimination of healthcare-associated infections: a call to action. *American Journal of Infection Control* 2010;38:671-675. [PubMed Citation](#)
2. Enani MA: Compliance with surgical site infection prevention bundle, a pilot study in a Saudi Arabian cardiac centre. Abstract. Fifth Decennial International Conference on Healthcare-Associated Infections. Atlanta, GA 2010. Available at: <http://shea.confex.com/shea/2010/webprogram/Paper1878.html>
3. Sohn AH et al.: Risk factors and risk adjustment for surgical site infections in pediatric cardiothoracic surgery patients. *American Journal of Infection Control* 2010;38:706-710. [PubMed Citation](#)
4. Chen LF et al.: Depth and location of surgical site infections following 7 major procedure categories. Abstract. Fifth Decennial International Conference on Healthcare-Associated Infections. Atlanta, GA 2010. Available at: <http://shea.confex.com/shea/2010/webprogram/Paper1443.html>
5. Chen LF et al.: Impact of major infection due to Staphylococcus aureus following cardiac surgery. Abstract. Fifth Decennial International Conference on Healthcare-Associated Infections. Atlanta, GA 2010. Available at: <http://shea.confex.com/shea/2010/webprogram/Paper2052.html>
6. Litter C: Cutting infections. *Prevention Strategist* 2010;3(3):28-31.
7. Darouiche RO et al: Chlorhexidine-alcohol versus povidone-iodine for surgical site antisepsis. *New England Journal of Medicine* 2010;362(1):18-26. [PubMed Citation](#)
8. Infection Control Today: Survey shows one-third of HCWs don't follow evidence-based guidelines for skin asepsis. 2010 (November) Available at: <http://www.infection-controltoday.com/news/2010/11/survey-shows-one-third-of-hcws-dont-follow-evidence-based-guidelines-for-skin-antiseptis.aspx>

Your friends at Atrium wish you and yours a happy and healthy holiday season!