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Prevention of Surgical-Site Infections

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CORRESPONDENCE

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TO THE EDITOR: I am concerned about the generalizability of the findings of Bode et al. (Jan. 7 issue)[1] regarding the identification of nasal carriers of *Staphylococcus aureus* and the subsequent use of mupirocin nasal ointment and chlorhexidine soap. First, it is unclear how the researchers identified patients who were expected to be hospitalized for 4 or more days, since no specific protocol is provided. Second, key surgical data are lacking, despite the preponderance of surgical patients (88%). No data are provided on the appropriateness of antimicrobial prophylaxis, in particular the timing of administration; 84 of 828 surgical patients (10%) received no prophylaxis. Similarly, no data are provided to explain the high rate of infection: among surgical patients, *S. aureus* infection developed in 3.6% of those receiving prophylaxis and 8.4% of those receiving placebo; 11 to 12% of patients had non–*S. aureus* infection. Would the intervention be as effective in a hospital with lower baseline rates of infection? Finally, it is unclear whether such a screening protocol would work in settings with a high rate of methicillin-resistant *S. aureus* infection, as is the case in many community hospitals.[2]

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No potential conflict of interest relevant to this letter was reported.

1. Bode LG, Kluytmans JA, Wertheim HF, et al. Preventing surgical-site infections in nasal carriers of *Staphylococcus aureus*. N Engl J Med 2010;362:9-17.
2. Anderson DJ, Sexton DJ, Kanafani ZA, Auten G, Kaye KS. Severe surgical site infection in community hospitals: epidemiology, key procedures, and the changing prevalence of methicillin-resistant Staphylococcus aureus. Infect Control Hosp Epidemiol 2007;28:1047-53.

TO THE EDITOR: The study by Bode et al. highlights the value of mupirocin–chlorhexidine prophylaxis in preventing nosocomial *S. aureus* infection. Although resistance rates are low in the Netherlands, where Bode et al. conducted their study, our experience at the Providence Veterans Affairs Medical Center has shown that increased use of mupirocin can result in increased rates of resistance in methicillin-resistant *S. aureus*.

Our targeted presurgical surveillance and decolonization program for methicillin-resistant *S. aureus* with mupirocin–chlorhexidine started in 2006, followed by facility-wide surveillance and provider-initiated decolonization in 2007. Using Pearson correlation coefficients, we have been evaluating mupirocin resistance in *S. aureus* since June 2004 and assessing the effect of facility-level use of mupirocin.[1-4] In 980 isolates of methicillin-resistant *S. aureus*, we found that an increase in the monthly use of mupirocin had a significant association with subsequent increases in low-level resistance after 1 month ($P=0.05$) and in high-level resistance after 2 months ($P=0.03$). Mupiro-

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cin resistance in methicillin-susceptible *S. aureus* was uncommon during the 4.5-year period (9 cases of resistance in 342 isolates), and the use of mupirocin was not correlated with lagged resistance in the subsequent 12 months. These data suggest an ecologic association between mupirocin use and resistance in methicillin-resistant *S. aureus*. These findings have implications for facilities instituting decolonization programs, since the increased use of mupirocin may reduce the drug's effectiveness.

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No potential conflict of interest relevant to this letter was reported.

1. Cookson BD. The emergence of mupirocin resistance: a challenge to infection control and antibiotic prescribing practice. J Antimicrob Chemother 1998;41:11-8.
2. Deshpande LM, Fix AM, Pfaller MA, Jones RN. Emerging elevated mupirocin resistance rates among staphylococcal isolates in the SENTRY Antimicrobial Surveillance Program (2000): correlations of results from disk diffusion, Etest and reference dilution methods. Diagn Microbiol Infect Dis 2002;42:283-90.
3. M100-S19: performance standards for antimicrobial susceptibility testing: 19th informational supplement. Wayne, PA: Clinical and Laboratory Standards Institute, 2009.
4. Patel JB, Gorwitz RJ, Jernigan JA. Mupirocin resistance. Clin Infect Dis 2009;49:935-41.

TO THE EDITOR: We do not believe that preoperative *S. aureus* screening and decolonization provides only a marginal benefit or should be reserved for the highest-risk surgical patients, as suggested by Wenzel[1] in the editorial accompanying the article by Bode et al. *S. aureus*, a virulent pathogen, can cause a substantial number of surgical-site infections and deaths across a wide spectrum of patients.[2]

A total of 91 patients with *S. aureus* colonization in three studies[3-5] underwent preoperative screening and decolonization; no *S. aureus* infections developed in these patients, as compared with 32 of 533 patients (6%) with such colonization who received chlorhexidine antisepsis but not decolonization ($P=0.009$). Screening also facilitates better perioperative prophylaxis (e.g., for methicillin-resistant *S. aureus*). Without screening, appropriate switching from cefazolin to vancomycin often does not happen. In one cited study,[4] surgeons routinely switched antibiotics, and methicillin-susceptible *S. aureus* caused the only surgical-site infection in a patient who did not receive mupirocin. In another study,[3] surgeons did not switch antibiotics, and methicillin-resistant *S. aureus* was rare and prophylaxis usually appropriate. In a third study,[5] which was focused on patients with methicillin-resistant *S. aureus*, those who underwent decolonization also received appropriate perioperative prophylaxis, whereas the other patients who were colonized with methicillin-resistant *S. aureus* usually did not receive a glycopeptide, a factor that may have influenced the development of 29 surgical-site infections with the methicillin-resistant strain.

One advantage of screening is that colonized patients can be isolated to prevent spread. More than 30 studies have shown that active detection and isolation were effective at controlling methicillin-resistant *S. aureus* infections among surgical patients, and 12 studies of cost-effectiveness reported savings with such prophylaxis.

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Dr. Jarvis reports having received consulting fees from Becton Dickinson, Johnson & Johnson, Bard, Kimberly-Clark, and 3M. No other potential conflict of interest relevant to this letter was reported.

1. Wenzel RP. Minimizing surgical-site infections. N Engl J Med 2010;362:75-7.
2. Kaye KS, Anderson DJ, Choi Y, Link K, Thacker P, Sexton DJ. The deadly toll of invasive methicillin-resistant Staphylococcus aureus infection in community hospitals. Clin Infect Dis 2008; 46:1568-77.
3. Price CS, Williams AE, Phillips G, Dayton M, Smith W, Morgan S. Staphylococcus aureus nasal colonization in preoperative orthopaedic outpatients. Clin Orthop Relat Res 2008;466:2842-7.
4. Salgado CD, Greco CS, Buddington RS, Farr BM. Decrease in total knee replacement (TKR) infection rate after implementing new infection control measures. Presented at the 13th Annual Scientific Meeting of the Society for Healthcare Epidemiology of America, Arlington, VA, April 5–8, 2003. abstract.
5. Harbarth S, Fankhauser C, Schrenzel J, et al. Universal screening for methicillin-resistant Staphylococcus aureus at hospital admission and nosocomial infection in surgical patients. JAMA 2008;299:1149-57.

TO THE EDITOR: In their study comparing chlorhexidine–alcohol with povidone–iodine for surgical-site antisepsis, Darouiche et al. (Jan. 7 issue)[1]