

# Universal Surveillance for Methicillin-Resistant *Staphylococcus aureus* in 3 Affiliated Hospitals

Ari Robicsek, MD; Jennifer L. Beaumont, MS; Suzanne M. Paule, BS; Donna M. Hacek, BS; Richard B. Thomson, Jr., PhD; Karen L. Kaul, MD, PhD; Peggy King, RN, MBA; and Lance R. Peterson, MD

18 March 2008 | Volume 148 Issue 6 | Pages 409-418

**Background:** The effect of large-scale expanded surveillance for methicillin-resistant *Staphylococcus aureus* (MRSA) on health care-associated MRSA disease is not known.

**Objective:** To examine the effect of 2 expanded surveillance interventions on MRSA disease.

**Design:** Observational study comparing rates of MRSA clinical disease during and after hospital admission in 3 consecutive periods: baseline (12 months), MRSA surveillance for all admissions to the intensive care unit (ICU) (12 months), and universal MRSA surveillance for all hospital admissions (21 months).

**Setting:** A 3-hospital, 850-bed organization with approximately 40 000 annual admissions.

**Intervention:** Polymerase chain reaction-based nasal surveillance for MRSA followed by topical decolonization therapy and contact isolation of patients who tested positive for MRSA.

**Measurements:** Poisson and segmented regression models were used to compare prevalence density of hospital-associated clinical MRSA disease (bloodstream, respiratory, urinary tract, and surgical site) in each period. Rates of bloodstream disease with methicillin-susceptible *S. aureus* were used as a control.

**Results:** The prevalence density of aggregate hospital-associated MRSA disease (all body sites) per 10 000 patient-days at baseline, during ICU surveillance, and during universal surveillance was 8.9 (95% CI, 7.6 to 10.4), 7.4 (CI, 6.1 to 9.0;  $P = 0.15$  compared with baseline), and 3.9 (CI, 3.2 to 4.7;  $P < 0.001$  compared with baseline and ICU surveillance), respectively. During universal surveillance, the prevalence density of MRSA infection at each body site had a statistically significant decrease compared with baseline. The methicillin-susceptible *S. aureus* bacteremia rate did not statistically significantly change during the 3 periods. In a segmented regression model, the aggregate hospital-associated MRSA disease prevalence density changed by  $-36.2\%$  (CI,  $-65.4\%$  to  $9.8\%$ ;  $P = 0.17$ ) from baseline to ICU surveillance and by  $-69.6\%$  (CI,  $-89.2\%$  to  $-19.6\%$ );  $P = 0.03$ ) from baseline to universal surveillance. During universal surveillance, the MRSA disease rate decreased during hospitalization and in the 30 days after discharge; no further reduction occurred thereafter. Surveillance with clinical cultures would have identified 17.8% of actual MRSA polymerase chain reaction would have identified 33.3%.

**Limitation:** The findings rely on observational data.

**Conclusion:** The introduction of universal admission surveillance for MRSA was associated with a large reduction in MRSA disease during admission and 30 days after discharge.