vaccine has been reported as approximately 80%, which is considered inadequate to provide population protection. Previous studies have shown that the effectiveness of 2 doses of vaccine is from 88% to 95%.[8,9] The estimated herd immunity threshold for mumps ranges from 88% to 92%.[10]

Although there was no single explanation for this outbreak, multiple factors may have contributed; these factors include waning immunity, vaccine failure, high population density and high contact rates in colleges, and incomplete vaccine-induced immunity to the wild virus. The relatively advanced age of the majority of infected patients points toward the waning immunity hypothesis. However, more research is needed to study the long-term vaccine effectiveness.

In our study, all the subjects had received 2 doses of MMR vaccine, and yet 16 HCWs were found to be seronegative. In a recent measles outbreak, an unvaccinated HCW became infected in a hospital. Of 64 people with confirmed cases of measles, 17 became infected while visiting the healthcare facility.[11]

A limitation of our study is the small sample size; we did not include all the HCWs employed. Therefore, the results may underestimate the number of susceptible HCWs already employed.

Mumps should be considered a reemerging yet vaccine-preventable disease, with transmission occurring in both healthcare and community settings. Future studies should include all HCWs, to better assess mumps seroprevalence in healthcare institutions. In view of the possible waning immunity, it is essential to carry out periodic serological surveillance and to vaccinate susceptible HCWs.

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Reduction of Hospital-Acquired Methicillin-Resistant *Staphylococcus aureus* Infection by Cohorting Patients in a Dedicated Unit

To the Editor—One of the risk factors for methicillin-resistant *Staphylococcus aureus* (MRSA) acquisition is proximity to MRSA-colonized or MRSA-infected patients who are not receiving care that includes isolation precautions.[1] Increased numbers of preventable adverse events in patients placed under barrier precautions have been reported recently.[2–4] These factors may adversely affect the nosocomial infection rates and length of hospital stay (LOS) for patients with MRSA infection. We describe our experience creating a dedicated MRSA infection unit and the implementations that helped reduce the rate of hospital-acquired MRSA infection and average LOS in the medical and surgical units at Crouse Hospital (Syracuse, NY).

Crouse Hospital has 506 acute care beds. In 1999, Crouse Hospital had an outbreak of MRSA infection in the intensive care unit (ICU) during which 1 patient died. Patient beds were situated in close proximity to each other and were separated by curtains. To control the outbreak, all patients in the ICU were screened for MRSA; if they tested positive, they were cohorted to one side of the unit, were placed under contact precautions, and were assigned dedicated staff. The

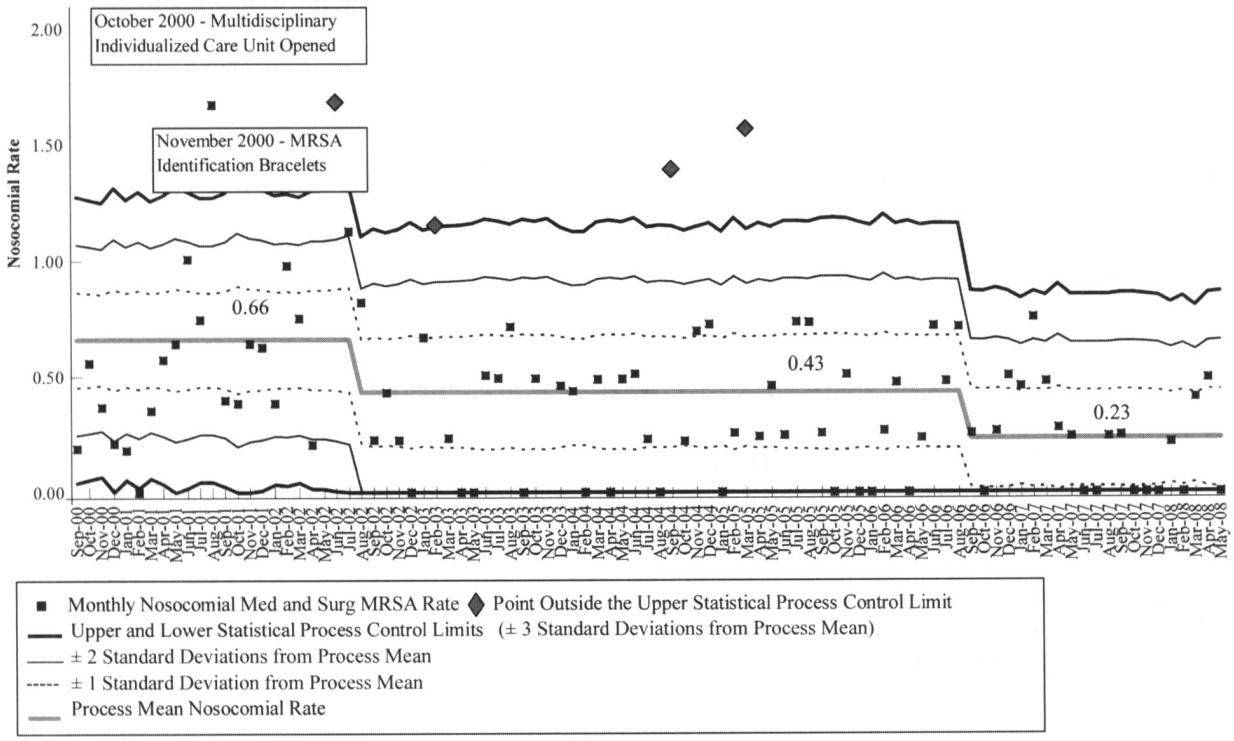

FIGURE. Methicillin-resistant *Staphylococcus aureus* (MRSA) nosocomial infection rate per 1,000 patient-days in medical and surgical (med and surg) units at Crouse Hospital, September 2000–May 2008, after establishment of a dedicated MRSA unit.

intervention was successful in preventing further spread of MRSA colonization and infection in the ICU.

The Crouse infection-control policy and procedure for MRSA-colonized and MRSA-infected patients at that time included MRSA screening (as defined by the Centers for Disease Control and Prevention[5] and the Hospital Infection Control Practices Advisory Committee[6]) and placement under contact precautions in a private room. This created problems with regard to bed availability for other patients—especially those in the emergency department—and a decreased census, and had financial repercussions. Healthcare providers found it difficult to care for these patients because of the time constraints associated with using isolation precautions. The perception of patients, administration, and infection-control personnel was that patients who were colonized or infected with MRSA were getting a lower level of care because of the time required for healthcare providers to use gowns and gloves.

A unit with 17 private rooms, each with a bathroom, became available. Hospital administration and the medical and surgical unit staff endorsed the idea of a self-contained unit capable of providing all aspects of care, including rehabilitation, required by patients colonized or infected with MRSA. The designated staff (voluntarily assigned) would not have to gown on entering the unit, although they would still practice hand hygiene and wear gloves. A gown would be worn only for patients colonized with other drug-resistant organisms. Staff not assigned to the unit would practice hand hygiene, would don a gown on entering the unit, and would change gloves after contact with each patient. Gowns would be removed when leaving the unit and changed only in between examining patients who had infections with other resistant organisms. Patients who were coinfected or colonized with other resistant organisms were cohorted with similar patients at one end of the unit. Patients and their families would be able to ambulate in the hallways without gowning and wearing gloves. Space was available for physical therapy and whirlpool treatments. The unit opened in October 2000. A policy was created in 2003 to never remove MRSA status once a patient had a culture positive for MRSA, and a computer entry system was initiated to alert staff of the patient's MRSA status on readmission to the hospital.

Six years of data were extracted from infection-control records. Crouse Hospital monitors MRSA infection rates (no. of infections per 1,000 patient-days) through use of statistical process-control charts. A pattern ("runs rule") of 11 of 15 points below the process average is used to detect a decrease in the process average. Three different process averages were detected, during September 2000–July 2002, August 2002–August 2006, and September 2006–February 2008. Crouse's hospital-acquired MRSA infection rates decreased from 0.66 infections per 1,000 patient care days (during September 2000–July 2002) to 0.43 infections per 1,000 patient-days

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(during August 2002–August 2006) and then decreased to 0.23 infections per 1,000 patient-days (during September 2006–February 2008) (Figure). There was also a significant decrease in the mean LOS in the MRSA unit, in comparison of 2002 with 2003-2006, from 23.9 days to 12 days ($P = .009$).

Patient benefits include the freedom to ambulate in the hall and lounge area. Physical therapy is available for gait training and stair walking in the unit's mini–physical therapy room. Patients have verbalized how important this is, in contrast to isolation for their entire hospitalization. Patients are frequently assigned the same nursing personnel during their stay and on readmission. The level of visitor emotional stress, compared with seeing loved ones placed "in isolation," decreased because visitors no longer had to wear gowns or gloves; this new ward allowed for a closer relationship to develop among family, visitor, and nurse during this and possible subsequent hospitalizations. Crouse Hospital was able to decrease costs because fewer gowns were used and the LOS for patients with MRSA infection or colonization decreased, which represented a cost savings of $1.5 million. Bed placement in the general and medical and surgical unit population has eased because of the decreased need to isolate beds.

Just cohorting staff to care for patients has been reported as an effective way of reducing transmission of infection in hospitals.[7] The rate of hand-washing compliance on this designated unit exceeds 90%; the staff is more likely to comply because they are aware that the unit patients are colonized or infected with a resistant organism. The rates of MRSA-colonized or MRSA-infected patients may have decreased because patients are considered "once positive, always positive" and are no longer rescreened on subsequent hospitalizations. A small census with fewer staff members makes it easier to care for unit patients and to attend to their needs. This could explain why the average LOS has decreased significantly.

Cohorting patients on this dedicated MRSA unit has been a challenging and successful intervention. Creation of this designated unit has helped reduce both the rate of hospital-acquired MRSA infection in the medical and surgical units and the LOS in the MRSA unit.

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Antimicrobial Stewardship Programs Must Apply to All

To the Editor—We read with great interest the letter from Kenichi Nomura, MD, PhD,[1] from the Department of Oncology and Hematology of Kyoto, Japan, in the May issue of the journal, that questioned the utility of antimicrobial stewardship programs that apply to all clinicians. First of all, we agree that there is plenty of evidence of the benefits of antimicrobial stewardship programs worldwide. The structure for antimicrobial stewardship programs has been published by the Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America.[2] A multidisciplinary team is needed, and, although there is no agreement about which is the best approach, a combination of education, the need for a preapproval order (ie, a "front-end approach"), and a postprescription review of the case and streamlining of the prescription process (ie, a "back-end approach") might be a good option.

Furthermore, to prevent the emergence of drug resistance, an intervention combining antibiotic stewardship programs with other infection control practices, such as isolation precautions and adherence to hand hygiene practices, is even more important.[3] The Centers for Disease Control and Prevention has published a 12-step program to reduce resistance, and one part of the program is to use antimicrobials wisely.