Anti-MRSA Program Succeeds Across Institutions

'A coordinated hand-hygiene program [can] bring significant reductions in MRSA infection rates.'

BY BRUCE K. DIXON
Chicago Bureau

CHICAGO — Multisite implementation of a generic hand-hygiene culture-change program can significantly reduce infections caused by methicillin-resistant *Staphylococcus aureus*, according to Dr. M. Lindsay Grayson.

In a landmark study involving six urban and rural Australian hospitals, a centrally organized program encouraging the widespread use of alcohol-based hand rubs halved MRSA bacteremia rates, Dr. Grayson said at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy.

It is the first large multisite study to demonstrate the benefits of a hand-hygiene culture change, said Dr. Grayson, director of infectious diseases at Austin Health, a provider of tertiary health services in Melbourne, and professorial fellow at the University of Melbourne. In fact, it was a single-institution study at Austin Hospital that set the stage for this expanded study (Med. J. Aust. 2005; 183:509-14).

"[In the current study, we] introduced alcohol-based hand rubs and alcohol wipes for [those sharing] equipment, as well as an educational program for health care workers, patients, and patients' relatives," he reported.

The researchers encouraged the culture change with a promotional drive that included coffee-break seminars, quizzes with prizes, a newsletter on hand hygiene, and the attachment of notices to staffers' pay advice slips. They devised slogans to remind people about hand hygiene, and even hired an advertising consultant to maximize the effect of the message.

They also held feedback sessions with senior nurses on sentinel wards to provide them with information on recent outcome data, and they conducted medical, surgical, and nursing grand rounds on MRSA.

A key component of the program was the development of a computer-based educational package that could be accessed online.

These and other culture change procedures were maintained and used in the 2-year multicenter study of four hospitals in metropolitan Melbourne and two regional hospitals. The program was coordinated by staff at Austin Health and the Victorian Quality Council in Melbourne, and funding was provided by the Department of Human Services for the state of Victoria, which backs efforts to control the MRSA "superbug."

The primary outcome measures were rates of hand-hygiene compliance measured at 3- and 6-month intervals, and of MRSA disease—including bacteremia and clinical isolates—per 100 patient discharges measured at 1-month intervals, Dr. Grayson said.

"For all six sites, hand-hygiene compliance rose from 21% at baseline to 47% at 2 years. We identified the same significant improvements in MRSA disease rates that we identified in the single-center Austin study," he said, noting that MRSA bacteremia fell from 0.03 to 0.01 per 100 patient discharges, and clinical isolates fell from 1.12 to 0.8 per 100 discharges.

"We were able to show that during the 2-year program, there were 719 fewer isolates than would have been expected had we not intervened. More importantly, MRSA bacteremia rates were roughly halved, with 60 fewer patients developing bacteremia than we would have otherwise expected," Dr. Grayson said at the meeting, which was sponsored by the American Society for Microbiology.

The results of a cost analysis suggest that the culture change produced a potential savings over the 2-year period of at least $1.5 million. "The program cost roughly $750,000, so this was a 2-to-1 multiplier effect in terms of savings," Dr. Grayson said.

This study shows that "a coordinated hand-hygiene program that does not involve direct observation can improve compliance in both rural and urban health care settings and bring significant reductions in MRSA infection rates," he concluded.

A Swiss researcher, Dr. Hugo Sax, said that although such studies show that progress is being made in hand hygiene, optimal rates of compliance will be achieved only if more physicians lead by example.

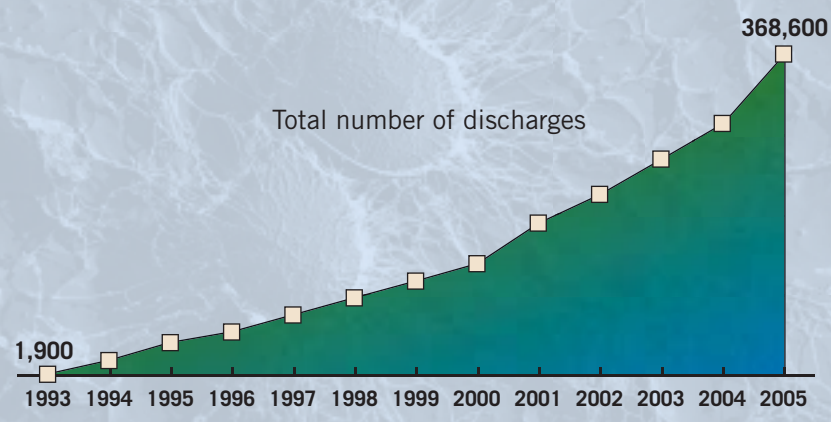
"We have to address and educate different health care populations with tailored approaches instead of a one-size-fits-all approach," said Dr. Sax, a consulting physician at the University Hospital in Geneva.

But first, physicians must align their own thinking toward patient safety, he said in an interview. "Physician training doesn't have the same patient-care focus that nurses and others experience, so hygiene is not a high-level issue for physicians, and it should be."

Dr. John M. Boyce, chief of infectious diseases at the Hospital of Saint Raphael in New Haven, Conn., agreed. "The evidence that hand hygiene reduces the spread of MRSA and other organisms is compelling, and we have to convince our physician colleagues that using alcohol hand rubs both before and after each patient visit doesn't slow down their daily routines," he said in an interview. ■

DATA WATCH

Steady Growth in Methicillin-Resistant *Staphylococcus aureus* Cases in U.S. Hospitals



Note: Based on data from the Nationwide Inpatient Sample.
Source: Healthcare Cost and Utilization Project

ELSEVIER GLOBAL MEDICAL NEWS

New Community-Acquired MRSA Subclone Has Emerged

BY PATRICE WENDLING
Chicago Bureau

CHICAGO — The pUSA03 subclone of the USA300 strain is emerging as a major cause of community-acquired methicillin-resistant *Staphylococcus aureus*, especially in men who have sex with men.

The new strain is likely spread through skin-to-skin, sexual contact, Binh An Diep, Ph.D., and his associates reported in a poster at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy.

USA300 has recently emerged as the predominant cause of community-acquired MRSA and skin and soft-tissue infections in the United States.

A population-based study that involved all MRSA infections treated at 9 of 10 participating medical centers in San Francisco showed the incidence of the pUSA03 subclone was 171 cases per 100,000 in one San Francisco ZIP code. That compares with 57 cases per 100,000 in three other city ZIP codes and 47 cases per 100,000 in four other city ZIP codes, Dr. Diep and his associates reported.

The high-incidence ZIP code (94114) corresponds to the Castro district, which has the highest concentration of gay men in the United States. The Castro neighborhood is an affluent area with an average annual income of $90,000, making it less likely that the majority of infected individuals were IV drug users, Dr. Diep, of the University of California, San Francisco, observed in an interview.

"The mechanism seems to be one of skin-to-skin contact, and having very vigorous perianal sex that creates a breach of the skin barrier leading to perianal abscess," he said. A previous report in six heterosexual patients supports this largely unrecognized method of transmission for community-acquired MRSA (Clin. Infect. Dis. 2007;44:410-3).

"The take-home message is really personal hygiene," Dr. Diep said. "Because MRSA is now spread skin-to-skin, wearing a condom won't help. So you have to be very careful and bathe yourself very well."

The investigators also reviewed the medical charts of 183 patients treated at San Francisco General's Hospital Positive Health Program, an outpatient HIV clinic, and the charts of 130 patients treated at Boston's Fenway Community Health, which also has an outpatient clinic. MRSA isolates, cultured predominantly from skin and soft-tissue infection sites, were genotyped, and pUSA03 was detected using polymerase chain reaction assays.

The pUSA03 subclone was detected in about 29% of patients from both surveys, and, of these, 99% were men who have sex with men. Among gay men who were infected with the pUSA03 subclone of USA300, 39% (35 of 89) had infections that involved the buttocks and genitoperineal area, and 30% (27 of 89) had infections that involved the extremities.

In the San Francisco survey, being a man who has sex with men was the strongest predictor of infection with the pUSA03 subclone after controlling for the effects of a previous MRSA infection and for clindamycin use in the previous year.

Previous use of trimethoprimsulfamethoxazole was significantly associated with pUSA03 subclone infection, but prior use of mupirocin and hospitalization in the previous year were not significant risk factors, the investigators reported at the meeting, which was sponsored at the American Society for Microbiology.

In the Boston cohort, multidrug-resistant USA300 carrying the pUSA03 plasmid was recovered exclusively among men having sex with men.

The percentage of USA300 resistant that were to multiple classes of commonly used antimicrobial agents, including β-lactams, macrolides, clindamycin, tetracyclines, and mupirocin, varied in the surveys by location. In San Francisco, 18% of USA300 isolates were multidrug-resistant, whereas in Boston, 48% of the isolates were multidrug-resistant, Dr. Diep said. ■