

The Ultimate Battle Against MRSA

Hospitals give ICU patients germ-killing baths and antibiotic nose ointment upon admission

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If you are admitted to one of the 320 intensive-care units at HCA Inc.'s hospitals, you will be bathed with germ-killing soap and administered an antibiotic nose ointment twice daily for five days.

HCA, the largest chain of for-profit hospitals in the U.S., has adopted this regimen after studying the best ways to reduce infections due to antibiotic-resistant bacteria, or "superbugs" such as MRSA, which can be deadly for patients after surgery or illness.

Though bacteria can spread among hospital patients from health-care worker's hands and contaminated objects, infections can also be caused by the bacteria normally on our skin or in our noses, such as *Staphylococcus aureus*. About a third of people are colonized with staph, and some estimate that another third are intermittent carriers. It usually doesn't cause illness, but if the bacteria enter the body, such as through an incision, it can lead to infections in the bloodstream, lungs and surgical sites.

Close to half of these staph bacteria have become resistant to antibiotics that include methicillin, making them more difficult to fight. Researchers are trying to find the most effective methods for getting rid of the bacteria carried by patients without increasing the risk of making the bugs even more resistant to antibiotics. The last frontier of attack for hospitals has become patients' own bodies.

Dr. Susan Huang, an infectious disease professor at University of California Irvine, says her goal is to drive MRSA infections to zero.

To be sure, hospitals have reduced MRSA infections with better hand washing and hygiene precautions, screening and isolating patients who are carriers. The Centers for Disease Control and Prevention estimates that the incidence of health care-associated MRSA decreased by 5.36% in 2014, compared with 2013, while community infections rose slightly in the same period. In total, CDC estimates 72,444 patients had invasive MRSA infections in 2014 and 9,194 died. But limits to surveillance may underestimate MRSA infections, experts say.

"Everyone was resting on their laurels because we've been able to reduce MRSA, largely from hospital efforts to reduce infection risk," says Susan Huang, professor of infectious diseases at the University of California Irvine. "But these are preventable infections and we should be able to drive them down to zero."

Dr. Huang is lead investigator in a number of prevention studies that include researchers at Harvard Medical School and Rush University. She led Reduce MRSA, the first major study of the approach known as "universal decolonization," which calls for treating incoming ICU

patients with preventive bathing with the germ-fighting soap chlorhexidine and the administration of a nasal antibiotic ointment, mupirocin. The study took place at 74 ICUs in 43 HCA hospitals and compared the approach to two others: the routine practice of screening all patients and isolating those with current or previous colonization or infection, and adding the cleansing and nasal ointment regimen to screening and isolation of MRSA carriers or infected patients.

The study, published in the *New England Journal of Medicine* in 2013, demonstrated that the universal decolonization protocol was superior to the other two approaches, and especially to routine care, reducing MRSA by 37% and all types of bloodstream infections by 44%. A subsequent study estimated the approach saved \$171,000 and prevented nine additional bloodstream infections for every 1,000 ICU admissions.

The combination of cost savings and effectiveness led HCA to adopt universal decolonization in its remaining ICUs.

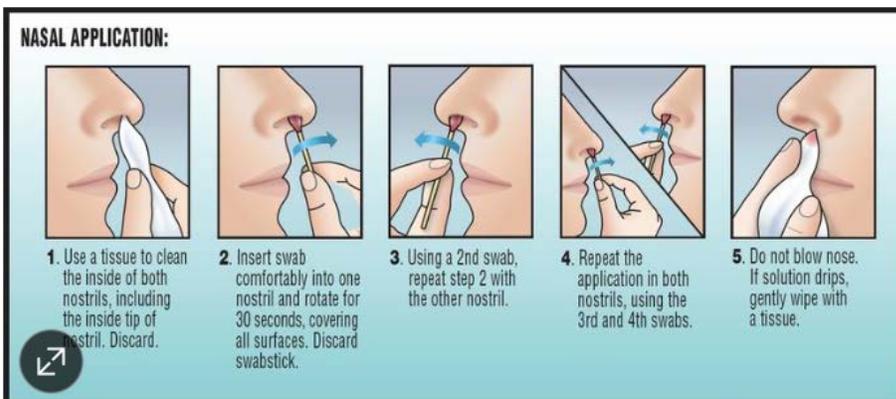
“Having created compelling evidence for a new and lifesaving best practice, we felt an immediate obligation to make it the standard practice across HCA,” says Jonathan Perlin, HCA chief medical officer and president, clinical services.

One concern is whether the use of the antibiotic nose ointment, mupirocin, could lead to further resistance to treatment—the problem of bacteria becoming stronger than the drugs used to fight them. There were no increases in antibiotic resistance during the Reduce MRSA trial, according to Dr. Perlin, but a second phase is now under way.

That study, called Swap Out, in 140 HCA hospitals, will evaluate whether an iodine-based nasal antiseptic may be equivalent to the antibiotic mupirocin in reducing MRSA when each is used in combination with chlorhexidine bathing. “We hope it will also answer whether the antiseptic may be less likely than the antibiotic to cause antibiotic resistance,” Dr. Huang says.



A study at HCA hospitals aims to assess whether iodine-based antiseptic nasal swabs, such as Clorox's, may be as effective in reducing MRSA as antibiotic mupirocin. PHOTO: CLOROX HEALTHCARE



The nasal antiseptic swabs are used in combination with an antiseptic bath in one study of a regimen to prevent MRSA infections. PHOTO: CLOROX HEALTHCARE

At the request of CDC and the National Institutes of Health, another study is investigating treatment of patients in other hospital units besides the ICU. The study, called Abate, includes about 600,000 patients in regular medical and surgical units in about 50 HCA hospitals. The study is comparing standard bathing and showering to an antiseptic bath for all patients and the antibiotic nose ointment for patients who test positive for MRSA on their bodies or have a history of the infection. Dr. Perlin says the data is currently being analyzed.

Another study called Clear, also led by Dr. Huang, is investigating whether sending patients home with antiseptic regimens after hospital discharge may help prevent new or recurrent MRSA infections. The study enrolled over 2,000 patients who were recently hospitalized and had an MRSA-positive test of any kind. They were randomized to either receive education about personal hygiene or education plus a five-day regimen twice a month for six months that included the nasal antibiotic ointment, antiseptic mouth wash with chlorhexidine, and chlorhexidine for bathing or showering. Dr. Huang says the results, which will be presented at a conference next month, are promising.

Judy Newberry, 70, participated in the Clear trial from August 2011 to August 2012, following open heart surgery at St. Jude Medical in Center in Fullerton, Calif. Her surgery was complicated by poorly healing bone in her sternum that required surgeons to take muscle from another part of her body to cover an area that needed protecting. She tested positive as a carrier of MRSA on a hospital screening test, though she didn't get an infection in the hospital.

Ms. Newberry says she was stunned to learn she carried MRSA in her nose, and she understood she was at risk of infection after going home. She says she was vigilant about following the home regimen, and happy to learn that in follow-up visits she was no longer an MRSA carrier.