Researchers Create Comprehensive Guidelines To Reduce Post-Surgical Staph Infections

Staph infections in hospitals are a serious concern, so much so that the term Methicillin-resistant *Staphylococcus aureus* (MRSA) is as commonly known as MRI. Far less known is that in many of these cases, patients are infecting themselves.

In heart surgeries and knee and joint-replacement procedures, up to 85 percent of staph infections after surgery come from patients' own bacteria, according to a 2002 study in the *New England Journal of Medicine*.

Despite the threat that staph bacteria pose to patients, there is no uniformly accepted procedure to reduce surgical-site infections in the United States. Now, a team of researchers led by the University of Iowa is recommending guidelines that will cut the infection rate by 71 percent for staph bacteria and 59 percent for a broader class of infectious agents known as gram-positive bacteria. In a paper published Thursday (June 13) in the *British Medical Journal*, the researchers recommend three steps to reduce post-surgical staph infections:

- Swab patients' noses for two strains of staph (MRSA and MSSA) before surgery
- For the 30 percent of patients who have staph naturally in their noses, apply a anti-bacterial nose ointment in the days before surgery
- At surgery, give an antibiotic specifically for MRSA to patients who have the MRSA strain in their noses; for all others, give a more general antibiotic

Marin Schweizer, an assistant professor in internal medicine at the UI and the lead author on the *BMJ* paper, notes the nose ointment costs around $20 a tube and is usually covered by health insurance.

"We now know we can target staph where it exists naturally in some patients, which is in the nose," she says. "That's the bull's-eye, and we can wipe it out. What we are recommending is a really simple, cheap solution to a big problem."

The group is now testing the protocol at 20 community hospitals nationwide, including the UI Hospitals and Clinics, as well as 10 Veterans Affairs health-care centers, including the one in Iowa City. The VA is funding the study.

The recommendations come from the team's review of 39 studies of various surgical-site infection practices employed at hospitals nationwide. Many of the individual studies involved small patient samples, and thus were not statistically significant. By combining studies with similar treatment practices and analyzing the outcomes from other studies with different treatments, the UI-led team found a best approach and a large enough sample to make it statistically significant.

"The combination matters, and the treatment being in a bundle matters, too," says Schweizer, whose primary appointment is in the Carver College of Medicine. "By putting it all together in one care bundle, that one checklist, it becomes standard operating procedure for every hospital."

Three in ten people in the U.S. unwittingly carry staph in their noses, where they reside benignly as the alpha bacterium in a warm, moist olfactory world. While harmless in the nose, staph can wreak major havoc if introduced within the body, such as a wound healing from surgery. In fact, the researchers found that 78 percent to 85 percent of surgical-site infections involving staph come from the patients' own bacteria. In those cases, the infecting agents were traced to bacteria in the patients' noses by comparing the DNA profile of the bacteria at the surgical site with those in the patients' noses. Most likely, people touched their noses and then touched the wound, freeing the bacteria to roam.

Those post-surgery staph infections mean pain, personal and financial, with two studies estimating treatment to cost between 40,000 and $100,000, most of it due to follow-up surgeries.

Despite the risks and repercussions, the team found that 47 percent of hospitals reported in a survey that they don't use the nose ointment for staph carriers.

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