THE WALL STREET JOURNAL

Ten Steps to Preventing Infection in Hospitals

Too many patients get sick in the very places that are supposed to heal them

By STEPHANIE SIMON

The facts are frightening: As many as one in 10 patients hospitalized in the U.S. will come down with an infection—often due to the very care that is supposed to be restoring health.

These infections afflict nearly two million patients a year, cause close to 100,000 deaths and cost up to $6.5 billion.

But they are not inevitable.

Here are 10 ways to prevent infection in health-care settings—a list gleaned from conversations with doctors, nurses, administrators, the nonprofit Committee to Reduce Infection Deaths, and the Association for Professionals in Infection Control and Epidemiology.

We've divided the list into two parts: first, promising new technologies, and second, a look at back-to-basics techniques that many hospitals have reinvigorated, with great success.

NEW TECHNOLOGIES

1. UNDERCOVER AGENTS

Some of the most vicious vectors of infection can survive for weeks on medical equipment and in patient rooms. The culprits include the drug-resistant MRSA bacteria, which can cause staph infections, and the nasty Clostridium difficile, or C. diff, which causes severe diarrhea.

Hospitals, of course, have rigorous protocols for cleaning. But how well are they doing?

To find out, Philip Carling, an epidemiologist at Caritas Carney Hospital in Dorchester, Mass., went undercover. He developed an invisible solution with fluorescent markers and sprayed it all over patient rooms in dozens of hospitals. Then he let cleaning crews do their thing. Afterward, he went over each room with a black light. Any spot the crews missed would glow fluorescent.

Turned out they missed a lot.

Toilets sparkled. But bathroom light switches and door knobs did not. Telephones, nurse-call buttons and grab rails were all routinely contaminated.

Showing the results to cleaning crews—and training them to do better—helped a great deal, boosting compliance with proper cleaning techniques to 77% from 44%. Dr. Carling has licensed the fluorescent solution and a training program to Ecolab Inc., a global sanitation company.

2. ROBOTIC HELPERS When surgeon Bolanle Asiyanbola tested emergency-room equipment that had been disinfected by hand, she found one in four pieces was still contaminated with bacteria.

Enter SUDS, a shower-sized cubicle with a fogging mechanism inside.

Dr. Asiyanbola led the team at Johns Hopkins that developed SUDS to disinfect even the most hard-to-clean equipment, such as electrocardiogram wires. She recently published a study showing that devices cleaned in SUDS stayed clean for two days, even after they'd been reused.

SUDS is not yet on the market. But other systems are, among them the Bioquell Z, a little machine that sprays a disinfecting hydrogen-peroxide vapor—and looks an awful lot like the Star Wars robot R2D2.

Crews wheel the Bioquell Z, which is made by Bioquell Inc., of Horsham, Pa., into a patient's room and seal the door. About 90 minutes later, the room and any equipment inside are disinfected, with no residual smell.

3. COMPUTER SURVEILLANCE One of the hottest new fields in infection prevention is data mining. Software such as CareFusion Corp.'s MedMined Data Surveillance tracks a hospital's admission, discharge and transfer data and laboratory results.

The system might pick up on, say, a spike in urinary-tract infections on one floor. Doctors can then take immediate precautions—reviewing procedures, disinfecting equipment and checking for defective catheters.

Such software can cost tens of thousands of dollars to install and more to run, but devotees say it saves money and lives.

And don't underestimate the motivational power of data. Stephen Streed, director of epidemiology at Lee Memorial Health System in Florida, tracks infection rate by surgeon—and then posts a list annually in his four hospitals. The list is coded to protect anonymity, but each surgeon knows his or her ranking.

"They growl a bit, but then they find their way to my office and ask, 'Why am I in the bottom third of this list?' " Dr. Streed says. Those at the bottom soon improve. "It's a very, very powerful tool," he says.

4. BUG-BLASTING BATHS Recent research suggests that washing ill patients daily with a mild antibacterial soap can cut bloodstream infections dramatically.

The soap of choice, chlorhexidine glutonate, comes in several formulations, including a bar of soap and a baby-wipe cloth. It's available over the counter.

Many doctors are wary about prescribing antibacterial agents because overuse can spur the rapid evolution of drug-resistant bugs. But some experts suggest it may be helpful for patients facing surgery to shower with chlorhexidine for two to four days before the operation.

5. REPORTING LAWS At least 25 states have passed laws requiring hospitals to report rates of common infections. In most cases, the reports are—or soon will be—publicly available. That, of course, is a big incentive for hospitals to improve. Another incentive: Medicare now limits reimbursement for treatment of hospital-associated infections.

All this is helping change hospital culture. "We used to think of this as the job of the infection-control nurse," says Nancy Foster, a vice president at the American Hospital Association. "Now we know everyone needs to be involved."

BACK TO BASICS

1. HAND HYGIENE David Hooper, the chief of infection control at Massachusetts General Hospital, says the key to preventing infection is simple: Listen to your mother. "Wash your hands and clean your room," he says.

Hospitals that have placed dispensers of alcohol-based hand sanitizer at every turn—in patient rooms, in hallways, by elevators, at nursing stations—see a dramatic increase in compliance with basic hand hygiene, from less than 50% to 80% or more. That's a huge step toward preventing infection.

2. CHECK-IT-TWICE LISTS Several years ago, Peter Pronovost, a critical-care specialist at Johns Hopkins Medical Center, began touting the humble checklist as a powerful tool to ensure procedures are done accurately and safely. *(See the accompanying interview with Dr. Pronovost.)*

Checklists are now common in intensive-care units and operating rooms—but they're also starting to pop up in bedside medical charts.

Some hospitals require each shift nurse to review a checklist for each patient, answering questions such as: Does this patient have a catheter? If so, is it still necessary?

"Patients get all these tubes stuck in them and they stay there forever because people forget about them," says Barbara DeBaun, a nurse who advises the Bay Area Patient Safety Collaborative in San Francisco. "That can be a major source of infection."

3. CAN'T-MISS KITS Hospitals have begun to create portable kits filled with all the equipment needed for common procedures, such as inserting an intraveneous line or changing a dressing. That way, the nurse doesn't have to run back to the supply closet mid-procedure because he's forgotten a sterile drape or a skin-prep solution. And he's less likely to forget those steps in the first place.

4. ORAL FIXATION Nurses can go a long way to preventing ventilator-associated pneumonia—one of the most common infections in intensive-care units—by regularly cleaning a patient's mouth, gums and teeth. This keeps bacteria to a minimum.

Elevating the head of the patient's bed at 30 to 35 degrees is also crucial. And patients should be weaned from sedation at regular intervals.

5. SWAB AND STUDY Quick diagnostic tests now allow hospitals to identify infected patients within hours, rather than days.

There's still debate about whether all incoming patients should be tested for particularly nasty pathogens such as MRSA.

But at the very least, when patients who do show symptoms are tested, the quick results can shape an effective response. The pathogen C. diff, for instance, is not killed by alcohol-based scrubs, so health-care providers and visitors must wash with soap and water upon entering and exiting rooms of infected patients.

— Ms. Simon is a staff reporter with The Wall Street Journal's Dallas bureau. She can be reached at stephanie.simon@wsj.com.