

The Microbe Hunters

If hospital costs don't get you,
hospital-acquired infections just might

by Joan Arehart-Treichel

Most people dread going to a hospital, with reason. A stay can run hundreds, even thousands of dollars. Doctors and nurses are often abrupt and impersonal. Blood is drained from your veins, drugs are shot into your rump, tubes are hooked up to your nostrils. But there's still another reason to forego a hospital visit: hospital-acquired infections.

Last year 18 million Americans received hospital care. One out of every 18 patients acquired an infection during the course of their hospital stay. These infections required patients to spend days, weeks, even months more in the hospital than they should have. The infections cost them about \$300 million over the \$45 billion they already spent for hospital care. Twenty thousand patients died because of hospital-caused infections.

If these statistics sound like *Ripley's believe-it-or-not* look at the particulars—how pathogens are passed on to vulnerable and unwary patients. Hospital microbiologists and surveillance nurses have tracked dangerous microbes to sinks, windows, tables, floors, pails, mops. Pathogens thrive on pus and blood flowing from operating tables. They've been plucked from patients in intensive care units and from doctors, nurses and other hospital staff members. One nurse anesthetist, a pathogen shedder, infected 256 patients. A hospital downwind from a poultry farm was inundated with the bacterium *Salmonella*, which causes gastrointestinal upsets similar to those caused by typhoid and can be transmitted from one person to another. Even people outside the hospital may fall prey to hospital pathogens. Youngsters playing with syringes dumped in

a land fill became infected.

Certain types of patients are, understandably, more susceptible to hospital-caused infections than others. Hospital infections are a major cause of death in premature infants and organ transplant patients. Surgical patients often succumb to post-operative infections, the pathogens being transmitted by the surgery team. Patients who have had their immune systems suppressed with drugs, such as cancer patients, are common targets. So are burn patients whom one microbiologist describes as "glorified Petri dishes." Patients who have a catheter poked up their urinary tracts have a 90 percent chance of acquiring a urinary tract infection—an especially upsetting statistic if a urinary tract infection was why you were popped in the hospital.

With hospital-caused infections reaching scandalous proportions, what's being done about them? Far too little or the wrong things, in most American hospitals. A number of hospitals have surveillance nurses whose major job is to keep track of the number of patient infections in the hospital. Then when there are enough infections, action is taken to track down the source of the infection. This approach, little better than closing the gate after the horse has bolted, is endorsed and promoted by the Center for Disease Control (part of the U.S. Public Health Service). "We feel," declares CDC doctor Walter Stamm, "that the most important aspect of control of hospital-acquired infections is focusing on patients and what's going on with the patient."

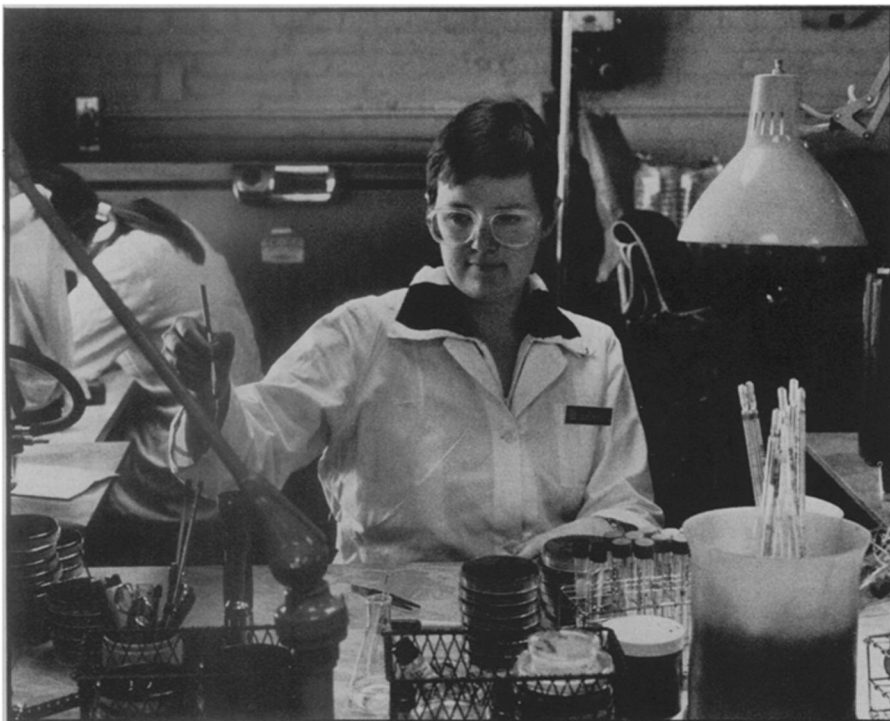
Other hospitals try to control hospital pathogens before they infect patients—a more laudable approach than waiting until patients are infected be-

fore taking action. But while these hospitals gather data on microbes, they do it sporadically or fail to make effective use of the data they collect. Gerard J. McGarrity of the Institute for Medical Research in Camden, N.J., asked 70 hospital surveillance nurses whether they routinely sample their hospital environment for microbes and whether they prevent infections by this sampling. The nurses replied that they routinely sample, but rarely prevent infections. "The reason they are not getting good results," McGarrity declares, "is that they are not quality-control checking critical areas, such as urinary catheters or inhalation-therapy equipment, but are only sampling microbes from the air, floor and tables."

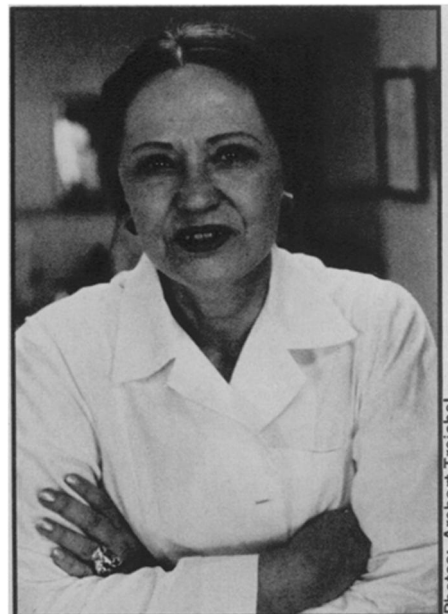
Routinely monitoring critical areas and equipment in the hospital for microbes and using the information obtained to keep the areas and equipment clean is probably the most effective means of preventing hospital-caused infections. Unfortunately such preventive measures are being applied by few American hospitals, either because the hospitals disagree with the philosophy or do not have the staff and funds to do so.

An outstanding example of a hospital enforcing these measures is Peter Bent Brigham Hospital in Boston (the teaching hospital for Harvard Medical School). Brigham has a microbiology staff, headed by Ruth B. Kundsins, which devotes its energies solely to routinely culturing microbes from critical hospital areas and using the information to prevent infections. "Monitoring," Kundsins stresses, "must be purposeful, evaluated, communicated."

Each member of Kundsins's staff concentrates on one or several critical



Scott checks the intravenous solutions to make sure they are not contaminated.



Kundsinn: Monitoring with a purpose.

areas of the hospital. Hollis S. Bodman collects and cultures microbes from the operating room, Moniek Spaepen from inhalation-therapy equipment, Judith Scott from intravenous solutions and Robert Perkins from other critical areas. The staff also takes regular cultures from patients at special risk of infection, such as burn patients, and from the environment of special-risk patients. For instance, they sampled not only the food but the sherry to be consumed by one immunosuppressed patient.

Using their sampling skills to identify pathogens, the staff then puts the information obtained to practical use. Their sampling of microorganisms has led to rigid and detailed recommendations for hospital housecleaning—how to clean the operating room floor and how often, the need to wash staff and patient gowns in germicides, not just in soap, the need to change the water in the humidifiers for inhalation therapy every 24 hours to maintain sterility. The staff then follows up with more monitoring, to make sure that the recommendations are being implemented. They devised a technique for recovering the kinds and numbers of microbes from intravenous solutions. They now use the technique to check exact duplicates of the solutions patients are to receive. They have found that when intravenous solutions are contaminated, the fungi and bacteria in the solutions usually come from the air in the rooms

where the solutions were prepared. This discovery led to better cleaning of these rooms. They have been instrumental in getting ultraviolet lamps installed in the operating rooms because they found that the lamps reduce the danger of pathogens getting into patients' wounds during surgery.

Lutheran General Hospital in Park Ridge, Ill., is a community (nonteaching) hospital that routinely monitors critical areas of the hospital and puts the data to use. Microbiologist James G. Shaffer reports that he and his staff at Lutheran have traced pathogens before they caused infections. For instance, they found *Staphylococcus* in the nursery. This bacterium is especially dangerous to patients with post-operative wounds. The bacterium, Shaffer declares, probably wouldn't have been observed if they hadn't done routine sampling. Shaffer and his co-workers have also found a strong correlation between the amounts of microorganisms in the hospital and the quality of housekeeping. When the count gets high, they get after the housekeeping staff to do a better job. "These people," says Shaffer, "are more likely to be impressed by a [microbial] colony than by a comment."

The Baltimore Cancer Research Center also believes in vigorously tracking down hospital microbes and using the information obtained to prevent infections. "My philosophy," says the center's chief microbiologist, Viola Mae

Young, "is that one has to very carefully study the environment of any situation they find themselves in. In other words, we have just moved to the University of Maryland. Here I will do intense surveillance culturing until I know the cleaning is up to standard. I will discover what the problem areas are and take care of them. Once I have that fully in hand, I will do more spot checking, not quite as much as on a routine basis." Because the center's patients are extremely susceptible to infections, Young and her staff also culture bacteria regularly from various recesses of the patients' bodies. This way a pathogen can be spotted immediately, the patient treated and isolated from other patients.

Might more hospitals be turning "microbe hunters" loose to effectively prevent hospital infections? "The current trend is away from this," Young says. "It is not very encouraging."

"I don't see any trend toward quality-control checking of critical areas," McGarrity agrees. "I would like to. Some sampling can give you a good handle on what is happening as far as infection control is concerned."

"No, there is no upsurge of interest," Kundsinn concurs. "Actually the CDC has been downgrading it, saying one has to look for an epidemic. My claim is that we have an epidemic. Anything that is not normal is an epidemic. Picking up infections in the hospital, that's not normal. It shouldn't be." □