

'Bug Squad' Squashes Barriers to Optimal Antibiotic Rx



By Bruce Buckley

Long before the term antimicrobial stewardship came into common usage, a small interdisciplinary team at St. Luke's Magic Valley Medical Center in Twin Falls, Idaho, began employing many of the same antibiotic management practices that have now become prevalent across the country.

The three team members—a clinical pharmacist, pathologist and microbiologist—dubbed themselves “the bug squad.” Their aim was to optimize patient outcomes by better matching antibiotics to bacterial susceptibilities and avoiding unnecessary drug use, said Kenny Alexander, PharmD, BS (microbiology), the clinical pharmacist member of the team.



As part of its antibiotic stewardship program, St. Luke's uses an automated blood culture system and antibiotic susceptibility testing platform to ensure optimal response to drug regimens.

More than a decade and a half later, the bug squad's battle continues. The original three members now have expanded into an all-hands antimicrobial stewardship effort, whose activities have greatly reduced antibiotic toxicities and other adverse events, gotten many patients out of the hospital quicker, helped to curb the spread of multidrug-resistant organisms throughout the medical center and significantly reduced drug costs.

In 2013, for example, St. Luke's saved \$830,000 in drug costs through optimal antibiotic use, according to Dr. Alexander. The one-year cost of daptomycin (Cubicin, Merck) alone, he added, fell to \$30,000 from \$256,000. Additionally, in 2014 the average hospital length of stay for patients with uncomplicated pneumonia decreased by 40%—from 4.5 to 2.7 days—by getting them on appropriate treatment

quicker. For its efforts, St. Luke's bug squad received one of Qualis Health's 2014 Excellence in Healthcare Quality awards.

Similar stewardship teams are at work nationally. Their goal is not only to improve patient outcomes and save costs within their institutions, but also to preserve effective treatments for serious infections in the face of an onslaught of multidrug-resistant pathogens. In 2013, the Centers for Disease Control and Prevention estimated that, in the United States alone, at least 2 million illnesses and 23,000 deaths were caused annually by antibiotic-resistant bacteria (www.cdc.gov/drugresistance/threat-report-2013).

High-Tech Help

Interdisciplinary teams such as the one at St. Luke's have been aided by advanced technology that has greatly reduced the time from blood culturing to identification of organisms and antibiotic sensitivities. "We work closely with our microbiology department," said Dr. Alexander, who was a microbiologist at the medical center before becoming a pharmacist. "We talk anywhere from six to 12 times a day. They let me know what's growing, whether it's positive or negative. That can be very valuable information as far as knowing whether or not to treat."

To help speed detection and treatment decisions, St. Luke's uses the BacT/ALERT 3D automated blood culture system and VITEK 2 bacterial identification and antibiotic susceptibility platform, both by bioMerieux. These are just a part of the antibiotic decision-making toolkit—offered by a number of companies—that is available to infectious disease (ID) treatment programs.

"There are a whole range of technologies that are speeding detection, identification and sensitivity testing for organisms," said Sam Bozzette, MD, PhD, the vice president of Medical Affairs-Americas and Global HEOR (Health Economics and Outcomes Research) at bioMerieux, in Durham, N.C. Dr. Bozzette pointed to "the emerging role of biomarkers that help determine who is infected to begin with and who isn't, even before the cultures are incubated." Then, he added, "there is also molecular testing, which can now be done very quickly. For example our BioFire technology can identify well over a dozen pathogens from several types of specimens in a matter of hours using polymerase chain reaction."

What's more, Dr. Bozzette said, "new incubators are growing organisms faster. Mass spectroscopy is able to make identifications in a matter of a minute or two instead of hours to days. And even antimicrobial sensitivity testing is moving along: Something that used to take four to five days now can come out in 12 to 24 hours. These technologies really provide the fuel for a well-oiled antimicrobial stewardship machine."

Working Closely With the Team

At St. Luke's, Dr. Alexander works with a group of hospitalists, rounding daily with the team, helping to manage medication therapy for 60 to 80 patients. He also co-manages the stewardship program, providing coverage for adult patients throughout the medical center.

The now-expanded bug squad continues to meet twice a week for in-depth discussions on infection

control issues. Thomas DiRocco, MD, the chair of the medical center's infection control program, is part of the squad, along with an ad hoc group that includes a pulmonologist, surgeon, pathologists, microbiologists and infection-prevention nurses. A journal club convenes once a month to review the latest literature on a single subject. "We get together and discuss what we need to be doing to save money and help patients get out of the hospital quicker," Dr. Alexander said. A discussion on pneumonia led to the improved hospital length of stay for patients with uncomplicated cases, he noted.

Dr. Alexander regularly fields requests to consult on antibiotic issues. "I just got a call today from one of our orthopedic docs," he told *Pharmacy Practice News*. A patient had developed an infection after leg surgery. The on-call physician had ordered an antibiotic, but the patient worsened after discharge and returned to the hospital. The orthopedist wanted to know which antibiotic should be ordered on discharge. Dr. Alexander said "the bugs that grew out were a staph and strep plus an anaerobe. I was sure they had covered the staph and strep originally, so we put him on coverage for the anaerobe, along with staph and strep, and he'll be able to leave the hospital today."

Dr. Alexander's role on the ID team is even more valuable because St. Luke's doesn't have an ID physician. Dr. Bozzette noted that ID societies stress the importance of ID physicians. But he added, "Pharmacists are really the key team members in places that don't have ID physicians—and really in most places that do."

Dr. Alexander reported no relevant financial relationships.

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