

FIGHTING ANTIMICROBIAL RESISTANCE

HUNTERDON MEDICAL CENTER

- ◆ Flemington, NJ
- ◆ 178 beds
- ◆ www.hunterdonhealthcare.org

Hunterdon Medical Center is a community hospital and a teaching institution. Part of Hunterdon Healthcare System, it is affiliated with the University of Medicine and Dentistry of New Jersey – Robert Wood Johnson Medical School.

STEEEP

Timely

A three-day stop order on antibiotics prescribed prompts physicians and pharmacists to review cultures to make sure the most appropriate drug is being used.

Effective

The use of guidelines and the collaboration between pharmacists and doctors improved the prescribing of antibiotics and significantly lowered the drug resistance of several bacteria.

Efficient

\$157,000 saved in pharmacy costs in 2007.

THE PROBLEM

Antimicrobial resistance is a growing problem nationwide, caused, in part, by injudicious use of antibiotics. At Hunterdon Medical Center, some antibiotics were losing their ability to cure infections present in patients coming to the hospital. For example, the effectiveness of the broad-spectrum antibiotic Ciprofloxacin was declining against *E. coli*, *klebsiella pneumoniae* and *pseudomonas aeruginosa*.

THE SOLUTION

Hunterdon Medical Center in 2006 became the pilot site for the 'Bugs and Drugs' program developed by the hospital alliance VHA Inc. and John G. Gums, PharmD, professor of pharmacy and medicine at the University of Florida. This stimulated the development of the antibiotic stewardship program at the hospital. Hunterdon's effort involves regular evaluations of antibiotic resistance at the facility, guidelines for empiric use of antibiotics, and collaboration between physicians and doctors of pharmacy. The initiative focused heavily on Cipro.

RESULTS

From 2006 to the last half of 2007, susceptibility to Cipro went from:

- » 68 percent to 76 percent for *E. coli*
- » 26 percent to 51 percent for *klebsiella pneumoniae*
- » 54 percent to 74 percent for *pseudomonas aeruginosa*

BACKGROUND

In 2004, Robert Pickoff, MD, Hunterdon Medical Center's chief medical officer, began looking at how changes in drug utilization could help stem the tide of antibiotic resistance at the hospital. His preliminary efforts grabbed the attention of officials at VHA Inc., who were creating an antibiotic stewardship program. Hunterdon was selected as the test site for the hospital alliance's Bugs and Drugs program.

Hunterdon's effort was strengthened by David Adelman, director of pharmacy. After his arrival at the hospital in 2005, Adelman started a pharmacy residency program, which, along with Rutgers pharmacy student clinical rotations, assisted in increasing the number of doctorate-level pharmacists. With the support of hospital leadership, Adelman also boosted the number of clinical coordinators with PharmDs from one to four. These staff members partnered with the physicians in the campaign against antibiotic resistance.

The antibiotic utilization subcommittee of the hospital's pharmacy and therapeutics committee had found that in many cases, physicians were not choosing the best antibiotics for empirical therapy, which is drug treatment before a culture can identify the specific bacteria causing the infection. The group also found that once the bacteria cultures came back in three or four days, doctors were often not switching patients to a more effective antibiotic for that particular infection.

Hunterdon's first step in the Bugs and Drugs program was to share its data on antibiotic utilization and drug resistance with Gums. His analysis of the data showed that "the longer somebody is on the inappropriate antibiotic, the higher the rate of resistance," Pickoff says.

Gums made several recommendations. One of the most important, Pickoff says, was his advice to develop separate antibiograms – analyses of bacteria cultures for antibiotic

TEAM MEMBERS

» **David Adelman**
Director of Pharmacy

» **Robert Pickoff, MD**
Chief Medical Officer

» **Robert P. Wise**
President and CEO

resistance – not just for the entire facility, but for different areas of the hospital, such as the emergency department and intensive care unit. The antibiograms are posted on the hospital's intranet so that physicians and pharmacists can access them easily and use them when deciding which antibiotic to prescribe.

"What most hospitals do is take all of the cultures that are done and test them against all these antibiotics to see what they are sensitive to and report them altogether for the entire institution," Pickoff explains. However, "bacteria in each of the units of the hospital are really very different, and they actually have different sensitivities and resistances."

Based on the antibiograms' results, the hospital implemented guidelines for the empirical use of antibiotics in general, and in the various units of the hospital. They were posted on the intranet. Cipro, an overutilized broad-spectrum antibiotic, was targeted in particular. The guidelines recommend physicians order it empirically only for patients with diverticulitis or Crohn's Disease, Adelman says.

The hospital's formulary was not changed, both Pickoff and Adelman emphasize. To improve utilization, the program relies on the guidelines and the intervention of the doctors of pharmacy in cases where physicians prescribe outside the guidelines. The clinical pharmacists make rounds with physicians and give them advice on the spot. They also monitor prescribing habits from the pharmacy. So if a physician prescribes Cipro against the guidelines, "we would go and speak with the physician," Adelman says.

The stewardship program doesn't rely on rotation of antibiotics to preserve their effectiveness. "We talked about that," Pickoff says. "But that supposes continued injudicious use of antibiotics. We thought that while that [technique] has been shown to be successful at times, the best thing to do would be to get people to use antibiotics more judiciously."

The initiative has shown "that antibiotic stewardship works, and it works not because you put restrictive policies in place for physicians, but it works because of close monitoring of individuals," Adelman says.

PRINCIPLES OF PERFORMANCE EXCELLENCE

The Patient Experience

The antibiotic stewardship effort has had a huge impact on patient safety, Adelman and Pickoff note. "The board of trustees was able to see that if we kept going the way that we were going, we probably wouldn't be able to admit patients with infections to the hospital because the drugs were burning themselves out," Adelman says.

In the past when an antibiotic stopped working, hospitals and physicians simply switched over to the next one because a steady stream of new antibiotics was coming from the drug companies, Pickoff says. However, that stream has dried up. "We're now left with using the antibiotics we have more effectively." Through the stewardship program, "what we've done is reverse the tide of antibiotic resistance so that our armamentarium of antibiotics is still useful," Pickoff adds.

Creation of High-Reliability Culture

One of the unique features of Hunterdon's program is the close relationship that has developed between physicians and doctorate-level pharmacists. It wasn't completely smooth going at first. "Somebody just showing up and giving doctors advice isn't always welcome," Pickoff says. "These people had to prove their mettle and show that they knew what they were talking about." They did so quickly. "We evolved from the PharmDs chasing down the physicians to make recommendations to now the PharmDs get phone calls from physicians for advice," he says.

Initially, about 57 percent of pharmacists' suggestions were accepted, which is better than the national norm, Adelman says. "At most institutions, if we can get 40 percent of our recommendations accepted, it's pretty good." Now, the figure at Hunterdon is 89 percent. "To get it up to almost 90 percent was really an amazing thing."

CONTINUAL IMPROVEMENT

The antibiogram used to be reported only yearly, but under the stewardship program it is now reported to the antibiotic utilization committee twice a year and up to quarterly for the clinical pharmacy specialists so that any negative development can be addressed quickly. One change under consideration is to work with Gums to implement a computer program that would create daily antibiograms that would get down to the individual patient level, Adelman says. "We plug in what condition we think that patient came in on, and [the computer system] gives back to us the possible choices of antibiotics that we should use. Then we will make the selection. We're going to be able to do that on individual patients in real time."