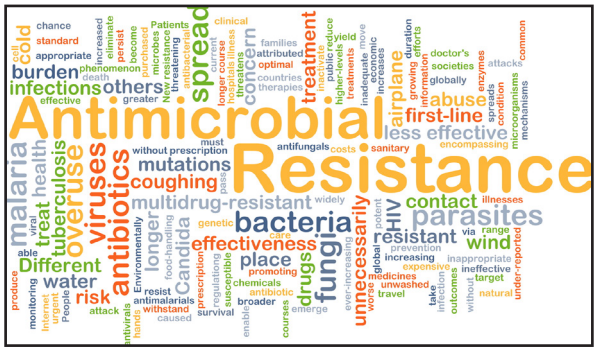
Being a Good Steward

JCMC Initiative Creates Awareness, Changes in Antibiotic Use

The first patient received penicillin in 1941. The following year, the first penicillin-resistance case was reported.

In the more than 75 years since, clinicians have continued to grapple with antimicrobial stewardship. Responding to the growing scientific evidence regarding over prescribing and misuse of the therapeutic agents, the Joint Commission added a new Medication Management standard (MM.09.01) applicable to hospitals, critical access hospitals and nursing care centers that went into effect on Jan. 1, 2017. The standard requires organizations to make antimicrobial stewardship an organizational priority, create multidisciplinary teams to craft and institute plans outlining appropriate dispensing, and educate staff, patients and families on the proper use of antibiotics and other antimicrobial medications.

When the new mandate was handed down, it simply meant 'business as usual' for Johnson City Medical Center (JCMC). The large hospital, which is now part of Ballad Health, had already instituted a stringent antimicrobial stewardship initiative in 2015 to address the problems of improper prescribing and growing drug resistance.



Paul Lewis, PharmD, BCPS (AQ-ID), a clinical pharmacy and infectious disease specialist at JCMC, said the impetus behind their successful program was rooted in the same issues facing facilities across the nation. Despite increasing calls for restraint in prescribing antibiotics, Lewis said there often remains a 'just in case' mentality that leads providers to prescribe an antibiotic even when the evidence doesn't support the clinical decision.

"That's why we have this problem of 20-50 percent of all antibiotics prescribed being excessive or unnecessary," he explained, citing recent Centers for Disease Control and Prevention statistics. As a result, he continued, "In the population as a whole, we're seeing increasing rates of *Clostridium difficile* (*C. diff*), multi-drug resistant organisms, and adverse events."

A board certified pharmacotherapy specialist with added qualifications in infectious disease, Lewis said nephrotoxicity, bone marrow suppression, seizures, and pulmonary, liver and central nervous system toxicities are among the adverse events increasing in frequency.

Creating a Culture of Change

"The goal of our stewardship program is to get the right agent on board as quickly as possible and eliminate unnecessary exposure," he explained. "Our global goal is to do what's right for the patient – that includes the current patient we're seeing right now and future patients to come."

Using the evidence at hand, the multidisciplinary stewardship team set about educating prescribers and creating processes with clinical decision support tools to bolster appropriate dispensing practices. Lewis stressed the importance of multimodal message delivery, noting culture change is unlikely to be accomplished by any single approach. Educational efforts range from e-mails, order sets, and computer modules to one-on-one conversations, case studies, and retrospective reviews. "Familiarity is a very powerful tool," he said of continuously reinforcing the message.

While information is the foundation of change, Lewis said there is another, equally critical, component. "If you deliver a 'perfect' message about the importance of antibiotic stewardship and no one buys in, you haven't really done anything. No initiative will be successful if your culture is not where it needs to be."

When instituting new initiatives that require changes in processes and mindset, Lewis said it's essential to identify key practice leaders who will help drive that change. "Every sports team has captains … every business has captains, too. They are your culture leaders," he stated.

Shifting Out of Autopilot

As part of the initiative, the stewardship team developed both global and patient-level strategies customized for various antimicrobial agents. Prescribers were asked to stop and consider two key questions specific to each patient's situation before automatically prescribing an antimicrobial agent:

1) Is the therapy effective?

2) Is the therapy excessive?

During a best practices session for the Tennessee Center for Patient Safety, Lewis walked statewide attendees through a case study that is often used as a teaching tool at JCMC. In the example, a 63-year-old female patient presented with shortness of breath, cough and fever. Based on patient history and x-ray, she was diagnosed with sepsis secondary to healthcare-associated pneumonia (HCAP) and admitted to the hospital where blood and sputum cultures were drawn.

The patient was initiated on three antibiotics including levofloxacin, which is often used to cover *Legionella*, along with intravenous pantoprazole for stress ulcer prophylaxis. "She had no risk factors for *Legionella*," said Lewis, adding the highly contagious pathogen is very rare in HCAP cases in the U.S. "She probably shouldn't have been started on levofloxacin, and certainly it should have been discontinued quickly." He added pantoprazole should not be used for stress ulcer prevention outside the intensive care unit.

On day three, he continued, the culture taken at admission grew *Candida albicans*, which is extremely common in respiratory secretions. "Evidence says not to treat it … but reflexively, you see a culture, you treat a culture," he noted of old habits. At JCMC, education and a revision to the pneumonia order set changed prescriber behaviors to more closely mirror the guidelines. However, Lewis added, prescribers have the ability to overrule guidelines and order sets based on their clinical judgment. "Autonomy stays with the physician," he stated.

Celebrating a New Mindset

Antibiotic utilization statistics at JCMC underscore the success of the hospital's antimicrobial stewardship initiative. "We've seen reductions in inappropriate antibiotic use," said Lewis. "We want to eliminate that unnecessary use … not just shift from one agent to another."

Dr. Paul Lewis

In the period between July 2015 and October 2016, the hospital saw a sustained downward trend in days of therapy per 1,000 patient days for fluconazole, levofloxacin, and vancomycin. Lewis said over that time period, JCMC realized about a 50 percent reduction in usage of fluconazole and levofloxacin, and about a 15 percent reduction in vancomycin.

There was also a 20 percent drop in hospital-onset *C. diff* over a one-year period pre- and post-launch of the initiative even while there was a 14 percent drop in average proton pump inhibitor (PPI) use per 1,000 patient days and a 31 percent decrease in average IV PPI use.

Ultimately, Lewis concluded, the positive changes resulting in improved antimicrobial stewardship at Johnson City Medical Center have come about because the entire team was receptive to re-thinking the familiar and re-visiting processes to improve patient care.

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