

# King's Daughters Medical Center Expand Antimicrobial Stewardship To Outpatient Settings

Suboptimal use of antibiotics, leading to a rise in antimicrobial resistance, is a growing concern – 20 to 50 percent of all antibiotics prescribed in U.S. acute care hospitals are either unnecessary or inappropriate.<sup>1</sup> According to the Centers for Disease Control and Prevention, antibiotic use is the most important modifiable driver of antibiotic resistance, and antibiotic-resistant infections lead to poor health outcomes, more toxic treatments and higher healthcare costs.<sup>2</sup>

In response to these facts, there is an increased effort to reduce or refine antibiotic use in hospitals across the U.S. However, the majority of antimicrobials prescribed to patients originate in outpatient settings and total inappropriate antibiotic use in outpatient facilities may approach 50 percent.<sup>3</sup> This includes unnecessary antibiotic use, as well as inappropriate selection, dosing, and duration.<sup>3</sup>

At King's Daughters Medical Center (KDMC) in Ashland, Ky., pharmacists have looked beyond the four walls of the hospital to expand their antimicrobial stewardship efforts using technology from Premier®. The goal is to optimize appropriate antimicrobials in outpatient centers by leveraging Clinical Surveillance powered by TheraDoc®.

## EXPANDING ANTIMICROBIAL STEWARDSHIP

KDMC, a 455-bed general medical and surgical hospital, has had an active antimicrobial stewardship program since August 2011 and began using TheraDoc in early 2012 to support and enhance the program.

TheraDoc provides pharmacists with clinical insights and tools necessary to help identify potential interventions and recognize opportunities to optimize drug therapy in real time. Although the KDMC hospital pharmacy supports select outpatient centers, TheraDoc initially was only being used for inpatient antimicrobial stewardship.

According to Jessica Sobnosky, PharmD, BCPS, clinical pharmacist at KDMC, outpatient centers present a challenge for antimicrobial stewardship because patients are not necessarily in the hospital's EMR system and are not always easily tracked. In addition, patients may be seen by multiple providers and time between appointments can vary, leading to delays in reviewing cultures and making therapy adjustments.

## IV Infusion Center

In early 2015, KDMC pharmacists used TheraDoc to conduct a medication-use evaluation for daptomycin in the IV Infusion Center, revealing an opportunity for potential antibiotic streamlining. "We noticed that the cost for daptomycin had gone up and assumed we were using more, but we decided to take a closer look by running reports in TheraDoc," Sobnosky said. "The review uncovered opportunities to de-escalate therapy in the Infusion Center."

In May 2015, the antimicrobial stewardship program was expanded to the Infusion Center. Pharmacists set up an IV Therapy Review in TheraDoc and began reviewing all IV therapy patients once a week. They also started tracking use of antimicrobials and dosing regimens.

"When we have new patients, we put them under the IV Therapy Review so we can follow them week-to-week," Sobnosky said. "We are able to quickly determine if patients have new cultures, make sure their therapy is appropriate, look for any interventions we can make or recommend monitoring."

TheraDoc provides a single location for individual patient data, medication information, lab results and physician notes. It also allows pharmacists to track interventions and potential cost savings. "Without TheraDoc, we wouldn't be nearly as efficient, and it would be difficult to look at every patient individually," Sobnosky said.

## Wound Care Center

After seeing the benefits in the Infusion Center, pharmacists turned their attention to the Wound Care Center. Wound Care Center patients are seen by multiple providers, which can lead to delays in reviewing cultures and making therapy adjustments. The antimicrobial stewardship program was

## Results

- 40% antibiotic intervention rate within outpatient wound care center
- 22% antibiotic intervention rate within outpatient IV infusion center



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expanded to the Wound Care Center in November 2015 with the creation of a Wound Care Center Review section in TheraDoc, which allows pharmacists to monitor patients and follow up on all positive culture results.

“Because physicians rotate in the Wound Care Center, we noticed a disconnect between the times cultures were ordered and therapy adjustments were made,” Sobnosky said. “Often, culture results were not reviewed until the ordering physician had returned. With TheraDoc, we can track culture results and receive real-time alerts about which patients need prompt follow up. Having all of the data in one place allows us to make therapy adjustments sooner and keeps pharmacists and physicians informed about new culture results and treatment interventions.”

**INCREASED INTERVENTIONS BENEFIT PATIENTS**

Since expanding TheraDoc to outpatient facilities, KDMC pharmacists have been able to increase drug interventions, de-escalate therapy for more patients and reduce time to appropriate therapy. In particular, interventions increased by

22 percent in the IV Infusion Center and 40 percent in the Wound Care Center (see table). Interventions include IV to PO recommendations, duration of therapy clarification, drug-bug mismatches, recommendations for alternate antibiotics, dose adjustments and recommendations for monitoring. Expanding antimicrobial stewardship and improving antibiotic utilization in outpatient facilities also has resulted in a cost savings of more than \$10,000.

**CONCLUSION**

According to Sobnosky, the most important goal of antimicrobial stewardship is to ensure patients are on the most effective and appropriate therapy for the infection being treated. “At KDMC, we have a large number of patients on antimicrobials that we need to track and review in a timely manner,” she said. “TheraDoc increases our ability to confidently manage antimicrobials throughout the hospital – and beyond its four walls – with a focus on improving antimicrobial use, reducing costs and targeting patients who really need intervention.”

**Table 1:** Antibiotic Interventions Increased

Outpatient Facility	Duration	Patient Encounters	Interventions/ Recommendations
IV Infusion Center	May 2015 – May 2017	208	45 (22%)
Wound Care Center	Nov. 2015 – May 2017	271	237 (40%)

*\*Some patients received multiple interventions.*



**Jessica Sobnosky, PharmD, BCPS,**  
Clinical pharmacist leads the antimicrobial stewardship program at King’s Daughters Medical Center.

**References**

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