Optimizing Antimicrobial Stewardship with Sentri7® at Texas Health Arlington Memorial Hospital

HOSPITAL PROFILE

Texas Health Arlington Memorial Hospital is a 300-bed community hospital in North Central Texas. The hospital has Epic installed as its hospital information system. The pharmacy team consists of a mix of centralized staff pharmacists and decentralized clinical pharmacists, including specialists in pediatrics, ICU, oncology and cardiac critical care.

Justin Clark has been a clinical pharmacist at Texas Health Arlington Memorial Hospital since August 2009. Sentri7® clinical surveillance software was already in place when he arrived. Clark’s original goals for Sentri7 were to reduce the time it takes pharmacists to sift through charts and to reduce the use of daily paper reports, as well as increase its use for antimicrobial stewardship.

“Overall, our goals were to help our pharmacy department run efficiently while optimizing patient care,” Clark said.

IMPLEMENTING ANTIMICROBIAL STEWARDSHIP

Arlington’s official Antimicrobial Stewardship Program (ASP) started in December 2009. Sentri7 helped get the program off the ground faster because pharmacists were already doing some stewardship activities within the software. The formalized program was championed by an Infectious Disease physician and the pharmacists were assigned to make interventions for antibiotics.

“Bottom line, Sentri7® helps the pharmacy department run efficiently and effectively in today’s economy.”

Pharmacy OneSource®
The ASP’s primary objective was to optimize antimicrobial utilization while minimizing adverse events associated with the indiscriminate use. The secondary objective was to reduce healthcare costs without adversely impacting quality of care.

Sentri7 allows the hospital to customize clinical rules for patients on target antibiotics who have positive cultures. For example, Arlington uses Sentri7 to identify opportunities to de-escalate antibiotics along with monitoring for resistant organisms such as:

- E. coli positive patients on levofloxacin therapy
- Pseudomonas aeruginosa positive patients on piperacillin-tazobactam therapy susceptible to other therapies
- Methicillin-sensitive Staph aureus on either vancomycin or linezolid
- Enterococcus faecalis on vancomycin with corresponding penicillin sensitive results

These optimization rules have been in place since early 2010 and they hope to see some improvements in sensitivities in the antibiogram data for the targeted organisms.

Example Antimicrobial Stewardship Rules on a Sentri7 Dashboard
(Not Specific to Arlington)
Sentri7 presents the pharmacists with situations where the patient’s culture results indicate resistance to the current antimicrobial therapy AND the physician has not reviewed the results within the previous 24 hours. The pharmacists are able to see the results in real time and get the therapy streamlined more rapidly to appropriate options... essentially get them the “right drug for the right bug.”

Sentri7 functionality includes a Performance Reporting tool that tracks the number of times a rule matches to the patient parameters, and the corresponding number of times that a pharmacist intervened for the specific rule. This tool helps the team determine how well they are doing in responding to care opportunities.

Arlington pharmacists also utilize a clinical rule that identifies opportunities to change therapy from intravenous to oral antibiotics. Clark built this rule to take into account several patient-specific factors, including: length of current intravenous antibiotic treatment, current NPO/PO status, patient diagnosis, and trending for WBC and temperature values. The pharmacists, working with approved criteria from the Pharmacy and Therapeutics Committee, have approval to change clindamycin, azithromycin, levofloxacin, metronidazole, linezolid and fluconazole from IV to PO routes for qualified patients. This data is tracked once again by performance reporting, which shows the number of matches to the rule versus the number of times the pharmacist has made the appropriate switch.

They also target patients who have been on a carbapenem class antibiotics for greater than 72 hours using clinical rules created with Sentri7.

Pharmacists at Texas Health Arlington Memorial Hospital provide pharmacokinetic dosing and monitoring for about 70 percent of the patients receiving vancomycin therapy at the facility. The pharmacists noticed potential problems with physicians not ordering serum levels for the other 30 percent. Using Sentri7, Clark built a rule that will alert them if 72 hours have gone by and there has been no vancomycin serum level ordered. This rule has helped to ensure an appropriate and safe level of care throughout the facility.

RESULTS

In 2009, Arlington pharmacists documented 1,022 antibiotic-related interventions. In 2010 they had a 54% increase of interventions to 1,577.

Arlington administrators have seen their antibiotic costs per patient day decrease based on the interventions the pharmacists are making. "Sentri7 has definitely helped us identify those interventions," Clark said. “We wouldn’t have been able to get as far as we have without this type of system.”
In addition to ASP activities, Arlington pharmacists also have a dashboard related to patient safety issues. A rule is in place for Core Measures, which looks for patients who are not on appropriate medications for a diagnosis of stroke. They also have a National Patient Safety Goal dashboard for anticoagulation monitoring. They have additional rules built for renal dose monitoring and IV-to-PO conversions for non-antimicrobial agents as well.

For example, one rule on their patient safety dashboard looks for patients receiving erythropoietin who have hemoglobin levels greater than 12. Giving erythropoietin to a patient who has hemoglobin of more than 10 g/dl can increase the risk of cardiovascular events.

The pharmacy department encourages other hospital departments to utilize the data mining power of Sentri7. Clinical rules built by Dr. Clark have helped other clinicians outside the pharmacy at Arlington Memorial Hospital. For instance, Outcomes Management uses clinical rules, managed by pharmacy, to perform audits of patients receiving the anticoagulant warfarin. A clinical nurse specialist from Quality Management uses Sentri7 rules to identify patients to investigate for appropriate care of heart failure as compared to CMS Core Measures.

“Some of the information they find with Sentri7, they can’t find through other methods; it helps improve their workflow,” Clark said.

In the pharmacy, management keeps track of monthly intervention totals for each pharmacist and the numbers get factored into their performance evaluations each year. Differences in unit assignment and opportunities for interventions are considered.

The Arlington pharmacy team documented more than 20,000 interventions and follow-ups representing more than 1,700 hours of clinical work in 2010. Hard and soft cost savings total more than $770,000 for the year.

Clark says of Sentri7: “Bottom line, Sentri7 helps the pharmacy department run efficiently and effectively in today’s economy.”