

University of Rochester Medical Center Department of Pharmacy

Evaluation of Emergency Pharmacist Services on Antimicrobial Stewardship for Ambulatory Patients Discharged from the Emergency Department

Principal Investigators: Stephanie Baker, Pharm.D; Elizabeth Ashley Dodds, Pharm.D, MHS, BCPS

Co-Investigators: Nicole M. Acquisto, Pharm.D; Rollin J. (Terry) Fairbanks, MD; Manish N. Shah, MD, MPH; Curtis E. Haas, Pharm.D, FCCP, BCPS

Background: Two evolving and increasingly recognized clinical practices for pharmacists are emergency medicine and antimicrobial stewardship. Antibiotic use is common for patients discharged or transferred from the emergency department (ED) with often limited or inconsistent follow-up of culture results to systematically assure appropriate therapy. It is therefore logical to integrate antimicrobial stewardship responsibilities into the practice of the emergency medicine pharmacist (EPH). Currently there is no published evidence establishing the value of incorporating antimicrobial stewardship oversight into the practice of the EPH. This study is designed to retrospectively evaluate the impact of the clinical pharmacist on appropriate antibiotic therapy for patients seen in a busy ED of an academic medical center. The EPH is ideally positioned and has the requisite knowledge and skills to evaluate and manage antimicrobial therapy for patients treated in the ED. Antimicrobial stewardship will be maintained as a top priority for the EPH, while traditionally it has been a secondary priority for the MLPs due to many competing responsibilities. Reducing time to appropriate antibiotic therapy is anticipated to improve outcome for patients presenting to the ED with community-acquired infections with the potential for fewer readmissions to the ED or hospital. By incorporating the EPH in the antimicrobial use process, we anticipate significant improvements in the timeliness and appropriateness of treatment.

Objective: The primary objective of this study is to evaluate the effect of the EPH on the time to appropriate antimicrobial therapy for patients initially evaluated in the emergency department. Secondary objectives are to determine if the EPH affects empiric and final antimicrobial choice and the rate of readmission to the ED.

Methods: This study will include data from two time periods for patients discharged from the ED following a visit for acute infection with subsequent positive cultures. From 11/2007 to 1/2008, the responsibility for all follow-up of culture data and adjustments to treatment was assigned to mid-level practitioners (MLP) in the ED. In October 2008, the EPH was integrated into this responsibility. The EPH reviews all culture data on a daily basis and new culture data is forwarded directly to the EPH when it becomes available. The EPH takes responsibility to make necessary adjustments to therapy. The EPH has also provided education to MLPs concerning appropriate antibiotic therapy, and tools were created to assist providers with empiric antibiotic selection. The second study period will include all qualifying patients from 11/2008 to 1/2009. Appropriateness of empiric and final antimicrobial therapy will be based upon standards derived from local and national guidelines, as well as community antibiogram results. Time to appropriate antibiotic therapy will be the primary endpoint. A sample size of 200 patients per study period is estimated to be adequate to detect a $\geq 30\%$ relative change in time to appropriate therapy ($\alpha = 0.05$; $\beta = 0.2$). For the control period (11/2007-1/2008) there are data available for approximately 225 patients, and it is anticipated a similar number of patients will qualify during the intervention period. Continuous data will be analyzed using the Wilcoxon Rank Sum test, and categorical variables will be compared using Chi-squared analysis or Fisher's exact test. Time to appropriate therapy will also be compared using survival analysis techniques.