Title: Implementation of extended infusion cefepime and meropenem within a community hospital: a feasibility study

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Purpose/Background: The administration of cefepime and meropenem via extended infusion prolongs the time in which free drug plasma concentrations exceed minimum inhibitory concentrations. This administration technique has been shown to increase drug efficacy, as well as decrease patient length of stay and drug utilization costs. However, the feasibility of extended infusion administrations may be limited by intravenous access, infusion durations, and drug incompatibilities.

Objective: To determine the feasibility of implementing an extended infusion cefepime and meropenem protocol hospital-wide at Sentara Martha Jefferson Hospital.

Methods: This was a single-center, prospective, observational, feasibility study performed on all patients with orders to receive cefepime or meropenem from December 11, 2018 to March 1, 2019. Patients were excluded if they met the following criteria: received a one-time dose of either antibiotic, had an estimated creatinine clearance of less than 10 mL/min, had suspected or confirmed meningitis, or were pregnant and/or breastfeeding. Education was provided in the form of a computer-based training module to be completed by all nursing staff, prior to December 1, 2018. Dosage selection was determined by a pharmacist according to protocol. The primary outcome was to determine the percentage of all eligible patients that were started and maintained on the extended infusion dosing protocol throughout the entire course of treatment. Secondary outcome measures included appropriateness of dose selection based on indication and renal function, missed dosages, barriers to implementation, drug incompatibilities, and reported safety events.

Results: A total of 38 patients receiving cefepime were eligible for study inclusion and were not excluded. Extended infusion cefepime was implemented in 35 of these patients (92.1%); three patients (7.9%) transitioned back to traditional infusion durations (30 minutes) while receiving treatment. Dosing errors occurred in six patients (16%) and were primarily due to failure to recognize renal impairment and obesity. Regarding meropenem, 32 patients were eligible for study inclusion and not excluded. Meropenem extended infusion was implemented in 30 of these patients (93.8%); only one patient (3.1%) was transitioned back to traditional infusion durations. Dosing errors occurred in three patients (9%), and were primarily due to failure to recognize renal impairment. There were no reported safety events for cefepime or meropenem.

Conclusion: A high percentage of patients were initiated and maintained on the extended infusion cefepime (n=35, 92.1%) and meropenem (n=30, 93.8%) protocol during this study. Therefore, the implementation of this administration technique as standard of care was feasible, and will be continued in our institution.