Title: Evaluation of a drug-bug mismatch report and impact on antimicrobial stewardship interventions

Introduction: Antimicrobial stewardship is a priority for hospitals, and utilizing a variety of generated reports can enhance stewardship activities. At AtlantiCare Regional Medical Center (ARMC), TheraDoc software is used to help optimize antimicrobial therapy. A report evaluating antimicrobials and current cultures with susceptibilities is called drug-bug mismatch (DBM). The report identifies patients with an identified organism that is not covered by their current antimicrobial treatment. The purpose of this study was to evaluate the utility of this report and determine whether or not an intervention was truly needed for patients identified in the DBM.

Methods: From August 2019 to September 2019 the results of our hospital DBM were reviewed by a pharmacist, and interventions were pursued when appropriate. The patient, culture, indication for antibiotic, antibiotics ordered, and potential for intervention was analyzed for each alert. Each alert was documented as requiring an intervention or not. Those mismatches not resulting in an intervention were categorized as to why they were not helpful, such as contamination, colonization, or the intervention was already made. For the purposes of analyzing results, alerts were stratified into 6 different groups based on the type of culture. The groups were urine, blood, sputum, bone or bodily fluid, wound or tissues, and stool. The study investigator was responsible for assessing each case, following up with the physician, and then determining if there was a true DBM. With a true DBM, the investigator intervened to ensure the appropriate antibiotics were initiated for the patient. Approval by the institutional review board at ARMC was deemed not necessary for this evaluation.

Results: A total of 42 DBM alerts were analyzed from various sources, including 16 urine, 5 blood, 7 sputum, 4 bone or bodily fluid, 9 wound or tissue, and 1 stool culture. Overall, 20 of 42 (48%) alerts resulted in an intervention by the pharmacist. Urine and sputum culture alerts required interventions at the lowest rate with resultant treatment interventions in 4 of 16 (25%) and 2 of 7 (29%) of those cases respectively. Blood culture alerts were the most successful as all 5 alerts required an intervention. Alerts associated with wound or tissue cultures identified gaps in therapy as 6 of 9 (67%) cases required an intervention. Additionally, alerts due to positive bone or bodily fluid cultures resulted in interventions 2 of 4 (50%) cases. Colonization or contamination appeared to be the major cause of alerts that did not result in intervention, as well as a treatment modification being made before the pharmacist could intervene.
**Conclusion:** The drug-bug mismatch alert software can be a beneficial tool for pharmacists and physicians participating in antimicrobial stewardship activities. However, the alerts had varying value depending on the culture source in our experience at ARMC. If used appropriately, the DBM feature can be valuable asset for an antimicrobial stewardship program. Further modifications to our process in utilizing this DBM report are warranted to enhance value and allocate time accordingly.