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Readiness for AUC-Dosing of Vancomycin in Montana Hospitals

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UGP 2020: Readiness for AUC-Dosing of Vancomycin in Montana Hospitals
Final Report
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Introduction

Vancomycin is an essential antibiotic for treating methicillin-resistant *Staphylococcus Aureus* (MRSA) infections. Vancomycin requires close monitoring because of its potential to damage the kidney.[1] Evidence now supports the use of a new parameter, area-under-the-curve (AUC), to monitor vancomycin dosing and recently has become the standard-of-care.[2,3,4] The preferred method for estimating AUC is with sophisticated, computer software using a Bayesian analysis. The expense of commercially available programs may be difficult to justify for hospitals with limited budgets, especially smaller hospitals that infrequently administer vancomycin to patients.

Study Objectives

1) Determine how prepared are hospitals in Montana to implement AUC-guided dosing of vancomycin.
2) Determine whether there is a difference in readiness to use AUC-guided dosing based on institutional or monitoring characteristics.
3) Provide opportunity for AUC dosing educational materials and training to all sites.

Objective 1 and Objective 2 -- Survey of Hospitals

An IRB proposal describing a survey-methods study of current vancomycin dosing practices in Montana was submitted for review. The project was judged as "not human-subjects research."

A questionnaire was developed to collect information about current vancomycin dosing practices at Montana hospitals and to assess readiness to implement AUC-guided dosing of vancomycin. The questionnaire was tested by two colleagues at the University of Montana and revised based on feedback.

All 90 institutions listed as members on the Montana Hospital Association website were contacted via either phone call or email to identify a contact most knowledgeable with the institution's vancomycin dosing practices and to assess eligibility for the study. Institutions were excluded from the study if they did not have any acute care beds or if they did not administer vancomycin to patients. Ultimately, 28 institutions were excluded from the study   The remaining 62 hospitals were invited to participate in the study, conducted with an online Qualtrics® questionnaire. Several reminder emails and friendly phone calls were used to achieve a response rate of 74%, and no significant difference was observed in the response rate for larger institutions (> 25 acute care beds) compared to smaller institutions (≤ 25 acute care beds), 93% versus 68% (p=0.088). Participation incentives were also sent to participants in the study to increase the response rate.

Initial results of this survey were presented in a poster at the Northwest Pharmacy Convention (virtual).

Objective 3 – Education on AUC-guided dosing

In the questionnaire, participants also shared their educational needs and preferences regarding AUC-guided dosing of vancomycin. A one-hour, free, continuing education presentation was created to

address the needs of the participants identified in the survey. The presentation was delivered online and on-demand, as the vast majority of respondents preferred this format. At the time of writing this summary, 18 individuals have registered for this CE module and 3 individuals have claimed CE credit for completed the module.

A comparison of the three most popular commercial programs used for Bayesian estimation of vancomycin AUC was a planned component of the scope of work. The budget included $2000 to purchase a 1-year subscription to one of these programs, DoseMeRx®. Unfortunately, it is the policy of DoseMeRx® to sell subscriptions only to hospitals or institutions that are administering vancomycin to patients, so this program could not be purchased. Consequently, a comparison of the three main commercial products was not completed. Fortunately, a comparison of commercial dosing software was not a priority for survey participants. More respondents were interested in a comparison of free, online programs, which became one of the main foci of the online CE program.

A review of the free, online programs produced an interesting revelation. The two most popular, free-online programs used a simplistic approximation of standard pharmacokinetic equations to calculate AUC. A more accurate calculation could be done easily using the *Solver* function in Excel®. A description of this more accurate approach, and comparisons between the exact and approximate calculations, will be the subject of a poster abstract to be submitted to the Midyear Meeting of the American Society of Health-System Pharmacists.

A manuscript based on these results is in preparation and will be submitted to the American Journal of Health-System Pharmacy (AJHP).