



From Trough to AUC: Change Management Tips

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PREPARING FOR THE CONVERSION TO AUC FOR VANCOMYCIN DOSING



Build a Foundation

It is important to begin discussing the guideline changes with your teams, including nursing, pharmacy, and the medical staff.

Basic definitions

Many of our partners found it helpful to review the basics of pharmacokinetics and pharmacodynamics with their teams, such as half-life, volume of distribution, and AUC. DoseMeRx provides a vancomycin [pharmacokinetics refresher](#) that is a helpful resource for pharmacy staff and clinicians.

Clinical rationale

The new guidelines recommend a Bayesian-derived AUC/MIC_{BMD}* ratio of 400 to 600 (assuming a vancomycin MIC_{BMD} of 1 mg/L). Prescribers may not be fully aware of the literature highlighting the therapeutic benefit of shifting away from dosing based on a trough level and towards calculation of an AUC to help guide dosing decisions.

*BMD = Broth microdilution

Education

DoseMeRx customers have recognized that interdisciplinary education on AUC-based dosing is needed and is a critical component of a successful transition.

Assistant Professor Luigi Brunetti, PharmD, MPH Clinical Pharmacist at Robert Wood Johnson University Hospital Somerset, discusses strategies for incorporating AUC-based dosing approaches into clinical workflow in this CE accredited course: [Optimizing Vancomycin Therapy: Transitioning from trough based to AUC/MIC based dosing.](#)

Dr. Brunetti advocates for engaging the appropriate partners in the conversation including not only pharmacy, but also physicians (including infectious diseases), laboratory staff, and nursing. Soliciting input from each group will help to identify the topics that need additional education and will help pharmacy to customize training and education for each of these audiences. In addition, it is important to have conversations with these groups to understand the changes to your pharmacy workflow in order to adjust to dosing and monitoring based on AUC.

Learn about the Benefits

AKI: Reductions in Occurrence

Multiple clinical studies have shown that AUC-based vancomycin therapy can reduce the occurrence of vancomycin associated acute kidney injury (AKI). Vancomycin-associated AKI is commonly defined as

- 1) an increase in serum creatinine of ≥ 0.5 mg/dL
- 2) a 50% increase from baseline in consecutive daily readings or
- 3) a decrease in calculated creatinine clearance of 50% from baseline on two consecutive days in the absence of an alternative explanation
- 4) Newer studies suggest that a more sensitive threshold of an increase in serum creatinine ≥ 0.3 mg/dL over a 48-hour period may be an indicator of AKI

There are multiple publications that provide an excellent review of vancomycin associated AKI.

Vancomycin area under the curve and acute kidney injury: A meta-analysis.

(Aljefri DM, et al, 2019) | [Download Paper](#)

Making the change to area under the curve-based vancomycin dosing

(Heil et al., 2018) | [Download Paper](#)

Vancomycin and the risk of AKI: a systematic review and meta-analysis

(Ray et al., 2016) | [Download Paper](#)

Systematic review and meta-analysis of vancomycin-induced nephrotoxicity associated with dosing schedules that maintain troughs between 15 and 20 milligrams per liter

(van Hal et al, 2012) | [Download Paper](#)

Calculating AUC using Bayesian Dosing

The monitoring of AUC through the use of Bayesian software programs, such as DoseMeRx, is the preferred approach as stated in the guidelines. While two levels, a post infusion peak and a trough, are the generally preferred method, with Bayesian dosing using DoseMeRx, a single level can be appropriately used.

Bayesian dosing tools like DoseMeRx can make [mathematical accommodations](#) if the level is not drawn at an exact time, preventing a wasted blood draw.

Read Independent Research

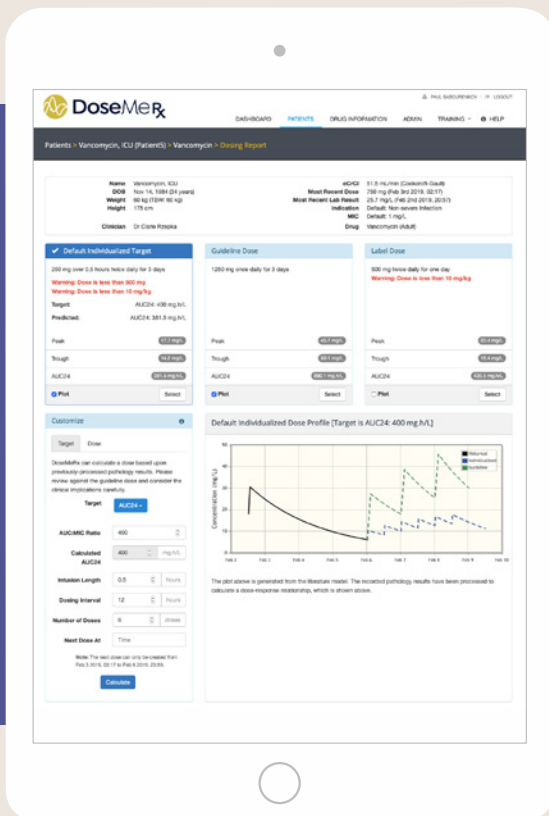
AUC-based Monitoring of Vancomycin Literature Review

We have compiled a list of independent research related to AUC-based monitoring of vancomycin shown to enhance patient outcomes, reduce adverse drug events, and lower healthcare costs. This research also highlights some of the challenges associated with the implementation of an AUC-based approach and evidence supporting the relationship between AUC:MIC and clinical outcomes – [read now.](#)

Review Bayesian Dosing and DoseMeRx

It's important to review Bayesian dosing and understand how a Bayesian dosing software, such as DoseMeRx, can support your vancomycin monitoring program. There is a preference given in the guidelines towards monitoring AUC using Bayesian software. By using a program that is supported by richly sampled vancomycin data (referred to as Bayesian prior), the pharmacist or other individual responsible for monitoring vancomycin can utilize the Bayesian dosing software to calculate doses designed to achieve the targeted AUC range.

Depending on your hospital's patient population, another advantage of considering DoseMeRx is that it can accommodate multiple [vancomycin models](#). This can assist you across adult (including obese and hemodialysis sub populations), pediatric and neonatal patients.



DoseMeRx is a unique, easy-to-use decision support software used by hundreds of clinicians around the world to support the dosing for thousands of patients. The platform leverages clinically validated pharmacokinetic drug models, patient characteristics and drug concentrations to guide dose optimization of vancomycin.

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