

# Wake Forest Baptist Medical Center

Center for Antimicrobial Utilization, Stewardship, and Epidemiology

## Guidelines for monitoring vancomycin concentrations in adult patients

v.2.2 9/2020

### I. Why obtain a vancomycin concentration?

- A. To determine if vancomycin dosing is therapeutic
- B. To monitor for accumulation of vancomycin if renal function declines
- C. To ensure vancomycin is still therapeutic if renal function improves

### II. What is the target AUC?

Target AUC/MIC for treating *S aureus* and Enterococcal infections is 400-600mg-hr/L. Note that it is acceptable to assume an MIC of 1mg/L and simply adjust dose to achieve the targeted AUC. When using AUC to adjust vancomycin, most corresponding troughs will range between 10-20mg/L (20-25mg/L for continuous infusions)

### III. What are the principles of individualizing vancomycin dose using serum concentrations?

- A. Among patients with stable renal function, adjusting dose to area-under-the-concentration-time-curve (AUC) optimizes efficacy and safety. Ideally this should be AUC/MIC ratio: see below.
- B. Serum concentration monitoring is usually not necessary for courses  $\leq 3$  days
- C. If measuring concentrations with an initial or new dosing regimen, the AUC study should be performed when the regimen is at "steady-state", ie, renal function is stable and patient has received at least 4 doses of a prescribed regimen (including any loading dose).
- D. AUC is determined using a pre- and post- dose serum concentration, either around the same dose or between two doses.
- E. Optimal pre-dose concentrations (trough) are obtained within 30 minutes before the next scheduled dose. Acceptable troughs are obtained within 1 hour before the next scheduled dose if the dosing interval is Q12h or more frequent. Acceptable troughs are obtained within 2 hours before the next scheduled dose if the dosing interval is Q24h or less frequent.
- F. Post-dose concentrations (peak) must be obtained at least one hour following the end of a dosing infusion.
- G. Among patients with changing, unpredictable, or generally poor renal function, particularly those with critical illness, dosing vancomycin with a regular frequency may not be practical. In these cases, it is appropriate to give a loading dose and then obtain random vancomycin concentrations to determine the timing of subsequent doses. In these dosing scenarios, vancomycin cannot be directed at an AUC target. For complicated or serious infections (eg, HAP, endocarditis) a subsequent dose is warranted if the vancomycin concentration is  $< 20$  mcg/mL. For less severe infections (eg, cellulitis) a subsequent dose is warranted if the vancomycin concentration is  $< 15$  mcg/mL.

### IV. How often should a vancomycin AUC study be obtained?

- A. If extended therapy with vancomycin is necessary (e.g. 6 weeks duration) and all clinical parameters are stable, serum concentration monitoring should be performed weekly, either a repeat AUC study or by trough concentration if an AUC study is not feasible, e.g. in the outpatient/home infusion setting. In the latter case, targeting a trough previously associated with an adequate AUC on that dose is reasonable.
- B. If renal function becomes unstable, obtaining a trough concentration can help identify drug accumulation or sub-therapeutic dosing and inform dose adjustment. Repeat monitoring may also be indicated to rule out sub-therapeutic dosing if clinical response to vancomycin is less than anticipated.