SBUH Guidelines for Vancomycin Serum Concentration Monitoring

Vancomycin Serum Concentration Monitoring at SBUH is stratified by duration of therapy and indication.

No monitoring needed:

- **Skin and Soft Tissue Infections -** No need for serum trough concentration monitoring for non-obese patients with normal renal function who are receiving vancomycin 1 g q12h or 15 mg per kg q12h.[6]
- **For anticipated duration of therapy less than 3 to 5 days -** No need for monitoring if patients have stable normal renal function and are being dosed with vancomycin at 15 - 20 mg per kg q12h or dosed by SBUH dosing guides.

Monitoring recommended:

Deep-seated infections (i.e. pneumonia, bacteremia, meningitis, and osteomyelitis) or the anticipated duration of therapy is greater than 3 to 5 days

Monitor by steady state trough concentration (avoid obtaining blood specimen during patient's sleeping hours, 22:00 to 06:00):

- Dosing interval **q6h** – monitor vancomycin trough concentration prior to the 5th dose or 6th dose. This is to allow sufficient time for steady state to be attained and avoid making dosing adjustment based on non-steady state trough level.
- Dosing interval **q8h and q12h** – monitor vancomycin trough concentration prior to the 4th dose or 5th dose when steady state is likely to have been achieved
- Dosing interval **q24h** - monitor vancomycin trough concentration prior to the 3rd dose. Although this may not be a steady state trough concentration, waiting to monitoring until the 4th dose or the 4th day will lead to a delay in dosing optimization if needed.

Once the measured steady state trough concentration is within the target range

- For patients with unchanged renal function and dosing frequency of q24h or q12h, monitor vancomycin trough concentration once a week
- For patients with unchanged renal function and dosing frequency of q6h or q8h, monitor vancomycin trough concentration twice a week (e.g. Monday and Thursday)

Special Situations

Patients with ESRD who receive hemodialysis on a fixed schedule of 3 times a week

- Monitor by pre-hemodialysis level (see SBUH Vancomycin Dosing Guidelines for monitoring targets)
- If the same post-hemodialysis dose is given for 2 consecutive hemodialysis sessions in achieving the pre-HD target, that same dose can be given after each hemodialysis thereafter. Monitoring can be extended to once a week or once every 2 weeks.

Consultation with the Antimicrobial Stewardship Team or Infectious Diseases Consult service for dosing adjustment is recommended in the following situations:

- Patients with changing or unstable renal function
- Patients receiving high daily doses (>4 grams per day). Additional vancomycin serum levels such as peak levels may be needed to better define the pharmacokinetic parameters of the antibiotic.
- Repeated trough levels below the desired target range (i.e. <15 mcg/mL for serious infections)
- Patients with trough level greater than 25 mcg/mL

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Background

The pharmacokinetic and pharmacodynamic (PK/PD) index of vancomycin that correlates with clinical success and lower mortality in the treatment of complicated MRSA infections (bacteremia and pneumonia) is the 24-hr Area Under the Serum Concentration-Time Curve (AUC_{0-24}) to Minimum Inhibitory Concentration (MIC) ratio ≥400. [1-4] **However, due to the ease of utilizing serum trough concentration for monitoring, national professional societies (ASHP, IDSA and SIDP) endorse the use of vancomycin serum trough concentration of 15 to 20 mcg/mL as a surrogate for the AUC_{0-24} target in the treatment of bacteremia, pneumonia, meningitis and osteomyelitis.**[5] **To the contrary, the optimal PK/PD target for skin and soft tissue infection is not defined, though a traditional regimen of 1 gram every 12 hours is considered sufficient for non-obese patients with normal renal function given the good penetrance of vancomycin into that site.** [6]

References

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