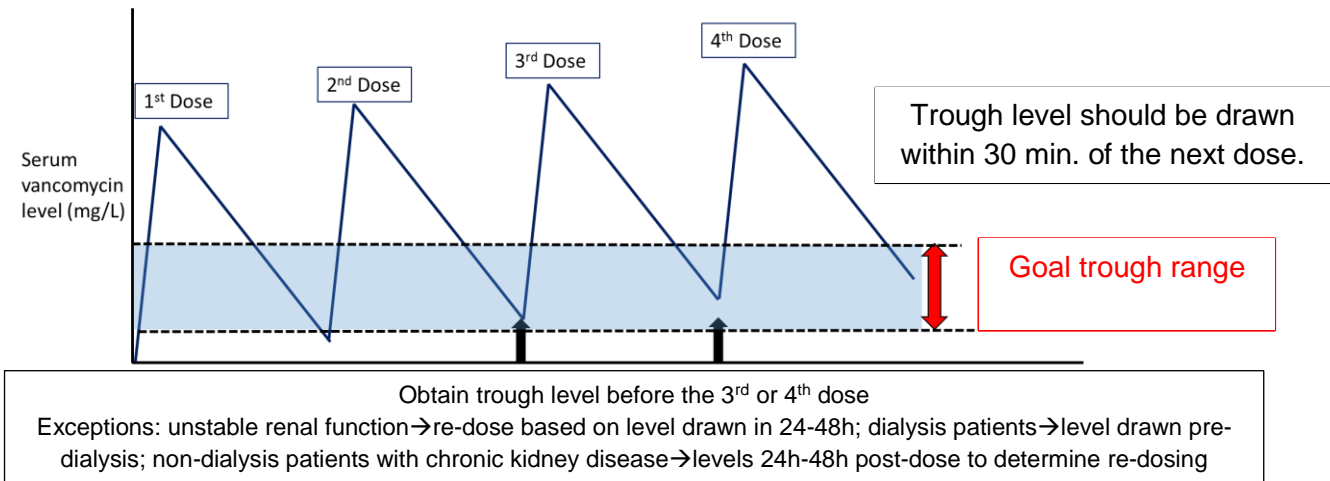


# Vancomycin Monitoring and Adjustment

- For guidance on empiric dosing, see Intravenous Vancomycin Empiric Dosing
- **Indication for monitoring vancomycin trough levels:**
  - Duration of vancomycin treatment expected to be a minimum of 5 days
  - Treatment of serious infections (e.g. sepsis, bacterial meningitis, infective endocarditis), deep-seated infections (e.g. bone and joint infections), or any indications that require more aggressive dosing
  - For safety, in patients at risk of nephrotoxicity: concurrent nephrotoxic medications, pre-existing renal insufficiency or unstable renal function, older (age > 60), or extremes of weight (under 50 or over 100 kg)
- **Obtaining vancomycin levels:**



- **Selecting and interpreting trough levels:**
  - Always interpret trough level in context of timing of the preceding dose, particularly if the level appears to be much higher or lower than expected
  - Trough for most patients in most indications: 8-15 mg/L
  - Serious infections (e.g. sepsis, central nervous system infections, and endocarditis) or deep-seated infections (e.g. bone and joint infections) may require more aggressive dosing with trough level in the 15-20 mg/L range, but this decision must be balanced with the risk of acute kidney injury, which is associated with higher vancomycin levels.
- **Adjusting vancomycin doses:**
  - “Dose-by-proportion,” assuming renal function and volume of distribution are stable. Example: 1000 mg q12h resulted in trough level of 18 mg/L → regimen may be adjusted to 750 mg q12h with new trough expected to be ~10-13 mg/L if the goal trough range is 8-15 mg/L.
  - Changing the dose in increments of 250 mg and/or the frequency to q8h, q12h, q24h, q48h are all reasonable strategies. Consult Pharmacist.
- **When to recheck levels:**
  - After a change in dosing regimen, recheck by before the 3<sup>rd</sup> or 4<sup>th</sup> dose of the new regimen
  - Renal function becomes unstable, or with introduction of another nephrotoxic medication
  - Treatment >7 days expected. Recheck level weekly during therapy, as vancomycin can accumulate.
- **Other monitoring parameters:**
  - Renal function, including SCr, and electrolytes; hydration status
  - Weekly WBC, absolute neutrophil count (ANC), platelet in patients receiving > 7 days of vancomycin. Neutropenia (ANC < 1x10<sup>9</sup>/L) is reported as 2-12%, but expected to resolve upon discontinuation of vancomycin. Thrombocytopenia is rare (< 150x10<sup>9</sup> platelets/L) is rare (reported as 5-8%). Severe thrombocytopenia (< 100x10<sup>9</sup> platelets/L) was reported as less than 1%.

# Vancomycin Monitoring and Adjustment

## References

- Vancouver General Hospital Vancomycin Dosing Card 2<sup>nd</sup> edition (July 2015)
- Wong-Beringer A, Joo J, Tse E, Berginer P. Vancomycin-associated nephrotoxicity: a critical appraisal of risk with high-dose therapy. *Int J Antimicrob Agent* 2011;37:95-101.
- Van Hal SJ, Patterson DL, Lodise TP. Systematic Review and Meta-Analysis of Vancomycin-Induced Nephrotoxicity Associated with Dosing Schedules That Maintain Troughs between 15 and 20 Milligrams per Liter *Antimicrob Agent Chemother* 2013;57:734-744.
- Jeffres MN. The Whole Price of Vancomycin: Toxicities, Troughs, and Time. *Drugs* (2017) 77:1143–1154.
- Black E, Lau TTY, Ensom MHH. Vancomycin-induced neutropenia: is it dose or duration related? *Ann Pharmacother* 2011;45:629-38.
- Patel N, VanDeWall H, Tristani L, et al. A comparative evaluation of adverse platelet outcomes among Veterans' Affairs patients receiving linezolid or vancomycin. *J Antimicrob Chemother* 2011;67:725-735.
- Nasraway SA, Shorr AF, Kuter DJ, et al. Linezolid does not increase the risk of thrombocytopenia in patients with nosocomial pneumonia: comparative analysis of linezolid and vancomycin use. *Clin Infect Dis* 2003;37:1609-16.
- Rao N, Ziran BH, Wagener MM et al. Similar hematologic effects of long-term linezolid and vancomycin therapy in a prospective observational study of patients with orthopedic infections. *Clin Infect Dis* 2004;38:1058-1064.