

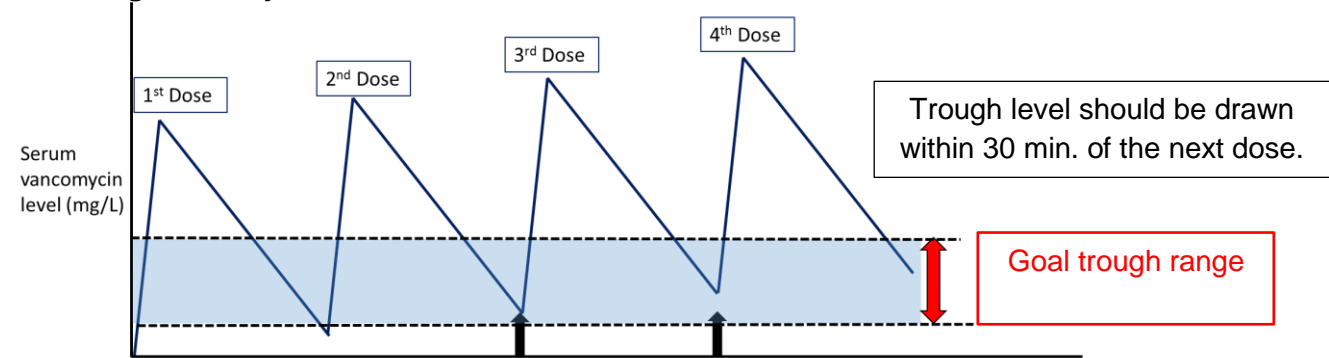
Vancomycin Monitoring and Adjustment

✦ 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:**



Obtain trough level before the 3rd or 4th dose

Exceptions: unstable renal function → re-dose based on level drawn in 24-48h; dialysis patients → level drawn pre-dialysis; non-dialysis patients with chronic kidney disease → levels 24h-48h post-dose to determine re-dosing

✦ **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: 1g 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 3rd or 4th 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 <1x10⁹/L) is reported as 2-12%, but expected to resolve upon discontinuation of vancomycin. Thrombocytopenia (<150x10⁹ platelets/L) is rare (reported as 5-8%). Severe thrombocytopenia (<100x10⁹ platelets/L) was reported as less than 1%.

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References

Bugs and Drugs mobile application

Vancouver General Hospital Vancomycin Dosing Card 2nd 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.

Johns-Hopkins Antibiotic Guidelines mobile application

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.