

# Vancomycin Dosing, Administration & Monitoring Guidelines for Adults

## Indications

**Vancomycin use is limited to the following indications (unless use is in accordance with an approved protocol or approval is obtained from Infectious Diseases):**

- Empiric therapy for severe community-acquired sepsis
- Empiric therapy for severe nosocomial sepsis in patients with IV lines and/or known to be MRSA colonised
- Empiric therapy for surgical site infections in patients known to be MRSA colonised
- Treatment of suspected or proven penicillin resistant pneumococcal meningitis
- Empiric therapy in combination with meropenem for post-neurosurgical CNS infections

## Dosing Weight

**Total Body Weight (TBW)** should be used to calculate both loading and maintenance doses. Both the volume of distribution and clearance (in the absence of renal dysfunction) of vancomycin increase proportionately according to TBW, even in morbidly obese patients. Calculated doses should be rounded to the nearest 250mg for ease of dose preparation.

## Initial Loading Dose

A one-time initial **loading dose of 30mg/kg (TBW)** is recommended for all patients and especially those who are seriously ill to assist in rapidly achieving therapeutic plasma concentrations. This is particularly important for patients who may have a significantly increased volume of distribution in the setting of severe sepsis and septic shock.

### Vancomycin Loading Dose

Total Body Weight	Loading Dose
>110kg	30mg/kg
90-110kg	3000mg
75-89kg	2500mg
60-74kg	2000mg
50-59kg	1500mg
30-49	1000mg

## Maintenance Dosing

**Maintenance dosing** should commence at **15mg/kg (TBW)** once the estimated dosing interval has elapsed.

### Vancomycin Maintenance Dose

Total Body Weight	Dose
>110kg	15mg/kg
90-110kg	1500mg
75-89kg	1250mg
60-74kg	1000mg
50-59kg	750mg
30-49	500mg

### Maintenance Dosing Frequency

CrCL* mL/min	Suggested Interval
>60	12-hourly
20-59	24-hourly
<20	Redose when plasma level <20mg/L
Haemodialysis / Peritoneal dialysis	

\*Estimated Creatinine Clearance

## Dose Administration

### Infusion Rate

Vancomycin must be administered slowly with infusion rates not exceeding **10mg/minute**, unless appropriate monitoring is in place (e.g. ICU/Operating Theatre). Rapid administration increases the risk of histamine-release reactions ("Red Man Syndrome") which can lead to patient discomfort, significant hypotension and cardiac events.

### Infusion Concentration

Vancomycin solutions should be diluted to a maximum concentration of **5mg/mL** to minimise thrombophlebitis when given via peripheral IV. Higher concentrations of up to 10mg/mL can be given for short periods to patients with fluid restrictions and more concentrated solutions may be administered via central IV lines. The same restrictions on infusion rate apply when administered via a central line.

## Therapeutic Drug Monitoring

### When to Sample

A vancomycin plasma trough sample should be taken approximately 48hrs after initiation of therapy (3<sup>rd</sup> Day) and timed to coincide with morning pathology rounds and within 30 minutes prior to the morning dose. Routine levels should be ordered no more than twice weekly if stable and within target range. Follow up levels subsequent to a dose adjustment should be ordered 36-48 hours after the new dosing regimen has started.

### Target Range

The plasma trough target range for most infections is **15-20mg/L**. The Infectious Diseases team may advise on altered target ranges depending on patient or microbiological factors.

### High & Low Levels

When plasma levels are unexpectedly high or low, confirm the timing of sampling and the administration history/record of vancomycin doses with the relevant nursing staff. Such levels may reflect missed doses or sampling performed during or shortly after vancomycin infusions rather than true trough levels.

### Withholding Doses

Doses should not routinely be withheld while awaiting results of vancomycin plasma levels as delays in dose administration may result in sub-therapeutic exposure. Doses should be given as scheduled immediately following sampling for trough levels unless explicitly withheld by a medical officer.

## Dose Adjustments

Before adjusting doses based on a plasma level it is important to ascertain whether the level is a true trough. Adjustments based on random or post infusion levels can result in significant under dosing

Dose adjustments should be made in a roughly linear fashion in accordance with trough plasma levels.

An increase in dose by 50% should result in an increase in trough level by roughly 50%, although caution should be exercised when trough levels are very low or very high.

### Example of dose adjustment:

Current dose: vancomycin 1000mg 12-hourly, actual level: 12mg/L, target level: 18mg/L (15-20mg/L)

New vancomycin dose:  $[\text{target level}]/[\text{actual level}] \times \text{dose} = 18/12 \times 1000\text{mg} = 1500\text{mg}$  12-hourly

## Additional Advice & Support

The Infectious Diseases team is available to provide advice on dosing and monitoring of vancomycin therapy for specific patients as requested

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### References

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