

TITLE: VANCOMYCIN DOSING AND MONITORING IN ADULTS

1. Estimate patient's creatinine clearance (CrCL)

$$\text{CrCL (male) ml/min} = \frac{(140 - \text{age}) \times \text{IBW (kg)}}{72 \times \text{SCr}} \times 0.85 \text{ for females}$$

$$\text{IBW (males)} = 50 \text{ kg} + (2.3 \times \text{height in inches} > 60 \text{ inches})$$

$$\text{IBW (females)} = 45 \text{ kg} + (2.3 \times \text{height in inches} > 60 \text{ inches})$$

Instead of IBW, use adjusted body weight (ABW) in obese patients (TBW > 30% over IBW): $\text{ABW (kg)} = \text{IBW} + 0.4 (\text{TBW} - \text{IBW})$

(Use minimum SCr of 1 mg/dL. Certain disease states or other factors may alter the relationship between SCr and CrCL resulting in over- or under- estimation of CrCL)

2. Determine maintenance dose using the following

Each maintenance dose (approx. 15-20 mg/kg of actual body weight, rounded to the nearest 250 mg) should be administered at the dosing interval recommended for a patient's CrCL. Maximum initial dose is 1750 mg every 12 hours until serum concentration monitoring indicates the need for higher dosing. Utilize recommended infusion rates to minimize development of "Red Man's Syndrome."

VANCOMYCIN MAINTENANCE DOSES		INFUSION RATE BASED ON DOSE (approx. ≤ 15 mg/min)
Total body wt (kg)	Dose (mg)	
≥ 111	1750	120 minutes
90-110	1500	90 minutes
75-89	1250	75 minutes
60-74	1000	60 minutes
50-59	750	60 minutes
30-49	500	60 minutes

A one-time loading dose of 25-30 mg/kg of actual body weight (rounded to the nearest 250 mg) at a recommended rate of 500 mg/hour (but no more than 1 g/hr) may be considered for seriously ill patients (e.g., sepsis, fever and neutropenia, suspected/proven MRSA bacteremia) with CrCL > 30 mL/min to rapidly attain therapeutic concentrations.

VANCOMYCIN LOADING DOSES		INFUSION RATE BASED ON DOSE (approx. ≤ 15 mg/min)
Total body wt (kg)	Dose (mg)	
≥ 90	3000	360 minutes
75-89	2500	300 minutes
60-74	2000	240 minutes
50-59	1500	180 minutes
30-49	1000	120 minutes

VANCOMYCIN DOSING INTERVAL BASED ON ESTIMATED CrCL	
CrCL (mL/min)	Dosing interval
≥ 100	Q8-12h (Consider Q8h dosing if <50 years old with severe infection and normal renal function)
50-99	Q12h
30-49	Q24h
< 30 *	Initial loading dose of 15-20 mg/kg. Redose with 15 mg/kg when serum level ≤ 15 mg/L or when ≤ 20 mg/L in severe infections where penetration may be compromised (e.g., meningitis, pneumonia)
Hemodialysis	
Peritoneal dialysis	
Continuous renal replacement therapy (CRRT)	Q24-48h (Maintain trough 10-15 mg/L or 15-20 mg/L in severe infections where penetration may be compromised (e.g., meningitis, pneumonia))

* For patients with acute renal failure or unstable and/or increasing SCr, dose as if CrCL < 30 mL/min. Consider Q48h dosing in patients with CrCL 20-30 mL/min and stable SCr.

3. Serum concentration monitoring

In most cases, ONLY vancomycin troughs necessary for routine monitoring

- Obtain trough levels prior to the 4th dose of a new regimen (prior to the 3rd dose for patients with dosing intervals > 24 hours)
- Trough levels should be obtained within 30 minutes before the next scheduled dose.
- Repeat trough levels weekly with stable dosing OR with any significant changes in renal function
- Target trough concentrations of 10 - 15 mg/L recommended
- Trough concentrations of up to 20 mg/L may be desired in selected, severe or complicated infections where drug penetration may be compromised (e.g. endocarditis/bacteremia, osteomyelitis, meningitis, pneumonia). Consider Infectious Disease or Clinical Pharmacist consult in these cases.
- Peak levels NOT routinely obtained
- For obese patients, initial dosing should be based on actual body weight then adjusted based on serum vancomycin concentrations to achieve therapeutic levels

Random concentrations ONLY if severe renal dysfunction or receiving renal replacement therapy.

- Obtain a level within 24-48 hours in patients on CRRT or after 3-4 days in patients on HD/PD. More frequent sampling is usually not necessary. Re-dose when serum level ≤15 mg/L or ≤ 20 mg/L in selected, severe infections where drug penetration may be compromised (e.g. meningitis, pneumonia).