VANCOMYCIN ADULT DOSING GUIDELINES – Summary

NB Provincial Health Authorities Anti-Infective Stewardship Committee, October 2020

INITIAL DOSE

Loading dose:

- Consider using a loading dose in patients with:
  - severe infections where rapid attainment of target level of 10-15 mg/mL is desired
  - significant renal dysfunction in order to decrease the time required to attain steady state
- **Recommended Dose: 25-30 mg/kg IV**
  - based on actual body weight, for 1 dose, followed by maintenance dose separated by recommended dosing interval
  - consider capping the loading dose at a maximum of 3 g
  - loading doses do not need to be adjusted in patients with renal dysfunction; only maintenance dosing interval requires adjustment
- If loading dose not used then proceed with administration of a maintenance dose at recommended dosing interval

Maintenance dose:

- **15-20 mg/kg IV**
  - based on actual body weight; maximum of 2g/dose for *initial* maintenance doses (prior to vancomycin levels)
  - doses greater than 500 mg – round to the nearest 250 mg
  - doses less than 500 mg – round to the nearest 50 mg

Dosing interval:

- Interval depends on patient's renal function and targeted serum vancomycin concentration (refer to tables on following page)

Clinical Pearls:

- Use care when selecting patients for q8h dosing – recommend avoiding in patients that are older and/or with multiple co-morbidities (ex. diabetes, heart failure, etc.) or where estimated creatinine clearance would be expected to be an overestimate (ex. low muscle mass in an elderly patient, dysmobility, paraplegia, etc.)
- Consider q8h dosing for patients who are younger and otherwise well with few medical co-morbidities
- The provided ranges for estimated creatinine clearance are only intended to be a guide for the selection of an empiric dosing interval and should not be used in isolation without considering patient and infection-related factors – especially when estimated creatinine clearance approaches either end of the range.

Target trough of **10 to 15** mg/L	
Creatinine Clearance	Dosing Interval
greater than 80 mL/min	q8-12h
40 to 80 mL/min	q24h
20 to 39 mL/min	q36h
10 to 19 mL/min	q48h
less than 10 mL/min	consider a loading dose, then adjust maintenance dose based on serial serum drug levels to target trough

Estimated creatinine clearance (CrCl) in mL/min

Women	Men
CrCl = $\frac{(140\text{-age}) \times \text{weight (in kg)}\dagger}{\text{SCr (in mcmol/L)}}$	CrCl = $\frac{(140\text{-age}) \times \text{weight (in kg)}\dagger \times 1.2}{\text{SCr (in mcmol/L)}}$
IBW = 45.5 kg + (0.92 x cm above 150 cm) *or* 45.5 kg + (2.3 x inches above 60")	IBW = 50 kg + (0.92 x cm above 150 cm) *or* 50 kg + (2.3 x inches above 60")
†Use ideal body weight unless actual weight is 20% above ideal body weight (IBW), in such case use adjusted body weight. Adjusted body weight = 0.4 x (actual body weight – IBW) + IBW If actual weight is less than ideal body weight, use actual weight.	

LEVELS

Target serum concentrations:

- Vancomycin levels should always be maintained above 10 mg/L to avoid the development of resistance.
- After a thorough review of the available evidence, NB-ASC recommends a target trough level of 10-15 mg/L for ALL infections.
    - There is no reliable data to support the use of a target trough of 15-20mg/L.
    - However, there is data demonstrating that target troughs of 15-20 mg/L are associated with greater nephrotoxicity.

- Levels are recommended in:
    - patients who are severely ill
    - patients with anticipated therapy duration of 7 days or greater
    - patients with impaired renal function (CrCl 50 mL/min or less) or unstable renal function
    - patients on dialysis
    - concomitant use of other nephrotoxic drugs
    - patients with altered volume of distribution or clearance of vancomycin, including
        - morbidly obese patients
        - cystic fibrosis
        - burns more than 20% BSA
        - pregnancy

- Trough (pre) levels are taken within 30 minutes before a dose
- First trough level should be taken at steady state, typically
    - **prior to 4th dose if q12h interval**
    - **prior to the 5th dose if q8h interval**

INTERPRETING TROUGH LEVELS AND ADJUSTING DOSE

Trough level	Recommendation
below target range	decrease interval
above target range	decrease dose or increase interval

Clinical Pearls:

- If trough level is significantly elevated (i.e. greater than 25 mg/L) hold vancomycin and use repeat levels to determine when to restart vancomycin and new dosing regimen

MONITORING

- Subsequent vancomycin trough levels:
    - with dosage change: trough should be repeated at new steady state
    - once target trough achieved: trough should be taken approximately every 7 days in hemodynamically stable patients
- patient's clinical response to vancomycin
- CBC at least weekly on long-term vancomycin therapy
- Serum creatinine (SCr) at least twice a week initially, then at least weekly on long-term therapy
    - more frequent monitoring should be considered if
        - renal function changing
        - concurrent nephrotoxic drug
        - underlying renal dysfunction
        - age greater than 60

References: See full guideline document