PIER VANCOMYCIN GUIDELINES: neonates, infants and children

Paediatric Innovation, Education and Research Network

Table 1: NEONATES (under 1 month)

Corrected gestational age	Dose
Up to 33 weeks	Prescribe 15mg/kg every 12 hours*
33-44 weeks	Prescribe 15mg/kg every 8 hours*
Greater than 44 weeks	Use dosing guidelines in Table 2

Monitoring: Target trough level = 10-20mg/L.
Request a trough level 1 hour before the 3rd dose (or 4th dose). Record blood sampling time on Equest form and administration chart. Do not delay giving the dose.
Interpret the result of the assay before the following dose and adjust dose regime if indicated.
See Table 3 for interpretation of levels and dose adjustment.

***If renal impairment or decreased urine output** (<2ml/kg/hr), take trough level before the 2nd dose as a safety check, then give dose and check result before giving the 3rd dose.

This level is a SAFETY CHECK and should be interpreted with caution. For this level ONLY: If level >12mg/L, reduce frequency; If level <5mg/L, increase frequency. Give 2 or 3 doses and recheck levels before the 3rd or 4th dose. Then follow Table 3 for interpretation of levels and dose adjustment.

Table 2: INFANTS and CHILDREN (1month – 18years)

A: Normal, stable renal function e.g. Child previously fit and well; no history of renal impairment; no trend of rising serum creatinine or urea; no reduction in urine output; not requiring inotropes. Estimated creatinine clearance > 90ml/min/1.73m^2	**B: Possible mild-moderate renal impairment** e.g. Rising creatinine, urea and/ or phosphate ; child requiring inotropic support; post-op cardiac surgery; history of renal impairment. Estimated creatinine clearance 50-90ml/min/1.73m^2
Prescribe 25mg/kg LOADING DOSE to be given over 2 hr, followed by 15mg/kg every 6 hours (started 6 hours after the loading dose). **Monitoring:** Request a trough level 1 hour before the 3rd (or 4th dose). Record blood sampling time on Equest form and administration chart. Do not delay giving the dose. Interpret the result of the assay before the following dose. **See Table 3** for interpretation of levels and dose adjustment. **Target trough level = 10-20mg/L**.	**Prescribe 15mg/kg every 8 hours** **Monitoring:** Request a trough level before the 2nd dose. Do not delay giving the dose. Check result before giving the 3rd dose. *This level is a SAFETY CHECK and should be interpreted with caution. For this level ONLY: - If level >12mg/L, reduce frequency to 12 hourly. If level <5mg/L, change to Group A dosing and give loading dose followed by 15mg/kg every 6 hours.* *Give 2 or 3 doses and recheck levels before the 3rd (or 4th dose). Then follow Table 3 for interpretation of levels and dose adjustment.* **Target trough level = 10-20mg/L**.
C: Moderate renal impairment and haemofiltration patients Estimated creatinine clearance 20-50ml/min/1.73m^2	**D: Severe renal impairment and peritoneal dialysis patients** Estimated creatinine clearance less than 20ml/min/1.73m^2.
Prescribe 15mg/kg every 12 hours If haemofiltration is interrupted for more than 4 hours check level before giving next dose, and review dosing. **Monitoring:** Request a trough level before the 2nd dose. Do not delay giving the dose. Check result before giving the 3rd dose. *This level is a SAFETY CHECK and should be interpreted with caution. For this level ONLY: - If level >12mg/L, reduce dose to 10mg/kg every 12 hours. If level <5mg/L, increase frequency to 15mg/kg every 8 hours.* *Give 2 or 3 doses and recheck levels before the 3rd or 4th dose. Then follow Table 3 for interpretation of levels and dose adjustment.* **Target trough level = 10-20mg/L**.	**Prescribe loading dose of 15mg/kg stat.** **Monitoring:** Check level every 12 hours until between 10-20mg/l. Prescribe 10mg/kg as next dose. Check level 12 hours later. **Target trough level = 10-20mg/L**.

Note: In some cases it is necessary to increase the dose in excess of doses stated in the BNF-C. The BNF dosage recommendations were originally intended to achieve trough levels of 5-10mg/l. Trough level recommendations have subsequently been increased to 10-20mg/L.

Table 3: INTERPRETATION of VANCOMYCIN LEVELS and DOSE ADJUSTMENT

Before interpreting levels, consider the following points:-

- Was the blood sample taken at the correct time, and is it a true trough specimen?
- Was the blood sample taken from the intravenous line used to infuse vancomycin?
- Was vancomycin used as a line lock?
- Has the patients' renal function or hydration status deteriorated or improved?
- Was the dose calculated on an actual or estimated body weight?

Pre-dose (trough) level	Dose adjustment
>25mg/L	x See notes above – consider if this is a sampling error or a valid result. If considered valid, omit next dose. x Recheck blood level every 12 hours until level falls to <20mg/L. x Reduce next dose by 50%. x Seek advice from pharmacist on dose interval and rechecking levels.
20-25mg/L	x If dosing is 6 hourly, reduce interval to 8 hourly. x If dosing is 8 hourly or less frequent, reduce next dose by 30% and continue with the current dosing interval. x *Give 2 doses and recheck levels before the 3rd dose. Review sooner if renal function deteriorates.*
TARGET TROUGH LEVELS = 10-20MG/L	**Continue with current dosing regimen.** For less sensitive strains of MRSA and for some cases of infective endocarditis (on microbiology advice) the target range is 15-20mg/L. x *Reassess renal function, and recheck pre-dose levels accordingly. For patients with stable renal function, vancomycin levels should be checked twice weekly.*
7.5-10mg/L	x If dosing is 6 hourly, increase dose by 30% and continue with the current dosing interval x If dosing is 8 hourly, continue at same dose and reduce dosing interval to 6 hourly x If dosing is 12 hourly, continue at same dose and reduce dosing interval to 8 hourly. x *Give 2 or 3 doses and recheck levels before the 3rd (or 4th dose). Review sooner if renal function deteriorates.*
<7.5mg/L	x Caution – consider carefully if this is a sampling error. x If level is considered to be a valid result, increase the dose by 50% and continue with the current dosing interval, or change the dosing interval. x *Give 2 or 3 doses and recheck levels before the 3rd (or 4th dose).*

Table 4: PREPARATION and ADMINISTRATION of DOSES for ALL AGE GROUPS:

- For peripheral intravenous infusion, dilute to 5mg/ml with glucose 5% or sodium chloride 0.9%.
- For central intravenous infusion, concentrations up to10mg/ml may be used.
- **Administer doses of 15mg/kg over 1 hour**
- **Doses <u>over</u> 15mg/kg should be given at a <u>maximum</u> rate of 15mg/kg/hr.**
- Red man syndrome due to histamine release is more likely if these rates are exceeded.

References:
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