



NEONATAL MEDICATION GUIDELINE

Vancomycin

INTERMITTENT REGIMEN FOR EMPIRICAL THERAPY OF LATE ONSET SEPSIS

Scope (Staff): Medical, Nursing and Pharmacy staff

Scope (Area): NICU KEMH, NICU PCH, NETS WA

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Requires Neonatologist or Microbiologist approval within 24 hours of initiation

HIGH RISK Medication

Incorrect dosing with respect to age, weight and renal function may result in significant ototoxicity and nephrotoxicity. Under dosing may result in treatment failure, monitoring of drug levels is required.

Description

Antibiotic: Bactericidal glycopeptide

Presentation

Vial: 500mg

Pre-filled syringe: 40mg/8mL (5mg/mL) available at KEMH

Storage

Vial: Store at room temperature, below 25°C

Pre-filled syringe: Refrigerate at 2-8°C, do not freeze.

Indications

- Empirical Treatment of late onset sepsis
- Confirmed gram positive infections including Methicillin resistant *S. aureus* (MRSA) or coagulase negative staphylococcal (CoNS) infections– refer to clinical microbiology or infectious diseases physician for treatment advice
- Antibiotic Prophylaxis : Ventriculoperitoneal (VP) Shunt or CSF Reservoir Insertion

Contraindications and Precautions

- Concurrent nephrotoxic medications (gentamicin, piperacillin with tazobactam, furosemide, aciclovir or indometacin)
- Low urine output (less than 1mL/kg/hour)
- Pre-existing renal impairment (raised serum creatinine from age specific normal ranges)
- Haemodynamic instability
- Confirmed MRSA or CoNS- organism susceptibility may impact drug choice and dosing; a continuous infusion may be preferred

Dosage modification/reduction and earlier/frequent trough level monitoring may be required in patients with above risk factors. Consider contacting microbiology or paediatric infectious diseases physician for advice.

Dose

IV Intermittent Infusion:

Check baseline renal function (creatinine, urea and electrolytes) and repeat when first trough level is sampled.

Corrected Gestational Age	Postnatal Age	Dose	Frequency
Less than 30 weeks	0 – 7 days	10mg/kg/dose	12 hourly
	Greater than 7 days	10mg/kg/dose	8 hourly
30 - 37 weeks	0 – 7 days	15mg/kg/dose	12 hourly
	Greater than 7 days	15mg/kg/dose	8 hourly
37 – 44 weeks	All ages	15mg/kg/dose	8 hourly

Monitoring

Sampling of Levels

- First level: trough level 1 hour prior to 4th dose and await result
- Change of dose: trough level 1 hour prior to 4th dose and await result
- Previous level within range: trough level in 3 days' time and await result

Re-initiation of vancomycin at any time: Perform a trough level prior to commencing treatment and review prior to administering the 2nd dose

Target Trough Levels

Intermittent Dosing:

For empirical treatment: **5-15 mg/L**

Blood levels will need repeating if a drug dose is altered or if the infant's clinical situation (i.e. renal failure) is likely to lead to unpredictable levels.

Renal Function

Check creatinine, urea and electrolytes at baseline, with the first trough level and every 3 days thereafter at a minimum.

Consider more frequent monitoring of trough levels, creatinine, urea and electrolytes in patients with pre-existing renal impairment or at risk of deteriorating renal function (see precautions) or on other nephrotoxic medications.

Dose Adjustment

The following table aims to target a vancomycin trough level of **5-15mg/L (for empirical therapy)**.

Subsequent doses may be increased incrementally up to a **maximum dose of 80mg/kg/day** based on serum trough levels if clinically appropriate (e.g. absence of renal impairment or concomitant use of nephrotoxic medications).

In the event that dose escalation to 80mg/kg/day does not achieve the target level, consider changing to a continuous vancomycin infusion, in consultation with Infectious Diseases and/or Clinical Microbiology. Any further dose increases require approval from Infectious Diseases and/or Clinical Microbiology.

Only adjust a dose after confirming last doses were given correctly and at stated times, in addition to checking relevant microbiology results.

Reported Trough level	Current Dose Frequency	Suggested adjustment
Less than 5 mg/L	Every 12 hours	Use the same dose, increase frequency to every 8 hours.
	Every 8 hours	Increase dose by 50% (1.5 times current dose) and keep frequency at every 8 hours.
5 to 15 mg/L	Every 12 hours	No Adjustment required
	Every 8 hours	
16 to 20mg/L	Every 12 hours	Check renal function (creatinine, urea and electrolytes). Reduce dose by 30% (0.7 times current dose) – frequency to remain the same. Repeat level in 24 hours.
	Every 8 hours	
Vancomycin trough level greater than 20mg/L consultation with Microbiology/Paediatric ID and Pharmacy		
Greater than 20 mg/L	Every 12 hours	Check renal function (creatinine, urea and electrolytes). <u>Withhold</u> further doses and contact clinical microbiology or paediatric infectious diseases. Repeat level 24 hours after last dose (write urgent on pathology form).
	Every 8 hours	

Preparation

Use pre-filled syringes where available to prevent any need for double-dilutions.

Doses can also be ordered from Pharmacy at PCH.

Safety Tip: Discard an appropriate volume from a pre-filled syringe to achieve the correct dose prior to administration

IV Infusion: Method for double dilution

Safety Tip: Preparation requires a double dilution- minimise distractions during the preparation of this solution

Step 1 Reconstitution:

Add 10mL of water for injections to a 500mg vial. Concentration is now 50mg/mL

Step 2 Dilution:

Withdraw 1mL of the above solution and dilute to 10mL with glucose 5% or sodium chloride 0.9%

Safety Tip: Discard the contents of the first syringe immediately after the 1mL is withdrawn

Final Concentration is 5mg/mL

Maximum concentration: Concentrations of up to 10mg/mL may be used if neonate is fluid restricted. 10mg/mL solutions must be infused through a central line.

Administration

IV Intermittent Infusion

Infuse over one to two hours via syringe pump. A two hour infusion is recommended for the first dose or after an incidence of “Red man Syndrome”.

Pre-filled syringes do not need to remain protected from light during the infusion.

IV Continuous Infusion

Refer to: KEMH Neonatal Medication Guideline: Vancomycin Continuous Infusion

Compatible Fluids

Glucose 5% (Preferred), Glucose 10% or Sodium Chloride 0.9%

Adverse Effects

Common: Local pain, thrombophlebitis, erythematous rash

Serious: Nephrotoxicity, auditory and vestibular deafness, tachycardia, palpitations, red man syndrome, neutropenia, eosinophilia, thrombocytopenia

The symptoms of red man syndrome are fever, chills, erythema, rash (head, neck and upper chest), hypotension

Interactions

There is an increased risk of nephrotoxicity in patients who receive combination therapy with other nephrotoxic medications such as NSAIDs (Indometacin), gentamicin or piperacillin with tazobactam.

Guidelines & Resources

[Sepsis: Neonatal](#)

[Ventriculoperitoneal \(VP\) Shunt or CSF Reservoir Insertion](#)

[Neonatal Vancomycin Monograph- Continuous Infusion](#)

[Neonatal Vancomycin Monograph- Highly Restricted Intermittent Infusion for Blood Culture Positive Infections](#)

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Vancomycin Intermittent Empirical Therapy

Keywords	Vancomycin, intermittent, infusion, empirical therapy				
Document Owner:	Head of Department - Neonatology				
Author/ Reviewer	KEMH & PCH Pharmacy/Neonatology Directorate				
Version Info:	V10 – separation of empirical and targeted therapy guidelines; updated dose for 37-44 weeks to be in line with national guidelines and current neonatal references, dose adjustment table to target level of 5-15mg/mL				
Date First Issued:	December 2014	Last Reviewed:	19/04/2021	Review Date:	19/04/2024
Endorsed by:	Neonatal Directorate Management Group			Date:	April 2021
NSQHS Standards Applicable:	<input checked="" type="checkbox"/>  Std 1: Clinical Governance <input type="checkbox"/>  Std 2: Partnering with Consumers <input checked="" type="checkbox"/>  Std 3: Preventing and Controlling Healthcare Associated Infection <input checked="" type="checkbox"/>  Std 4: Medication Safety		<input type="checkbox"/>  Std 5: Comprehensive Care <input type="checkbox"/>  Std 6: Communicating for Safety <input type="checkbox"/>  Std 7: Blood Management <input type="checkbox"/>  Std 8: Recognising and Responding to Acute Deterioration		
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