Government of Western Australia
North Metropolitan Health Service
Women and Newborn Health Service

ADULT MEDICATION GUIDELINE	
VANCOMYCIN IV	
Scope (Staff):	All WNHS Staff
Scope (Area):	Obstetrics and Gynaecology
This document should be read in conjunction with the Disclaimer.	

Quick Links

Dose	Administration	Monitoring	Pregnancy and Breastfeeding

Restrictions

Formulary: Restricted

HIGH RISK Medication ⚠

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

Medication Class

Bactericidal glycopeptide

Presentation

Vial: 500mg

Storage

Store at room temperature, below 25°C. Protect from light

Dose

All adult patients treated with vancomycin at KEMH should be discussed with the microbiology team and pharmacy team

Loading Dose

IV infusion:

It is the consensus view of the Therapeutic Guidelines Antibiotic Expert Groups that a loading dose should be considered for critically ill adults because these patients are at high risk of poor outcomes.

A weight-based loading dose of 25-30mg/kg (rounded to the nearest 250mg) up to maximum of 2.5g is recommended because volume of distribution and clearance of vancomycin correlate with actual body weight. See Table 1.

Seek expert advice on loading doses for obese patients and patients with severe renal impairment.

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Table 1: Calculated vancomycin LOADING dosages for adults with NORMAL renal function:

Actual Body Weight (kg)	Recommended **LOADING** Dose
40-44	1 g
45-54	1.25 g
55-64	1.5 g
65-74	1.75 g
75-84	2 g
85-94	2.25 g
>95	2.5g

Maintenance Doses

IV infusion:

For intermittent vancomycin dosing in non-obese adults, an initial maintenance dosage is 15 to 20 mg /kg (actual body weight) every 12 hours. See Table 2.

Table 2: Calculated vancomycin MAINTENANCE dosages for adults with NORMAL renal function:

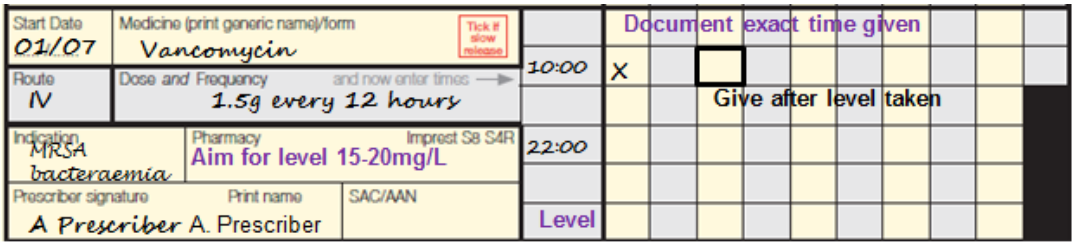
Actual Body Weight (kg)	Recommended **Maintenance** Dose
	Creatinine clearance >60mL/minute
40 to 49	750 mg 12-hourly
50 to 64	1 g 12-hourly
65 to 78	1.25 g 12-hourly
79 to 92	1.5g 12-hourly
93 to 107	1.75 g 12-hourly
108 or more	2 g 12-hourly

Renal impairment and obesity:

The frequency of vancomycin dosing depends on patient renal function, a direct correlate of vancomycin clearance. Guidance on the frequency of vancomycin dosing in patients with renal impairment (creatinine clearance [CrCL] < 60 mL/minute) is addressed in Therapeutic Guidelines (eTG complete) Antibiotic: Principles of Vancomycin Use. Alternatively, advice may be sought from the on call Clinical Microbiologist.

Dosing advice for patients with severe renal impairment (CrCL < 20mL/minute) or for obese adults (body mass index > 35 kg/m^2) must be sought from the KEMH on call Clinical Microbiologist.

Image 1: Example of vancomycin inpatient order



<u>Surgical prophylaxis</u>

IV infusion:

Based on 15mg/kg single dose:

Weight (kg)	Dose	Infusion Duration
< 50	15mg/kg	Dependent on calculated dose. Refer to Table 3 below.
50-75	1g	≥ 60 minutes
> 75kg	1.5g	≥ 90 minutes

Prevention of group B streptococcal disease

IV infusion:

Based on 20mg/kg every 12 hours:

Weight (kg)	Dose	Infusion Duration
< 50	20mg/kg, 12 hourly	Dependent on calculated dose. Refer to Table 3 below.
50-74	1.25g, 12 hourly	≥ 90 minute
75-100	1.75g, 12 hourly	≥ 120 minutes
> 100	2g, 12 hourly	≥ 120 minutes

Administration

IV infusion

Step 1 Reconstitution:

Add 10mL Water for Injection to vial. Concentration is 50mg/mL**.**

***Step 2 Dilution*:**

Further dilute to 5mg/mL with glucose 5% or sodium chloride 0.9%.

Maximum concentration for administration via a peripheral line is 5mg/mL (i.e. 1g in at least 200mL fluid). Maximum concentration for administration via a central line is 10mg/mL (i.e. 1g in at least 100mL fluid)

***Step 3 Administration*:**

Infuse at the volumes and durations suggested in Table 3 or *at a maximum rate of 10mg/min (to avoid red man syndrome).*

Table 3: Recommended vancomycin infusion volume and duration

Dose	Volume	Infusion Duration
500 mg	≥ 100mL	≥ 60 minutes
750 mg	≥ 250mL	≥ 60 minutes
1 g	≥ 250mL	≥ 60 minutes
1.25 g	≥ 250mL	≥ 90 minutes
1.5 g	≥ 500mL	≥ 90 minutes

1.75 g	≥ 500mL	≥ 120 minutes
2 g	≥ 500mL	≥ 120 minutes

Fluid restricted patients

May be administered using a concentration NOT exceeding 10mg/mL via a central line or PIVC and at a rate NOT exceeding 10mg/minute

Surgical prophylaxis

Ideally, complete administration prior to induction of anaesthesia.

In an emergency situation, where vancomycin is required, the Antibiotic Expert Groups of the Therapeutic Guidelines: Antibiotic 16 (2019) recommend that the infusion should be started at least 15 minutes before incision to ensure adequate blood and tissue concentrations at the time of incision and allow potential infusion related toxicity to be recognised before the induction of anaesthesia. The infusion can be completed after surgical incision

Continuous infusion

Can be given as continuous infusion – seek microbiology advice regarding dosing and monitoring

Monitoring

Therapeutic Drug Monitoring (TDM)

Plasma concentration monitoring is recommended for patients treated with vancomycin for longer than 48 hours, to optimise dosing. Monitoring is also important to minimise the risk of toxicity, especially in obese patients or patients with impaired kidney function.

The recommended approach to vancomycin monitoring varies depending on renal function**.**

Patients with normal renal function (creatinine clearance [CrCL] >60 mL/min):

The first TDM (trough level) should occur just prior to the fourth dose (including the loading dose). It is not necessary to wait for the result to give the next scheduled dose.

Patients with a CrCL of 20-60 mL/min

Consider monitoring trough level earlier (after 48 hours).

Patients with a CrCL of <20mL/min

Consider monitoring trough level earlier (after 48 hours). Unless patient is critically unwell, wait for trough result prior to giving dose.

Once stable therapeutic target levels are achieved, TDM can be undertaken twice weekly**.**

Table 4: Dose adjustment Guide

Trough plasma concentration	Suggested dosage adjustment
Less than 10 mg/L	Increase dosage by adjusting the dose or dose interval**.**
10 to 14 mg/L	For patients with uncomplicated infection who are clinically improving, maintain current dosage. For patients with complicated infection, increase dosage by adjusting the dose or dose interval
15 to 20 mg/L	Maintain current dosage
21 to 25 mg/L	Reduce dosage by adjusting the dose or dose interval or withhold dose. Monitor for nephrotoxicity.
More than 25 mg/L	Withhold the dose until concentration is less than 20 mg/L and seek microbiology expert advice.

Monitoring of Renal Function

Serum creatinine must be measured and documented whenever vancomycin TDM is carried out, to assist with interpretation of vancomycin serum levels.

Creatinine levels should be checked daily for the first 2 to 3 days of therapy, even if creatinine levels are in the normal range. If serum creatinine increases significantly at any stage, check serum level and wait for trough result prior to re-dosing.

Patients with unstable renal function and patients receiving concomitant treatment with nephrotoxic drugs including piperacillin/tazobactam require closer monitoring of renal function (possibly daily) to ensure toxicity is avoided as per Microbiologist/ID physician.

Red Man Syndrome

Red man syndrome is a non-immunological reaction that can occur during or shortly after an infusion of vancomycin and is related to the rate of infusion. The reaction is mediated by histamine release, which is characterised by rash, muscle spasms of the chest and back, and sometimes hypotension.

If a patient experiences an infusion related reaction to vancomycin:

- Temporarily stop the infusion. Restart at a lower rate (i.e. 1 g over 2 hours)
- Administer an antihistamine (e.g. promethazine).

If newly hypotensive (SBP <90mmHg) or shock-like symptoms, initiate a Code Blue - Medical.

Pregnancy

1st Trimester: Considered safe to use

2nd Trimester: Considered safe to use

3rd Trimester: Considered safe to use

Breastfeeding

Safe to use

Comments

Vancomycin and Piperacillin-Tazobactam Co-Therapy

There is an increased rate of nephrotoxicity (up to 20%) in patients who receive combination therapy with piperacillin-tazobactam and vancomycin.

In order to limit the risk of acute kidney injury with this combination therapy:

- Use alternative antibiotic if possible.
- Avoid vancomycin loading dose unless the patient is critically ill.
- Limit duration of treatment with combination therapy.
- Increased monitoring of renal function and serum vancomycin level is recommended when combination therapy cannot be avoided.
- Avoid treatment with other nephrotoxic agents (e.g. anti-inflammatory medications) whenever possible.
- Maintain adequate hydration.

Related Policies, Procedures & Guidelines

HDWA Policies:

Methicillin-resistant Staphylococcus aureus (MRSA)

NMHS Policies:

Infection prevention and control policy

WNHS Policies:

Antimicrobial Stewardship (AMS) policy

Micro Alerts and Multi-Resistant Organisms

High Risk Medicines

KEMH Clinical Guidelines:

Antibiotic Prophylaxis for Caesarean Section

Group B Streptococcal Disease

Group A Streptococcus (GAS)

Cardiac Disease

Infections: Antibiotic prophylaxis for gynaecological and urogynaecological surgery

Sepsis and septic shock: Antibiotics for adult patients at KEMH

Transmission based precautions

KEMH Pharmaceutical & Medicines Management Guidelines:

Medication Administration

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