Critical Care Guidelines
FOR CRITICAL CARE USE ONLY

Prescribing Chart for Vancomycin Continuous Infusion: Fluid Restricted Patients

Patients who are fluid restricted can receive a solution of higher concentration (i.e. 10mg/ml) **via central line only.** If patient is not fluid restricted, see guideline for Vancomycin by Continuous Infusion

The risk of infusion-related adverse effects can be increased with these higher concentrations.

Prescribe on the chart as '**Vancomycin FLUID RESTRICTED**'.

These rates are not programmed in Braun infusion pumps and usual settings need to be overridden. Rate of infusion should never exceed 500mg/hour.

Loading dose

Use the patient's **Actual Body Weight** for the loading dose.

Table 1.

Weight	Dose	Infusion volume of glucose 5%*	Infusion time
<40kg	750mg	100ml	1.5 hours
40-59kg	1000mg	100ml	2 hours
60-90kg	1500mg	150ml	3 hours
>90kg	2000mg	200ml	4 hours

*Can be prepared in sodium chloride 0.9% if glucose 5% unsuitable.

Maintenance Infusion

Obtain weight to use for creatinine clearance from tables below.
Use table 2 below to calculate the patient's maximum body weight.
Is the patient's *actual* body weight less than the *maximum* body weight?
Use whichever body weight is **lower** to calculate creatinine clearance (see table 3).

Table 2

Height feet	Height cm	Male Max BW kg	Female Max BW kg
4'8''	142	49	43
4'9''	145	52	47
4'10''	147	54	49
4'11''	150	58	52
5'0''	152	60	55
5'1''	155	62	58
5'2''	158	66	60
5'3''	160	68	62
5'4''	163	71	66
5'5''	165	74	68
5'6''	168	77	71
5'7''	170	79	74

Height feet	Height cm	Male Max BW kg	Female Max BW kg
5'8''	173	82	77
5'9''	175	85	79
5'10''	178	88	82
5'11''	180	90	85
6'0''	183	94	88
6'1''	185	96	90
6'2''	188	98	94
6'3''	191	101	
6'4''	193	104	
6'5''	195	107	
6'6''	198	109	
6'7''	201	113	

Table 3

Cockcroft and Gault equation: If creatinine is < 60 micromol/L, use **60** micromol/L

CrCl (ml/min) = (140-age) **x** Weight (kg) **x** 1.23(male) or 1.04(female)

Serum creatinine (micromol/L)

CrCl calculator available: Creatinine Calculator

The continuous infusion must be given via a dedicated **central line only**. The total daily dose will depend on the patient's renal function (table 4), and should be split into two twelve-hour infusions. **Start the continuous infusion immediately after the loading dose is complete**.

Table 4

Creatinine Clearance (ml/min) Use Cockcroft and Gault equation (eGFR not applicable)	**Daily maintenance dose**
<20 or CVVHD*	500mg
20-29	500mg
30-39	750mg
40-54	1000mg
55-74	1500mg
75-89	2000mg
90-110	2500mg
>110	3000mg

* For patients who are receiving CVVHD for fluid removal only and who do **NOT** have an AKI, use their creatinine level prior to starting on CVVHD to determine creatinine clearance.

Preparation of infusion

Reconstitute 500mg vials with 10mls water for injections and 1000mg vials with 20ml water for injections, to give a final concentration of 50mg/ml. Remove the volume of glucose 5% (or sodium chloride 0.9%) from the infusion bag, equivalent to the volume of vancomycin to be added. Chemically stable for 24 hours.

Table 5.

Daily Maintenance Dose	**Dose in each infusion bag to be administered over 12 hours. X**	**Volume of infusion bag for 12 hour infusion. Y**	**Volume of reconstituted vancomycin (50mg/ml) to add to 12 hour infusion bag.**	**12 hour Infusion rate mls/hr. Z**
250mg	125mg	50ml	2.5ml	4.1mls/hour
500mg	250mg	50ml	5.0ml	4.1mls/hour
750mg	375mg	50ml	7.5ml	4.1mls/hour
1000mg	500mg	50ml	10ml	4.1mls/hour
1250mg	625mg	100ml	12.5ml	8.3mls/hour
1500mg	750mg	100ml	15ml	8.3mls/hour
1750mg	875mg	100ml	17.5ml	8.3mls/hour
2000mg	1000mg	100ml	20ml	8.3mls/hour
2500mg	1250mg	150ml	25ml	12.5mls/hour
3000mg	1500mg	150ml	30ml	12.5mls/hour
3500mg	1750mg	200ml	35ml	16.6mls/hour
4000mg	2000mg	200ml	40ml	16.6mls/hour

Prescribe as: *X* mg over 12 hours in *Y* mls glucose 5% at *Z* mls/hour (≡ 2X mg in 24 hours)

Dose Adjustment

- Check vancomycin level at 6am daily.
- Adjust dose according to the table below.
- If started between midnight and 6am, wait for the following morning's level before adjusting dose. However, if urine output deteriorates over the course of the day, consider checking level sooner.
- Complete the bag which is running before replacing with a new bag (unless infusion is stopped or level>25mg/l).

If the patient is seriously ill (severe or deep-seated infections), the target range is 20-25mg/l. If the measured concentration is < 20mg/l, consider increasing the dose.

Table 6.

Vancomycin Serum Concentration	Suggested Dose Adjustment
<15mg/L	Increase daily dose by 500mg.
15-25mg/L	If the patient is responding, maintain the present dosage regimen. **If necessary, consider increasing the dose to achieve a steady state concentration of 20-25mg/L**
25-30mg/L	Decrease daily dose by 500mg – if the patient is receiving 500mg daily, then reduce the daily dose by 250mg.
>30mg/L	**Stop the infusion for at least 6 hours,** then recheck the level. Restart at a reduced dose when the serum level is <25mg/L. Please review the patient parameters when considering the dose eg. if creatinine has changed. Seek senior medical or pharmacist's advice.

Discharge from Critical Care

Stop the continuous infusion. Prescribe intermittent dosing to commence after a suitable time interval i.e. 6-12 hours. This interval will depend on the current vancomycin level and proposed target trough range for intermittent dosing, i.e. 10-15mg/L or 15-20mg/L. If total daily dose (TDD) by continuous infusion has been ≤1gram, then the intermittent dose should be the TDD given 24 hourly. A trough level should then be taken before the 2nd maintenance dose.
If total daily dose >1gram: give in 2 divided doses at 12 hourly intervals, i.e. TDD = 1500mg, give 750mg 12 hourly. Thereafter, serum levels may be checked after a further 24 hours of intermittent dosing. A trough level should be taken before the 3rd maintenance dose.

References:

1. Vancomycin 500mg powder for concentrate for solution for infusion vials, Bowmed Ibisquis: last updated on 01 Aug 2022 https://www.medicines.org.uk/emc/product/8759/smpc#gref : Accessed 28/07/2023

2. NHS Lothian IV Guide, page 662-666, Available: http://intranet.lothian.scot.nhs.uk/Directory/MedicinesManagement/DrugsTherapeutics/Documents/Guidelines/NHS%20Lothian%20UK%20IV%20Guide. Accessed: 28/7/23

3. Minimum Infusions Volumes, UKCPA, page 24, 4th edition 2012