Frimley Health
NHS Foundation Trust

Vancomycin continuous infusion guideline
Adult Critical Care Areas

Key Points

- Continuous vancomycin infusion is used to maintain consistent therapeutic levels, improve pharmacodynamic target attainment, and potentially reduce the risk of nephrotoxicity and dosing variability in critically ill patients
- Use of vancomycin by continuous infusion is an off-label use of vancomycin but is used within critical care
- The guideline will ensure the appropriate and safe administration of continuous vancomycin infusion to adult critical care patients
- The guideline will simplify serum vancomycin level monitoring requirements to reduce potential for error.
- It is not appropriate for patients with end-stage renal disease receiving intermittent haemodialysis (IHD)
- On discharge from ICU, dosing should be changed by critical care doctors to intermittent infusions

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Abbreviations

AUC	Area under the curve
CRRT	Continuous renal replacement therapy
ICU	Intensive Care Unit
IHD	Intermittent Haemodialysis
IV	Intravenous

Introduction

The efficacy of vancomycin depends on the time for which the serum concentration exceeds the minimum inhibitory concentration (MIC) for the micro-organism rather than the attainment of high peak concentrations (AUC_{24}/MIC).
Continuous infusion vancomycin provides stable serum concentrations throughout the dosing period, facilitating attainment of pharmacodynamic targets while avoiding the high peak and low trough concentrations associated with intermittent dosing. These advantages are particularly relevant in critically ill patients, where altered pharmacokinetics can make achievement of therapeutic exposure challenging. Avoidance of high peak levels has a potential reduction of nephrotoxicity.

The aim of this guideline is to:

- ensure the appropriate and safe administration of continuous vancomycin infusion to adult critical care patients.
- achieve and maintain therapeutic area under the curve (AUC) for plasma vancomycin concentration whilst minimising renal toxicity.
- simplify serum vancomycin level monitoring requirements to reduce potential for error.

Indication

- Adult patients on ICU requiring intravenous vancomycin
- Patients with end-stage renal disease receiving intermittent haemodialysis (IHD) are excluded
- Guideline covers treatment only when recommended by microbiology.

1. **Step 1 – Prescribe loading dose**

Loading dose is calculated on **Actual body weight** and is irrespective of renal function or continuous renal replacement therapy (CRRT).
Loading dose as per table 1 is suitable for both peripheral and central vein administration.

Table 1 - Loading dose

Actual body weight (kg)	Dose (mg)	Duration of loading dose infusion (min)	Final dilution volume 0.9% sodium chloride or 5% glucose (ml)
35-49	1250	120	250
50-64	1500	150	500
65-100	2000	200	500
>100	2500	250	500

Loading dose if **Central venous catheter only** and fluid restricted patients – **Each** 1g vancomycin, is made up to 100ml with 0.9% sodium chloride or 5% glucose and infused over 100 minutes.

When converting from intermittent vancomycin dosing regimen to continuous, send serum levels before loading and review if loading dose needed (Table 2).

Table 2 - Loading Dose for Patients Already Receiving Intermittent Vancomycin

Serum concentration(mg/L)	Loading dose
< 10	As per Table 1
11-15	500mg in 100 mls of 0.9% sodium chloride or 5% glucose over 60 minutes
16-25	NO LOADING DOSE - start continuous infusion as table 3
> 25	Delay start of infusion, re-check level after 6 hours

2. Step 2 - Initial maintenance dose

- Start immediately after loading dose
- Clinical assessment is required to determine starting infusion rate (if in doubt discuss with doctor or pharmacist). Use of serum creatinine alone may be misleading in the critically ill patient as serum creatinine may not be in steady state.

Table 3 - Doses for continuous infusion

Creatinine clearance (ml/min)	Dose over 24 hours (mg)	Initial infusion rate (mg/hr)
>50	2000	83
21 - 50	1500	63
10 – 20	1000	42
<10	500	21
Continuous renal replacement therapy	1500	63

- **Central venous catheter (preferred):** prepare concentration of 10 mg/ml using 0.9% sodium chloride or 5% glucose; proposed formulations: 500 mg in 50 mls, 1000 mg in 100 mls or 2500 mg in 250 mls.
- **Peripheral venous catheter:** prepare concentration of 5 mg/ml using 0.9% sodium chloride or 5% glucose; proposed formulations: 500 mg in 100 mls, 1250 mg in 250 mls or 2500 mg in 500 mls
- See infusion rate table (Table 4 for infusion rates in ml/hr)
- Expiry of vancomycin continuous infusion: 24 hours

Table 4 - Infusion rate according to total daily vancomycin dose:

Total Vancomycin dose over 24 hours	Hourly infusion rate	*Central vein (10mg/ml)*	*Peripheral vein (5mg/ml)*
3000mg	125mg/hr	12.5ml/hr	25ml/hr
2500mg	104mg/hr	10.4ml/hr	20.8ml/hr
2000mg	83mg/hr	8.3ml/hr	16.7ml/hr
1500mg	63mg/hr	6.3ml/hr	12.5ml/hr
1000mg	42mg/hr	4.2ml/hr	8.3ml/hr
500mg	21mg/hr	2.1ml/hr	4.2ml/hr
250mg	11mg/hr	1.1ml/hr	2.1ml/hr

3. **Step 3 - Dosing adjustment**

- Serum vancomycin level should be taken routinely every 24 hours with morning bloods. If morning bloods are due within 6 hours of a loading dose or change in infusion rate, delay vancomycin level until later in the day. Do not take samples from the lines that have been used to administer the agent.

Target serum vancomycin level is between **20-25mg/L.**

- Dose reductions are shown in table 5.

- If dose reduction required from 500mg/24 hrs, reduce to 250mg/24 hrs.

Table 5 - Vancomycin continuous dose adjustment

Vancomycin level (mg/L)	24 hours dose	Rate change
<10	Check if patient received a loading dose. If not, GIVE a loading dose and then recommence the infusion as per the renal function guide above. If the patient received a loading dose, REPEAT the loading dose AND increase the 24hrs dose by 1000mg.	
11-19	Increase by 500mg	Increase rate (see table 4)
20-25	Target range achieved	No change
26-35	Decrease by 500mg	Decrease rate (see table 4)
>35	Stop infusion for at least 6 hours	Discuss with doctor or pharmacist and restart at reduced rate

Changing to intermittent dosing on discharge

If level is in range, convert total daily dose to twice daily dosing (i.e. half total daily dose every 12 hours), give first dose 12 hours after cessation of infusion. If level is out of range, adjust total daily dosing as above, then convert to twice daily dosing.

For total daily doses of 750mg or less, convert to once daily dosing and give first dose 24 hours after cessation of infusion.

Patients will not receive continuous renal replacement therapy after discharge from ICU, therefore remove any adjustment made for CRRT.

Critical care doctors must stop the continuous infusion regime, prescribe a vancomycin step down dose and plan for the next level time on discharge from ITU. Handover must be directly to a named ward-based doctor, and the plan must also be recorded in the discharge summary.

References

1. Oxford University Hospitals (2021) *Guideline adapted with permission from Oxford University Hospitals (OUH) protocol for vancomycin by continuous infusion (adult critical care areas)*. Available at: https://ouh.quris.com/hospital-guidelines/adult-antimicrobial-guide/adult-antimicrobial-drug-monographs/vancomycin (Accessed: 17/09/2026)

2. Flannery, A.H., *et al*. (2020) 'Continuous versus intermittent infusion of vancomycin and the risk of acute kidney injury in critically ill adults: a systematic review and meta-analysis', *Critical Care Medicine*, 48(6), pp. 912–918.

Full version control record

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Version History

Version	Date	Guideline Lead(s)	Status	Comment
1	November 2026	Dr Jarek Graniewski, Consultant in Intensive Care Medicine Ms Sophia Ahmad, Intensive Care Lead Pharmacist (Wexham Park Hospital) Ms Laura Johnson, Intensive Care Lead Pharmacist (Frimley Park Hospital)	Final	New guideline **Ratified at:** Cross Site Critical Care Clinical Governance 27/10/2026 **DTC:** 11/11/2026

Related Documents

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