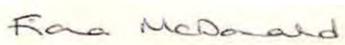
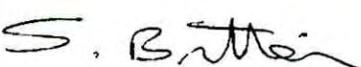
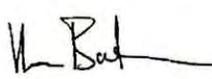


NHS Grampian Staff Guidance for the Administration of Intravenous Vancomycin in Adults via Intermittent (pulsed) Infusion

Co-ordinators: Specialist Antibiotic Pharmacists	Reviewer: Chair; Antimicrobial Management Team	Approver: Medicine Guidelines and Policies Group
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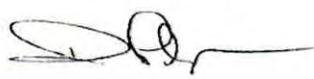
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Identifier: NHSG/Guid/Vanc/ MGPG956	Review Date: June 2020	Date Approved: June 2018
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Uncontrolled when printed
Version 5

Executive Sign-Off

This document has been endorsed by the Director of Pharmacy and Medicines Management

Signature: 

Title: NHS Grampian Staff Guidance for the Administration of Intravenous Vancomycin in Adults via Intermittent (pulsed) Infusion

Unique Identifier: NHSG/Guid/Vanc/MGPG956

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Across NHS Boards	Organisation Wide	Directorate	Clinical Service	Sub Department Area
				Acute Sector

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Lead Author/Co-ordinator: Specialist Antibiotic Pharmacists

Subject (as per document registration categories): Prescribing Policy

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Process Document: Policy, Protocol, Procedure or Guideline Guideline

Document application: NHS Grampian

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Responsibilities for implementation:

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Operational Management Unit: Unit Operational Managers

Policy statement: It is the responsibility of all staff to ensure that they are working to the most up to date and relevant policies, protocols procedures.

Review: This policy will be reviewed in two years or sooner if current treatment recommendations change

**This document is also available in large print and other formats and languages, upon request.
Please call NHS Grampian Corporate Communications on (01224) 551116 or (01224) 552245.**

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Feb 2017	Mar 2014	Review of exclusions/cautions Rate of infusion – units amended in line with PAR Added reference to the antimicrobial calculator and app and printing off the results. New note added regarding loading dose. Note re usual maximum dose added Added new prescription chart. Added new screenshot of calculator Added maintain body weight table Added info sheet for nurses and prescribers.	p2 p3 p4 p5 p8 Appendix 1 Appendix 2 Appendix 3 Appendix 4

* Changes marked should detail the section(s) of the document that have been amended, i.e. page number and section heading.

NHS Grampian Staff Guidance for the Administration of Intravenous Vancomycin in Adults via Intermittent (pulsed) Infusion

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Glossary of abbreviations

ABW	Actual body weight
CrCl	Creatinine Clearance
eGFR	estimated Glomerular Filtration Rate
IBW	Ideal body weight
MBW	Maximum Body Weight
MIC	Minimum Inhibitory Concentration
MRSA	Meticillin-resistant <i>Staphylococcus aureus</i>
NSAIDs	Non-steroidal anti-inflammatory drugs

NHS Grampian Staff Guidance for the Administration of Intravenous Vancomycin in Adults via Intermittent (pulsed) Infusion

Introduction and Rationale

This protocol details the dosing, prescribing, monitoring and administration of intravenous vancomycin as an intermittent (pulsed) infusion¹.

Vancomycin can also be administered as a continuous infusion, when practical, for patients with severe or deep-seated infections (e.g. pneumonia, endocarditis, bone and joint infections). In NHS Grampian only Intensive Care use continuous infusion which is not covered in this guidance– refer to ICU protocol.

Vancomycin is a glycopeptide antibacterial used in the treatment of serious staphylococcal or other gram-positive infections when other drugs such as the penicillins cannot be used because of resistance or patient intolerance. It is used particularly in the treatment of meticillin-resistant staphylococcal infections (MRSA)². Refer to [NHSG Infection Management Guidelines: Empirical Antibiotic Therapy](#) for indications.

Vancomycin works most effectively when the levels of the drug remain above the minimum inhibitory concentration (MIC) for the target organism at all times. Trough levels of vancomycin therefore require to be monitored throughout treatment and these should be 10-15mg/L in standard infections⁴. On the basis of the potential to improve penetration, to increase the probability of optimal target serum concentrations, and to improve the clinical outcomes of complicated infections, such as bacteraemia, endocarditis, osteomyelitis, meningitis and hospital-acquired pneumonia caused by *Staphylococcus aureus* (*S.aureus*), trough serum vancomycin concentrations of 15-20mg/L are recommended^{4,5}. This range is also recommended for less sensitive strains of *S. aureus*⁴.

Exclusions:

- Children <16 years of age.
- Patients who are allergic/hypersensitive to vancomycin
- Treatment of *Clostridium difficile* Infection (vancomycin should be given orally)
- Patients in intensive care who require a continuous vancomycin infusion

Cautions:

Advice should be sought from Microbiology or an Infection Specialist on treatment options if any of the following apply:

- Patients with previous hearing loss
- Patients treated in renal units or receiving haemodialysis or haemofiltration (contact the Renal unit for advice and follow the local unit protocol)
- Treatment of ventriculitis or ventriculoperitoneal shunt infections (contact neurology specialist for advice).

- Use with caution in patients with sensitivity to other glycopeptides (eg teicoplanin, dalbavancin) due to possibility of cross-sensitivity.
- Where possible, avoid co-administration with:
 - Gentamicin (aminoglycosides)
 - Nonsteroidal anti-inflammatory drugs (NSAIDs)
 - Amphotericin
 - Potent diuretics
 - Angiotensin converting enzyme inhibitors (ACE inhibitors).

This list is not exhaustive – consult the Summary of Product Characteristics (SmPC) for a full list (www.medicines.org.uk).

Vancomycin Administration

Vancomycin is very irritating to tissue, and should not be given intramuscularly as this causes injection site necrosis. It must be given by slow intravenous infusion using a dilute solution to reduce the risk of tissue necrosis if extravasation occurs. Vancomycin should not be given rapidly due to the risk of infusion reactions.

The intravenous use of vancomycin may be associated with the so-called 'red-neck' or 'red-man' syndrome, characterised by erythema, flushing, or rash over the face and upper torso, and sometimes by hypotension and shock-like symptoms. The effect appears to be due in part to the release of histamine and is usually related to rapid infusion¹. It may also cause pain or muscle spasm.

In order to avoid these risks:

- Vancomycin must **ALWAYS** be administered by intravenous **INFUSION** in either 0.9% Sodium Chloride or 5% Glucose
- Final concentration: **NOT MORE THAN** 5mg/mL for peripheral administration
- Rate of infusion: **NO FASTER THAN** 500mg/hour⁶.

STEP 1: Calculate and prescribe the loading dose and maintenance dose of vancomycin

- To reduce the risk of mortality, commence vancomycin administration **within 1 hour** of recognising sepsis
- *If creatinine is known* – use the [online calculator](#) (preferred method). The guidance in Table 1 (Initial LOADING dose) and Table 2 (MAINTENANCE dose) can be used if the online calculator is not available. The dose amount and dosage interval are based on estimated creatinine clearance (Box 1) and **actual** body weight.
- *If creatinine is not known* – calculate and prescribe a loading dose based on actual body weight (Table 1). Calculate the maintenance dose once the creatinine is available.

Box 1: Estimation of creatinine clearance (CrCl)

The following 'Cockcroft Gault' equation can be used to estimate creatinine clearance (CrCl):

$$\text{CrCl (mL/min)} = \frac{[140 - \text{age (years)}] \times \text{weight}^* \text{ (kg)}}{\text{serum creatinine}^\Delta \text{ (micromol / L)}} \times 1.23 \text{ (male) or } 1.04 \text{ (female)}$$

Cautions:

- *Use actual body weight or maximum body weight for patient's height, whichever is lower. For maximum body weight see [Appendix 3 - Body Weight Table](#).
- ^ΔIn patients with low creatinine (<60micromol/L), use 60 micromol/L to avoid overestimating creatinine clearance due to low muscle mass.
- Note: Use of estimated glomerular filtration rate (eGFR) from labs is **not** recommended for calculation of vancomycin doses.

Loading Infusion

N.B. The loading dose is based on weight only, so does not take renal function into account. When using the online calculator, on rare occasions a patient's clearance of vancomycin may be so high that the maintenance dose is higher than the loading dose. In these circumstances, the loading dose given should be the higher of the calculated loading and maintenance doses i.e. if loading dose is calculated as lower than maintenance dose then give the calculated maintenance dose as a loading dose instead.

Table 1: Initial Vancomycin LOADING Dose

Actual Body Weight (ABW)	Dose	Volume (0.9% Sodium Chloride [†])	Duration of infusion
<40kg	750mg	250mL	1.5 hours
40-59kg	1000mg	250mL	2 hours
60-90kg	1500mg	500mL	3 hours
>90kg	2000mg	500mL	4 hours

[†]Glucose 5% can be used in patients with sodium restriction.

Maintenance Dosage Regimen

- Give the first maintenance infusion 12, 24 or 48 hours after the loading infusion according to dose interval provided by the online calculator or Table 2 (below).

Table 2: Vancomycin MAINTENANCE dosage regimen

VANCOMYCIN PULSED INFUSION – INITIAL MAINTENANCE DOSAGE GUIDELINES			
CrCl (mL/min)	Dose	Dosing Interval	Volume of sodium chloride 0.9% [‡]
< 20	500mg over 1 hour	48 hours	250mL
20-29	500mg over 1 hour	24 hours	250mL
30-39	750mg over 1.5 hours	24 hours	250mL
40-54	500mg over 1 hour	12 hours	250mL
55-74	750mg over 1.5 hours	12 hours	250mL
75-89	1000mg over 2 hours	12 hours	250mL
90-110	1250mg over 2.5 hours	12 hours	250mL
>110	1500mg over 3 hours	12 hours	500mL

[‡] Glucose 5% may be used in patients with sodium restriction.

- Doses up to 2000mg can be diluted in 500mL fluid.
- The daily dose can be split into 3 equal doses and given 8 hourly. This approach is especially useful for patients who require high doses as it produces higher trough concentrations, and reduces the time of each individual infusion. For example, 1500mg 12 hourly (3000mg per day) could be prescribed as 1000mg 8 hourly, and 750mg 12 hourly (1500mg per day) as 500mg 8 hourly. For further advice discuss with pharmacist or microbiology.

STEP 2: Monitor the vancomycin concentration and reassess the dose

Concentrations are meaningless unless the dose and sample times are recorded accurately.

- Due to wide variability in the handling of vancomycin, early analysis of a vancomycin concentration is required to ensure that the dosage regimen is appropriate.
- Take a trough sample (pre-dose) within 24-48 hours of starting therapy then every 2-3 days, or daily if the patient has unstable renal function.
- Monitor creatinine daily.
- Record the exact time of all vancomycin samples on the Adult Intravenous Vancomycin Intermittent Infusion (pulsed) PAMR AND on the sample request form along with the last time of administration.
- If the renal function is stable, give the next dose before the trough result is available. If renal function is deteriorating, withhold until the result is available then follow the advice in Table 3.

Target trough vancomycin concentrations

- Target trough concentration range: **10 – 20mg/L**
- If the patient is seriously ill (**severe or deep-seated infection**), the target trough concentration range is **15 - 20mg/L**. If the measured concentration is <15mg/L, consider increasing the dose amount or reducing the dosage interval (see comment on 8 hourly dosing under table 2 above).
- If the patient is failing to respond, seek advice from microbiology or an infection specialist.

Adjustment of the vancomycin dosage regimen

- Always check that the dosage history and sampling time are appropriate before interpreting the result.
- Seek advice from pharmacy or microbiology if you need help to interpret the result.

If the measured concentration is unexpectedly HIGH or LOW

If the measured concentration is unexpectedly HIGH or LOW, consider the following:

- Were the dose and sample times recorded accurately?
- Was the correct dose administered?
- Was the sample taken from the line used to administer the drug?
- Was the sample taken during drug administration?
- Has renal function declined or improved?
- Does the patient have oedema or ascites?

Table 3: Adjustment of Vancomycin dosage regimen

Vancomycin Concentration	Suggested Dose Change
<10mg/L	Increase dose by 50% and consider reducing the dosage interval or seek advice*
10-15mg/L	If the patient is responding, maintain the present dosage regimen If the patient is seriously ill, consider increasing the dose amount or reducing the dosage interval to achieve a trough level of 15-20mg/L
15 - 20mg/L	Maintain the present dosage regimen
>20mg/L	Stop until <20mg/L and seek advice

*Usual maximum daily dose is 3g; discuss with senior medical staff/pharmacy before increasing above this.

If in doubt, take another sample before modifying the dosage regimen and / or contact pharmacy for advice.

General points

- Record the exact times of all measured concentrations on the Adult Intravenous Vancomycin Intermittent Infusion (pulsed) PAMR.
- Reassess the dose and continue or prescribe a dosage change.
- Assess daily for ongoing need for vancomycin and for signs of toxicity
- Document the action taken in the medical notes and on the Adult Intravenous Vancomycin Intermittent Infusion (pulsed) PAMR.
- Review the need for vancomycin daily.

Box 2: Toxicity

- Monitor creatinine daily. Seek advice if renal function is unstable (e.g. a change in creatinine of >15-20%)
- Signs of renal toxicity include increase in creatinine or decrease in urine output / oliguria.
- Consider an alternative agent if creatinine is rising or the patient becomes oliguric.
- Vancomycin may increase the risk of aminoglycoside induced ototoxicity – use caution if co-prescribing.

STEP 3: Assess daily the ongoing need for vancomycin and for signs of toxicity

- Review the need for vancomycin daily.
- Consider adjusting the dose regimen or using an alternative agent if renal function changes. See Box 2 above for signs of renal toxicity Consider changing to an oral alternative – refer to the [IV to Oral Switch \(IVOST policy\)](#).

Information Sheet:

See information sheet ([Appendix 4](#)) for nurses and prescribers, highlighting key safety checks to ensure that all appropriate prescribing details and monitoring have been documented before a dose is administered.

For further advice contact:

Antibiotic Pharmacists Bleep 3933, Ext: 51048.

Ward Clinical Pharmacists - see ward information for contact details.

Medical Microbiology via switchboard.

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Consultation List

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Appendix 1: Adult Intravenous Vancomycin Intermittent Infusion (Pulsed): Prescription, Administration & Monitoring Record

Private & Confidential

Adult Intravenous Vancomycin Intermittent Infusion (pulsed)
Prescription Administration and Monitoring Record

NHS Grampian

Surname	Community Health Index (CHI)		Age	Male <input type="checkbox"/>	Female <input type="checkbox"/>
Forename	Weight kg	Height m	Creatinine micromol / L	on	yy
Address	Source of initial dosage regimen Online calculator (preferred method) <input type="checkbox"/> Manual calculation <input type="checkbox"/> Weight based, creatinine not known <input type="checkbox"/>		PROMPT ADMINISTRATION within 1 hour of recognition of sepsis reduces mortality	Table 1 Actual Body weight Vancomycin loading dose (NaCl = sodium chloride)	
Postcode				<40kg	750mg in 250ml NaCl 0.9% over 1.5 hrs
			40-59kg	1000mg in 250ml NaCl 0.9% over 2 hrs	
			60-90kg	1500mg in 500ml NaCl 0.9% over 3 hrs	
			>90kg	2000mg in 500ml NaCl 0.9% over 4 hrs	

Step 1: Calculate & prescribe the loading and maintenance dose of vancomycin

- Use the online **vancomycin calculator**
- If creatinine is **not** known – calculate a loading dose based on actual body weight (see Table 1). Calculate maintenance dose once creatinine available.
- Prescribe loading dose (A), maintenance dose (B) and times in the prescribing sections of this chart (overleaf) – additional charts (C,D,E) available for dose changes.
- Prescribe vancomycin 'as per chart' on the Prescription and Administration Record.

Step 2: Checking the patient's vancomycin concentration

- Take a vancomycin trough (pre dose) sample within 48 hours of starting therapy. Then sample at least every 2-3 days, or daily if renal function unstable.
- After a trough level is taken, ensure the vancomycin dose which is due is given – do **NOT** withhold while awaiting the result unless instructed by medical staff.
- Record the exact time of all vancomycin samples (overleaf) **AND** on the sample request form.

Step 3: Interpreting vancomycin results and re-prescribing

- Always check that the dosing and sampling time history are correct before making any adjustments.
- Record the measured concentration. Refer to Table 2 for dose adjustment advice and reassess the dose / dosing interval as indicated.
- Document action on the monitoring section of the chart (overleaf) and in the medical notes.
- Prescribe the new dosage regimen if a change is required on a new section of the chart.
- Contact pharmacist for further advice as necessary (e.g. changing renal function, unexpected vancomycin result).

Step 4: Assess patient daily

- Monitor creatinine daily. Seek advice if renal function significantly changing (e.g. a change in creatinine of >15-20% or ↓ urine output / oliguria).
- Assess ongoing need for vancomycin.

Table 2

Vancomycin trough concentration	Suggested action for Intermittent Infusion
<10 mg / L	Increase dose by 50% or seek advice. <i>Usual maximum daily dose is 3g; discuss with senior medical staff/pharmacist before increasing above this.</i>
10-14.9 mg / L	If patient responding, maintain current dose. Otherwise, consider increasing the dose or altering the dosing schedule (refer to full guidance for further advice) to achieve a trough level of 15-20mg / L
15-20 mg / L	Maintain current dose
>20 mg / L	Stop until ≤20 mg / L and seek advice

If the measured concentration is unexpectedly HIGH or LOW

- Were dose and sample times recorded accurately?
- Was the correct / full dose administered?
- Was the sample taken from the line used to administer the drug?
- Was the sample taken during drug administration?
- Has renal function declined or improved?
- Does the patient have oedema or ascites?

If in doubt, take another sample before modifying the dosage regimen and / or contact pharmacist for advice

NHS Grampian Staff Guidance for the Administration of Intravenous Vancomycin in Adults via Intermittent (pulsed) Infusion
Review Date - June 2020

Appendix 1: Adult Intravenous Vancomycin Intermittent Infusion (Pulsed): Prescription, Administration & Monitoring Record (Continued)

Patient Name		Date of Birth		Community Health Index (CHI)	
Vancomycin Loading Dose Prescription					
A Ensure Vancomycin is prescribed 'as per chart' on the PAR and Inform nursing staff that Loading Dose is required					
Date to be given	Time to be given	Vancomycin Dose (mg)	Prescriber's signature + Print name	Date given	Time started
MM : DD : YY	:			MM : DD : YY	:
Max Infusion Rate is 500mg/hr					

Maintenance Dose Prescription		Administration Record (record exact times)				Maintenance Dose Prescription		Administration Record (record exact times)			
(Initial calculated dose)		Date				(Additional chart if required for continuation or dosage change)		Date			
B Drug	VANCOMYCIN	Time				C Drug	VANCOMYCIN	Time			
Dose	Route	Date Started				Dose	Route	Date Started			
	IV infusion	MM : DD : YY					IV infusion	MM : DD : YY			
Signature / Print Prescriber Name		Pharm				Signature / Print Prescriber Name		Pharm			
Indication		Duration / review date				Indication		Duration / review date			
Monitoring Record						Monitoring Record					
Date & time blood sample taken - pre dose trough						Date & time blood sample taken - pre dose trough					
Vancomycin level (mg / L)						Vancomycin level (mg / L)					
Is dosage change required? If Yes, tick and prescribe new dose in section C		<input type="checkbox"/>				Is dosage change required? If Yes, tick and prescribe new dose in section D		<input type="checkbox"/>			

Review the need for IV Vancomycin daily and discuss IV to Oral Switch (IVOST) with an infection specialist if necessary

Maintenance Dose Prescription		Administration Record (record exact times)				Maintenance Dose Prescription		Administration Record (record exact times)			
(Additional chart if required for continuation or dosage change)		Date				(Additional chart if required for continuation or dosage change)		Date			
D Drug	VANCOMYCIN	Time				E Drug	VANCOMYCIN	Time			
Dose	Route	Date Started				Dose	Route	Date Started			
	IV infusion	MM : DD : YY					IV infusion	MM : DD : YY			
Signature / Print Prescriber Name		Pharm				Signature / Print Prescriber Name		Pharm			
Indication		Duration / review date				Indication		Duration / review date			
Monitoring Record						Monitoring Record					
Date & time blood sample taken - pre dose trough						Date & time blood sample taken - pre dose trough					
Vancomycin level (mg / L)						Vancomycin level (mg / L)					
Is dosage change required? If Yes, tick and prescribe new dose in section E		<input type="checkbox"/>				Is dosage change required? If Yes, tick and prescribe new dose on a new chart		<input type="checkbox"/>			

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Appendix 2: Example of Vancomycin Calculator Screenshot

INTRAVENOUS VANCOMYCIN DOSE CALCULATOR FOR ADULT PATIENTS			
Type in the data shown in blue and press <enter>		Recommended doses and dosage intervals are shown in black below	
		INITIAL IV LOADING DOSE	
Age (years)	80	1000 mg over 2 hours	
Height (cm)	160		
OR Height (feet)		REGULAR IV MAINTENANCE DOSE	
(inches)		Intermittent (pulsed) infusion	
Weight (kg)	56.0	Time after loading to start of maintenance infusion	12 hours
Sex (m/f)	f	Maintenance Dose	500 mg
Creatinine (µmol/L)	70	Interval	12 hours
Height (cm)	160	Duration of infusion	1 hour(s)
Ideal body weight (kg)	52		
Weight for creatinine clearance (kg)	56		
Creatinine CL (ml/min)	49.9		

Appendix 3: Maximum Body Weight table – for creatinine clearance calculations

This table can be used to determine whether patients are classed as ‘obese’ (>20% over Ideal Body Weight) and to determine the Maximum Body Weight for use in the Cockcroft Gault equation ([see Box 1](#)).

Maximum Body Weight (MBW) table (= Ideal Body Weight + 20%)			
Height (ft inches)	Height (cm)	MBW (kg) MALE	MBW (kg) FEMALE
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
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	97
6' 4"	193	104	99
6' 5"	195	107	101
6' 6"	198	109	105
6' 7"	201	113	108
6' 8"	203	115	110

Appendix 4: NHS Grampian Adult INTRAVENOUS VANCOMYCIN Intermittent Infusion (pulsed) Information Sheet for NURSES & PRESCRIBERS

This information sheet highlights the key safety checks to ensure that all appropriate prescribing details and monitoring have been documented before a vancomycin dose is safely administered.

Before administering the first (loading) dose:

1. Check prescriber has used the Vancomycin prescription chart – see example below:

Table 1: PROSCRIPT ADMINISTRATION

Age	Weight	Vancomycin loading dose (over 3 hours)
<16y	<30kg	750mg in 250ml NaCl 0.9% over 1.5 hrs
16-30y	30-50kg	1000mg in 250ml NaCl 0.9% over 2 hrs
30-60y	50-75kg	1500mg in 250ml NaCl 0.9% over 3 hrs
>60y	>75kg	2000mg in 500ml NaCl 0.9% over 4 hrs

Table 2: Troughs before the maintenance infusion

Result	Action
>10 mg/L	Reduce dose by 20% or stop advice, repeat measurement after 48 hours. All levels must be fully documented on the chart.
10-14.9 mg/L	If patient responding, maintain current dose. Otherwise, consider increasing the dose or altering the dosing schedule refer to full guidance for further advice to achieve a trough level of 15-20mg/L.
15-20 mg/L	Administer current dose.
<15 mg/L	Stop until >10 mg/L and seek advice.

→ reference to this chart should be made on the patient's main prescription chart as shown below and opposite:

REGULAR THERAPY

Medication	Dose	Route	Frequency
VANCOMYCIN	1000	IV	12

Handwritten note: see vancomycin prescription chart

ONCE ONLY PRESCRIPTIONS

Date	Time	Medicine	Dose	Route	Prescribed By	Time Taken	Given By

2. Check if prescriber has printed off results from online calculator, added patient details, and filed with prescription charts (this gives a double check that dose is correct) – see example:
3. If online calculator not used/ printed off, see loading dose table on prescription chart to check this corresponds to patient's weight.
4. Ensure the time of administration is accurately noted using 24 hour clock.

INTRAVENOUS VANCOMYCIN DOSE CALCULATOR FOR ADULT PATIENTS			
Type in the data shown in blue and press <enter>		Recommended doses and dosage intervals are shown in black below	
INITIAL IV LOADING DOSE		1500 mg over 3 hours	
Age (years)	69		
Height (cm)	172		
OR Height (feet)			
(inches)			
Weight (kg)	82.0	Time after loading to start of maintenance infusion	12 hours
Sex (m/f)	m	Maintenance Dose	1000 mg
Creatinine (µmol/L)	94	Interval	12 hours
Weight (kg)	172	Duration of infusion	2 hour(s)
Ideal body weight (kg)	68	Ree intermittent (pulsed) infusion worksheet tab below for vancomycin monitoring guidelines.	
Weight for creatinine clearance (kg)	81		
Creatinine CL (ml/min)	75.5		

Before administering maintenance doses:

1. If there are any issues with the patient's IV access, inform medical staff well in advance of the next dose being required, as any delays will significantly affect the efficacy of antibiotic treatment.
2. If infusion not started within about 10-15 minutes of the prescribed time then accurately record the time (24 hour clock) as this will impact on interpretation of levels.
3. A trough level (immediately before dose given) should be taken within 48 hours of starting therapy and then the dose should be administered as prescribed i.e. do **not** wait for the result.
4. If a trough level has been recorded on the prescription chart, check that the prescriber has completed the Y/N box to indicate whether any dosage change is required.
5. If in doubt, check with prescriber / medical staff/ pharmacist before administering.