glycopeptides

indications

- Teicoplanin and vancomycin are active against a wide range of Gram-positive organisms. Gram-negative organisms are not susceptible.
- Their particular role is in treatment (and in special situations, prophylaxis) of infection with MRSA or methicillin-resistant coagulase-negative staphylococcal species (eg Staphylococcus epidermidis).
- They also have a place in treating severe infection with susceptible organisms in patients hypersensitive to penicillin and in meningitis due to highly penicillin-resistant Streptococcus pneumoniae.
- Vancomycin has been given orally to treat antimicrobial-associated diarrhoea, but emergence of resistance in enterococci makes it essential to reserve it for severe cases unresponsive to metronidazole.

routes of administration

- Teicoplanin can be given by IM injection, slow IV injection or infusion. Vancomycin is given by slow IV infusion (see Intravenous administration of antimicrobials) to avoid producing an anaphylactoid reaction or 'red-man' syndrome.

monitoring of teicoplanin

- Optimum efficacy with teicoplanin is achieved when peak plasma levels exceed 20 mg/L and particularly when trough levels exceed 10 mg/L (total drug).
- Patients with serious infections (particularly endocarditis) require higher plasma levels; they should have at least trough levels measured and the dose should be increased if trough levels fall below 20 mg/L.

monitoring of vancomycin

- Prospective studies on the value of monitoring vancomycin levels for either predicting efficacy or reducing toxicity are lacking. Further, there is no consensus on what target levels should be used for monitoring. Nevertheless, monitoring is considered important in some patient groups, especially those with abnormal volumes of distribution (eg severe burns or generalised oedema) or significant renal impairment (including those receiving renal replacement therapy).
- Monitoring is also recommended for all patients undergoing treatment for serious methicillin-resistant Staphylococcus aureus (MRSA) infections to reduce the risk of underdosing and thereby possible selection of vancomycin-intermediate and hetero-resistant vancomycin-intermediate strains.
- The current monitoring convention is to measure trough concentrations. In patients with normal renal function, the most widely accepted target trough concentrations are 10 to 20 mg/L in patients receiving 12-hourly dosing, and 15 to 25 mg/L in patients receiving 6-hourly dosing
- In patients with renal impairment, less frequent dosing is required to achieve the target trough concentration

vancomycin dosing & trough levels in patients with normal renal function

Age	Starting dose [NB1] (use actual body weight)	Target trough concentration (mg/L)
neonates <34 weeks postconceptional age	25 mg/kg 24-hourly	10-20
neonates 34-44 weeks postconceptional age	25 mg/kg 12-hourly	10-20
infants and children <12 years	30 mg/kg up to 1 g 12-hourly	10-20
	or 15 mg/kg up to 500 mg 6-hourly [NB2]	15-25
adults and children >12 years	25 mg/kg up to 1 g 12-hourly [NB3]	10-20
	or 12.5 mg/kg up to 500 mg 6-hourly [NB2]	15-25

NB1: Dose may need adjustment following evaluation of vancomycin blood level after first dose.
NB2: In these guidelines, 6-hourly dosing is recommended only for treatment of meningitis.
NB3: Many patients, particularly the obese, will require higher doses to achieve the target trough concentration.

vancomycin dosing in patients with impaired renal function

Creatinine clearance [NB2]		Starting dose [NB3] (use actual body weight)	Target trough concentration (mg/L)
(mL/s)	(mL/min)		
>0.8	>50	25 mg/kg up to 1 g 12-hourly	10-20
0.17-0.8	10-50	25 mg/kg up to 1 g 24-hourly	10-20
<0.17	<10	25 mg/kg up to 1 g, check levels at 48 hours	10-20