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TEICOPLANIN PRESCRIBING & MONITORING GUIDELINE FOR ADULTS

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EXCLUSIONS

This guideline does not apply to patients receiving renal replacement therapies. For these patients, please contact the Pharmacy Department for advice.

CROSS-SENSITIVITY WITH VANCOMYCIN

Teicoplanin must be administered with caution in patients with known hypersensitivity to vancomycin, as crossed hypersensitivity reactions including fatal anaphylactic shock, may occur.

A prior history of "red man syndrome" with vancomycin is **not** a contraindication to the use of teicoplanin.

RED MAN SYNDROME

The rate-dependent infusion reaction 'red man syndrome' can follow teicoplanin infusion causing an itchy rash on the face, neck, and upper torso and extremities. Severe reactions include angioedema, hypotension, tachycardia, weakness, muscle spasms, chest or back pain may occur. Stopping or slowing the infusion may result in cessation of these reactions. Infusion related reactions can be limited if the daily dose is **not** given via bolus injection, but infused over a 30-minute period.

DOSING

- Loading doses are required.
- **High dose teicoplanin (Table 1) is required for:**
    - endocarditis
    - bacteraemia
    - bone and joint infections
    - severe sepsis
    - critically unwell patients
    - Acute mastoiditis
    - Deep neck space / pharyngeal abscess
    - Severe cellulitis
    - when recommended by a microbiologist
- **For all other indications, please see Table 2 below for standard dosing.**
- Please note: dose banding has been used to avoid wastage.
- **If the patient has renal impairment (creatinine clearance ≤80mL/minute), no alterations to the loading doses are required.**
- After the patient has received the recommended number of loading doses, prescribe the same dose as a maintenance dose ONCE DAILY. Please see section below for maintenance dosing in patients with renal impairment (creatinine clearance ≤80mL/minute).
- Give the first maintenance dose 24 hours after the loading dose.

Table 1 - HIGH DOSE Endocarditis, Bacteraemia, Bone and joint infections, Acute mastoiditis Deep neck space / pharyngeal abscess, Severe cellulitis Severe sepsis and critically unwell patients Other infections when specifically advised by Microbiology for specific patients					
12mg/kg					
ACTUAL body weight	**Teicoplanin loading dose**	**Dosing frequency**	**No. of doses**	**Teicoplanin maintenance dose (start 24 hours after fifth loading dose)**	**Dosing frequency**
45 - 55kg	600mg	12 hourly	5	600mg	Once daily
56 - 70kg	800mg	12 hourly	5	800mg	Once daily
71 - 86 kg	1g	12 hourly	5	1g	Once daily
87 - 100kg	1.2g	12 hourly	5	1.2g	Once daily
>100kg	12mg/kg actual body weight. Round to the nearest 200mg.				

Table 2 – High dose teicoplanin banding

Table 2- STANDARD DOSE					
6mg/kg					
ACTUAL body weight	**Teicoplanin loading dose**	**Dosing frequency**	**No. of doses**	**Teicoplanin maintenance dose (start 24 hours after third loading dose)**	**Dosing frequency**
≤70kg	400mg	12 hourly	3	400mg	24 hourly
71 - 100kg	600mg	12 hourly	3	600mg	24 hourly
101 - 134kg	800mg	12 hourly	3	800mg	24 hourly
135 - 165kg	1g	12 hourly	3	1g	24 hourly

Table 2 – Standard dose teicoplanin banding

RENAL IMPAIRMENT

- If the patient has renal impairment (creatinine clearance ≤80mL/minute), please see section below.
- **No alterations to the loading doses are required if the patient has renal impairment.**
- **Dose adjustment is not required until after the fourth day of treatment.**
- Calculate the estimated creatinine clearance using the Cockcroft and Gault formula below:

Estimated creatinine clearance (mL/minute)	Male	$\frac{(140\text{-age in years}) \times \text{weight*}\ (kg)}{\text{serum creatinine}\ (\mu mol/L)} \times 1.23$
	Female	$\frac{(140\text{-age in years}) \times \text{weight*}\ (kg)}{\text{serum creatinine}\ (\mu mol/L)} \times 1.04$

* Use actual body weight unless ≥ 120% ideal body weight, in which case use adjusted body weight:
Adjusted body weight (ABW) (kg) = IBW + 0.4 (actual weight (kg) – IBW)

Patients' ideal body weight based on their height can be calculated using the formulae below. A reference table (**Table 3**) is also provided below which should avoid the need for calculation in the majority of cases.

- Males: Ideal body weight (kg) = 50kg + 0.9kg for every cm height over 152.4cm
- Females: Ideal body weight (kg) = 45.5kg + 0.9kg for every cm height over 152.4cm

Adult females (> 16 yrs)		**Adult males (>16 yrs)**	
Height	**IBW (kg)**	**Height**	**IBW (kg)**
≥191cm (6'3")	≥80.2	≥191cm(6' 3")	84.7
188cm (6'2")	77.5	188cm (6' 2")	82.0
185cm (6'1")	74.8	185cm (6' 1")	79.3
183cm (6')	73.0	183cm (6')	77.5
180cm (5'11")	70.3	180cm(5' 11")	74.8
178cm (5'10")	68.5	178cm(5' 10")	73.0
175cm (5'9")	65.8	175cm (5' 9")	70.3
173cm (5' 8")	64.0	173cm (5' 8")	68.5
170cm (5' 7")	61.3	170cm (5' 7")	65.8
168cm (5' 6")	59.5	168cm (5' 6")	64.0
165cm (5' 5")	56.8	165cm (5' 5")	61.3
163cm (5' 4")	55.0	163cm (5' 4")	59.5
160cm (5' 3")	52.3	160cm (5' 3")	56.8
157cm (5' 2")	49.6	157cm (5' 2")	54.1
155cm (5' 1")	47.8	155cm (5' 1")	52.3
≤152cm (5')	≤45.5	≤152cm (5')	≤50

Table 3: Ideal body weight for height

Patients with renal impairment should receive a **normal dose (see Tables 1 and 2) for the first FOUR DAYS.** After the FOURTH DAY, the dosing **frequency** should be reduced according to Table 4 below:

Creatinine clearance (mL/minute)	**Dose**
30-80	Give maintenance dose (see table 1 or 2) every 48 hours
<30	Give maintenance dose (see table 1 or 2) every 72 hours
Renal replacement therapy	Contact Pharmacy Department

Table 4: Dose frequency adjustments according to creatinine clearance

ADMINISTRATION OF TEICOPLANIN

Doses ≤800mg: Slow IV injection over 3-5 minutes
Doses >800mg: IV infusion

INSTRUCTIONS FOR RECONSTITUTION

Slowly add entire contents of ampoule of water for injections to appropriate strength of teicoplanin vial.
Gently roll vial to dissolve teicoplanin to avoid foam formation. Do not shake vial. If solution becomes foamy, allow to stand for 15 minutes to allow foam to subside. Only clear and yellowish solutions should be used.

N.B. A 23 G needle must be used to reconstitute the vial and when withdrawing the required dose from the vial.

INSTRUCTIONS FOR DILUTION AND SUITABLE DILUENT

Following reconstitution with water, injections may be further diluted with any suitable volume of sodium chloride 0.9% or glucose 5%.

MONITORING TEICOPLANIN LEVELS

- Levels are necessary to ensure the patient is not being under-dosed (i.e. to ensure therapy is effective). Levels should be kept consistently within the therapeutic range.
- Levels are only required for patients who are planned to receive treatment for **more than 7 days.**
- Take the first **pre-dose (trough)** level on day 3, 4 or 5 (when loading is complete).
- Do NOT omit doses while awaiting the level (results can take 48 hours or more to come back).
- Post-dose (peak) levels are not required.
- See table 5 below for target levels.
- Repeat levels weekly.
- Discuss with pharmacy any levels that are out of range.

Indication for teicoplanin	**Target pre-dose (trough) level**
Bone/joint infection	20 - 40mg/L (to avoid toxicity, pre-dose teicoplanin levels should be < 60mg/L)
Infective endocarditis	30 – 40mg/L (to avoid toxicity, pre-dose teicoplanin levels should be < 60mg/L)
All other infections (unless higher level specified by microbiologist)	15 – 40mg/L (to avoid toxicity, pre-dose teicoplanin levels should be < 60mg/L)

Table 5: Target pre-dose teicoplanin levels

ADDITIONAL MONITORING REQUIRED

- **Full blood count**
- **Liver function tests**
- **Urea and electrolytes**
  Nephrotoxicity is a side effect of teicoplanin, although the incidence is lower than with vancomycin. Patients with renal insufficiency, and/or in those receiving teicoplanin in conjunction with or sequentially with other medicinal products with known nephrotoxic potential (aminoglycosides, colistin, amphotericin B, ciclosporin, and cisplatin) should be carefully monitored, and should include auditory tests.
- **Auditory tests**
  Ototoxicity (deafness and tinnitus) has been reported in patients treated with teicoplanin. Patients who develop signs and symptoms of impaired hearing (or disorders of the inner ear) during treatment with teicoplanin should be carefully evaluated and monitored, especially in case of prolonged treatment and/or in patients with renal insufficiency. Patients receiving teicoplanin in conjunction with, or sequentially with, other medicinal products with known neurotoxic/ototoxic potential (aminoglycosides, ciclosporin, cisplatin, furosemide and ethacrynic acid) should be carefully monitored and the benefit of teicoplanin evaluated if hearing deteriorates.

REFERENCES

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