

SYNERGISTIC GENTAMICIN IN ENDOCARDITIS For use in Adults

This guideline should be used to aid with dosing and monitoring of low dose synergistic gentamicin for endocarditis in conjunction with Tayside Endocarditis Guidance.

Prescribing

Prescribe on the main drug chart. **DO NOT** use the therapeutic gentamicin prescription chart.

Administration

Doses should be administered by IV bolus injection over 3-5 minutes.

Initial dose

- Use Actual Body Weight (ABW) to determine dose as per the below table, even if obese, up to a maximum dose of 120mg.

Patient weight (ABW)	Dose
<45kg	40mg
45-65kg	60mg
66-85kg	80mg
86-110kg	100mg
>110kg	120mg

- Dose frequency is determined based on Creatinine Clearance. If ABW is greater than Maximum Body Weight (MBW), use MBW as the weight in the Creatinine Clearance calculation using the Cockcroft-Gault Equation (see Appendix 2 for MBW table). If Creatinine is less than 60, use 60 as the Creatinine value.
- CrCl = $\frac{(140 - \text{age}) \times \text{Weight (kg)}}{\text{Serum Creatinine } (\mu\text{mol/L})} \times 1.23$ (male) or 1.04 (female)

Creatinine Clearance	Dose frequency
≥45mL/min	12 hourly
25-44mL/min	24 hourly
<25mL/min	Check a level at 24 hours and do not re-dose until levels are <1mg/L.

Monitoring

Gentamicin levels

- Levels should be taken to guide subsequent dosing.
- Aiming for trough (taken just before next dose due) of ≤1mg/L AND peak (taken EXACTLY one hour post-dose) of 3-5mg/L.
- First levels should be taken after dose 3 (peak) and just before dose 4 (trough). **Do NOT delay giving the fourth gentamicin dose while waiting for the trough concentration to be reported, unless there are concerns over deteriorating renal function.**
- If levels AND renal function are stable, levels can then be taken every 2-3 days.
- If renal function OR levels are unstable, check both daily until levels AND renal function are stable.

- If maximum dose does not provide adequate levels in obese patients please refer patient to Antimicrobial Pharmacy Team / ID for review.
- If levels are out with range:
 - Always check levels have been taken at the correct time with respect to doses.
 - Double check renal function has not changed enough to require an alteration in dose frequency prior to using the table below.

Level	Action
If trough is >1mg/L	Consider reducing frequency of dosing (e.g. from 12 hourly to 24 hourly). Re-check trough when next dose due and do not re-dose until <1mg/L.
If peak is <3mg/L	Consider moving up a dose band.
If peak is >5mg/L	Consider moving down a dose band. Do not re-dose until trough <1mg/L.

Nephrotoxicity

- Check renal function daily and monitor for any signs of renal toxicity e.g. increasing creatinine, decreased urine output/oliguria.
- If renal function worsening, discuss ongoing gentamicin therapy with ID and seek advice from pharmacy regarding review of concomitant medications.
- Nephrotoxicity is more likely if prescribed alongside other nephrotoxic drugs; review these regularly during therapy with gentamicin.

Ototoxicity

- Can occur even when levels are within range and is more common as duration of therapy increases.
- Take particular care if patients are on other concomitant ototoxic agents (e.g. loop diuretics).
- Monitor for new tinnitus, dizziness, poor balance, hearing loss, or oscillating vision and ask patients to report any signs suggestive of this.
- Document in medical notes that this has been assessed regularly during gentamicin therapy.
- If any symptoms, STOP gentamicin and refer urgently to ID.
- Refer to audiology if on gentamicin for more than 7 days.

For further advice please contact:

ID Team – TAY.id@nhs.scot

Antimicrobial Pharmacy Team – TAY.antibioticpharm@nhs.scot

References:

Adapted from guidelines provided by NHS Fife, NHS Lothian and NHS Greater Glasgow and Clyde. With reference to the BASC 2011 guidelines (Guidelines for the diagnosis and antibiotic treatment of endocarditis in adults: a report of the Working Party of the British Society for Antimicrobial Chemotherapy).

Appendix 2- MBW table

Reference: <https://www.sapg.scot/media/4471/maximum-body-weight-table.pdf>

Maximum body weight table			
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