### Gentamicin Dosing and Monitoring

<table>
<thead>
<tr>
<th>Dose</th>
<th>Gentamicin Once Daily Dosing (NOT for Endocarditis / Meningitis / Extensive Burns)</th>
<th>Gentamicin Dosing for Endocarditis / Meningitis / Extensive Burns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Endocarditis:</strong></td>
<td></td>
<td>3mg/kg IV Q24H</td>
</tr>
<tr>
<td><strong>Meningitis / Extensive Burns:</strong></td>
<td>1 – 1.7mg/kg IV Q8H</td>
<td>Round dose to nearest 20mg (maximum 500mg in 24 hours)</td>
</tr>
<tr>
<td>Correct dose in obesity by using Dose Determining Weight (refer to page 4 for calculation)</td>
<td></td>
<td>If renally impaired refer to Renal Impairment - Antibiotic Dose Adjustment guideline</td>
</tr>
<tr>
<td>Administration</td>
<td>IV infusion: in 100ml of compatible infusion fluid and administer over 30 to 60 minutes (doses ≤ 180mg can be given as an IV bolus over 3 – 5 minutes)</td>
<td></td>
</tr>
<tr>
<td>When to monitor levels</td>
<td>Take “Trough” level immediately pre-dose Take “Peak” level one hour post dose</td>
<td>Initially monitor peak and trough levels with 3rd or 4th dose, then twice weekly, or more often if renal function poor or unstable.</td>
</tr>
<tr>
<td>Reference range</td>
<td></td>
<td>Endocarditis: Trough (pre-dose) level ≤ 1mg/L Peak (post dose) level 10-12mg/L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meningitis / Extensive Burns: Trough (pre-dose) level ≤ 2mg/L Peak (post dose) level 5 - 10mg/L</td>
</tr>
<tr>
<td>Taking the sample</td>
<td>Send blood to biochemistry, with the following information:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Name of antibiotic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• <strong>Time and date the level was taken</strong> (the sample will be meaningless without this information).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Whether it is a pre-dose or post dose level</td>
<td></td>
</tr>
<tr>
<td>Interpreting result</td>
<td>You DO NOT need to wait for the result before administering the next dose unless specifically advised or patient has impaired renal function. <strong>If result is high</strong>, first check that the level was taken at the correct time. In general, if the result is high, reduce the dose or increase the dosing interval. <strong>If in doubt, seek advice from Microbiology or Pharmacy</strong></td>
<td></td>
</tr>
<tr>
<td>Other monitoring parameters</td>
<td>Monitor renal function at least twice weekly. Monitor for signs of ototoxicity (e.g. ringing / feeling of fullness in the ears, hearing loss, dizziness, vertigo, jittery / bouncing vision). Monitor for concomitant use of potent diuretics, ototoxic or nephrotoxic medicines.</td>
<td>For patients on prolonged courses of gentamicin (i.e. &gt; 7 days) <strong>and at the request of the patient's consultant</strong> baseline and weekly vestibular / auditory functions tests should be assessed: a referral should be sent to (1) Physiotherapy on the IWA for a neurology assessment, (2) Out-patients (paper referral) requesting an audiometry assessment. Specify on the request form that the patient is on gentamicin.</td>
</tr>
</tbody>
</table>
## AMIKACIN DOSING AND MONITORING

| **Dose** | **Amikacin Once Daily Dosing**  
**(NOT for Endocarditis or Meningitis)** | **Amikacin Twice Daily Dosing for Endocarditis or Meningitis** |
|----------|----------------------------------------|-------------------------------------------------------------|
| **Dose** | 15mg/kg IV Q24H  
Maximum 1.5g daily for up to 10 days (Maximum cumulative dose 15g) unless specifically advised.  
Correct dose in obesity by using Dose Determining Weight (refer to page 4 for calculation)  
If renally impaired refer to Renal Impairment - Antibiotic Dose Adjustment guideline | 7.5mg/kg IV Q12H  
(can be increased in severe infections to 7.5mg/kg IV Q8H)  
Maximum 1.5g daily for up to 10 days (Maximum cumulative dose 15g) unless specifically advised.  
Correct dose in obesity by using Dose Determining Weight (refer to page 4 for calculation)  
If renally impaired refer to Renal Impairment - Antibiotic Dose Adjustment guideline |
| **Administration** | IV infusion: Dilute to 2.5mg/ml with NaCl or Glucose 5% and administer over 30 - 60 minutes. | IV bolus: slowly over 2-3 minutes or  
IV infusion (preferred): dilute to 2.5mg/ml with NaCl or Glucose 5% and administer over 30 - 60 minutes. |
| **When to monitor levels** | Pre-dose levels should be taken between 18-24 hours after last dose administered. Initially monitor pre-dose level before second dose and then every 48 hours or daily if renal function poor or unstable. | Take “Trough” level immediately pre-dose  
Take “Peak” level one hour post dose  
Initially monitor peak and trough levels with 3rd or 4th dose, then every 48 hours, or more often if renal function poor or unstable. |
| **Reference range** | Pre-dose level (trough) ≤5mg/L | Trough (pre-dose) level ≤ 10mg/L  
Peak (post-dose) level ≤ 30mg/L (aim for 20-30mg/L) |
| **Taking the sample** | Send blood to microbiology, with the following information:  
• Name of antibiotic  
• **Time and date the level was taken** (the sample will be meaningless without this information).  
• Whether it is a pre-dose or post dose level |  |
| **Interpreting result** | **You DO NOT need to wait for the result** before administering the next dose unless specifically advised or patient has impaired renal function.  
If result is high, first check that the level was taken at the correct time. In general, if the result is high, reduce the dose or increase the dosing interval. **If in doubt, seek advice from Microbiology or Pharmacy** |  |
| **Other monitoring parameters** | Monitor renal function at least twice weekly. Monitor for signs of ototoxicity and neurotoxicity (e.g. ringing / feeling of fullness in the ears, hearing loss, dizziness, vertigo, jittery / bouncing vision). Monitor for concomitant use of potent diuretics, ototoxic or nephrotoxic medicines.  
For patients on prolonged courses of amikacin (i.e. > 7 days) **and at the request of the patient's consultant** baseline and weekly vestibular / auditory functions tests should be assessed: a referral should be sent to (1) Physiotherapy on the IWA for a neurology assessment, (2) Out-patients (paper referral)requesting an audiometry assessment. Specify on the request form that the patient is on amikacin. |  |
# TOBRAMYCIN DOSING AND MONITORING

| **Tobramycin Once Daily Dosing**  
(NOT for Endocarditis, Meningitis or Extensive Burns) | **Tobramycin Multiple Daily Dosing for Endocarditis / Meningitis / Extensive Burns) |
|----------------------------------------------------------|--------------------------------------------------------------------------------|
| **Dose**                                                 | **1 – 1.7mg/kg IV Q8H**  
(maximum 500mg in 24 hours) |
Correct dose in obesity by using Dose Determining Weight (refer to page 4 for calculation) | Correct dose in obesity by using Dose Determining Weight (refer to page 4 for calculation) |
If renally impaired refer to Renal Impairment - Antibiotic Dose Adjustment guideline | If renally impaired refer to Renal Impairment - Antibiotic Dose Adjustment guideline |
| **Administration**                                       |                                                                          |
IV infusion: in 50 - 100ml of compatible infusion fluid and administer over 30 to 60 minutes | IV infusion: in 50 - 100ml of compatible infusion fluid and administer over 30 to 60 minutes (doses ≤ 180mg can be given as an IV bolus over 3 – 5 minutes) |
| **When to monitor levels**                               |                                                                          |
Pre-dose levels taken between 18-24 hours after last dose administered. Initially monitor pre-dose level before second dose and then every 48 hours (daily if renal function unstable or poor). | Take “Trough” level immediately pre-dose  
Take “Peak” level one hour post dose  
Initially monitor peak and trough levels with 3rd or 4th dose, then every 48 hours, or more often if renal function poor or unstable. |
| **Reference range**                                      |                                                                          |
Pre-dose level ≤1mg/L | Trough (pre-dose) level ≤ 2mg/L  
Peak (post-dose) level 5-12mg/L |
| **Taking the sample**                                    |                                                                          |
Send blood to microbiology, with the following information:  
• Name of antibiotic  
• **Time and date the level was taken** (the sample will be meaningless without this information).  
• Whether it is a pre-dose or post dose level |  |
| **Interpreting result**                                  |                                                                          |
**You DO NOT need to wait for the result** before administering the next dose unless specifically advised or patient has impaired renal function.  
**If result is high,** first check that the level was taken at the correct time. In general, if the result is high, reduce the dose or increase the dosing interval.  
**If in doubt, seek advice from Microbiology or Pharmacy** |  |
| **Other monitoring parameters**                           |                                                                          |
Monitor renal function at least twice weekly. Monitor for signs of ototoxicity (e.g. ringing / feeling of fullness in the ears, hearing loss, dizziness, vertigo, jittery / bouncing vision).  
Monitor for concomitant use of potent diuretics, ototoxic or nephrotoxic medicines.  
For patients on prolonged courses of tobramycin (i.e. > 7 days) **and at the request of the patient's consultant** baseline and weekly vestibular / auditory functions tests should be assessed: a referral should be sent to (1) Physiotherapy on the IWA for a neurology assessment, (2) Out-patients (paper referral) requesting an audiometry assessment. Specify on the request form that the patient is on tobramycin. |  |
Correcting Aminoglycoside Doses in Obesity:

- Dose is calculated on actual body weight unless the patient is obese
- If patient is obese (> 20% above IBW) then the dose should be based on a corrected weight called "Dose Determining Weight"

### STEP 1: Calculate patient’s Ideal Body Weight (IBW)
- IBW (males) kg = 50kg + (2.3kg x no of inches > 5ft)
- IBW (females) kg = 45.5kg + (2.3kg x no of inches > 5ft)

### STEP 2: If Actual Body Weight (ABW) is greater than (IBW + (20% of IBW)) use the patient’s Dose Determining Weight to calculate the aminoglycoside dose:
- DDW = IBW + 0.4 (ABW - IBW)

### Aminoglycoside Dose Adjustment in Renal Impairment

Cockcroft-Gault creatinine clearance estimates should be used to calculate GFR according to the formula:

\[
GFR = \frac{(140\text{-age}) \times \text{Weight}\times N}{\text{Serum creatinine (in } \mu \text{mol/L)}}
\]

Where N is 1.23 for males and 1.04 for females.

*Note: use IBW if patient is obese