Guide to Gentamicin: High Dose 5mg/kg* Once Daily (Adults)

* use Ideal Body Weight if patient is overweight

Prescribing gentamicin as a single dose will ensure that target peak concentrations are achieved in all patients. Once daily dosing is at least as effective and less nephrotoxic than conventional multiple daily dosing.

Exclusions to using high dose once daily gentamicin dosing include:

- Serum creatinine > 200micromol/L in < 75 year old or >150micromol/L in >75 year old, or Creatinine Clearance < 40 ml/min
- Patients with severe liver disease e.g. ascites, jaundice or bilirubin > 50micromol/L
- Endocarditis (seek advice from Microbiology)
- Major burns
- Neonates
- Pregnancy
- Prophylaxis

Baseline Serum Creatinine
- Measure the serum creatinine before initiating treatment
- Record the patient’s weight (Ideal Body Weight if overweight or actual body weight if not overweight) and serum creatinine in the medical notes and on the drug chart

Calculation of Ideal Body Weight

<table>
<thead>
<tr>
<th>Ideal Body Weight IBW (male)</th>
<th>Ideal Body Weight IBW (female)</th>
</tr>
</thead>
<tbody>
<tr>
<td>= 50kg + (2.3 x every inch over 5ft)</td>
<td>= 45.5kg + (2.3 x every inch over 5ft)</td>
</tr>
</tbody>
</table>

Dose and Administration

- 5mg/kg gentamicin IV as a single daily dose. 500mg is the maximum single dose
- Use Ideal Body Weight if the patient is overweight
- Round the dose up or down to the nearest 20mg and administer as an intravenous infusion in 100ml sodium chloride 0.9% over 30 minutes.
- Prescribe using the High Dose Gentamicin prescription sticker (stick onto the variable section of the relevant drug chart)
- Prescribe and sign for one dose at a time only

Recording the start time

- Record the actual infusion start time on the prescription sticker for each dose

Monitoring

One sample is required
- Trough levels taken approximately 1 hour prior to the next dose
- The sample time is vital and may not coincide with the phlebotomy round

Level interpretation

- Trough level should be <1mg/litre
- If the trough level is between 1 to 2mg/litre and estimated CrCl >60ml/min, extend the 24 hourly dosage interval to 36 hours (see below)
- If the trough level is >2mg/litre, seek advice from Microbiology or Pharmacy
- Refer to the Level Interpretation Advice Flow Chart

Second and subsequent doses

The maximum duration of treatment is 7 days

- The second dose may be given before the level is reported if the CrCl > 60ml/min with stable renal function and the first dose is based on an appropriate weight (ideal body weight if overweight or actual body weight if not overweight)
- Await interpretation of the first level if CrCl is less than 60ml/min, or seek advice from Microbiology or Pharmacy

<table>
<thead>
<tr>
<th>Calculated CrCl</th>
<th>Advised Initial Dosing Interval</th>
<th>Trough level &lt;1mg/litre</th>
<th>Trough level 1 to 2mg/litre</th>
<th>Trough level 2 to 3mg/litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;60 ml/min</td>
<td>24 hours</td>
<td>continue</td>
<td>change to 36 hourly</td>
<td>seek advice</td>
</tr>
<tr>
<td>40 to 59 ml/min</td>
<td>36 hours</td>
<td>continue</td>
<td>seek advice</td>
<td>seek advice</td>
</tr>
<tr>
<td>CrCl (ml/min) =</td>
<td>(140 – age in years) x IBW (kg) x 1.04 (female) or 1.23 (male)</td>
<td>Serum creatinine (micromol/L)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sampling Frequency

- Monitor the gentamicin level and serum creatinine at least twice weekly, or as advised by Microbiology or Pharmacy.

Sample Details

- 3ml blood in yellow top vacutainer. Label with:
  - Patient name, Hospital Number, Ward, Date
  - Mark form with “High dose once daily gentamicin”
  - Record actual administration time and date of last dose plus actual time of sample
  - Record the dose, clinical diagnosis and start date of gentamicin
  - Send to Laboratory Medicine with fully completed green assay request form

Urgent Level

- Contact Laboratory Medicine 4033, or out of hours contact Duty Biochemist on bleep 1621

Further information:
- Microbiology 4105
- Ward Pharmacist
- Medicines Information 4270
Authors: Julian Hemming, Stephen Cotterill (Microbiology), Peter Davies (Pharmacist)
Antibiotic Reference Group Approved: February 2012
Drugs & Therapeutic Committee Approved: March 2012

Review Date: May 2014
Level Interpretation Advice: High Dose 5mg/kg Gentamicin (Adults)

Prescribed 36 hourly

Reported Trough level:
- <1mg/L: Continue current 36 hourly dosage interval
- 1 to 2mg/L: Ensure treatment is appropriate. Check: indication, Age, weight, Serum creatinine. Consider: patients’ clinical condition & renal function
- 1 to 1.2 mg/L: If renal function is stable, continue with 36 hourly dosage interval
- >1.2 to 2mg/L: Re-check level after a further 6 to 12 hours, at next practical time
- >1mg/L: Re-check level prior to next 48 hourly dose
- >2 to 3mg/L: Stop high dose gentamicin treatment
- <1mg/L: Second dose can be prescribed and administered 48 hours after first dose
- >2 to 3mg/L: Stop high dose gentamicin treatment
Level Interpretation Advice: High Dose 5mg/kg Gentamicin (Adults) 
Prescribed 24 hourly

Reported Trough level

<1mg/L
Continue current 24 hourly dosage interval

1 to >3 mg/L
Ensure treatment is appropriate
Check:
- indication
- Age, weight
- Serum creatinine
- Gentamicin dose
Consider:
- patients’ clinical condition & renal function

1 to 1.2mg/L
Trough Level
If renal function is stable, continue with 24 hourly dosage interval

>1.2 to 2mg/L
Re-check level after a further 6 to 12 hours, at next practical time

>2 to 3mg/L
Re-check level after a further 24 hours

<1mg/L
Trough Level

Trough Level

<1mg/L
Second dose can be prescribed and administered 36 hours after first dose

>1mg/L
Allow a further toxic decay time up to a total of 48 hours. Adjust the dosage interval accordingly

>1mg/L after 48 hours
Re-check level prior to next 48 hourly dose

>1mg/L after 48 hours
Re-check level prior to next 48 hourly dose

Re-check level prior to next 36 hourly dose

Re-check level prior to next 24 hourly dose

Re-check level prior to next 24 hourly dose

Re-check level prior to next 36 hourly dose

Re-check level prior to next 48 hourly dose

Stop high dose gentamicin treatment

Re-check level after 2 days

Re-check level prior to next 48 hourly dose

Re-check level prior to next 36 hourly dose

Re-check level prior to next 24 hourly dose

Re-check level prior to next 24 hourly dose

Re-check level after 2 days