GUIDELINE FOR PRESCRIBING GENTAMICIN TO ADULTS (August 2012)

Gentamicin

- Gentamicin must be used with care as high levels are associated with nephro- and ototoxicity.
- Never give to blind patients as ototoxic side effects would be catastrophic.
- Use with caution in patients with renal impairment, or impaired hearing/balance, elderly, or patients likely to need long term antibiotics.
- Two different gentamicin regimens are used in this Trust: once daily and multiple daily dosing (for infective endocarditis treatment)
- For gentamicin prescribing in paediatrics and neonates, see department guidelines

1. Once-daily Gentamicin

- Once daily gentamicin is used for most patients (but see exceptions)
- Most patients will only need one or two doses commonly in addition to a normal course of a beta-lactam.
- Further doses only to be continued if indicated clinically and/or appropriate for culture results.
- Avoid prolonged courses i.e. >7 days

1.1 Exceptions

- Infective endocarditis. Low doses are used for synergy with benzylpenicillin, (see below)
- Use with caution in pregnant women - seek advice
- Use with caution if GFR is less than 20mL/minute – see below

1.2 Dosage

5mg/kg Lean Body Weight, once daily IV (dose interval depends on level), typical dose 250-350mg daily

1.3 Dosage adjustment in obese patients

- Aminoglycosides poorly distribute into adipose tissue. Dose adjustment is needed if the patient is obese (BMI > 30 kg/m²)
- Dose is based on Lean Body Weight (LBW)
- Calculate the LBW in kg as follows:
  - Female 45.5 + (2.3 x Height in inches over 5 feet)
  - Male 50 + (2.3 x Height in inches over 5 feet)

Table showing rounded dose of gentamicin @5mg/Kg against height to be used where BMI >30kg/m²
<table>
<thead>
<tr>
<th>Height (feet and inches)</th>
<th>Height (cm)</th>
<th>Male Kg LBW</th>
<th>Gentamicin dose @5mg/kg</th>
<th>Female Kg LBW</th>
<th>Gentamicin dose @5mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>5'</td>
<td>150</td>
<td>50</td>
<td>240</td>
<td>45.5</td>
<td>220</td>
</tr>
<tr>
<td>5'2&quot;</td>
<td>155</td>
<td>54.6</td>
<td>280</td>
<td>50.1</td>
<td>240</td>
</tr>
<tr>
<td>5'4&quot;</td>
<td>160</td>
<td>59.2</td>
<td>300</td>
<td>54.7</td>
<td>280</td>
</tr>
<tr>
<td>5'6&quot;</td>
<td>165</td>
<td>63.8</td>
<td>320</td>
<td>59.3</td>
<td>300</td>
</tr>
<tr>
<td>5'8&quot;</td>
<td>170</td>
<td>68.4</td>
<td>340</td>
<td>63.9</td>
<td>320</td>
</tr>
<tr>
<td>5'10&quot;</td>
<td>175</td>
<td>73</td>
<td>360</td>
<td>68.5</td>
<td>340</td>
</tr>
<tr>
<td>6'</td>
<td>180</td>
<td>77.6</td>
<td>380</td>
<td>73.1</td>
<td>360</td>
</tr>
<tr>
<td>6'2&quot;</td>
<td>185</td>
<td>82.2</td>
<td>420</td>
<td>77.7</td>
<td>380</td>
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<tr>
<td>6'4&quot;</td>
<td>190</td>
<td>86.8</td>
<td>440</td>
<td>82.3</td>
<td>420</td>
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<tr>
<td>6'6&quot;</td>
<td>195</td>
<td>91.4</td>
<td>460</td>
<td>86.9</td>
<td>440</td>
</tr>
</tbody>
</table>

1.4 Dosage adjustments in renal impairment

- Use the same once daily dose as above (unless GFR < 20mL/min), then use the nomogram (after blood level testing) to determine the time interval of subsequent doses.
- If GFR <20mL/min use 2-3mg/kg LBW and check for trough levels ie 20 – 24 hours post dose. Do NOT give a further dose until level is <1mg/L.

1.5 Gentamicin monitoring

- Send the sample in a yellow topped vacutainer or a red topped vacuette.
- Take the blood sample **6-14 hours** after the **1st** dose
- Take further levels **twice** weekly if 1st level satisfactory and renal function stable
- **NB:** for haemodialysis patients follow the Dixon Ward protocol for gentamicin monitoring (W&S)

1.6 Completing the request form

**In addition to the usual demographic information, the following details must be provided**

- Sample type - should be post-dose, or random if previously high level
- Dosing regimen
- Date + exact time of blood sample
- Date + exact time last dose was given

1.7 Interpretation of Gentamicin levels

- Gentamicin levels are reported electronically by Biochemistry
- Calculate the time between previous dose and the time of the level
- Plot the level against dosing interval on the nomogram below to determine the time interval for subsequent doses i.e. 12, 24, 36, or 48 hourly.
- Give the same dose as previously (i.e. 5mg/kg lean body weight) at the time interval indicated by the nomogram
- If the level falls beyond the 48 hourly line do not give any further doses of gentamicin and discuss with a Medical Microbiologist non-urgently
- Levels taken later than 14 hours cannot be interpreted with the nomogram but if the result is <1mg/L it is safe to give another dose at 24 hours.
The Nomogram

Urban-Craig Nomogram for GENTAMICIN

Give every 48 hours

Give every 36 hrs

Give every 24 hrs

Give every 12 hrs

Do not give any further doses and seek advice from a Medical Microbiologist

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1.9 Once-daily Gentamicin – Quick Reference Guide

START HERE

Are you treating infective endocarditis?

Yes

Infective endocarditis is treated with TDS gentamicin—refer to guidelines

No

Are any of these contraindications present?
- pregnancy
- blindness
- creatinine clearance <20mL/minute

Yes

DD gentamicin may not be suitable for this patient; seek advice from a Medical Microbiologist

No

Is the patient obese? (BMI > 30kg/m²)

No

Calculate dose using the patient’s actual weight: Dose is 5mg/kg

Yes

Calculate the patient’s Lean Body Weight (LBW) (kg)

BMI = \frac{\text{Weight (kg)}}{\text{Height} \times \text{height (m)}}

Prescribe this dose on the patient’s prescription chart. Ensure you document the duration and indication for treatment on the chart and in the Medical Notes.

Take levels 6 to 14 hours after the first dose. Ensure the exact times of collection and the last dose are recorded on

Interpret levels using the nomogram to the right. Prescribe further doses at the interval specified by the nomogram, always giving the same dose.

Monitor U+Es regularly.

Is the patient’s renal function stable?

No

Yes

Measure further gentamicin levels twice weekly

Monitor gentamicin levels after each dose.