GENTAMICIN GUIDELINE FOR USE IN ADULTS (HARTFORD Guidance)

- Aminoglycoside antibiotic – bactericidal against many gram-negative and some gram-positive organisms. NO anabolic activity. See Micro Man.
- Gentamicin is monitored using the Hartford nomogram which relates observed concentration to the time post dose within a given concentration range.
- Follow separate guidance when using gentamicin for Surgical Prophylaxis or in Endocarditis, Pregnancy, Cystic Fibrosis, Renal Unit inpatients or patients on dialysis
- The dose is calculated as detailed below and repeated at 24 hour intervals or longer.

**STEP 1: ASSESS PATIENT SUITABILITY**

**Does the patient have any of the following exclusion criteria?**

- Children <16 years old
- Ascites >20% body weight
- Major burns >20% body surface
- Decompensated Liver Disease
- Myasthenia Gravis
- Renal Transplant
- Acute Kidney Injury (AKI 3) on dialysis or eGFR <20ml/min
- End stage renal failure on dialysis with residual kidney function

**Does the patient have?**

- Chronic Kidney Disease (eGFR 20-29ml/min)
- Acute Kidney Injury (AKI 1 or 2) in previous 48 hours (>50% increase in baseline serum creatinine or oliguria (<0.5ml/kg/hr > 6 hours))

**ALTERNATIVE METHOD:**

- If creatinine is NOT known OR online calculator not available, calculate dose based on equations below:
  - Determine ideal body weight of patient using national online table.
  - Is actual weight >20% above their ideal body weight (IBW)?
    - If NO → eGFR ≥ 20ml/min Dose = Actual Body Weight x 7mg (Maximum 600mg – Round to nearest 40mg)
    - ID/Micro approved in eGFR <20ml/min Dose = Actual Body Weight x 2.5mg (Maximum dose: 180mg- Round to nearest 10mg)
  - If YES → calculate dosing weight (DW) and dose from equations below:
    - DW = IBW + 0.4 (ABW - IBW)
    - eGFR ≥ 20ml/min Dose = 7mg x DW (Maximum 600mg – Round to nearest 40mg)
    - ID/Micro approved in eGFR <20ml/min Dose = DW x 2.5mg (Maximum dose: 180mg- Round to nearest 10mg)

**STEP 2: CALCULATE DOSE – seek advice on calculation for patients at extremes of age/height/weight or if amputee**

**PREFERRED METHOD:** Use online calculator (available on NHST antibiotic website or Antimicrobial Companion App) when creatinine is known. In patients with low creatinine (<60 micromol/L) use 60 micromol/L. See NHST antibiotic website for gentamicin chart and calculator guidance for prescribers and nursing staff.

**ALTERNATIVE METHOD:** If creatinine is NOT known OR online calculator not available, calculate dose based on equations below:

- Determine ideal body weight of patient using national online table.
- Is actual weight >20% above their ideal body weight (IBW)?
  - If NO → eGFR ≥ 20ml/min Dose = Actual Body Weight x 7mg (Maximum 600mg – Round to nearest 40mg)
    - ID/Micro approved in eGFR <20ml/min Dose = Actual Body Weight x 2.5mg (Maximum dose: 180mg- Round to nearest 10mg)
  - If YES → calculate dosing weight (DW) and dose from equations below:
    - DW = IBW + 0.4 (ABW - IBW)
    - eGFR ≥ 20ml/min Dose = 7mg x DW (Maximum 600mg – Round to nearest 40mg)
    - ID/Micro approved in eGFR <20ml/min Dose = DW x 2.5mg (Maximum dose: 180mg- Round to nearest 10mg)

**Document dose calculation on the gentamicin prescription chart and tick which source of first dose was used.

**Prescribe initial dose on the gentamicin chart specifying the date and time the dose should be given.

**Stick the gentamicin chart to the 'as required' page on the TPAR so the red band is clearly visible when TPAR closed.

**Prescribe gentamicin ‘as per chart’ on the regular section of the TPAR.

**STEP 3: MONITOR RENAL FUNCTION, GENTAMICIN LEVELS AND DETERMINE DOSING INTERVAL**

**eGFR <20ml/min**

- Ensure start time of infusion and dose is documented on gentamicin chart and ICE request. Take blood sample prior to printing off label at 24 hours from the BEGINNING of the IV infusion.
- Do NOT use nomogram if eGFR <20ml/min. If therapy is to continue give a further dose once gentamicin level is <1mg/L. Record ALL sample dates/times accurately overleaf and prescribe subsequent doses.

**GFR ≥20ml/min**

- Ensure start time of infusion and dose is documented on gentamicin chart and ICE request. Take blood sample prior to printing off label 6-14 hours from the BEGINNING of the IV infusion.
- Evaluate on the nomogram. If the level falls in the area designated 24 hours, 36 hourly or 48 hourly the dosing interval should be every 24, 36, 48 hours respectively. If the point is on the line, choose the longer interval.
- Record ALL sample dates/times accurately overleaf and prescribe subsequent doses.

**NB** Q means dosing interval on graph above

- Administer in 100ml sodium chloride 0.9% or dextrose 5% over 60 minutes.

**Endocarditis**

- Review antibiotics daily. If IV therapy is still indicated after 72 hours seek advice and consider switching to aztreonam to reduce risks of prolonged treatment with gentamicin

**Cystic Fibrosis**

- Review IV antibiotics daily. If IV therapy is still indicated after 72 hours seek advice and consider switching to aztreonam to reduce risks of prolonged treatment with gentamicin

**Pregnancy**

- Review IV antibiotics daily. If IV therapy is still indicated after 72 hours seek advice and consider switching to aztreonam to reduce risks of prolonged treatment with gentamicin

**Chronic Kidney Disease (eGFR 20-29ml/min)**

- Review IV antibiotics daily. If IV therapy is still indicated after 72 hours seek advice and consider switching to aztreonam to reduce risks of prolonged treatment with gentamicin

**Acute Kidney Injury (AKI 1 or 2) in previous 48 hours**

- Review IV antibiotics daily. If IV therapy is still indicated after 72 hours seek advice and consider switching to aztreonam to reduce risks of prolonged treatment with gentamicin

**Does the patient have any of the following exclusion criteria?**

- Children <16 years old
- Ascites >20% body weight
- Major burns >20% body surface
- Decompensated Liver Disease
- Myasthenia Gravis
- Renal Transplant
- Acute Kidney Injury (AKI 3) on dialysis or eGFR <20ml/min
- End stage renal failure on dialysis with residual kidney function

**Maximum gentamicin course length is 72hours.**

- Review IV antibiotics daily. If IV therapy is still indicated after 72 hours seek advice and consider switching to aztreonam to reduce risks of prolonged treatment with gentamicin

**Does the patient have?**

- Chronic Kidney Disease (eGFR 20-29ml/min)
- Acute Kidney Injury (AKI 1 or 2) in previous 48 hours (>50% increase in baseline serum creatinine or oliguria (<0.5ml/kg/hr > 6 hours))

**GENTAMICIN GUIDELINE FOR USE IN ADULTS (HARTFORD Guidance)**

Updated by AMG: Feb 2017 Approved: Sep 2019 Review Date: Sep 2022