ADULTS ONCE-DAILY DOSING:

I. PATIENT SELECTION
   a. Pharmacy will be automatically consulted for all patients receiving aminoglycosides.
   b. Inclusion criteria:
      i. Patients with no documented allergies to the drug
      ii. Those with suspected or confirmed infection caused by Gram-negative bacteria
   c. Exclusion criteria → Use conventional dosing for the following patient populations:
      i. Pregnancy
      ii. Patients with ascites or burns
      iii. Patients on dialysis or those with severe renal dysfunction (CrCl < 30mL/min)
      iv. Synergy for gram positive infections
      v. Endocarditis

II. CALCULATE DOSE
   a. Use Actual Body Weight for dosing calculation unless the patient is obese (BMI ≥ 30 kg/m²).
      Use Adjusted Body Weight if obese.
   b. Extended interval dosing base on Hartford Nomogram
      i. Gentamicin / Tobramycin: 7 mg/kg (may use 5 mg/kg for UTI)
      ii. Amikacin: 15 mg/kg
   c. NOTE: the above doses were specifically studied for the Hartford Nomogram and the use of
      other doses is not recommended.
   d. NOTE: Amikacin recommended for infections caused by Pseudomonas aeruginosa

III. CALCULATE INTERVAL

<table>
<thead>
<tr>
<th>Estimated CrCl</th>
<th>Initial Dosing Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 60 mL/min</td>
<td>q24h</td>
</tr>
<tr>
<td>40 – 59 mL/min</td>
<td>q36h</td>
</tr>
<tr>
<td>20 – 39 mL/min</td>
<td>q48h</td>
</tr>
<tr>
<td>&lt; 20 mL/min</td>
<td>Not recommended</td>
</tr>
</tbody>
</table>

IV. ADMINISTRATION
   a. To minimize the possibility of neuromuscular blockade, doses should be infused over at least
      30 minutes.

V. PATIENT MONITORING
   a. General Monitoring:
      i. Daily: medication profile, signs for efficacy and toxicity, clinical status
      ii. Every other day: renal function (SCr, BUN, Intake/Output’s) – if rapidly changing,
         monitor daily
      iii. Every 3 days: CBC w/differential
      iv. Pharmacist may order CBC and BMP as clinically indicated to ensure appropriate
         monitoring.
b. A serum aminoglycoside concentration at 6-14 hours (~10 hours) post-infusion after the first dose should be drawn.

c. Dosage adjustments should be made according to the Hartford Nomogram (see below)
   i. If the level falls on the line choose the longer dosing interval
   ii. If the level falls off the nomogram use conventional dosing

d. Pharmacist may make dose adjustments based on drug level results.

e. Maintenance levels should be drawn at least once weekly
   i. For patients with acute changes in renal function a trough level should be drawn 30 minutes prior to next dose

f. If using amikacin, plot ½ of the serum concentration on the nomogram

g. If using 5 mg/kg dose, the resulting level must be multiplied by a factor to equal 7 mg divided by the dose used
   i. Example: If a patient is receiving 5mg/kg/day and the 10h post-dose level was 2 mcg/mL, you would multiply the level by 1.4 (7/5) to get a level of 2.8 mcg/mL. This adjusted level is the one you would plot on the Hartford Nomogram.

VI. EQUATIONS

   a. **IBW** Males: IBW = 50 kg + (2.3 kg for each inch over 5 feet)
   b. **IBW** Females: IBW = 45.5 kg + (2.3 kg for each inch over 5 feet)
   c. **Adjusted Body Weight** = IBW + 0.4(actual weight - IBW)
   d. **CrCl**: \[ \frac{(140 - \text{age}) \times \text{(Wt in kg)}}{(72 \times \text{Serum Cr})} \times 0.85 \text{ if female} \]
AMINOGLYCOSIDE ONCE-DAILY DOSING GUIDELINE

INFANTS & CHILDREN (age > 30 days) ONCE-DAILY DOSING:

I. PATIENT SELECTION
   a. Pharmacy will be automatically consulted for all patients receiving aminoglycosides.
   b. Once-daily dosing algorithm is preferred method of aminoglycoside dosing.
   c. Conventional dosing preferred for tularemia, gram positive synergy, endocarditis, hemodialysis, renal insufficiency, ascites, burns, pregnancy, and ages not included in the dosing chart.
   d. This guideline covers infants and children > 30 days old. For neonates: see Conventional Dosing Policy.

II. CALCULATE DOSE & INTERVAL
   a. Use actual body weight
   b. NOTE: tobramycin recommended for infections in patients with cystic fibrosis

<table>
<thead>
<tr>
<th>Drug</th>
<th>Daily Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cystic Fibrosis</td>
<td></td>
</tr>
<tr>
<td>Gentamicin / Tobramycin</td>
<td>10 mg/kg IV q24h</td>
</tr>
<tr>
<td>Amikacin</td>
<td>30 mg/kg IV q24h</td>
</tr>
<tr>
<td>Non-Cystic Fibrosis</td>
<td></td>
</tr>
<tr>
<td>Gentamicin / Tobramycin</td>
<td>9.5 mg/kg IV q24h</td>
</tr>
<tr>
<td>Amikacin</td>
<td>15 mg/kg IV q24h</td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td></td>
</tr>
<tr>
<td>Gentamicin / Tobramycin</td>
<td>7.5 mg/kg IV q24h</td>
</tr>
<tr>
<td>Amikacin</td>
<td>7.5 mg/kg IV q24h</td>
</tr>
</tbody>
</table>

III. ADMINISTRATION
   a. To minimize the possibility of neuromuscular blockade, doses should be infused over at least 30 minutes.

IV. PATIENT MONITORING
   a. Renal function (BUN, SCr, UOP) should be monitored in all patients on aminoglycosides.
      i. BUN and SCr should be monitored twice weekly
      ii. UOP should be monitored daily
AMINOGLYCOSIDE ONCE-DAILY DOSING GUIDELINE

iii. Pharmacist may order CBC and BMP as clinically indicated to ensure appropriate monitoring.

b. Peaks and troughs should be drawn if therapy continues for greater than 48 hours
   i. Draw peak 60 minutes after start of infusion.
   ii. Draw trough 30 minutes prior to next dose.
   iii. Does not apply to inhaled aminoglycosides.

c. Pharmacist may make dose adjustments based off of drug level results.

d. For patients on prolonged IV aminoglycoside therapy, peaks and troughs should be drawn twice weekly.

e. If patient on aminoglycoside for ≥ 10 days, obtain SCr 1 week after treatment complete. If patient is to be discharged before this time, remind consulting physician to order SCr at follow-up visit.

f. If patient on aminoglycoside for ≥ 2 weeks, remind consulting physician to order audiology exam.

g. For patients with more serious infections (i.e. CF exacerbation, meningitis), a peak closer to 30 or 35 mcg/mL is preferred. For less severe infections (i.e. gram negative bacteremia), a peak closer to 20 or 25 mcg/mL is acceptable.

V. EQUATIONS

a. **Schwartz equation**: eGFR (mL/min) = (k x length in cm) / (SCr in mg/dL)

<table>
<thead>
<tr>
<th>Age</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low birth weight ≤1 year</td>
<td>0.33</td>
</tr>
<tr>
<td>Full term ≤1 year</td>
<td>0.45</td>
</tr>
<tr>
<td>&gt;1 year – 12 years</td>
<td>0.55</td>
</tr>
<tr>
<td>&gt; 12 years female</td>
<td>0.55</td>
</tr>
<tr>
<td>&gt; 12 years male</td>
<td>0.7</td>
</tr>
</tbody>
</table>

b. **Bedside Schwartz equation**: eGFR (mL/min): = (0.413 x Ht in cm) / (SCr in mg/dL)
   i. Preferred in patients age 1 – 16 years

c. **Cockcroft – Gault CrCl**: ([140 – age] x (Wt in kg)) / (72 x Serum Cr) x 0.85 if female
   i. Consider for adult-sized adolescents or teenagers

d. **IBW in kg (males)** = 50 + (2.3 x inches over 60)

e. **IBW in kg (females)** = 45.5 + (2.3 x inches over 60)
AMINOGLYCOSIDE ONCE-DAILY DOSING GUIDELINE

**CONTACT ID/AMS PHARMACIST FOR ASSISTANCE WITH DOSING**

References