Aminoglycoside Dosing for Pediatrics
University Health System

Necessary patient information for dosing

Body weight

- Use ACTUAL body weight unless actual body weight is >130% of IBW. If actual body weight is >130% of ideal, use adjusted body weight.
  - IBW calculation for children 1-17 years old = (Height^2 x 1.65)/1000
  - Height in cm, weight in kg
  - Adjusted body weight: IBW + 0.4 (actual body weight - ideal body weight)

CrCl (ml/min/1.73m^2) = [length (cm) x k] / SCr

- k = 0.45 for infants 1 to 52 weeks old
- k = 0.55 for children 1 to 13 years old
- k = 0.55 for adolescent females 13-16 years old
- k = 0.7 for adolescent males 13-16 years old

General rules

- Avoid aminoglycosides in children with impaired renal function or those on multiple concomitant nephrotoxins if possible
- Conventional dosing (q8 hours) is more commonly used in pediatrics patients (>30 days old) than extended interval (q24 hour dosing)
- Extended interval (q24 hours) aminoglycoside dosing is preferred in CF patients >3 years old
- Doses can be given over 30 minutes
- Peak serum concentrations are important for bacterial killing
- Trough serum concentration monitoring is recommended as a safety marker
  - Should be checked at least once weekly for pediatric patients on aminoglycoside therapy
  - 30 minutes prior to a dose

General dosing recommendations for gentamicin and tobramycin

Neonatal dosing - USE FOR ALL INFANTS <30 days old

<table>
<thead>
<tr>
<th>CGA* (weeks)</th>
<th>Post natal age (days)</th>
<th>Dose (mg/kg)</th>
<th>Interval (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;29</td>
<td>0-7</td>
<td>5</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>8-28</td>
<td>4</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>&gt;29</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>30-34</td>
<td>0-7</td>
<td>4.5</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>&gt;8</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>&gt;35</td>
<td>ALL</td>
<td>4</td>
<td>24</td>
</tr>
</tbody>
</table>

*Corrected gestational age

Conventional dosing (age >30 days old)

- Starting dose = 2.5 mg/kg/dose every 8 hours
- Higher doses may be utilized in young infants/children
- If aminoglycoside is necessary and CrCl <30 mL/min, may start on q12 hour dosing

OR

Extended-interval dosing (non-CF patients)

- 3 months to <2 years: 9.5 mg/kg/dose every 24 hours
- 2 to <8 years: 8.5 mg/kg/dose every 24 hours
- ≥8 years: 7 mg/kg/dose every 24 hours
**Indication specific dosing**

**Cystic fibrosis, pulmonary infection - TOBRAMYCIN PREFERRED**
- Conventional dosing (for children <3 years old): 3.3 mg/kg/dose every 8 hours
- Extended-interval dosing: I.V.: 10-15 mg/kg/dose every 24 hours
- Alternative dosing: 7.5-10 mg/kg/dose every 12 hours
  - May be utilized in CF patients with ultra rapid renal clearance

**Urinary tract infection**
- Conventional dosing: Infants and Children 2-24 months: I.V.: 5 mg/kg/day divided every 8 hours
  - OR
- Extended-interval dosing:
  - 1 month to <5 years: 7.5 mg/kg/dose every 24 hours
  - 5-10 years: 6 mg/kg/dose every 24 hours
  - >10 years: 4.5 mg/kg/dose every 24 hours

**Therapeutic Drug Monitoring**
Aminoglycoside serum concentrations should NOT be drawn from same intravenous line through which drug is infusing. Drug may adhere to lumen of line even if line is flushed.

**Conventional dosing (q 8 hours)**
- Peaks: 6-10 mcg/mL
  - Should be drawn 30 minutes following the infusion of the 3rd dose
  - Peaks not necessary for treatment of urinary tract infections
- Troughs: <2 mcg/mL
  - Drawn before 4th dose

**Extended interval dosing, NON-CF patients (q 24 hours)**
- Peaks: 12-20 mcg/mL
  - Draw peak level ~1 hour following end of infusion
    - Peaks >20 mcg/mL may be required for more resistant Gram-negative organisms
  - Peaks can be drawn after 1st dose
- Troughs: <0.5 mcg/mL

**Extended interval dosing, CF patients (q 24 hours - TOBRAMYCIN PREFERRED)**
- Peaks: 20-40 mcg/mL
  - Draw peak level ~1 hour following end of infusion
  - Peaks can be drawn after 1st dose
- Random level (10 hours post dose): >1 mcg/mL
- Troughs: <0.5 mcg/mL

**Alternative dosing, CF patients (q 12 hours)**
- Peaks: >10 mcg/mL
- Troughs: <1 mcg/mL

**References**