Aminoglycoside Dosing Algorithm
Gram-Negative Infections

### Calculate Pharmacokinetic Factors & Select Dosing Weight (DW)
- If actual body weight (ABW) < IBW, use ABW
- If ABW < 130% IBW, use IBW
- If ABW > 130% IBW, use adjBW

\[
CrCl \text{ (mL/min)} = \frac{(140 - \text{age}) \times \text{weight} \times (0.85 \text{ for female})}{72 \times \text{Scr}}
\]

### Adjusted body weight (AdjBW)
- IBW + 0.4 x (ABW−IBW)

### Ideal body weight (IBW)
- Male: 50+2.3 x (ht in inches−60)
- Female: 45.5+2.3 x (ht in inches−60)

### CrCl < 30 mL/min

#### Traditional Dosing

**Gentamicin / Tobramycin:** 3 mg/kg (DW)
**Amikacin 7.5 mg/kg (DW)**

Order peak level 30 mins post-infusion
Calculate Vd → Vd = dose / peak

Was Peak at Goal?
- Gent/tobra = 8-10 mg/L
- Amikacin = 25-30 mg/L

- **Yes**
  - Continue same dose

- **No**
  - Calculate new dose
    - New dose = Vd x desired peak

### CrCl ≥ 30 mL/min

#### Extended Interval Dosing

**Gentamicin / Tobramycin:** 5-7 mg/kg (DW)*
**Amikacin 15-20 mg/kg (DW)**

Order random level 8-10 hrs post-infusion
(Plot on nomogram below to determine interval)

### Determine dosing interval with nomogram

**FIG. 1.** ODA nomogram for gentamicin and tobramycin at 7 mg/kg.
Plot gent, tobra, or *amikacin* level to determine interval $rac{2}{2}$


### Follow-up Monitoring

(\text{Goal trough} <1-2 \text{ mg/mL for gent/tobra}; <10 \text{ mg/mL for amikacin})
- Stable renal function – check first trough before 3rd dose
- Check peak and trough every 3 days initially, then weekly
- Serum creatinine daily (2 times weekly long-term)

More frequent monitoring (serum creatinine, troughs, etc) may be required if critically ill or fluctuating renal function.

### For consults / questions / complicated cases:
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* Consider lower doses in elderly patients and higher doses in younger patients and those who may clear drug more quickly

+ Dosing in HD should be based on peak levels (efficacy) and 2-hour post-dialysis levels
Aminoglycoside Dosing Algorithm
Gram-Positive Synergy
(Before using aminoglycosides for gram-positive synergy, recommend formal Infectious diseases consultation to evaluate risk versus benefit of adjunctive aminoglycoside use.)

**Calculate Pharmacokinetic Factors & Select Dosing Weight (DW)**
- If actual body weight (ABW) < IBW, use ABW
- If ABW < 130% IBW, use IBW
- If ABW > 130% IBW, use adjBW

\[
CrCl \ (mL/min) = \left(140 - \text{age}\right) \times \text{weight} \times (0.85 \text{ for female}) / 72 \times \text{SCr}
\]

**Streptococcal Endocarditis**
- Gentamicin 3 mg/kg (DW)
  - CrCl > 30 mL/min: Q24h
  - CrCl < 30 mL/min: Q48h
  - Scheduled HD: Give 1 mg/kg 3x/week

  *If renal function unstable, anuria or random dialysis sessions, dose by level. Check level daily (or pre-dialysis) and redose when <1-2 mg/L.*

*Streptomycin not recommended for streptococcal endocarditis.*

**Follow-up Monitoring**
- (goal trough = undetectable)
  - Stable renal function – check first trough before 3rd dose
  - Check trough every 3 days initially, then weekly
  - Serum creatinine daily (2 times weekly long-term)

*More frequent monitoring (serum creatinine, troughs, etc) may be required if critically ill or fluctuating renal function.*

**Staphylococcal or Enterococcal Endocarditis**
- Gentamicin 1 mg/kg (DW)
  - CrCl > 30 mL/min: Q8h
  - CrCl 10-30 mL/min: Q12h
  - CrCl <10 mL/min: Q24h
  - Scheduled HD: Give 1 mg/kg 3x/week

  *If renal function unstable, anuria or random dialysis sessions, dose by level. Check level daily (or pre-dialysis) and redose when <1-2 mg/L.*

  *For streptomycin dosing, consult ID or pharmacy. (Streptomycin not recommended for staphylococcal endocarditis.)*

**Follow-up Monitoring**
- (goal trough ~1 mg/mL)
  - Stable renal function – check first trough before 3rd dose
  - Check trough every 3 days initially, then weekly
  - Serum creatinine daily (2 times weekly long-term)

*More frequent monitoring (serum creatinine, troughs, etc) may be required if critically ill or fluctuating renal function.*

**Continued maintenance dosing should be adjusted or discontinued based on respective trough targets.**

*Obtain a formal Infectious Diseases consultation regarding duration of adjunctive aminoglycoside therapy.*

**Adjusted body weight (AdjBW)**
- IBW + 0.4 x (ABW–IBW)

**Ideal body weight (IBW)**
- Male: 50+2.3 x (ht in inches-60)
- Female: 45.5+2.3 x (ht in inches-60)

For consults/questions/complicated cases:
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Revised 11/2014

+ Dosing in HD should be based on 2-hour post-dialysis levels