Guidelines for Administration of High Dose Once Daily Aminoglycosides (HDOD)

High Dose Once Daily Aminoglycosides (HDOD) are considered safe and effective in patients with stable renal function

Exclusion Criteria for HDOD:

If patients fall into the following categories, use traditional/conventional dosing since there is limited data using HDOD in the following patient populations

Acute renal failure OR CrCl < 20 mL/min	Age < 18 OR > 90
Half-life ($t_{1/2}$) ≥ 4 hours	Severe burns
Dialysis	Ascites

To use Traditional Dosing Methods, see www.globalrph.com "medical calculator"

For AMG dosing, contact the Antimicrobial Stewardship team or follow the steps below:

I. Calculate the patient's Ideal Body Weight (IBW)

Male: 50 kg + [2.3 kg for each inch over 5 feet]

Female: 45 kg + [2.3 kg for each inch over 5 feet]

II. Determine the dose based on the table below (round dose to the nearest 20 mg)

Aminoglycoside	Maintenance Dose
Tobramycin	5 mg/kg (IBW)
Gentamicin	5 mg/kg (IBW)

- Dose is based on **IBW except** in obese patients **OR** those under their **IBW**
- Use **ABW** if patient weight is less than IBW
- Use **AdjBW** in patients who are obese (≥ 130% of IBW)

Adjusted Body Weight (AdjBW) Calculation

AdjBW = 0.4 (ABW – IBW) + IBW

III. Estimate the patient's creatinine clearance (CrCl) using the Cockcroft and Gault equation (refer to Pharmacokinetic Section)

IV. Select dosing interval based on calculated CrCl from the tables below:

CrCl (mL/min)	Estimated Dosing Interval
≥ 60	Every 24 hours
40–59	Every 36 hours
20–39	Every 48 hours
≤ 20	Use traditional dosing method, see www.Globalrph.com "medical calculator"

ABW= Actual Body Weight; AdjBW= Adjusted Body Weight; AMG= aminoglycosides (i.e., gentamicin and tobramycin); CrCl= Creatinine clearance; HDOD= High Dose Once Daily Aminoglycosides; IBW= Ideal Body Weight (in kg); t1/2= half life

V. Commonly Targeted Peak and Trough Concentrations in HDOD

Disease State	Gentamicin/Tobramycin		Amikacin	
	Recommended Peak (mcg/mL)	Estimated mg/kg (IBW)	Recommended Peak (mcg/mL)	Estimated mg/kg (IBW)
Cystitis	6–8	2–3	30-40	10–15
Gram-Positive Synergy	6–8	2–3	30–40	10–15
Pyelonephritis	12–14	3–4	60–70	20
Pneumonia	16–20	5–6	60–80	20–25
Sepsis	10–12	3–4	60–70	20
Intra-abd/SSTI	12–16	4–5	60–70	20
Clinical Considerations	**Trough should not exceed 0.3 mcg/mL**		**Trough should not exceed 1 mcg/mL**	

VI. Monitoring of serum levels and dosage adjustments

a. First-dose levels are **NOT** routinely needed

- First-dose levels may be indicated in patients with variable volume of distribution or unstable renal function (sepsis or post-operatively) to assess clearance

b. Serum levels should be performed routinely by day 3 of therapy ***only*** once it has been determined that aminoglycoside therapy is to continue

- **Example:** ***empiric therapy for sepsis from a UTI awaiting culture results does not require peak/trough levels***

c. Peak and trough serum levels: 1–2 hours post-end of infusion (peak) and immediately prior to the next dose

- Document actual time medication was hung
- Obtain peak level 1-2 hour post infusion (very important for distribution phase); 2 hr preferred if dose > 400 mg
- Use pharmacokinetic formulas (or www.globalrph.com "medical calculator"), to extrapolate peaks and troughs
- Extrapolated trough concentrations should not exceed 0.30 mg/mL
- Dosage or interval adjustments should be made at this time

d. Once stabilized, if therapy is to continue > 1 week, obtain the following laboratory values:

- SCr and BUN levels to monitor renal function (every other day)
- Peak and trough levels (efficacy and no toxicity), twice per week

e. If there is a suggested change in renal function OR other nephrotoxic agents (e.g., cisplatin, amphotericin B, pentamidine, vancomycin) are being used concurrently, more frequent levels of BUN, SCr, and monitoring may be necessary

BUN= Blood urea nitrogen; HDOD= high dose once daily; IBW= ideal body weight; SCr= Serum creatinine; SSTI= skin and soft tissue infection; UTI= Urinary tract infection