Riverside Medical Center
Department of Pharmacy
Adult Aminoglycoside Extended-Interval Dosing Protocol

EXTENDED-INTERVAL AMINOGLYCOSIDE DOSING (EID)

EID is the preferred dosing strategy for aminoglycosides except in the following situations:

- Pregnant patients
- Pediatric patients (<18 yo)
- Burn patients
- Neutropenic patients
- Patients with ascites, extensive edema, shock, or any other situation where volume status is unknown or rapidly changing
- Renal function is unstable (SCr changed by 0.5 mg/dL or 30% in last 48 hours)
- Patients with CrCL<20 mL/min or on any type of dialysis
- When used for enterococcal endocarditis
- When used for gram-positive infections (i.e. synergy dosing)

1. Choosing which weight to use:

- If the patient is NORMAL or UNDERWEIGHT, use actual body weight (ABW)
- If the patient is OBESE (>20% over IBW), use adjusted body weight (AdjBW)
  - AdjBW = IBW+0.4 (ABW-IBW)

2. Calculate the DOSE of the aminoglycoside to be infused over 1 hour.

- Gentamicin or Tobramycin: 7 mg/kg
- Amikacin: 15 mg/kg
- Round to the nearest 10mg for gent/tobra and 50mg for amikacin

3. Calculate the patient's creatinine clearance (CrCl) and choose an empiric interval:

CrCl (mL/min)	Dosing Interval
≥60 mL/min	Q 24 hours
40-59 mL/min	Q 36 hours
20-39 mL/min	Q 48 hours
<20 mL/min	use conventional dosing

4. Order a random serum drug level 7 -12 hours after the start of the infusion of the 1st dose. Peak levels should NOT be drawn when using EID therapy.

5. Initiate therapeutic monitoring i-Vent in Epic and copy to progress note.

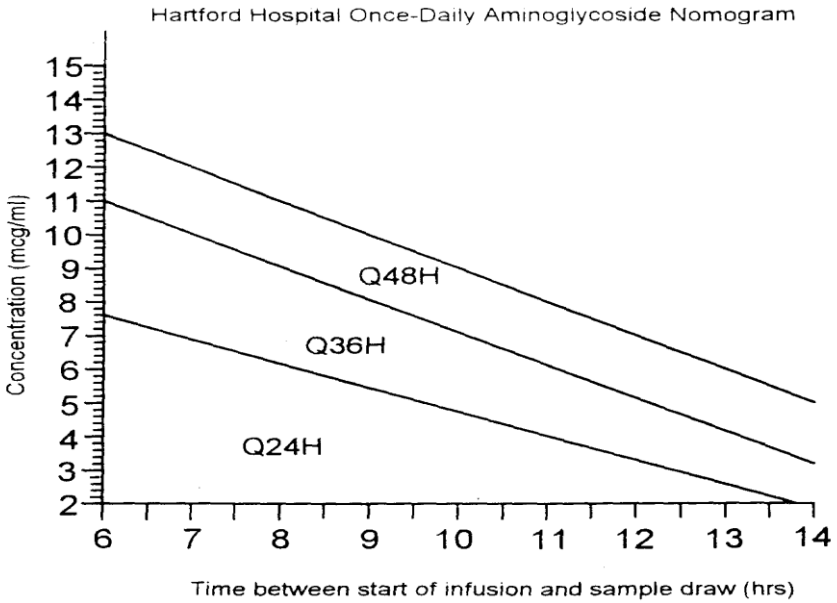
a. Enter "Aminoglycoside Name" Dosing per Pharmacy Protocol order if not done so already
b. Open a new i-Vent linked to the Dosing per Pharmacy Protocol order
c. Select the appropriate subtype
d. Choose appropriate follow-up day/time
e. Complete initial consult note
f. Copy to progress note for the treatment team

6. Apply the serum concentration to the Hartford Nomogram [time the serum concentration was obtained (X-axis) versus actual serum concentration (Y-axis)]

- Gentamicin or Tobramycin: use actual serum concentration
- Amikacin: Use ½ of the actual serum concentration

7. Determine the dosing interval based on serum drug level:

- Empiric dosing interval may need to be adjusted based on the serum drug level and where it falls in the nomogram
- If the point falls on a line, choose the longer interval
- If the random level is below the nomogram, use Q 24 hours for the interval or convert to conventional dosing
- If the random level is above the nomogram, the scheduled therapy should be stopped. Draw another concentration at 24-36 hours after the start of infusion and convert the patient to conventional dosing.



8. Update therapeutic monitoring i-Vent and copy to progress note.

9. Follow-up monitoring:

- BUN/Scr daily
- Daily updates to the therapeutic monitoring i-Vent and copy to progress note
- If treatment continues > 5 days, obtain a trough level and check for toxicity.
- Goal trough level is <1 mcg/mL
- If clinical condition or renal function changes draw serum levels when clinically appropriate

Riverside Medical Center
Pharmacy Department
Adult Aminoglycoside Conventional Dosing Protocol

CONVENTIONAL AMINOGLYSIDE DOSING

****This dosing should be used in patients who are not eligible for extended-interval dosing.****

1. Calculate dose:
Aminoglycoside dosing should be based on IBW except for the following instances:

- If the patient is UNDERWEIGHT, use actual body weight (ABW)
- If the patient is OBESE (>20% over IBW), use adjusted body weight (AdjBW)
  - AdjBW = IBW+0.4 (ABW-IBW)

Loading and maintenance doses should be dosed according to the following table:

TYPE OF INFECTION	GENTAMICIN or TOBRAMYCIN	AMIKACIN
Life Threatening Infections (i.e. pneumonia, sepsis)	LD = 2.5 mg/kg MD = 2 mg/kg/dose	7.5 mg/kg/dose
Severe (i.e. soft tissue, pyelonephritis)	LD = 2 mg/kg MD = 1.5 mg/kg/dose	7.5 mg/kg/dose
Urinary Tract Infections or Synergy (for gram-positive infections)	LD = 2 mg/kg MD = 1 mg/kg/dose	7.5 mg/kg/dose

- Round to the nearest 10mg for gent/tobra and 50mg for amikacin

2. Calculate interval:
Use the following table for the dosing interval:

CALCULATED CrCl	DOSING INTERVAL
> 60 mL/min	Q 8 hours
40-60 mL/min	Q 12 hours
20-39 mL/min	Q 24 hours
< 20 mL/min	Order random level at 24 hours; dose according to level

3. Initiate therapeutic monitoring i-Vent in Epic and copy to progress note.

a. Enter "Aminoglycoside Name" Dosing per Pharmacy Protocol order if not done so already
b. Open a new i-Vent linked to the Dosing per Pharmacy Protocol order
c. Select the appropriate subtype
d. Choose appropriate follow-up day/time
e. Complete initial consult note
f. Copy to progress note for the treatment team

4. Therapeutic aminoglycoside monitoring:

Peak and trough levels should be drawn around the third maintenance dose. Trough should be obtained 30 minutes BEFORE the third maintenance dose; peak should be drawn 30 minutes after the END of infusion.

TYPE OF INFECTION	GENTAMICIN or TOBRAMYCIN		AMIKACIN	
	Peaks	Troughs	Peaks	Troughs
Life Threatening (i.e. pneumonia, sepsis)	8-10 mcg/ml	< 2 mcg/ml	25-30 mcg/ml	5-10 mcg/ml
Severe (i.e. soft tissue, pyelonephritis)	6-8 mcg/ml	< 2 mcg/ml	20-25 mcg/ml	5-10 mcg/ml
Urinary Tract Infections	4-6 mcg/ml	< 2 mcg/ml	15-20 mcg/ml	5-10 mcg/ml

5. Follow-up monitoring and documentation:

- BUN/Scr daily
- Daily updates to the therapeutic monitoring i-Vent and copy to progress note
- Reorder PEAK and TROUGH levels with 3rd – 4th maintenance dose if change in dose, renal function, or clinical status
- If stable, obtain TROUGH every 3-5 days

References:

1) Gentamicin injection [prescribing information]. Schaumberg, IL: APP Pharmaceuticals LCC; August 2008.
2) Tobramycin (tobramycin sulfate injection solution) [prescribing information]. Lake Forest,IL: Akorn Inc; August 2014.
3) Amikacin [prescribing information]. Eatontown, NJ: Heritage Pharmaceuticals; December 2013.
4) Nicolau DP, Freeman CD, et al. Experience with a once-daily aminoglycoside program administered to 2,184 adult patients. Antimicrobial Agents and Chemotherapy;1995:650-655.
5) Maglio D, Nightingale C, & Nicolau DP. Extended interval aminoglycoside dosing: from concept to clinic. International Journal of Antimicrobial Agents;2002;19:341-348.
6) Freeman CD, Nicolau DP, et al. Once-daily dosing of aminoglycosides: review and recommendations for clinical practice. Journal of Antimicrobial Chemotherapy; 1997;39:677-86.