

HP is a 58 y/o male who presents to the ER with mental status changes, lethargy, fever and diaphoresis. His wife says “he just hasn’t been himself”. She found him on the sofa somewhat unresponsive and decided to get help. Looking at his chart you see he was treated for prostate cancer in 2006 and was seen in the outpatient clinic for a UTI 6 days ago. Blood and urine cultures are obtained and IV fluids are started.

Physical Exam: Tmax 39.8°C, BP 114/65 mmHg, P 80 BPM, R 18 /min, Ht 67 in, Wt 58.2 kg

Labs: WBC 17.8 (84% segs), BUN 48 mg/dL, Scr 2.0 mg/dL

Gram stains of the blood culture reveals GNR (Gram-negative rods) 2 of 2

The ER attending makes the diagnosis of Gram-negative sepsis likely secondary to UTI. As the pharmacist on the ER team you are consulted for recommendations. You recommend starting tobramycin ASAP and the team agrees. The plan is to give HP one dose of tobramycin in the ER and get him transferred up to the MICU for further care.

1. What is HP’s ideal body weight?
2. What is HP’s CrCl?
3. What is the anticipated half-life of tobramycin in HP?
4. What dose of tobramycin do you recommend based on 2mg/kg/dose?

Three days later you are in the MICU monitoring HP (now admitted for continued IV antibiotics). Looking in the chart you see that after your initial dose in the ER, HP was started on a tobramycin regimen of 80 mg Q8h. You also notice that his cardiac output has improved, his Scr is trending down and his urine output has increased. You request tobramycin levels with the next dose to ensure you are within therapeutic range. The lab reports the following:

Tobramycin 0.8 mg/L @ 1430
Tobramycin 3.9 mg/L @ 1630

You talk to the nurse and she says HP gets his tobramycin at 0700, 1500 and 2300. As per hospital policy, all aminoglycosides are infused over 30 minutes.

5. Calculate the half-life based on HP’s actual renal function

6. Determine the actual (back-extrapolated) tobramycin peak

7. Calculate the volume of distribution

You speak with the physician about HP's tobramycin therapy and you both agree to target a peak of 8 mg/L and trough of 1 mg/L. Based on your calculations above:

8. What dosing interval will you use to achieve this target?

9. What tobramycin dose will achieve this target with your selected interval?