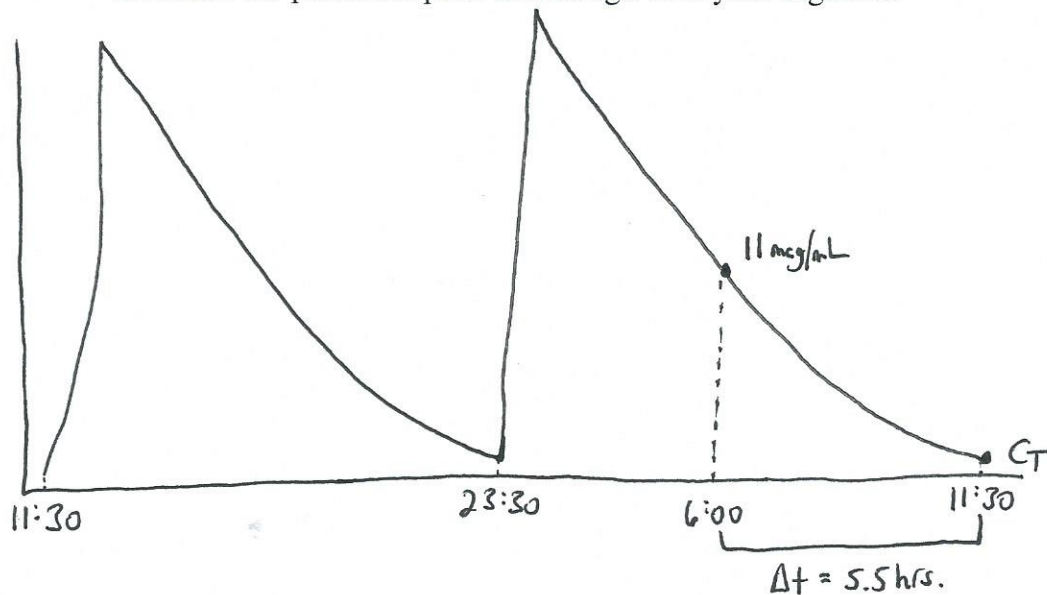


1. JR is a 42 yo, 5'11, 200 lb male currently being treated with vancomycin 1000 mg IV q12 for MRSA cellulitis of the upper extremity. His SrCr is stable at 1.2 mg/dL. Vancomycin is being administered at 11:30 and 23:30. Prior to the fifth dose of vancomycin, a measured trough at 6:00 is 11 mcg/mL. The goal vancomycin trough for this patient is 15 mcg/mL and goal vancomycin peak is 30 mcg/mL.

- a) Assess the vancomycin trough and recommend a new dosing regimen if necessary. Calculate the predicted peak and trough with your regimen.



$$\textcircled{1} \text{CrCl} = \frac{(140 - 42)(90.9)}{72 \times 1.2} = \boxed{103 \text{ mL/min.}}$$

$$\textcircled{6} \text{new } k_0 = (0.09/\text{h})(63.6 \text{ L})(30 \text{ mg/L})$$

$$\textcircled{2} k_e = 0.00083(103 \text{ mL/min}) + 0.0044 = \boxed{0.09/\text{h}}$$

$$\frac{(1 - e^{-0.09/\text{h} \times 8\text{h}})}{(1 - e^{-0.09/\text{h} \times 1\text{h}})} =$$

$$\textcircled{3} C_2 = C_1 \times e^{-k_e \times t}$$

$$k_0 = \frac{1024 \text{ mg}}{\text{h}} \times 1\text{h} = 1024 \text{ mg} \Rightarrow \boxed{1000 \text{ mg}}$$

$$C_T = 11 \text{ mg/L} \times e^{-0.09/\text{h} \times 5.5\text{h}}$$

$$\boxed{C_T = 6.7 \text{ mg/L}} \rightarrow \text{too low}$$

$$7. C_{\text{peak}} = \frac{1000 \text{ mg}}{\text{h}} \times \frac{(1 - e^{-0.09/\text{h} \times 1\text{h}})}{(1 - e^{-0.09/\text{h} \times 8\text{h}})} =$$

$$\textcircled{4} V_d = \frac{0.7 \text{ L}}{\text{kg}} \times 90.9 \text{ kg} = \boxed{63.6 \text{ L}}$$

$$\boxed{C_{\text{peak}} = 29.3 \text{ mg/L}}$$

$$\boxed{\begin{array}{l} 1000 \text{ mg IV q8h} \\ C_p = 29.3 \text{ mg/L} \\ C_T = 15.6 \text{ mg/L} \end{array}}$$

$$\textcircled{5} \tau_{\text{new}} = \frac{\ln(30 \text{ mg/L} / 15 \text{ mg/L})}{0.09/\text{h}} + 1\text{h} = 8.7\text{h} \Rightarrow \boxed{8\text{h}}$$

$$8. C_{\text{Trough}} = 29.3 \text{ mg/L} \times (e^{-0.09/\text{h} \times 8\text{h}})$$

$$\boxed{C_{\text{Trough}} = 15.6 \text{ mg/L}}$$

2. SW is a 67 yo, 5'0", 180 lb female with gram-negative bacteremia. Her SrCr is 1.5 mg/dL and has been stable. The attending physician would like to initiate tobramycin, using extended-interval dosing. He asks you to help him calculate the initial dosing regimen.

- a) Calculate the initial dose and dosage interval using the Hartford nomogram.

$$\frac{7\text{mg}}{\text{kg}} \times 60\text{kg} = \boxed{420\text{mg}}$$

← Adj BW (obese)

$$CrCl = \frac{(140 - 67)(60)}{72 \times 1.5} \times 0.85 = \boxed{35\text{ mL/min}}$$

↓
Q 48h.

$$BMI = \frac{81.8\text{kg}}{(1.52\text{m})^2} = 35.4\text{ kg/m}^2 \Rightarrow \text{OBESE}$$

$$IBW = 45.5 + 2.3(0) = 45.5\text{ kg}$$

$$Adj\ BW = 0.4(81.8 - 45.5) + 45.5 = 60\text{kg}$$

420mg IV q 48h.

- b) A random gentamicin concentration measured 8 hours after the dose is 8 mg/L. Does the dosing regimen need to be altered? If so, what is the new recommended dosing regimen?

Yes, the dose remains the same = 420mg.

Based on the Hartford nomogram, the interval needs to be changed to Q 36h.

420mg IV q 36h.