PHA 5128

Homework 3,
Spring 2009 (10pts)

1. A 69 year old male who is being treated for a gram negative wound infection with gentamicin. He is 5'4" tall and weighs 172 lbs. His SCr is 1.3 mg/dL (8pts).

   a) Calculate his gentamicin clearance (1pt).

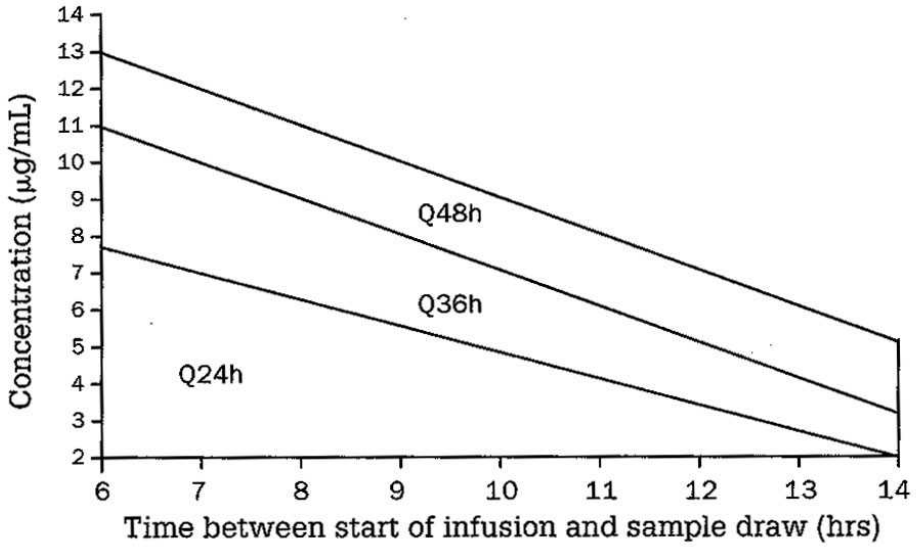
   b) Calculate the volume of distribution (*Vd*) and elimination half-life ($T_{1/2}$) (1pts)

   c) Calculate the dose and dosing interval if 10 mg/L (clinical peak) and 1 mg/L (clinical trough) of a half-hour infusion treatment are desired (2pts).

   d) For Once-a-day strategy (Q24h), calculate the steady state concentration C_{11} (11 hour after the start of infusion) with 7 mg/kg (for dosing weight) gentamicin in a 30-minute-infusion (assume one-compartment as in class) (1pt).

   e) Assume C_{11} calculated in d) is the real observation, how should we adjust dosing interval according to ODA nomogram below (1pt).

ODA Nomogram for Gentamicin and Tobramycin at 7 mg/kg



2. Discuss why the sampling time is important to monitor aminoglycoside administration. When and why clinical peak and trough levels should be drawn. (2pts)

3. K. T., a 42-year old, 50-kg, non-obese woman with a serum creatinine of 1.5 mg/dL. What is the dosing regimen according to the nomogram below? Following the recommended treatment, what is the expected peak vancomycin concentration for her at steady state (assume i.v. bolus)? (2pts).

Cl_{cr} (ml/min) →	30	40	50	60	70	80	90	100	≥ 110
Weight (kg) ↓									
50	500 q24h	500 q24h	500 q12h	500 q12h	500 q12h	500 q12h	500 q12h	500 q8h	500 q8h
55	500 q24h	500 q24h	500 q12h	500 q12h	500 q12h	500 q12h	500 q12h	500 q8h	500 q8h
60	500 q24h	500 q24h	500 q12h	500 q12h	1000 q12h	1000 q12h	1000 q12h	500 q8h	500 q8h
65	1000 q24h	1000 q24h	1000 q24h	1000 q12h	1000 q12h	1000 q12h	1000 q12h	1000 q12h	1000 q8h
70	1000 q24h	1000 q24h	1000 q24h	1000 q12h	1000 q12h	1000 q12h	1000 q12h	1000 q8h	1000 q8h
75	1000 q24h	1000 q24h	1000 q24h	1000 q12h	1000 q12h	1000 q12h	1000 q12h	1000 q8h	1000 q8h
80	1000 q24h	1000 q24h	1000 q24h	1000 q12h	1000 q12h	1000 q12h	1000 q12h	1000 q8h	1000 q8h
85	1000 q24h	1000 q24h	1000 q24h	1000 q12h	1000 q12h	1000 q12h	1000 q8h	1000 q8h	1000 q8h
90	1000 q24	1000 q24h	1000 q12h	1000 q12h	1000 q12h	1000 q8h	1000 q8h	1000 q8h	1000 q8h
95	1000 q24h	1000 q24h	1000 q12h	1000 q12h	1000 q12h	1000 q8h	1000 q8h	1000 q8h	1000 q8h
100	1000 q24h	1000 q24h	1000 q12h	1000 q12h	1000 q12h	1000 q8h	1000 q8h	1000 q8h	1000 q8h
105	1000 q24h	1000 q24h	1000 q12h	1000 q12h	1000 q12h	1000 q8h	1000 q8h	1000 q8h	1000 q8h
≥ 110	1000 q24h	1000 q24h	1000 q12h	1000 q12h	1000 q12h	1000 q8h	1000 q8h	1000 q8h	1000 q8h

Figure 1. Detroit Receiving Hospital and University Health Center vancomycin dosing nomogram. (Updated 5/99)