

### Case Studies #3

1. B.F. is a 5' 4", 72 kg, 30 year old female who suffered a severe burn that has since been infected by *S. aureus*. Her  $C_{p_{creat}}$  is measured at 0.6 mg/dL. Design a dosing regimen of half-hour i.v. infusions of gentamicin that will give her a true  $C_{max}$  of 7.5 $\mu$ g/ml and a true trough concentration of 0.5 $\mu$ g/ml.
2. B.F. is given the infusion you recommended at 8:00 am. At 9:00 am a plasma sample is taken and yields a  $C_{p^*_{max}}$  of 9.2  $\mu$ g/ml. Another sample is taken one half hour before the next infusion to give a  $C_{p^*_{min}}$  of 2.4 $\mu$ g/ml. Calculate the actual  $k_e$  and  $V_d$  for B.F. and recommend a dosing change to give a true  $C_{max}$  of 7.5 $\mu$ g/ml. What is the new true  $C_{min}$  expected with this dosing change.
3. I.P. is admitted to the hospital after a major auto accident. At admission he weighed 71kg, and is 5'9". The day following surgery I.P. weighs 76kg and is suffering from an infection. At 10:00 am he is given a half an hour infusion of 350mg of amikacin.
  - a. Predict his volume of distribution.
  - b. What will his plasma concentration be at 3:00pm if his creatinine clearance is 7.2 L/h or 120ml/min?
4. G.W., a 30 year old, 50kg man, is receiving 70 mg of tobramycin infused IV over a 30 minute period every 8 hours. His serum creatinine has increased from 1mg/dl to 2mg/dl over the past 24 hours. Because his renal function appears to be decreasing, three plasma samples were obtained to monitor serum gentamicin concentrations as follows: just before a dose, 1 hour after the end of the infusion, and at the end of the dosing interval (two troughs and one peak level). The serum gentamicin concentrations at these times were 4mg/L, 8mg/L, and 5mg/L. Calculate the volume of distribution, elimination rate constant and clearance of tobramycin for G.W.
5. H.K., 55 year old, 55kg woman with a serum creatinine of 1.0mg/dl, has been empirically started on 500mg of vancomycin every 8 hours for treatment of a staphylococcal infection. What are the expected peak and trough vancomycin concentrations for H.K.