PHA 5127
Case Study 3
Fall 2002

1.   Is it possible that the renal clearance can exceed the hepatic clearance in a patient
      with normal kidney and liver function?

2.   Which of the following factors significantly affect the renal clearance of an
      unionized drug that shows complete passive renal reabsorption from the "urine"
      back into the blood:

      a)   plasma protein binding
      b)   activity of cationic transporters in the tubuli.
      c)   urine flow
      d)   pH of urine
      e)   liver blood flow

3.   Why do we use IBW (ideal body weight) for the calculation of CrCL (creatinine
      clearance) in Cockcroft-Gault equation?

4.   In order to calculate the CrCL, what information do we need?

5.   A 24-year-old female patient Noel Christmas (72 kg, 66 inches), is admitted to the
      hospital after sustaining multiple traumatic injuries. Her recovery is complicated
      by the onset of moderate renal failure and she also experienced a spiking fever,
      gram-positive bacilli, and the physician decides to begin a course of gentamicin.
      The serum creatinine level of this patient is 1.6 mg/dL. [k_e (h^{-1})= 0.00293
      [CrCL(mL/min)]+0.014].

      a) Calculate the creatinine clearance of this patient using Cockcroft-Gault
          equation.

      b) After the first iv dose of gentamicin (2 mg/kg), the blood sample was taken at
          1 hr and the plasma concentration was 7.5 mg/L. How long will it take for
          plasma level to reach 2 mg/L?