PHASE 5127 Dose Optimization I

Case Study IV

1. For the following situations, indicate whether the drug is: filtered, reabsorbed (if fully or if reabsorbed through transporters), or actively secreted (Assume GFR is 130mL/min, urine flow is 1.5mL/min)
   a. Drug with \( fu = 0.3 \) and \( Cl_{ren} = 39 \text{mL/min} \)
   b. Drug with \( fu = 0.6 \) and \( Cl_{ren} = 30 \text{mL/min} \)
   c. Drug with \( fu = 0.05 \) and \( Cl_{ren} = 15 \text{mL/min} \)
   d. Drug with \( fu = 0.2 \) and \( Cl_{ren} = 0.3 \text{mL/min} \)
   e. Drug with \( fu = 0.8 \) and \( Cl_{ren} = 0.3 \text{mL/min} \)

2. A 25 year old, 5’6”, 80kg male patient with a serum creatinine concentration of 1.8mg/dL was given a drug treatment. Knowing this drug is mainly eliminated by glomerula filtration and has 60% plasma protein binding. Please estimate the Clearance of this drug (with Cockcroft-Gault equation)

3. TRUE (T) or FALSE (F)
   a. For a high extraction drug, liver blood flow is important to both hepatic clearance and oral bioavailability. 
      T  F
   b. For low extraction drug, \( fu \) (fraction of unbound drug in plasma) is important to both hepatic clearance and oral bioavailability. 
      T  F
   c. Basic drugs that are polar in their unionized form, the extent of re-absorption depends on the degree of its ionization. 
      T  F
   d. Secretion is indicated when renal clearance is larger than GFR*fu. 
      T  F
It is possible for renal clearance to be close to the kidney blood flow.

T    F

Assuming no plasma protein binding, the renal clearance equals the urine flow when full re-absorption occurs.

T    F