Hepatic Clearance Practice Problems
See also all examples and practice problems from DiPiro Lesson 9

Multiple Choice

1. Intrinsic clearance is the maximal ability of the liver to eliminate drug in the absence of any blood flow limitations.
   A. True
   B. False

2. What factors should be considered when trying to assess a patient’s hepatic metabolism?
   A. Extraction ratio
   B. Plasma protein binding
   C. Disease states
   D. Drug interactions
   E. All of the above

3. You have a patient who is being treated with lidocaine for ventricular arrhythmia. Lidocaine is primarily metabolized by CPY1A2, has a high extraction ratio, and is highly bound by the plasma protein alpha-1-acid glycoprotein. Lidocaine is being administered via a constant rate IV infusion. If your patient was to have a non-fatal myocardial infarction that resulted in no significant decrease in hepatic blood flow, how would you expect the hepatic clearance of lidocaine and the pharmacologic response to lidocaine to change? (Myocardial infarctions are known to significantly increase the concentration of alpha-1-acid glycoprotein)
   A. Decrease in hepatic clearance and increase in pharmacologic response
   B. Decrease in hepatic clearance and decrease in pharmacologic response
   C. Increase in hepatic clearance and decrease in pharmacologic response
   D. No significant change in hepatic clearance and decrease in pharmacologic response
   E. No significant change in hepatic clearance and increase in pharmacologic response

4. In what group of drugs would you expect hepatic enzyme induction and inhibition to have a greater impact on hepatic clearance?
   A. Low extraction ratio drugs
   B. High extraction ratio drugs
   C. Both A and B
   D. Not enough information to determine
   E. None of the above
Fill in the blank

Fill in the blank with “increase,” “decrease,” or “stay the same.”

Drug A is highly metabolized by enzyme CYP3A4 into metabolite B. Metabolite B undergoes glucuronidation via enzyme UGT to form metabolite C. Metabolite C is eliminated from the body renally. Drug D induces CYP3A4. Drug E inhibits UGT.

5. If a patient taking drug A starts taking drug D, the plasma concentration of A will likely ……………… and the plasma concentration of B will likely ………………

6. If a patient taking drug A starts taking drug E, the plasma concentration of B will likely ……………… and the plasma concentration of C will likely ………………

7. If a patient taking drug A does into renal failure, the plasma concentration of C will likely ………………

8. List four factors that were discussed in class that can have an effect on hepatic metabolism:

……………………………………
……………………………………
……………………………………
……………………………………
Hepatic Clearance Practice Problems

Answer Key

1. A
2. E
3. E
4. A
5. decrease; increase
6. increase; decrease
7. increase
8. Possible answers include changes in liver function, changes in liver blood flow (Qh), intrinsic clearance, plasma protein binding, age, disease states or conditions (cirrhosis, hepatitis, heart failure, myocardial infarction, physical trauma, surgery), genetics, drug interactions (enzyme induction, enzyme inhibition)