**Team Case Assignment: Clinical Pharmacokinetics P313**

**March 26, 2013**

1. On rounds during your first rotation in the ICU, the team decides to start a patient on amiodarone for a ventricular arrhythmia. The team wants to load the patient with IV amiodarone (total 5 grams) then change to an oral maintenance dose.

A. How many days would you recommend to continue the IV amiodarone in order to complete a full loading dose?

B. Based on amiodarone pharmacokinetic parameters, explain to the physician in 1-2 sentences why it takes multiple days to fully load a patient on amiodarone compared to other drugs that require loading doses.

2. MJ is a 85 year-old, 45kg (5ft 1 in) female being treated for moderate heart failure. Her current serum creatinine is 1.7 mg/dl. You are a pharmacist working in an outpatient heart failure clinic.

A. Compute an oral digoxin tablet maintenance dose for this patient that will maintain a digoxin concentration of 0.8 mcg/L.

B. Would you recommend checking a digoxin concentration in MJ? If so, when would you recommend making another appointment for MJ in order to check a digoxin concentration? You cannot tell the patient to come back after 3-5 half-lives.

3. A 67 year-old, 130 kg (5’11”) male with ventricular tachycardia requires therapy with intravenous lidocaine. He has severe heart failure (NYHA Class IV) and normal liver function.

A. Suggest a loading dose of IV lidocaine for this patient. The goal concentration is 2 mg/L.

B. The physician started the patient on lidocaine 3 mg/min. The patient started to experience confusion and visual disturbances and a steady state concentration was found to be 6 mg/L. Calculate a new infusion dose to achieve a concentration of 2 mg/L. (Assume the infusion will be held until adverse effects resolve or at least estimated 1 half-life.)

Team-based learning assignment

March 26, 2013

Student names (List only names of students present): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Question 1A:**

Day 1: 150mg bolus + infusion at 1mg/min x 6 hrs + 0.5 mg/min x18 hrs = 1050mg on day 1

0.5mg/min x 24 hrs= 720 mg/day (after day 1)

Need 5000mg

- 1050mg (day 1)

3950 mg needed after day 1

3950mg/ 720mg (daily amount receiving at 0.5mg/min) = 5.5 days

5.5 days + day 1 = 6.5 days round to 7 days total

**Question 1B:**

Amiodarone Vd is large. Large doses are necessary to saturate tissue body stores.

**Question 2A:**

1. Calculate CrCl= 17ml/min

2. Calculate digoxin clearance for CHF= 1.3(CrCl) + 20 ml/min

Digoxin Cl= 42ml/min or 60L/day

3. MD= 0.8 mcg/L \* 60L/day

0.7

MD= 69 mcg/day – must round to nearest available dosage form which is ½ of a 125 mcg tablet or 125 mcg tab every other day

**Question 2B:**

Half-life = 0.693 (Vd)

Cl

1. Vd= 226 + 298 \* 17 ml/min x (45kg/70kg)

29.1 + 17 ml/min

2. Vd= (226 + 110) x 0.64

3. Vd= 215 L

4. Cl= see question 2

5. Half- life = 0.693 (215L) = 2.5 days

60 L/day

Answer: Choose any day between: 8- 13 days (3-5 half-lives) unless patient is displaying signs/symptoms of toxicity

**Question 3A:**

**Question 3B:**

**estion 3B:**