A 68 y/o male with atrial fibrillation uncontrolled on metoprolol 100 mg PO q12 and diltiazem CD 360 mg daily. The team gives a digoxin loading dose: 0.5 mg at 12 noon, 0.25 mg at 6 pm and 0.25 mg at midnight. A digoxin serum concentration was drawn at 4 am and found to be 3.6 mcg/L. Based on what you know about digoxin’s distribution phase, what is the best explanation as to why this patient’s digoxin concentration is supratherapeutic?

Wait 8 - 12 hrs

**Question 1:**

KM is a 56 yo male with PMH significant for NYHA Class III CHF, atrial fibrillation and CKD. KM presents to the ER with a feeling of palpitations and dizziness.

Current meds:

Warfarin 5 mg daily

Enalapril 5 mg daily

Metoprolol 100 mg BID

Furosemide 40 mg daily

VS: BP 96/52 HR 140 irreg irreg RR 20 Temp 99◦F Wt 80 kg Ht 5’6” inches

Pertinent labs: SCr 3.5 K+ 5

**The resident has decided to load KM on oral digoxin tablets to obtain ventricular rate control. The resident would like to obtain a serum digoxin concentration of 1 mcg/L. Calculate a loading dose for KM.**

1. **Determine if patient is obese and CrCl**

BMI = 28

CrCl = 27

1. **Calculate volume of distribution**

**424 L**

1. **Calculate loading dose**

424 mcg pure

600 mcg tab

**Question 2: Calculate a Maintenance dose for KM with a goal steady-state serum level of 1 mcg/L.**

1. **Calculate CrCl using the Cockcroft-Gault Method and determine if patient has CHF. Calculate clearance.**

55.1 ml/min

0.0551 L/min

1. **Calculate the maintenance dose, using the following formula:**

0.0551 mcg/min

80 mcg/day pure

digoxin 125 mcg tab daily

1. **Calculate Css based on the maintenance dose you calculated.**

MD = Css \* CL

MD = 0.06076 mcg/min

0.06076 mcg/min = Css \* 0.0551 L/min

1. **If you want to check a serum level at steady state to be sure you achieved a therapeutic level, when can you do so?**

1. Ideally 7-14 days after initiation or change in therapy (at steady-state)

**Question 3: Two weeks later KM is admitted back into the hospital with bradycardia. He was taking digoxin tablets 125 mcg daily at home. His steady state concentration is 2.5mcg/L. Calculate a new dose for KM. Target digoxin concentration 1.2 mcg/L.**

**1. Calculate clearance based on actual concentrations.**

CL = dose/Css = 50 L/day

**2. Compute new dose based on actual clearance**

MD = CL \* Css = 60 mcg/day

Gvngvhd

**Question 4:** A mother brings her 2 month old child (5.5 kg) into the emergency room after noticing that she had been administering 2.5 ml of the 50mcg/ml digoxin solution to her baby instead of 0.25 ml. The digoxin concentration was 13 mcg/L. Should we administer DigiFab to this patient? If so, what dose would we administer? **Note: Dosing in pediatrics is based in mg (40 mg/vial)**

* 1 vial (40 mg) binds 0.5 mg of digoxin 🡪 0.026 vials

OR

DigiFab (no. of vials) = Digoxin concentration (mcg/L) x weight in kg 🡪 0.71 vials

100