**Question 1: A non-obese 70 kg patient with normal organ function is ordered lidocaine for refractory ventricular tachycardia. What loading dose would you recommend? Goal 2 mg/L**

**1. Calculate volume of distribution (Vc and Vd)**

Vc = central compartment (includes heart)

Va = area (other organs)

LD = Cdes \* Vd

Vc = 70 \* 0.5 = 35L

**2. Calculate loading dose**

LD \* 0.87 salt = 2 mg/L \* 35 L

LD = 80 mg

**3. Based on what you know about lidocaine’s volume of distribution, why do you think a second loading dose is frequently needed to obtain a desired effect?**

**The patient from question 1 is still requiring lidocaine and the physician would like to order a maintenance infusion. What dose would you recommend?**

**4. Calculate clearance**

Cl = 10 ml/kg/min (on equation sheet)

70 kg on previous page

CL = 10 ml/kg/min \* 70 kg = 700 ml/min

**5. Calculate maintenance infusion dose**

infusion range 1-4 mg/min

goal: 2 mg/L

infusion = 2mg/L \* 0.7 L/min = 1.7 mg/min \* 0.87 salt = 1.5 mg/min

1.6 mg/min

**6. The patient’s nurse asks you to calculate the infusion rate of lidocaine (ml/hr). What would you recommend based on the maintenance dose calculated above? The infusion is a 0.4% solution.**

24 ml/hr

**7.** **When should a serum concentration be sampled in this patient**

calculate t1/2 = ln2 \* Varea / CL

Varea = 1.5 \* 70 = 105 L

CL = 700 L/min

T1/2 = 104 min

SS is when 3-5 t1/2

4-8 hours (when steady state occurs)

**Question 2: The team obtained a serum lidocaine concentration at the time you requested and it returned as 6.5 mg/L at the maintenance dose you recommended. Calculate a new dose that should provide a steady-state concentration of 2mg/L.**

**1. Calculate new clearance**

0.21 L/min

**2. Calculate new maintenance infusion rate**

1.6 mg/min ---- 6.5 mg/L

x ---- 2 mg/L

maintenance dose = 0.5 mg/min

**3. Calculate the infusion rate for the new dose.**

Use k0 = Css \* CL

0.5 mg/min