

## Homework Problem 2

1. A patient weighs 130lbs, ASA I. You have elected to anesthetize your patient with lidocaine 2%, epinephrine 1:100,000. What is the maximum number of cartridges your patient can receive?

With respect to lidocaine:

**Method 1**

$$130 \text{ lbs} \times \frac{2 \text{ mg lido}}{1 \text{ lb}} \times \frac{100 \text{ mg solution}}{2 \text{ mg lido}} \times \frac{1 \text{ ml solution}}{1000 \text{ mg solution}} \times \frac{1 \text{ cartridge}}{1.8 \text{ ml solution}}$$

$$= 7.22 \text{ cartridges}$$

130 lbs : patient weight

**2 mg lido /lb** : you memorized this (from class notes: lidocaine max dose = 2 mg lido per lb body weight, 300mg ABSOLUTE max)

**100mg solution :**  
**2 mg lido** 2% solution means two parts per 100 parts (how did I know to put 100 mg solution in the numerator and 2 mg lido in the denominator? I want the units to cancel)

**1 ml solution**  
**1000 mg solution** This is metric system. We will assume local anesthetic solutions are the same as pure water. (How did I know to put 1 ml soln in numerator and 1000 mg soln in denominator? Again, I want the units to cancel.)

**1 cartridge**  
**1.8 ml solution** If you don't yet know it, ALL anesthetic cartridges in the USA contain 1.8ml solution (including articaine . . . see paragraph 4 pg 73 of your textbook) (How did I know to put 1 cartridge in the numerator and 1.8 ml soln in the denominator? . . . you should know by now!)

**Method 2**

$$130 \text{ lbs} \times \frac{2 \text{ mg lido}}{1 \text{ lb}} = 260 \text{ mg} \text{ (this is the maximum mg of lidocaine this patient can receive)}$$

$$\frac{260 \text{ mg lido}}{36 \text{ mg lido/cart}} = 7.22 \text{ cartridges} \quad \text{(How do I know there are 36 mg lido in a cartridge? The solution in one cartridge weighs 1800 mg [1.8ml x 1000mg per ml] 2% of 1800 mg is 36 mg.)}$$

With respect to epinephrine:

$$0.2 \text{ mg epi} \times \frac{10^5 \text{ mg soln}}{1 \text{ mg epi}} \times \frac{1 \text{ ml soln}}{10^3 \text{ mg soln}} \times \frac{1 \text{ cart}}{1.8 \text{ ml soln}}$$

= 11.1 cartridges

So, the maximum number of cartridges the patient can receive is the lesser of 7.22 or 11.1, which of course is 7.2 cart or, if you want, call it 7 cartridges (but DO NOT call it 7 ¼ cartridges!)

For those of you who did not bother to go back and read paragraph 4 of page 73, go back and read it now.

And all of you should go back and review table 4-2 page 56, and the section **Maximum Doses Of Local Anesthetics** which begins on page 57, with particular emphasis on page 59 paragraphs 1, 2 and 3 . . .

### Homework Problem 3

Calculate the maximum dose (in cartridges) of lidocaine “plain” that your scheduled patient for next Friday can receive. Please do your work on the bottom of the form #19 you will be submitting next Friday for your evaluator’s review.

### Homework Problem 4

Calculate the maximum dose (in cartridges) of articaine 4% epi 1:200,000 that the same patient could receive. You needn’t do this on your form #19 (unless this is the anesthetic you are going to use on Friday).