

DH 255

Homework Problem – One way to solve the problem:

You have elected to anesthetize your patient with lidocaine 2%, epinephrine 1:100,000. The patient is ASA I. With respect to the vasoconstrictor **only**, what is the maximum number of dental cartridges that you can administer to your patient?

(All we are really doing is converting 0.2 mg epi to dental cartridges. This is the same type of problem as if one were asked how many seconds are there in one year?)

$$\frac{60 \text{ sec}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{365 \text{ day}}{1 \text{ year}} = 31536000 \text{ sec/year}$$

One way to solve the homework problem:

Things you need to know:

**Volume of a dental cartridge:** 1 cartridge = 1.8 ml (1.8ml is the volume of solution in every dental cartridge available in the U.S.A. )

**Concentration of epinephrine:** 1:100,000 means 1(part) epi to every 100,000 (parts) solution (given in the problem, also written on the label of the dental cartridge)

1ml H<sub>2</sub>O = 1gm H<sub>2</sub>O = 10<sup>3</sup>mg H<sub>2</sub>O = 1 cc H<sub>2</sub>O (This is the basis of the metric system. We will assume these relationships are the same for local anesthetic solution as they are for pure water.)

**Maximum recommended dose in milligrams** (AHA guidelines, you memorized these)

ASA I, II = 0.2 mg per appointment

ASA III, IV = 0.04 mg per appointment

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

$$= \frac{2 \times 10^{-1} \times 10^5}{1.8 \times 10^3} \text{ cartridges}$$

$$= \frac{20}{1.8} \text{ cartridges}$$

$$= 11.1 \text{ cartridges}$$

Look at the answer. That means that for a “healthy” (ASA I or ASA II) patient, they could have just over 11 cartridges of this particular local anesthetic solution and not exceed the maximum recommended dose of epinephrine. This answer tells us nothing about if we have exceeded the maximum dose for the other drug in the cartridge: local anesthetic.