

Cartridge Components Dilutions and Concentrations

Percent solution

- Different anesthetics come in various concentrations
- The concentrations are given as a percentage
 - 0.5% = 5 mg/cc
 - 1% = 10 mg/cc
 - 2% = 20 mg/cc
 - 3% = 30 mg/cc
 - 4% = 40mg/cc

Cartridge Components

- The prefilled 1.8ml dental cartridge consists of four parts:
 - Cylindrical glass tube
 - Stopper
 - Aluminum Cap
 - Diaphragm
- To determine the mg/cartridge, multiply the mg/cc by 1.8cc

Example

- How many milligrams of mepivacaine are contained within 2 cartridges of mepivacaine 3%?
 - 3% mepivacaine = 30mg/cc
 - 1 cartridge = 1.8 cc
 - 2 cartridges = 3.6 cc
 - (30 mg/cc)x(3.6 cc) = 108 mg

Concentrations of Vasoconstrictor in Local Anesthetics

1:50,000	0.02 mg/ml
1:100,000	0.01 mg/ml
1:200,000	0.005 mg/ml

Calculation

- 1:50,000 =
- 1gram/50,000 ml =
- 1000mg/50,000ml =
- 1mg/50ml = 0.02mg/ml
- (0.02 mg/ml)x(1.8 ml/cartridge) = .036 mg/cartridge
- -OR-
- the way someone once explained it to me:
 - start with 1,000,000 (aka convert to µg) and divide the ml amount of the concentration, this give you the concentration in MICROGRAMS/ml
 - 1,000,000 µg/50,000 = 20µg/ml
 - If you are looking for mg, instead of µg, you can always divide by 1000 at this point (aka, move the decimal point to the left 3 places)

Example

- How much lidocaine in a cartridge of lidocaine 2% with epinephrine 1/100,000? How much epi?
- 2% lidocaine = 20mg/ml
 - $(20\text{mg/ml}) \times (1.8\text{ ml/cartridge}) = 36\text{mg}$ lidocaine/cartridge
- Epi 1/100,000 = 0.01mg/ml
 - $(0.01\text{ mg/ml}) \times (1.8\text{ ml/cartridge}) = 0.018\text{mg}$ epinephrine/cartridge

Calculating Maximum Dose of Epinephrine

- Normal, healthy patient: 0.2 mg per appointment
- From the slide above, we know that there is 0.018mg of epinephrine per cartridge containing epi 1/100,000
- Therefore: $0.2\text{mg} / 0.018\text{mg per cartridge} = 11.1$ cartridges contains the maximum dose of epinephrine