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% = 40 mg/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

<table>
<thead>
<tr>
<th>Concentration</th>
<th>mg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:50,000</td>
<td>0.02</td>
</tr>
<tr>
<td>1:100,000</td>
<td>0.01</td>
</tr>
<tr>
<td>1:200,000</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Calculation
- 1:50,000 =
  - 1 gram/50,000 ml =
  - 1000 mg/50,000 ml =
  - 1 mg/50 ml = 0.02 mg/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 gives 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
  · (20mg/ml)x(1.8 ml/cartridge) = 36mg lidocaine/cartridge
  ○ Epi 1/100,000 = 0.01mg/ml
  · (0.01 mg/ml)x(1.8 ml/cartridge) = 0.018mg 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: 0.2mg/0.018mg per cartridge = 11.1 cartridges contains the maximum dose of epinephrine