Step-By-Step Drug Calculations

You are ordered to give your 250 lb patient 3 mg/min of Lidocaine. You have available to you: 10 gtt/cc and 60 gtt/cc administration sets. You have two 1-gram vials of Lidocaine and 1,000 cc, 500 cc, and 250 cc bags of NS. How many gtts/minute do you provide?

Step 1: What are we asked to give?
-we are giving 3 mg/min of Lidocaine through an IV maintenance drip

Step 2: Which formula do we use?
-looking at this desired dose, we notice that the units are "mg/min"
-there is no sign of kg
-therefore we know that this requires a NON-weight dependent formula

Step 3: What do we know about the drug?
-Lidocaine is a 4:1 drip, so we have to mix 4 parts drug per every part solution
-we know the concentration will ALWAYS be 4 mg/1cc
-we also know that with 4:1 drugs we ALWAYS use a 60 gtt set

Step 4: What is the concentration?
-we can mix 1 gram in 250 cc or 2 grams in 500 cc to get a 4:1 concentration
-4mg/1cc

Step 5: Make a list of what we know
-desired dose: 3 mg/min
-patient weight (kg): 114kg (**distracter!!)**
-drop set: 60 gtt/cc
-concentration: 4mg/1cc

Step 6: Plug known information into the formula

$$\frac{3\text{mg/min} \times 60\text{ gtt/cc}}{4\text{mg/1cc}} = 45\text{ gtt/min}$$

You are ordered to give your 250 lb patient 7mcg/kg/min of Dopamine. You have available to you: 10 gtt/cc and 60 gtt/cc administration sets. You have four 200 mg vials of Dopamine and 1,000 cc, 500 cc, and 250 cc bags of NS. How many gtts/minute do you provide?

Step 1: What are we asked to give?
-we are giving 7 mcg/kg/min through an IV maintenance drip

Step 2: Which formula do we use?
-looking at this desired dose, we notice that the units are "mcg/kg/min"
-there are kg in the desired dose
-therefore we know that this requires a WEIGHT dependent formula

Step 3: What do we know about the drug?
-Dopamine has 3 concentrations: 800 mcg/1cc, 1600mcg/1cc, or 3200 mcg/1cc
-we know that the preferred concentration is 1600 mcg/1cc
-we also know that with Dopamine we ALWAYS use a 60 gtt set

Step 4: What is the concentration?
-we want to make a 1600 mcg/1cc concentration
-to do this we can mix either 800 mg in 500 cc OR 400 mg in 250 cc

Step 5: Make a list of what we know
-desired dose: 7 mcg/kg/min
-patient weight (kg): 114kg
-drop set: 60 gtt/cc
-concentration: 1600mcg/1cc

Step 6: Plug known information into the formula

$$\frac{7 \text{ mcg/kg/min} \times 114 \text{ kg} \times 60 \text{ gtt/cc}}{1600 \text{ mcg/1cc}} = 30 \text{ gtt/min}$$

You are ordered to give your 250 lb patient 5 mcg/min of Epinephrine. You have available to you: 10 gtt/cc and 60 gtt/cc administration sets. You have on hand a premixed bag of Epinephrine containing 2 mg/500cc. How many gtts/minute do you provide?

Step 1: What are we asked to give?
-we are giving 5 mcg/min of Epinephrine through an IV maintenance drip

Step 2: Which formula do we use?
-looking at this desired dose, we notice that the units are "mcg/min"
-there is no sign of kg
-therefore we know that this requires a NON-weight dependent formula

Step 3: What do we know about the drug?
-it's probably going to be better for us (without an IV pump) to use a 10 gtt/cc set

Step 4: What is the concentration?
-we have 2mg mixed in 500 cc
-if you change the 2 mg to 2000 mcg, we get 2000 mcg in 500cc
-therefore the concentration is 4 mcg/1cc

Step 5: Make a list of what we know
-desired dose: 5 mcg/min
-patient weight (kg): 114kg (**distracter!!)**
-drop set: 60 gtt/cc
-concentration: 4mcg/1cc

Step 6: Plug known information into the formula

$$\frac{5\text{mcg/min} \times 10\text{ gtt/cc}}{4\text{mg/1cc}} = 12.5\text{ gtt/min}$$

How many mg are in 250 cc of a 10% solution of Calcium Chloride?

Step one: What does 10% mean? **Always start here!**

-it means that this solution contains 10 grams per every 100 cc

Step two: What are we asked to find?

-we are asked to find the number of milligrams, not grams

-so change the 10 grams to 10000 mg (apples to apples)

Step three: Set up the problem

$$\frac{10000\text{mg}}{100\text{cc}} = \frac{x\text{ mg}}{250\text{cc}}$$

Step four: Cross multiply & solve for x

$100x = 2500000$

$x = 25000$ mg contained in 250 cc

How many mg are in 1 cc of a 1:10000 solution of Epinephrine?

Step one: What does 1:10000 mean? **Always start here**

-it means 1 gram of Epinephrine is contained in 10000 cc

Step two: What are we asked to find?

-we want to know how many milligrams are in 1 cc
-change grams to milligrams (apples to apples)
-1 gram is 1000 mg
-1000 mg are contained in 10000 cc

Step three: Set up the problem

$$\frac{1000\ \text{mg}}{10000\ \text{cc}} = \frac{x\ \text{mg}}{1\ \text{cc}}$$

Step four: Cross multiply and solve

$10000x = 1000$

$x = 0.1$ mg are contained in 1 cc