Metric Conversion

- Our Example Problem:
  - An IV solution contains 100 mg of Nitroglycerin. 100 mg of Nitroglycerin is equivalent to how many mcg?

Metric Conversion

Here are the 5 basic steps to change from one unit to another

Step 1 - Identify that you need to convert

Step 2 – Write down what you have

Step 3 – Write down your equivalent fraction

Step 4 – Reduce units

Step 5 – Perform the math

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Metric Conversion

- Our Example Problem:
  - An IV solution contains 100 mg of Nitroglycerin. 100 mg of Nitroglycerin is equivalent to how many mcg?

  <u>Step 1</u> *Identify you need to convert*
  The key words that let us know we will need to convert are "equivalent to"

  <u>Step 2</u> *Write down what you have*
  The quantity we have – our known quantity - is 100 mg of Nitroglycerin.
  Write this as a fraction with 1 on the bottom.

  $$\frac{100\ mg}{1}$$

  (Writing the amount as a fraction will help us when we multiply later.)

  <u>Step 3</u> *Relate the units*
  An equivalency chart will list how the units relate.

Metric Equivalents of Weight

1 kilogram (kg)	=	1000 grams (g)
1 gram (g)	=	1000 milligrams (mg)
1 milligram (mg)	=	1000 micrograms (μg or mcg)

Household Examples

		A pinch of salt	*Too small to see!*
1 kilogram	1 gram	1 milligram	1 microgram

Step 3   *Relate the units*
An equivalency chart will list how the units relate.
Our chart lists 1 mg = 1000 mcg.   We will write this equivalency as a fraction.

We can write this fraction 2 ways:

$$\frac{1\,mg}{1,000\,mcg} \quad or \quad \frac{1,000\,mcg}{1\,mg}$$

Because the fraction we wrote in step 2 has mg on the top, our next fraction must have mg on the bottom.

We now have:

$$\frac{100\,mg}{1} \quad x \quad \frac{1,000\,mcg}{1\,mg}$$

To convert we will need to multiply our fractions.

Metric Conversion

Step 4   *Reduce the units*
Cross off any matching pairs of unit labels. The label left should be what you want to find.

We now have:

$$\frac{100\,\cancel{mg}}{1} \quad x \quad \frac{1,000\,mcg}{1\,\cancel{mg}}$$

In this example the only unit left is mcg which is what we want to find.

Metric Conversion

Step 5   *Perform the math* $\dfrac{100\,\cancel{mg}}{1} \quad x \quad \dfrac{1,000\,mcg}{1\,\cancel{mg}}$

$$\frac{100\,x\,1000}{1\,x\,1} \qquad = \frac{100,000}{1} \; (reduce\ any\ fractions)$$

$$= 100,000 \; mcg$$
$$(remember\ your\ units)$$

100 mg is equivalent to 100,000 mcg.

Metric Conversion

These are the steps we used.

1. *Determine the need to perform a metric conversion (key words "equivalent to", all units are metric)*
2. *Write down the starting term*
3. *Find an equivalency for the units.*
   Write the equivalency down next to the starting term with the units you want to eliminate on the bottom
4. *Reduce the units (Eliminate only the words that match in the top and bottom of your fractions.) When you are finished you should have only the terms you are looking for left.*
5. *Perform the math operations and reduce your answer. (In some calculations you may need to round as specified by your instructions.)*

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____