

# Challenge Day #2

## Introduction to Medical Math

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# Decimals

Why are they important?

How are they used?



# Whole Numbers

Millions- 0,000,000.000

Hundred thousands- 0,000,000.000

Ten thousands- 0,000,000.000

Thousands- 0,000,000.000

Hundreds- 0,000,000.000

Tens- 0,000,000.000

Ones (units)- 0,000,000.000

Decimal point .

Tenths- 0,000,000.000

Hundredths- 0,000,000.000

Thousandths- 0,000,000.000

Example:

$10.1 > 9.15$

$3.2 > 2.99$

$7.01 > 6.99$



# Things To Keep In Mind

- Only consider 3 figures after the decimal point on the fractional side, because drug dosages measured as decimal fractions do not contain more than three digits.
- Zero is used to replace whole numbers in decimal fractions that do not contain whole numbers.
- 0.25 vs .25



## Things to Keep In Mind (cont.)

- When you see a decimal fraction in which the whole numbers are the same, or there are no whole numbers, stop and look first at the number representing the tenths.
- If in decimal fractions the numbers representing the tenths are identical then the number representing the hundredths will determine the relative value.
- Example:  
Which fraction has the greater value?  
0.125 or 0.25



# When Do I Round?

- Answers should be rounded only at the end of the equation
- Usually you will round to the nearest tenth
- If it is less than 1 it should be rounded to the nearest hundredth
- If it is greater than 20 then round to the whole number



# Units of Measurement: The Metric System

Length- meter

Volume- liter

Weight- gram

1 kilometer= 1000 meters

1 kilogram= 1000 grams

1 kiloliter= 1000 liters

kilo= larger

Milli, micro and centi = smaller



# Abbreviations

m= meter

g= gram

L= liter

k= kilo

m= milli

mc= micro

c= centi

mcg= microgram

kg= kilogram

mL= milliliter

cm=centimeter

mg= milligram

kL= kiloliter

mm= millimeter





# Conversions

When converting from one to another, move the decimal point 3 places to left or right depending on your conversion.

$$0.5\text{g} = 500\text{mg}$$

$$2.5\text{L} = 2500\text{mL}$$

$$200\text{mL} = 0.2\text{L}$$

$$1500\text{mcg} = 1.5\text{mg}$$

$$300\text{mcg} = 0.3\text{mg}$$

$$1\text{kg} = 1000\text{g}$$

$$1\text{g} = 1000\text{mg}$$

$$1\text{mg} = 1000\text{mcg}$$

$$1\text{L} = 1000\text{mL}$$



# Percentages %

A percent represents the number of grams of drug per 100mL of solution

1%= 10mg/mL

2.5%= 25mg/mL

10%= 100mg/mL

0.9%= 9mg/mL



# Household Measures

ounce= oz= 30mL

tablespoon= T, TBS, tbs = 15mL

teaspoon= t, TSP, tsp = 5mL

dram= dr = 4mL

drop= gtt = 1mL



## 5 Rights of Medication

1. Right patient
2. Right drug
3. Right dose
4. Right frequency
5. Right route



## Weight Conversion: kg $\rightarrow$ lb & lb $\rightarrow$ kg

- Wt in kgs  $\times 2.2 =$  wt in lbs
- Wt in lbs /  $2.2 =$  wt in kgs



# Basic Drug Calculations

Keep track of your units!!

$\frac{\text{Dosage}}{\text{Concentration}} \times \text{weight} = \text{volume to administer}$

wt= 10kg

dosage= 1mg/kg

Concentration= 10mg/mL

$\frac{1\text{mg}}{10\text{mg/mL}} \times 10\text{kg} = 1\text{mL}$

10mg/mL

*(This can be reversed to weight times dose divided by concentration)*



# References

Curren, Anna. *Dimensional Analysis for Meds, 4th Edition by Anna M. Curren, Cengage Learning*. 4th ed., Clifton Park, NY, Cengage Learning, 2010.



Let's Practice!

