PHARMACY TECHNICIAN TRAINING COURSE

Week #1

What we want to do this week:

- Welcome ! and complete some information on students
- make sure we know how to use our calculators
- learn about units and how to cancel them out
- learn about brand and generic drugs
- learn some terminology dealing with brand and generic drugs

Things to Memorize this week: [Yikes!!]

20 drops	=	1 mL	(USP)
1 milliliter	=	1 cc	(mL and CC are the SAME)
5 milliliters	=	1 teaspoonful	
15 milliliters	=	1 tablespoonful	
30 milliliters	=	1 ounce	

There are 1000 mL in a liter.
There are 1000 mg in a gram.
There are 1000 grams in a kilogram.

<u>Prescription Abbreviations</u>

QD	daily
BID	twice daily
TID	three times daily
QID	four times daily
Q4H	every four hours
Q#H	every ## hours
HS	bedtime
PRN	as needed

Pharmacokinetic Terminology

absorption	the process of drugs entering the bloodstream
adverse drug effects	the effects of drugs which we do NOT want
aqueous solution	drug dissolved in water
AUC	Area under the curve, a measure of drug absorption
bioavailability	the amount (%) of a dosage which reaches the bloodstream
bioequivalent	describes drugs that have the same bioavailability AND the same rate of absorption; "A" rated drugs in the Orange Book.
brand name	the trade name used to market a drug (*e.g.* Motrin*)*
C_{MAX}	maximum blood concentration following drug administration; this is a measure of the rate of drug absorption
distribution	the process of drugs moving from the bloodstream to other sites
elimination	the process of removing drugs from the bloodstream or body
FDA	Food and Drug Administration, the federal agency that monitors manufactured drugs for safety and effectiveness
generic name	the common name for a drug (*e.g.* ibuprofen)
half-life	time it takes for ½ of drug in the bloodstream to be eliminated
metabolism	the process of chemically changing a drug (usually in the liver) into related compounds which may be active (produce an effect) or inactive (produce no effect).
nonproprietary name	generic name
Orange Book	FDA Publication: Approved Drug Products with Therapeutic Equivalency
proprietary name	brand name
side effect	an undesired effect of a drug
therapeutic range	the range of blood levels that produce a therapeutic effect

PHARMACY CALCULATIONS

There are two important concepts that we want to begin with: using calculators and canceling units. The first skill, that of using your calculator, is one that you may have already mastered. If you have not, now is the time to do so. There are two basic types of calculators. Most common calculators operate by entering the numbers and the math operations (+, -, x, ÷) in the same order as you see them in an equation. Other calculators allow you to enter an entire written equation and provide you with an answer.

Any type of calculator that is *silent, hand-held, non-programmable, battery-operated* is acceptable for the NPTCB Exam. Pick a calculator and work with it throughout the course so that you can consistently use it to get correct answers.

The second skill we want to reinforce is that of canceling things out. If we divide a number by itself, we will always get the value 'one'. Similarly, when the same units appear in the numerator (the top part of a division problem) and the denominator (the bottom part of a division problem), the units cancel out.

We will begin by working through some problems through which we can practice canceling out units and working with our calculators. If you do not get the same number answer as in class, you need to work with your calculator. If you do not get the units of the answer, you need to practice canceling out units.

Finally, let us end with the most important concept for successfully mastering pharmacy calculations:

Correct Answers have both numbers and units.

Rx

Amoxicillin 250 mg
#30
1 TID

NOTE:
The following calculations are provided to allow us to practice:
USING OUR CALCULATORS
CANCELING OUT UNITS
You do **NOT** have to understand how to set up these equations at the present time.

How much drug is dispensed ?

$$\frac{250 \text{ mg}}{\text{capsule}} \times 30 \text{ capsules} =$$

How long will it last?

$$\frac{1 \text{ day}}{3 \text{ capsules}} \times 30 \text{ capsules} =$$

How many to last 12 days?

$$\frac{3 \text{ caps}}{\text{day}} \times 12 \text{ days} =$$

Rx

Robitussin
4 oz
½ tsp QID

$$\frac{30 \text{ mL}}{\text{ounce}} \times 4 \text{ ounces} =$$

$$\frac{1 \text{ Liter}}{1000 \text{ mL}} \times \frac{30 \text{ mL}}{\text{ounce}} \times 4 \text{ ounces} =$$

$$\frac{1 \text{ bottle}}{4 \text{ ounces}} \times \frac{1 \text{ ounce}}{30 \text{ mL}} \times 1000 \text{ mL} =$$

Rx

Ventolin Inhaler MDI
#1 (200 puffs)
Use 2 puffs Q6H

$$\frac{2 \text{ puffs}}{\text{dose}} \times \frac{1 \text{ dose}}{6 \text{ hours}} \times \frac{24 \text{ hours}}{\text{day}} =$$

$$\frac{1 \text{ day}}{8 \text{ puffs}} \times \frac{200 \text{ puffs}}{\text{inhaler}} =$$

Rx

Amoxicillin 250mg/5mL
5 oz
$1\frac{1}{2}$ tsp Q8H till gone

$$\frac{1\text{ gram}}{1000\text{ mg}} \times \frac{250\text{ mg}}{5\text{ mL}} \times \frac{30\text{ mL}}{\text{ounce}} \times 5\text{ ounces} =$$

$$\frac{250\text{ mg}}{\text{tsp}} \times \frac{1\frac{1}{2}\text{ tsp}}{\text{dose}} \times \frac{1\text{ dose}}{8\text{ hours}} \times \frac{24\text{ hours}}{\text{day}} =$$

Rx

Potassium Chloride
20 mEq / 30 mL
10 mEq po BID

$$\frac{30\text{ mL}}{20\text{ mEq}} \times \frac{10\text{ mEq}}{\textit{dose}} \times \frac{2\text{ doses}}{\text{day}} =$$

Rx

Cimetidine Oral Soln
(300mg/5mL)
240 mL

400 mg Q HS

$$\frac{5\text{ mL}}{300\text{ mg}} \times \frac{400\text{ mg}}{\text{dose}} =$$

$$\frac{1\text{ dose}}{6.7\text{ mL}} \times 240\text{ mL} =$$

A 180 lb patient is receiving 0.6 mg/Kg/hr from a 1000 mL iv that contains 2 gm of drug. What is the rate in mL/hr ?

$$180\text{ lb} \times \frac{\text{Kg}}{2.2\text{ lb}} \times \frac{0.6\text{ mg}}{\text{Kg hr}} \times \frac{1000\text{ mL}}{2\text{ grams}} \times \frac{1\text{ gram}}{1000\text{ mg}} =$$

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