DRUG CALCULATION PRESENTATION

By:
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FIRST RULE:

- ALWAYS CHECK YOUR ANSWER!
Second Rule:

- DOES
- YOUR
- ANSWER
- MAKE
- SENSE?
Rules to Remember:

- When writing a whole number as a fraction, place the whole number over one.
  
  2 tablets = 2 / 1
  10 mgs = 10 / 1
  100 mgs = 100 / 1
Rules to Remember:

- When moving a decimal, to the right or left of “ZERO”, double check your answer.

*Whole numbers to left (of zero)
  - units
  - tens
  - hundreds
  - thousands
  - ten-thousands

*Decimal fractions to the right (of zero)
  - tenths
  - hundredths
  - thousandths
  - ten-thousands
Rule to Remember:

- When changing a decimal point to a percentage, move the decimal point (2) places to the right.
  
  \[0.45 = 45\%\]
  
  \[0.06 = 6\%\]
  
  \[0.008 = 0.8\%\]
Rule to Remember:

- You multiply a fraction by 100 to obtain the percent.
  
  \[
  \frac{1}{2} \times \frac{100}{1} = 50\%
  \]
  
  \[
  \frac{1}{8} \times \frac{100}{1} = 12\frac{1}{2}\%
  \]
Rule to Remember:

- When changing a percent to a fraction, divide the percent by a denominator of 100 (N/D).
  
  50% = 50 / 100

  66 2/3% = 200 / 3 (X) 1 / 100 = 2 / 3

* Reverse the divisor and multiply with percents that are mixed fractions
Rule to Remember:

- When calculating the percent of a whole number, change the percent to a decimal and multiply by the whole number.
  - $200\% \text{ of } 35 = 2.00 \times 35 = 70.0$
  - $5\% \text{ of } 25 = 0.05 \times 25 = 1.25$
Rule to Remember:

- Review roman numerals because medications are sometimes ordered using roman numerals.

  ASA  V grains q6h orally
  Tylenol  X grains q6h orally
Rule to Remember:

- When rounding off numbers < 5 round down and =/> 5 round up.
  
  $45.88 = 46.0$
  $10.35 = 10.0$

REMEMBER: Look at the medication you are giving because some medication (injections) can be given in “tenths” (example: 1.2 ml) or “hundredths” (example: 0.23 ml).
Conversions:

- 1 liter (L) = 1000 ml (milliters)
- 1 gram (g) = 1000 mgs (milligrams)
- 1 mg (milligrams) = 1000 mcgs (micrograms)
- 1 gram (g) = 15 grain (gr)
- 1 grain (gr) = 60 mg (milligrams)
- 1 dram (dr) = 4 ml (milliters)
- 1 ounce (oz) = 30 ml (milliters)
- 1 tsp (teaspoon) = 5 ml (milliters)
- 1 tbs (tablespoon) = 15 ml (milliters)
- 1 kg (kilogram) = 2.2 lbs (pounds)
- 1 inch = 2.54 cm (centimeters)
- 16 ounces (ozs) = 1 lb (pound)
- 1 cup = 8 ounces (ozs)
- 1 ml (milliter) = 15 minims
- 1 tsp (teaspoon) = 5 ml (milliters)
- 1 tbs (tablespoon) = 15 ml (milliters)
- 1 drop (gtt) = 15 minims
IV Drip Rate Calculation:

- mls to infuse (X) drip factor

\[ \text{mls to infuse (X) drip factor} \div \text{minutes (min.) to infuse} = \text{gtts/min.} \]
Client Rights:

- **Right** client
- **Right** drug
- **Right** dose
- **Right** time
- **Right** route
- **Right** documentation
- **Right** to refuse treatment
Drug Names:

- Generic Names are official names used by the drug companies (Acetaminophen).

- Trade or Brand Names are names assigned to a product by its manufacturer (Tylenol).
Recommended Volume for Administration Per Sites:

- Intradermal = 0.1 ml (example PPD, allergy testing)
- Subcutaneous injection = 0.5-1.0 ml per site
- Intramuscular injection = 3.0 ml per site (1 ml in the deltoid)
- IV injection (IV push) = 1-60 ml
A Calculation Method: use the calculation method easiest for you

Method:
1. Medication Available: 250mg tablets
   250mg (:-is to) 1 tablet
2. Medication Ordered: 500mg (how many tablets you would give)
   500mg (:-is to) (X) tablet
3. Formula:
   Ordered (Desired)
   ---------- (X) Supplied (tsp, ml, tablet, capsule, etc.)= X
   Available (Have)
4. 500 mg : X tablets
   250 mg : 1 tablet
   --------------------------- (cross multiply) = ------------------ = ------------ = 2 tablets
   500 (X) 1
   250 (X) X
   250
5. Checking Accuracy of Answer:

   250mg X (ordered medication) 500
   ---------- (X) ------------------------ = --------- = 500mg (your answer is correct)
   1 tablet 2 tablets 1

REMEMBER: Always check your answer for accuracy (step 5). An error in calculation can result in life threatening complications for the client.
Calculation Method: use the calculation method easiest for you

- Method:
  1. Medication Available: 250mg tablets
     \[ 250\text{mg} = 1 \text{tablet} \]
  2. Medication Ordered: 500mg
     \[ 500\text{mg} = (X) \text{tablets} \]
  3. Formula:
     \[
     \frac{250\text{mg}}{1 \text{tablet}} \frac{500\text{mg}}{x \text{tablets}} = \frac{500\text{mg}}{250\text{mg}} = 2 \text{tablets}
     \]
  4. Checking you answer for accuracy:
     \[
     \frac{250\text{mg}}{1 \text{tablet}} \frac{x=\text{ordered medication (500mg)}}{500} = \frac{500\text{mg}}{2 \text{tablets}} = 500 \text{mg} \quad \text{(your answer is 1 tablet is correct)}
     \]

REMEMBER: Always check your answer for accuracy (step 4). An error calculation can result in life threatening complications for the client.
Calculation Method: use the calculation method easiest for you

Available

1. Medication
   50 mg Lasix
   1 ml

2. Cross multiple
   100 mg (times) 1 ml
   50 mg (times) x ml

3. Check your work!
   50 mg Lasix
   1 ml

4. Cross multiple
   50 mg (times) 2 ml
   1 ml (times) x mg

*Ordered Medication: 100 mg Lasix PO QD
Available Medication: 50 mg Lasix in 1 ml

How many ml would you administer? 2 ml = 100 mg

50 mg (times) x ml
100
------ = x is 2 ml (how many ml (=) 100 mg Lasix)
50

x mg Lasix (medication ordered)
2 ml (to administer 100 mg Lasix)

50 mg (times) 2 ml
100
------ = x is 100 mg Lasix (this is the medication ordered and your answer of 2 ml is correct)
Practice Question:

- The physician orders Ampicillin 500mg q6h orally (po). Ampicillin is available: 250mg capsule (cap). How many capsules would you administer q6h?

*check answer:
Practice Question:

- The physician orders Lanoxin 0.25mg IM every day. Lanoxin is available: 0.5mg per 2 ml. How much Lanoxin would you administer IM?

*check answer:*
Practice Question:

- The physician orders Theophylline 160mg q6h orally (po). Theophylline is available: 80mg per 15 ml. How much Theophylline would you administer q6h?

*check answer:
The physician orders Morphine 5mg IM q4h. Morphine is available: 1 grain per 5 ml. How much Morphine would you administer? 1 grain = 60mg Morphine is available: 60mg per 5 ml

*check answer:*
Practice Question:

- The physician orders Morphine 1/100 grain (gr) IM q6h for abdominal pain. Morphine is available: 0.5mg per 0.5 ml. How much would you administer?
  1/100 grain = 0.01 grain = 0.6mg

*check answer:
Practice Question:

The physician orders 1000 ml 0.9% Normal Saline to run over 10 hours. The IV tubing drip rate is 10 drops (gtts) per ml. How many drops per minute would the IV be regulated to?

1000 ml (X) 10 gtts per ml = 10000 gtts in 1000 ml

_________________________divided by
60 minutes (X) 10 hours = 600 minutes (min.)

10000 gtts in 1000 ml / 600 min. = 16.7 gtts per min. (round up)

17 gtts per min.

*check answer:*
Practice Question:

- The physician ordered Keflex 2500mg orally (po) in divided doses q6h every day. Keflex is available: 250mg per 5 ml. How much would you administer per dose?

  \[
  \frac{2500\text{mg}}{4\text{ doses (q6h)}} = 625\text{mg per dose}
  \]

*check answer:*
Practice Question:

- Conversions:
  - 15 ml = _____ teaspoons (tsp)
  - 45 ml = _____ ounces (oz)
  - 8 ounces (oz) = _____ ml
  - 76 kilograms (kg) = _____ lbs (pounds)
  - 60 inches = _____ centimeters (cm)