



Dosage Calculations

Worksheet #1

Formulas to Know

A. Flow Rate: How many mL/hour do I give?

- $\frac{\text{Volume in mL}}{\text{Time}} = \text{mL/hr}$ $\frac{1000 \text{ mL}}{5 \text{ hr}} = 200 \text{ mL/hr}$

B. How many gtt/min? (drops/min)

- $\frac{\text{Volume in mL}}{\text{Time in min}} \times \text{gtt factor} = \text{gtt/min}$ $\frac{125 \text{ mL}}{60 \text{ min}} \times 10 = 21 \text{ gtt/min}$

C. How to figure out mL/hr via pump (piggy back)

- $\frac{\text{Volume in mL}}{\text{Time in min}} \times 60 \text{ min} = \text{mL/hr}$ $\frac{50 \text{ mL}}{20 \text{ min}} \times 60 = 150 \text{ mL/hr}$

D. Convert from pounds to kg. Use a conversion factor.

eg. Change 40 lb to kg.

$$40 \text{ lb} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} = 40 \cancel{\text{ lb}} \times \frac{1 \text{ kg}}{2.2 \cancel{\text{ lb}}} = \frac{40 \times 1 \text{ kg}}{2.2} = \frac{40 \text{ kg}}{2.2} = 18.2 \text{ kg}$$

E. IV Ahead or behind: No more than 25% ahead or behind.

$$\frac{\text{Total mL remaining}}{\text{\# hours remaining}} = \text{recalculated mL/h}$$

$$\frac{\text{mL/hr}}{\text{time (min)}} \times \text{drop factor} = \text{gtt/min}$$

$$\frac{\text{Adjusted gtt/min} - \text{Ordered gtt/min}}{\text{Ordered gtt/min}} = \% \text{ variation}$$

1000 mL D5NS to run over 10 h at 125/h mL, Drop factor = 10, After 2 hours, 900 mL remain.....IV is behind schedule:

Original flow rate = **21 gtt/min**

Time remaining = **8 hours**

1. Recalculated mL/hr: $\frac{900 \text{ mL}}{8 \text{ h}} = 113 \text{ mL/hr}$
2. Recalculated Drop rate: $\frac{113 \text{ mL}}{60 \text{ min}} \times 10 \text{ gtt/mL} = 19 \text{ gtt/min}$
3. % variation = $\frac{21 \text{ gtt/min} - 19 \text{ gtt/min}}{19 \text{ gtt/min}} = 11\% \text{ increase} =$
OK to change rate (within 25%) **19 gtt/min**

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Solve the following questions:

1. **Order:** IV of D5W @ 75mL/hr
 - a) Calculate the drip rate using a macrodrip (10 drops/mL) set.
 - b) What is the total volume of IV solution infused over a 24-hour period?

2. **Order:** Administer 3 L of D5 $\frac{1}{2}$ NS over 24 hours
 - a) Calculate the hourly rate.
 - b) Calculate the drip rate using a microdrip administration set.

3. You have 1 L of IV fluid infusing at 60 mL/hr. How many hours will it take to infuse the whole litre?

4. **Order:** Ancef 250 mg IV q6h
Parenteral Drug Manual: 1 g vial: Add 4.5 mL sterile water for a total volume of 5 mL.
Add medication to a 50 mL minibag and administer over 20 minutes.
- a) What is the final concentration per mL?
 - b) What volume of medication will you administer?
 - c) Calculate the drip rate using a macrodrip (12 drops/mL) administration set.
 - d) A pump becomes available. What will you set the pump at for the piggyback infusion?
5. **Order:** Benadryl 40mg IV q8h prn
Label reads: Benadryl 50mg/mL
Parenteral Drug Manual: Add medication to 50 mL minibag and infuse over 30 minutes
- a) What volume will you add to the minibag?
 - b) Calculate the drip rate using a macrodrip (15 drops/mL) administration set.
 - c) A pump becomes available. What will you set the pump at for the piggyback infusion?

6. **Order:** 1). IV NS @ 100 mL/hr.
2). Vancomycin 100mg IV q8h
Label Reads: Vancomycin 500 mg/mL
Parenteral Drug Manual: Dilute in 100 mL minibag and administer over 30-60 minutes.

- a) What volume of medication will you administer?
- b) Considering the IV rate you decide to administer it over _____ minutes.
- c) What drip rate will you require to administer this medication (macro, 10 drops/mL)?
- d) A pump becomes available. What will you set the pump at for the piggyback infusion?

7. **Order:** Crystapen 750 000 units IV q6h
Parenteral Drug Manual: Reconstitute 1 000 000 unit vial with 1.8 mL of sterile water for a final volume of 2 mL. Further dilute into a 50 mL minibag and administered over 45 minutes.

- a) What volume of medication will you administer?
- b) What drip rate will you set (macro 10 drops/mL)?
- c) A pump becomes available. What will you set the pump at for the piggyback infusion?

8. Calculate the hourly rate to infuse 1500 mL over 4 hours?

9. Order: Infuse 2 L of D5W over 8 hours.
 - a) Calculate the hourly rate

 - b) What drip rate will you set (macro 20 drops/mL)?

10. If 2200 mL of RL is administered at 95 mL/hr. How many hours will it take to infuse all the IV fluid?

11. Order: NS @ 80 mL/hr. Using a macrodrip (10 drops/mL), what is the drip rate?

12. **Order:** IV @100mL/hr and Lanoxin 0.125 mg IV daily
Label Reads: Lanoxin 0.25 mg/2 mL ampules
Parenteral Drug Manual: Administer in 25 mL minibag over 20 minutes.
 - a) What volume of medication will you draw up?

 - b) What will your piggyback flow rate be by pump?

13. Order: Infuse 650 ml of NS over 5 hours. What hourly rate would you set the pump at?

14. Order: IV NS @ 100 ml/hr.

When you arrive to check the IV (macro 10 drops/mL) you count 15 gtts/min, is this correct?

Yes or No. If no, what should the gtt/min be?

Answers:

- | | | |
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| 1. a) 13 gtts/min
b) 1800 mL | mL/hr accepted) | 9. a) 250mL/hr
b) 83 or 84 gtts/min
accepted |
| 2. a) 125 mL/hr
b) 125 gtts/min | 6. a) 0.2 mL
b) 60 min: try to keep
the piggy back at the same
rate of the primary IV
infusion unless more | 10. 23.2 hours |
| 3. 16.7 hours | than one IV med to be
admin within the hour. | 11. 13 gtts/min |
| 4. a) 200 mg/mL
b) 1.3 mL
c) 30 gtts/min
d) 150 mL/hr | c) 17 gtts/min
d) 100 mL/hour | 12. a) 1 mL
b) 75 & 78 mL/hr
accepted |
| 5. a) 0.8 mL
b) 25 or 26 gtt/min
c) 100 mL/hour (102 | 7. a) 1.5 mL
b) 11 gtts/min
c) 66 mL/hr | 13. 130 mL/hr |
| | 8. 375 mL/hr | 14. No, should be
17gtt/min |