# Beautiful Nursing Ultimate

# MEDICATION DOSAGE

## Packet

1 kg = 2.2 lbs

1 ml = 1 cc

30 ml = 1 oz

5 ml = 1 tsp

15 ml = 1 tbsp


1 kg = 1000 gm

1 gm = 1000 mg

1 mg = 1000 mcg

1 L = 1000 ml


1 tbsp = 3 tsp

1 cup = 8 oz

2 cups = 1 pint

2 pints = 1 quart


60 min = 1 hr

# MED DOSE BASICS

Medication calculation is a vital skill all nurses should learn in order to properly do medication administration in a clinical setting.

The easiest way to do medication calculations is with a method called "Dimensional Analysis". This method reduces errors and can be used for all dosage calculations.

## How To Do Dimensional Analysis:

**1. Start with the conversion the question is asking for. Ex: mg, L, ml**

**EXAMPLE:** A patient drinks 3 ounces of orange juice. How many ml is that?
Start equation with ml since it asks for ml.

**2. Build equation by placing information with same label as denominator in the numerator so unwanted labels cancel out.**

Start with ml, then how can we get from ml → ounces? **Use your conversion sheet** to find out 30 ml = 1 ounce.

$$\frac{30 \text{ ml}}{1 \text{ oz}}$$

**3. Repeat until all conversions beside the answer are cancelled out. Note: Once all conversions from the question are added to the equation and the only conversion left after cancelling out is what the answer should be, then you are done.**

$$\frac{30 \text{ ml}}{1 \text{ oz}} = 3 \text{ oz}$$

**4. Calculate. MULTIPLY top row and DIVIDE by bottom row.**

$$\frac{30 \times 3}{1} = \textbf{90 ml}$$

# SIMPLE CONVERSIONS
## Practice Problems

1. 60 kg into lbs

2. 180 ml into ounces

3. 25 mg into grams.

4. 45 ml into tablespoons.

5. 1.4 L into ml.

6. 2 tsp into ml.

7. 20,000 mcg into kg.

8. 5 tbsp into tsp.

9. 180 ml into ounces.

10. 22 lbs into kg.

# SIMPLE CONVERSIONS
## ANSWERS

1. **132 lbs.** Convert 60 kg into lbs.

$$\frac{2.2 \text{ lbs}}{1 \text{ kg}} = 60 \text{ kg} \qquad = \textbf{132 lbs.}$$

2. **6 oz.** Convert 180 ml into ounces.

$$\frac{1 \text{ ounce}}{30 \text{ ml}} = 180 \text{ ml} \qquad = \textbf{6 ounces.}$$

3. **0.025 g.** Convert 25 mg into grams.

$$\frac{1 \text{ g}}{1000 \text{ mg}} = 25 \text{ mg} \qquad = \textbf{0.025 g}$$

4. **3 tbsp.** Convert 45 ml into tablespoons.

$$\frac{1 \text{ tbsp}}{15 \text{ ml}} = 45 \text{ ml} \qquad = \textbf{3 tbsp.}$$

5. **1400 ml.** Convert 1.4 L into ml.

$$\frac{1000 \text{ ml}}{1 \text{ L}} = 1.4 \text{ L} \qquad = \textbf{1400 ml}$$

6. **10 ml.** Convert 2 tsp into ml.

$$\frac{5 \text{ ml}}{1 \text{ tsp}} = 2 \text{ tsp} \qquad = \textbf{10 ml}$$

7. **0.00002 kg.** Convert 20,000 mcg into kg.

$$\frac{1 \text{ kg}}{1000 \text{ g}} = \frac{1 \text{ g}}{1000 \text{ mg}} = \frac{1 \text{ mg}}{1000 \text{ mcg}} = \frac{20{,}000 \text{ mcg}}{} = 0.00002 \text{ kg}$$

8. **15 tsp.** Convert 5 tbsp into tsp.

$$\frac{3 \text{ tsp}}{1 \text{ tbsp}} = \frac{5 \text{ tbsp}}{} = 15 \text{ tsp}$$

9. **6 oz**. Convert 180 ml into ounces.

$$\frac{1 \text{ oz}}{30 \text{ ml}} = \frac{180 \text{ ml}}{} = 6 \text{ oz.}$$

10. **10 kg.** Convert 22 lbs into kg.

$$\frac{1 \text{ kg}}{2.2 \text{ lbs}} = \frac{22 \text{ lbs}}{} = 10 \text{ kg.}$$

# MASS & LIQUIDS
## Practice Problems

1. A patient is having an annual exam and the scale says the patient weighs 110 lbs. What is the patient's weight in kg?

2. A provider orders Morphine 15 mg po. Morphine comes in a bottle of 5 mg/ml. How many ml does the patient receive?

3. A provider prescribes 150 mg of sertraline. The pharmacy sends a unit dose package labeled 100 mg per tablet. How many tablets will the nurse administer?

4. An order from the provider is sent over for Levothyroxine 0.1 mg po daily. The package is available in tablets of Levothyroxine 50 mcg. How many tablets would you administer?

5. The provider ordered 500 mg of Augmentin to be given to your patient every 12 hours. Using the label below, how many ml will you administer?



6. There is an order for 0.007 kg of Ampicillin. Ampicillin is available as 15,000 mg tablets. What should the nurse administer?

7. The nurse is to give Gentamycin 100 mg IM. The pharmacy sends a vial of Gentamycin labeled 0.5 grams/5 ml. How many ml will the nurse administer?

8. Amoxicillin suspension is available as 250 mg/ 5 ml. The doctor ordered amoxicillin 125 mg PO four times daily. How many ml will you give per day?

9. A patient was prescribed 10,000 mcg of Methylprednisolone. What should the nurse administer?



10. A nurse is ordered to administer Valium 2.5 mg IM. When reconstituted with 1.4 ml of sterile water, vial of Valium has a concentration of 10 mg/ 2 ml. How many ml will nurse administer?

# MASS & LIQUIDS
## ANSWERS

1. **50 kg.** A patient is having an annual exam and the scale says the patient weighs 110 lbs. What is the patient's weight in **kg**? Start with kg. Multiply TOP row, divide by BOTTOM row for each question.

$$\frac{1 \text{ kg}}{2.2 \text{ lbs}} = 110 \text{ lbs} = \textbf{50 kg}$$

2. **3 ml.** A provider orders Morphine 15 mg po. Morphine comes in a bottle of 5 mg/ml. How many **ml** does the patient receive? Start with ml. Note: we know that 1 ml = 5 mg according to Morphine bottle.

$$\frac{1 \text{ ml}}{5 \text{ mg}} = 15 \text{ mg} = \textbf{3 ml}$$

3. **1.5 tablets**. A provider prescribes 150 mg of sertraline. The pharmacy sends a unit dose package labeled 100 mg per tablet. How many **tablets** will the nurse administer? Start with tablets.

$$\frac{1 \text{ tablet}}{100 \text{ mg}} = 150 \text{ mg} = \textbf{1.5 tablets}$$

4. **2 tablets.** An order from the provider is sent over for Levothyroxine 0.1 mg po daily. The package is available in tablets of Levothyroxine 50 mcg. How many **tablets** would you administer? Start with tablets.

$$\frac{1 \text{ tablet}}{50 \text{ mcg}} = \frac{1000 \text{ mcg}}{1 \text{ mg}} = 0.1 \text{ mg} = \textbf{2 tablets}$$

5. **20 ml.** The provider ordered 500 mg of Augmentin to be given to your patient every 12 hours. Using the label below, how many ml will you administer? Start with ml. Label shows 125 mg/5 ml.

$$\frac{5 \text{ ml}}{125 \text{ mg}} = 500 \text{ mg} = \textbf{20 ml every 12 hrs.}$$

6. **0.5 tablet.** There is an order for 0.007 kg of Ampicillin. Ampicillin is available as 15,000 mg tablets. What should the nurse administer? Start with tablets. Use conversions to get from mg→kg.

$$\frac{1 \text{ tablet}}{15,000 \text{ mg}} = \frac{1000 \text{ mg}}{1 \text{ gm}} = \frac{1000 \text{ gm}}{1 \text{ kg}} = 0.007 \text{ kg} = 0.46 \text{ or } \textbf{0.5 tablet}$$

7. **1 ml.** The nurse is to give Gentamycin 100 mg IM. The pharmacy sends a vial of Gentamycin labeled 0.5 grams/5 ml. How many ml will the nurse administer? Start with ml.

$$\frac{5 \text{ ml}}{0.5 \text{ g}} = \frac{1 \text{ g}}{1000 \text{ mg}} = 100 \text{ mg} = \textbf{1 ml}$$

8. **10 ml/day.** Amoxicillin suspension is available as 250 mg/ 5 ml. The doctor ordered amoxicillin 125 mg PO four times daily. How many **ml** will you give per day? Start with ml.

$$\frac{5 \text{ ml}}{250 \text{ mg}} = 125 \text{ mg} = 2.5 \text{ ml / per dose} = \textbf{10 ml / per day}$$

9. **2.5 tablets.** A patient was prescribed 10,000 mcg of Methylprednisolone. What should the nurse administer? Start with tablets. The package states 1 tablet is 4 mg.

$$\frac{1 \text{ tablet}}{4 \text{ mg}} = \frac{1 \text{ mg}}{1000 \text{ mcg}} = 10,000 \text{ mcg} = \textbf{2.5 tablets}$$

10. **0.5 ml.** A nurse is ordered to administer Valium 2.5 mg IM. When reconstituted with 1.4 ml of sterile water, vial of Valium has a concentration of 10 mg/ 2 ml. How many ml will nurse administer? Start with ml. Ignore amount for reconstituting medication, the end concentration of the medication is what should be used in the equation.

$$\frac{2 \text{ ml}}{10 \text{ mg}} = 2.5 \text{ mg} = \textbf{0.5 ml}$$

# PEDIATRIC WEIGHT
## Practice Problems

GUIDELINE FOR PEDIATRIC DOSAGE:
*Always convert weight from lbs → kg first before starting equation.  (1 kg = 2.2 lbs)*

1. A doctor orders a one time dose of morphine sulfate 0.05 mg/kg. Your client weighs 36 pounds. The syringe of morphine is labeled 0.5 mg/ml. How many ml will you give?

2. Provider ordered Digoxin Elixir Pediatric 15 mcg/kg of body weight per dose PO now. Label reads: Digoxin 0.05 mg per ml. How many ml should child receive per dose. Child weighs 60 lbs.

3. A child weighs 22 lbs. An order for Augmentin Oral Suspension is prescribed at 30 mg per kg/day PO in two divided doses. The label reads: 125 mg/ 5 ml. How many ml should be administered per dose?

4. Solumedrol 1.5 mg/kg is ordered for a child weighing 73 lbs. Solumedrol is available as 75 mg/ 1 ml is available. How many ml must the nurse administer?

5. A pediatric client weighs 40 lbs. The provider ordered Gantrisin Pediatric Suspension 150 mg per kg PO in four divided doses per day. The label reads: Gantrisin 0.5 g per tsp. How many ml should the nurse administer per dose?

6. A pediatrician ordered Velosef Oral Suspension 25 mg/kg in 2 divided doses PO. It is available as 250 mg per 5 ml. The client weighs 44 lbs. How many ml should the nurse administer per dose?

7. A child weighs 37 kg. An order for Tetracycline Hydrochloride 25 mg per kg/day in four divided doses PO. Pharmacy sends bottle of Tetracycline Hydrochloride for 125 mg per 5 ml. How many ml should the nurse administer per dose?

8.  Erythromycin 30 mg/kg/day divided every 6 hours PO. Child weighs 32 kg. How many ml will be given per dose after the medication is reconstituted? *Use Label Below.*

NDC 24338-130-13
100 mL For Oral Suspension
(when mixed)

EryPed® 400

ERYTHROMYCIN
ETHYLSUCCINATE FOR
ORAL SUSPENSION, USP

Erythromycin activity
400 mg per 5 mL
when reconstituted

Rx only

Before mixing, store below 86°F (30°C).
DIRECTIONS FOR MIXING: Add 49 mL water and shake vigorously. This makes 100 mL of suspension.
Contains erythromycin ethylsuccinate equivalent to 8 g erythromycin. When mixed as directed, each teaspoonful (5 mL) contains: Erythromycin ethylsuccinate equivalent to erythromycin ................ 400 mg in a banana-flavored, aqueous vehicle.
DOSAGE MAY BE ADMINISTERED WITHOUT REGARD TO MEALS.
Usual dose: Children: 30-50 mg/kg/day in divided doses. See package enclosure for full prescribing information.
Child-resistant closure not required; exemption approved by U.S. Consumer Product Safety Commission.
Arbor Pharmaceuticals, LLC
Atlanta, GA 30328

earbor
PHARMACEUTICALS, LLC

EPED-TB400-00     (List 6305)

# PEDIATRIC WEIGHT
## ANSWERS

1. **1.6 ml.** A doctor orders a one time dose of morphine sulfate 0.05 mg/kg. Your client weighs 36 pounds. The syringe of morphine is labeled 0.5 mg/ml. How many **ml** will you give? First begin with converting lbs → kg. Start equation with ml, find it in equation. 36 lbs = 16.4 kg

$$\frac{1 \text{ ml}}{0.5 \text{ mg}} = \frac{0.05 \text{ mg}}{1 \text{ kg}} = \frac{16.4 \text{ kg}}{} = \textbf{1.6 ml}$$

2. **8.2 ml/dose.** Provider ordered Digoxin Elixir Pediatric 15 mcg/kg of body weight per dose PO now. Label reads: Digoxin 0.05 mg per ml. How many ml should child receive per dose. Child weighs 60 lbs. Converts 60 lbs → 27.3 kg. Start with ml.

$$\frac{1 \text{ ml}}{0.05 \text{ mg}} = \frac{1 \text{ mg}}{1000 \text{ mcg}} = \frac{15 \text{ mcg}}{1 \text{ kg}} \quad \frac{27.3 \text{ kg}}{} = \text{Round up to } \textbf{8.2 ml/dose.}$$

3. **6 ml/dose.** A child weighs 22 lbs. An order for Augmentin Oral Suspension is prescribed at 30 mg per kg/day PO in two divided doses. The label reads: 125 mg/ 5 ml. How many ml should be administered per dose? Convert 22 lbs → 10 kg. Start with ml.

$$\frac{5 \text{ ml}}{125 \text{ mg}} = \frac{30 \text{ mg}}{1 \text{ kg}} = \frac{10 \text{ kg}}{\text{day}} = \textit{12 ml/day. We need per dose so divide by 2.}$$
$$12/2 = \textbf{6 ml/dose.}$$

4. **0.66 ml.** Solumedrol 1.5 mg/kg is ordered for a child weighing 73 lbs. Solumedrol is available as 75 mg/ 1 ml is available. How many ml must the nurse administer? Convert 73 lbs → 33.2 kg. Start with ml.

$$\frac{1 \text{ ml}}{75 \text{ mg}} = \frac{1.5 \text{ mg}}{1 \text{ kg}} \quad \frac{33.2 \text{ kg}}{} = \textbf{0.66 ml}$$

5. **6.8 ml/dose.** A pediatric client weighs 40 lbs. The provider ordered Gantrisin Pediatric Suspension 150 mg per kg PO in four divided doses per day. The label reads: Gantrisin 0.5 g per tsp. How many ml should the nurse administer per dose? Convert 40 lbs → 18.2 kg. Start with ml. We technically do not have ml, but we know using our list of conversion that we can get from ml to tsp.

$$\frac{5\text{ ml}}{1\ \text{\st{tsp}}} = \frac{1\ \text{\st{tsp}}}{0.5\ \text{\st{g}}} = \frac{1\ \text{g}}{1000\ \text{\st{mg}}} = \frac{150\ \text{\st{mg}}}{1\ \text{\st{kg}}} \quad \frac{18.2\ \text{\st{kg}}}{\text{day}}$$

= 27.3/day. Divide by 4 doses.

=**6.8 ml/dose**

6. **5 ml/dose.** A pediatrician ordered Velosef Oral Suspension 25 mg/kg in 2 divided doses PO. It is available as 250 mg per 5 ml. The client weighs 44 lbs. How many ml should the nurse administer per dose? Convert 44 lbs → 20 kg. Start with ml.

$$\frac{5\text{ ml}}{250\text{ mg}} = \frac{25\text{ mg}}{1\text{ kg}} \quad 20\text{ kg}$$

= 10 ml/day. Divide by 2 doses.

= 10/2 = **5 ml/dose.**

7. **9.3 ml/dose.** A child weighs 37 kg. An order for Tetracycline Hydrochloride 25 mg per kg/day in four divided doses PO. Pharmacy sends bottle of Tetracycline Hydrochloride for 125 mg per 5 ml. How many ml should the nurse administer per dose? No need to convert lbs→kg. Start with ml.

$$\frac{5\text{ ml}}{125\text{ mg}} = \frac{25\text{ mg}}{1\text{ kg}} = \frac{37\text{ kg}}{\text{day}}$$

= 37 ml/day. Divide by 4 doses.

= 9.25 or **9.3 ml/dose**

8. **2 ml/dose.** Erythromycin 30 mg/kg/day divided **every 6 hours** PO. Child weighs 32 kg. How many ml will be given **per dose** after the medication is reconstituted? Start with ml. Notice 5 ml/400 mg on label.

$$\frac{5\text{ ml}}{400\text{ mg}} = \frac{30\text{ mg}}{1\text{ kg}} = \frac{32\text{ kg}}{1\text{ day}} =$$

12 ml/day. *It needs to be divided into 6 doses.*

12/6 = **2 ml/dose.**

# IV FLOW RATES
## Practice Problems

**GUIDELINE FOR IV FLOW RATES:**
*IV Flow Rates (otherwise known as hourly flow rate) are usually answered in **ML/HR.***

1. Order: 1000 ml LR over 6 hours. What is the hourly rate?

2. Order: 3000 ml 0.45 NS every 24 hours. What is the hourly rate?

3. Ancef 150 mg is diluted in 50 ml of D5W to infuse over 25 minutes. What is the hourly rate?

4. 40 mEq Potassium Chloride is ordered to be given in 100 ml NS over 45 minutes. What is the hourly rate?

5. Vancomycin 1 gm is to be given in 125 ml of D5NS over 75 minutes. What is the hourly rate?

6. 20 mEq Potassium Chloride in 50 ml NS over 30 minutes. What is the hourly rate?

7. Order: 1800ml ½ NS per day by infusion pump. What is the hourly rate?

8. Cimetidine 300 mg is diluted in 100 ml D5NS to be infused over 50 minutes. What is the hourly flow rate?

9. Order: 0.5 L D5LR in 8 hours. What is the hourly rate?

10. Order: 1 L of NS in 4 hours. What is the hourly rate?

# IV FLOW RATES

## ANSWERS

1.  **167 ml/hr.** Order: 1000 ml LR over 6 hours.

> 1000 ml
> _____          = **167 ml/hr**
> 6 hrs

2. **125 ml/hr.** Order: 3000 ml 0.45 NS every 24 hours.

> 3000 ml
> _____         =  **125 ml/hr**
> 24 hrs

3. **120 ml/hr.** Ancef 150 mg is diluted in 50 ml of D5W to infuse over 25 minutes. What is the hourly rate? Normally, answers are ml per hour, but this is 25 minutes. That means we have to give this medication at a faster rate to infuse what would normally take an hour in only 25 minutes. The equation should still end in ML/HR.

> 50 ml           60 ~~min~~
> _____    =    _____        = **120 ml/hr**
> 25 ~~min~~        1 hr

4. **133 ml/hr.** 40 mEq Potassium Chloride is ordered to be given in 100 ml NS over 45 minutes.  What is the hourly rate? Start with ml.

> 100 ml               60 ~~min~~
> _____    =      _____     = **133 ml/hr**
> 45 ~~minutes~~          1 hr

5. **100 ml/hr.** Vancomycin 1 gm is to be given in 125 ml of D5NS over 75 minutes. What is the hourly rate? Start with ml.

> 125 ml        60 ~~min~~
> _____  =    _____          = **100 ml/hr**
> 75 ~~min~~        1 hr

6. **100 ml/hr.** 20 mEq Potassium Chloride in 50 ml NS over 30 minutes. What is the hourly rate? Start with ml.

> 50 ml                60 ~~min~~
> _____      =        _____         = **100 ml/hr**
> 30 ~~minutes~~            1 hr

7. **75 ml/hr.** Order: 1800ml ½ NS per day by infusion pump. What is the hourly rate? Start with ml. This question is saying per day, meaning 1800 ml in 24 hours.

$$\frac{1800 \text{ ml}}{24 \text{ hrs}} = 75 \text{ ml/hr}$$

8. **120 ml/hr.** Cimetidine 300 mg is diluted in 100 ml D5NS to be infused over 50 minutes. What is the hourly flow rate? Start with ml, do not confuse using mg. IV flow rates are always ml/hr.

$$\frac{100 \text{ ml}}{50 \text{ min}} = \frac{60 \text{ min}}{1 \text{ hr}} = 120 \text{ ml/hr}$$

9. **63 ml/hr.** Order: 0.5 L D5LR in 8 hours. What is the hourly rate? Continue to start with ml. We do not have it in our equation, so use your list of conversions to find ml → L. No need to add 60 min/1 hr either since the equation is already set in hours.

$$\frac{1000 \text{ ml}}{1 \text{ L}} = \frac{0.5 \text{ L}}{8 \text{ hours}} = 62.5 \text{ or } \textbf{63 ml/hr}$$

10. **250 ml/hr.** Order: 1 L of NS in 4 hours. What is the hourly rate? Start with ml and use your list of conversions to find ml → L.

$$\frac{1000 \text{ ml}}{1 \text{ L}} = \frac{1 \text{ L}}{4 \text{ hours}} = 250 \text{ ml/hr}$$

# IV DROP RATE
## Practice Problems

1.  The nurse is to administer Keflin 1 gm in 50 ml over 20 minutes. The drop factor is 20 drops. What is the drip rate?

2. An order is prescribed for Tobramycin 80 mg in 120 ml over 1.5 hours. The drop factor is 12 drops. What is the drip rate?

3. IV flow rate for 598,000 mcl of D5W over 522 min. Drop factor of 91 gtts. What is the IV drip rate?

4. The nurse is to administer a medication at an IV flow rate of 631 ml of D5W over 936 min. Drop factor is 21 gtts. What is the IV drip rate?

5. An order for Sodium Chloride 0.9% at 100 ml/hr was prescribed. How many drops per minute, using tubing with a 15 drop factor?

6. Acyclovir 300 mg is in 150 ml of D5W to infuse over 1 ¼ hrs. Drop factor is 20 drops/ml. What is the drip rate?

7. Calculate the IV drip rate for 0.91 L of 0.9% NaCl IV over 22.1 hrs. Drop factor is 86. What is drip rate in gtts/min?

8. Calculate IV drip rate for 0.00065 kL of 0.9% NaCl over 12.5 hrs. Drop factor is 15 gtts/min. What is the IV drip rate?

# IV DROP RATE

## ANSWERS

1. **50 drops/min.** The nurse is to administer Keflin 1 gm in 50 ml over 20 minutes. The drop factor is 20 drops. What is the drip rate? Remember, drip rate is equal to drops/min. Anytime we are given drops, it is always drops/1ml. Start with drops.

$$\frac{20 \text{ drops}}{1 \text{ ml}} = \frac{50 \text{ ml}}{20 \text{ min}} \qquad = \textbf{50 drops/min}$$

2. **16 drops/min.** An order is prescribed for Tobramycin 80 mg in 120 ml over 1.5 hours. The drop factor is 12 drops. What is the drip rate? Start with drops.

$$\frac{12 \text{ drops}}{1 \text{ ml}} = \frac{120 \text{ ml}}{1.5 \text{ hrs}} = \frac{1 \text{ hr}}{60 \text{ min}} \qquad = \textbf{16 drops/min}$$

3. **104 drops/min.** Calculate IV flow rate for 598,000 mcl of D5W over 522 min. Drop factor of 91 gtts. What is the IV drip rate? Gtts is just a fancier term for drops. Use your list of conversions to go from mcl → Continue to start with drops.

$$\frac{91 \text{ gtts (drops)}}{1 \text{ ml}} = \frac{1 \text{ ml}}{1000 \text{ mcl}} = \frac{598,000 \text{ mcl}}{522 \text{ min}} \qquad = \textbf{104 gtts (drops)/min}$$

4. **14 drops/min.** The nurse is to administer a medication at an IV flow rate of 631 ml of D5W over 936 min. Drop factor is 21 gtts. What is the IV drip rate? Start with drops.

$$\frac{21 \text{ drops}}{1 \text{ ml}} = \frac{631 \text{ ml}}{936 \text{ min}} \qquad = \textbf{14 gtts (drops)/min}$$

5. **25 drops/min.** An order for Sodium Chloride 0.9% at 100 ml/hr was prescribed. How many drops per minute, using tubing with a 15 drop factor? Asking drops per minute is just asking the drip rate. Start with drops.

$$\frac{15 \text{ drops}}{1 \text{ ml}} = \frac{100 \text{ ml}}{1 \text{ hr}} = \frac{1 \text{ hr}}{60 \text{ min}} = \textbf{25 drops/min}$$

6. **40 drops/min.** Acyclovir 300 mg is in 150 ml of D5W to infuse over 1 ¼ hrs. Drop factor is 20 drops/ml. What is the drip rate? Start with drops.

$$\frac{20 \text{ drops}}{1 \text{ ml}} = \frac{150 \text{ ml}}{1.25 \text{ hr}} = \frac{1 \text{ hr}}{60 \text{ min}} = \textbf{40 drops/min.}$$

7. **59 gtts/min.** Calculate the IV drip rate for 0.91 L of 0.9% NaCl IV over 22.1 hrs. Drop factor is 86. What is drip rate in gtts/min? Start with drops. Use list of conversions to get from ml → L.

$$\frac{86 \text{ drops}}{1 \text{ ml}} = \frac{1000 \text{ ml}}{1 \text{ L}} = \frac{0.91 \text{ L}}{22.1 \text{ hrs}} = \frac{1 \text{ hr}}{60 \text{ min}} = \textbf{59 gtts (drops)/min}$$

8. **13 drops/min.** Calculate IV drip rate for 0.00065 kL of 0.9% NaCl over 12.5 hrs. Drop factor is 15 gtts/min. What is the IV drip rate? Start with drops and use list of conversions to go from kl → ml.

$$\frac{15 \text{ drops}}{1 \text{ ml}} = \frac{1000 \text{ ml}}{1 \text{ L}} = \frac{1000 \text{ L}}{1 \text{ kL}} = \frac{0.00065 \text{ kL}}{12.5 \text{ hrs}} = \frac{1 \text{ hr}}{60 \text{ min}} = \textbf{13 drops/min.}$$

# SLIDING SCALE INSULIN
## PRACTICE QUESTIONS

**1.** A patient was prescribed Insulin Aspart to given SQ AC and HS as follows:

| Blood Glucose | Insulin Dose |
|---|---|
| <70 mg/dL | Hypoglycemia Protocol |
| 70-150 | 0 units |
| 151-200 | 2 units |
| 201-250 | 4 units |
| 251-300 | 6 units |
| 301-350 | 8 units |
| 351-400 | 10 units |
| >400 units | Call MD |

*The client's blood glucose showed 360. How many units should the nurse administer?*

**2.** A patient was prescribed Humulin NPH 40 units and Humulin Regular 25 units SC every morning. The AM finger-stick blood sugar is 202mg/dL. How many units should the nurse administer?

| Blood Glucose | Insulin Dose |
|---|---|
| <70 | Hypoglycemia Protocol |
| 70-180 | 0 units |
| 181-200 | 2 units |
| 201-220 | 4 units |
| 221-240 | 6 units |
| >240 | Call MD |

# SLIDING SCALE INSULIN

## ANSWERS

1. **10 units.** Based on the scale with a blood glucose of 360, the patient should receive 10 units.

2. **69 units.** The nurse automatically gives 40 units NPH and 25 units Regular every morning along with extra insulin based on the finger-stick blood sugar results. BG was 202, which would mean 4 extra units of insulin should be administered.

$$40 + 25 + 4 = 69 \text{ units.}$$

# HEPARIN THERAPY
## PRACTICE QUESTIONS

1.  An order is placed for Heparin 5,000 units IV stat. Heparin comes in a vial with 10,000 units per 1 ml. How many ml will be given?

2. A provider orders an IV heparin drip at 12 units/kg/hr and to administer a loading bolus dose of 60 units/kg IV before initiation of drip. Heparin bag reads: 25,000 units/250 ml. Patient weighs 189 lbs. What is the flow rate you will set the IV pump at?

3. An order for IV Heparin at 18 units/kg/hr is prescribed with a loading bolus dose of 30 units/kg IV before initiation of drip. Heparin bag reads: 25,000 units/500 ml. Patient weighs 78 kg. What is the flow rate for the IV pump, and how many units will be administered for the bolus?

4. Your patient's recent PTT is 45. According to protocol, you need to increase Heparin drip by 2 units/kg/hr and administer 30 units/kg IV bolus. Current drip is at 22 units/kg/hr from bag that reads 25,000 units/250 ml. Patient weights 129 lbs. How many units will patient receive as a bolus, and how many units/kg/hr will the patient receive based on new PTT result?

5. Your patient has a Heparin drip running at 26 ml/hr. The heparin bag reads 12,500 units/250 ml. How many units per hour is the patient receiving?

# HEPARIN THERAPY
## ANSWERS

1. **0.5 ml.** An order is placed for Heparin 5,000 units IV stat. Heparin comes in a vial with 10,000 units per 1 ml. How many ml will be given? Start with ml.

$$\frac{1 \text{ ml}}{10,000 \text{ units}} \quad = \quad 5,000 \text{ units} \quad = \text{ } \textbf{0.5 ml}$$

2. **10.3 ml/hr**. A provider orders an IV heparin drip at 12 units/kg/hr and to administer a loading bolus dose of 60 units/kg IV before initiation of drip. Heparin bag reads: 25,000 units/250 ml. Patient weighs 189 lbs. What is the flow rate you will set the IV pump at? This is a more complex question. First convert 189 lbs → 86 kg. Next, the question is asking for the IV flow rate of the heparin drip (ml/hr), not the bolus. Start with ml since the answer we need is ML/HR.

$$\frac{250 \text{ ml}}{25,000 \text{ units}} \quad = \quad \frac{12 \text{ units}}{1 \text{ kg}} \quad = \quad \frac{86 \text{ kg}}{1 \text{ hr}} \quad = \quad \textbf{10.3 ml/hr}$$

3. **28 ml/hr flow rate, 2340 units bolus.** An order for IV Heparin at 18 units/kg/hr is prescribed with a loading bolus dose of 30 units/kg IV before initiation of drip. Heparin bag reads: 25,000 units/500 ml. Patient weighs 78 kg. What is the flow rate for the IV pump, and how many units will be administered for the bolus? This is a two part question. First answer the flow rate by starting with ml.

**FLOW RATE:**

$$\frac{500 \text{ ml}}{25,000 \text{ units}} \quad = \quad \frac{18 \text{ units}}{1 \text{ kg}} \quad = \quad \frac{78 \text{ kg}}{1 \text{ hr}} \quad = \textbf{28 ml/hr for flow rate}$$

**LOADING BOLUS:** 30 units/kg. Start with units.

$$\frac{30 \text{ units}}{1 \text{ kg}} \quad \frac{78 \text{ kg}}{} \quad = \textbf{2340 units for bolus.}$$

4. **Bolus of 1770 units, flow rate is 24 units/kg/hr.** Your patient's recent PTT is 45. According to protocol, you need to increase Heparin drip by 2 units/kg/hr and administer 30 units/kg IV bolus. Current drip is at 22 units/kg/hr from bag that reads 25,000 units/250 ml. Patient weights 129 lbs. How many units will patient receive as a bolus, and

how many units/kg/hr will the patient receive based on new PTT result? This is a two part question. First convert 129 lbs → 59 kg.

> **LOADING BOLUS:** 30 units/kg IV bolus order.
> 
> $$\frac{30 \text{ units}}{1 \text{ kg}} \quad 59 \text{ kg} \quad = \textbf{1770 units}$$
> 
> **NEW FLOW RATE**: Old one was 22 units/kg/hr. Order to increase by 2 units/kg/hr. 22 units + 2 units =24 units. Answer is 24 units/kg/hr.

5. **1300 units/hr.** Your patient has a Heparin drip running at 26 ml/hr. The heparin bag reads 12,500 units/250 ml. How many units per hour is the patient receiving? Start with units since that is what the answer is asking for.

$$\frac{12,500 \text{ units}}{250 \text{ ml}} \quad = \quad \frac{26 \text{ ml}}{1 \text{ hr}} \quad = \textbf{1300 units/hr.}$$

# THANK YOU!

## I HOPE THIS REVIEW HELPED YOU!

Remember: it takes time to master any skill.

XOXO,

Amanda from BeautifulNursing.com

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