Pharmacology
Drug Dosage Calculations

Overview

- Abbreviations
- Metric Conversions
- Desired Dose
- Concentrations
- Drip Rates
- Medications (Dopamine and Lidocaine)

Abbreviations

- cc- cubic centimeter
- DD- Desired Dose
- gm- gram
- gtt- drop/drops
- IM- Intramuscular
- IO- Intraosseous
- IV- Intravenous
- IVP- Intravenous Push

Abbreviations

- Kg- Kilogram
- L- Liter
- mcg- microgram
- mEq- milliequivalant
- mg- milligram
- mL- milliliter
- µg- microgram
- µgtt- micro drop

Metric Conversions

- Kg, g, mg, mcg
- Lbs. to Kg
- L to mL

Kg, g, mg, mcg

- To convert if going from large value to smaller value, move the decimal point 3 places to the right for each conversion.
- If going from smaller value to larger value, move the decimal point 3 places to the left for each conversion.

3.0 Kg = 3→0→0→0. g = 3000 g

3.0 Kg = 3→0→0→0→0→0→0. = 3,000,000 mg

3.0 Kg = 3→0→0→0→0→0→0→0 →0→0. = 3,000,000,000 mcg

Lbs. to Kg

- There are two methods that may be used to convert pounds to Kg:
- Lbs./ 2.2 = Kg
- 3 a.m. rule- (Lbs./ 2) – 10% = Kg

- Therefore, if you need to convert Kg to Lbs:
- Kg x 2.2 = Lbs. or
- (Kg x 2) + 10% = Lbs.

L to mL

- 1 L = 1→0→0→0. = 1,000 mL
- 500 mL = 5←0←0. = .5 L

Conversions to mg

- 300 mcg =
- . 3 mg
- 6 Kg =
- 6,000,000 mg
- 450 g =
- 450,000 mg
- .42 Kg =
- 420,000 mg
- 14 g =
- 14,000 mg
- 1,000 mcg =
- 1 mg

Conversions to mcg

- 1 g =
- 1,000,000 mcg
- .452 mg =
- 452 mcg
- .074 Kg =
- 74,000,000 mcg
- .010 mg =
- 10 mcg
- 175 g =
- 175,000 mcg
- .0006 Kg =
- 600,000 mcg

Conversions to g

- .043 Kg =
- 43 g
- 100,000 mcg =
- .1 g
- 1,000 mg =
- 1 g
- .075 mg =
- .000075 g
- 1,500 mcg =
- .001500 g
- 1 Kg =
- 1,000 g

Conversions to Kg

- 1000 g =
- 1 Kg
- 1,500 mg =
- .0015 Kg
- 142,000 mcg =
- .000142 Kg
- 150,000 g =
- 150 Kg
- .042 mg =
- .000000042 Kg
- 720,000,000 mcg =
- .72 Kg

Lbs. to Kg

- 275 Lbs. =
- 125 Kg
- 100 Lbs. =
- 45 Kg
- 315 Lbs. =
- 143 Kg
- 165 Lbs. =
- 75 Kg
- 215 Lbs. =
- 98 Kg
- 42 Lbs. =
- 19 Kg

Kg to Lbs.

- 100 Kg =
- 220 Lbs.
- 32 Kg =
- 70 Lbs.
- 125 Kg =
- 275 Lbs.
- 75 Kg =
- 165 Lbs.
- 15 Kg =
- 33 Lbs.
- 175 Kg =
- 385 Lbs.

L to mL

- 2 L =
- 2,000 mL
- .5 L =
- 500 mL
- 1 L =
- 1,000 mL
- .250 L =
- 250 mL
- .100 L =
- 100 mL
- 2.75 L =
- 2,750 mL

mL to L

- 3,000 mL =
- 3 L
- 1,500 mL =
- 1.5 L
- 500 mL =
- .5 L
- 1,000 mL =
- 1 L
- 2,500 mL =
- 2.5 L
- 250 mL =
- .25 L

mL v. cc

- A mL and a cc have the same value. Therefore:

- 1 mL = 1 cc
- 500 mL = 500 cc
- .5 cc = .5 mL
- 400 cc = 400 mL

Desired Dose

- The amount of a particular medication to be administered.
- The symbol “/” stands for per

Desired Dose

- A patient with chest pains needs to be given 4 mg of Morphine Sulfate for Chest Pains.

- 4 mg is the Desired Dose

Desired Dose

- A hypotensive patient needs to be given Dopamine at 10 µg/kg/minute. The patient weight is 220 Lbs.

- 1,000 µg/min is the desired dose

Desired Dose

- A physician orders 25 mg of Benadryl to a patient with itching and hives. Benadryl is supplied 50 mg/ 2 cc. What is the DD?

- 25 mg

Desired Dose

- A patient with hypotension is ordered to receive Dopamine at 5 µg/kg/min. The patient weight is 275 Lbs. Your Dopamine is mixed 800 mg in 500 mL. What is the DD?

- 625 µg/min

Desired Dose

- A pediatric patient is to receive Atropine .02 mg/kg. The patient weight is 18 Kg. What is the DD?

- .36 mg

Concentration

- The concentration is found by dividing the weight by the volume. (Ex: 50 mg/2 mL)
- The answer will result in the concentration/mL of medication
- 25 mg/mL

Concentration

- Phenergan is ordered 12.5 mg. It is supplied 25 mg/ 2 mL. What is the Concentration?

- 12.5 mg/mL

Concentration

- Lidocaine is ordered at 2 mg/min. It is supplied 2g/500 mL. What is the concentration?

- .004 g/mL or 4 mg/ml

Concentration

- Morphine is ordered 5 mg. It is supplied 10 mg/ 4 mL. What is the concentration?

- 2.5 mg/mL

Concentration

- Diazepam is ordered 5 mg. It is supplied 10 mg/ 2 mL. What is the concentration?

- 5mg/ mL

Concentration

- Dopamine is ordered 5 µg/kg/min to a 220 Lbs. patient. It is supplied 800 mg/ 500 mL. What is the concentration?

- 1.6 mg/mL or 1600 mcg/mL

Calculating the mL to be given

- There is a very simple mathematical equation to calculate the mL to be given:

- (D/H) x Q

- Dose you want to give (mg/mcg)
- What do you Have it supplied in (mg/mcg)
- What Quantity does it come in (mL)

Medication Calculations

- Phenergan is ordered 12.5 mg. It is supplied 25 mg/ 2 mL. How many mL will you need to give?

- (12.5mg/ 25 mg) x 2 mL
- .5 mg x 2 mL
- 1 mL

Medication Calculations

- Adenosine is ordered 12 mg IVP after no response to a 6 mg dose. Adenosine is supplied 12 mg/4 mL. How many mL will you need to give?

- 4 mL

Medication Calculations

- Lidocaine is ordered 1 mg/kg to a patient that weighs 150 Lbs. It is supplied 100 mg/5 mL. How many mL will you need to give?

- 3.4 mL

Medication Calculations

- Amiodarone is ordered 150 mg IVP over 10 minutes. It is supplied 200 mg/ 10 mL. How many mL will you need to give?

- 7.5 mL

Medication Calculations

- Lasix is ordered 40 mg IVP. It is supplied 100 mg/ 3 mL. How many mL will you need to give?

- 1.2 mL

Medication Calculations

- Epinephrine .3 mg 1:1,000 SQ is ordered to a patient with anaphylaxis. It is supplied 1 mg/ 1 mL. How many mL will you need to give?

- .3 mL

Medication Calculations

- Epinephrine .3 mg 1:10,000 IVP is ordered for a pediatric patient. It is supplied 1 mg/ 10 mL. How many mL will you need to give?

- 3 mL

Drip Rates

- First, remember that you are going to be mixing a medication into fluids, you must first withdraw the amount of fluid from the IV bag that you will be replacing with the medication, so that the concentration will remain the same originally calculated.
- For example, if Lidocaine comes 1 g/ 25 mL, and you will mix 1 g in your 500 mL IV bag, first withdraw 25 mL of fluid from your IV bag, then replace it with the 25 mL containing to 1 g of Lidocaine. The volume will still be 500. Otherwise it would be 525, altering the mg/min you will give.

Drip Rates

- (mL x gtt factor) / minutes

- Example: 500 mL using 15 gtt set over 1 hour.
- (500 x 15) / 60 =
- 125 gtts/min

Drip Rates

- A physician orders 500 mL LR to be infused over 2 hours. You have a 15 gtt IV tubing set. How many gtts/ minute will you give?

- 63 gtts/ min

Drip Rates

- A physician orders 200 mL of 0.9% Sodium Chloride be infused over one hour. You have a 10 gtt IV drip set. How many drops/ minute will you give?

- 33 gtts/ minute

Drip Rates

- A physician orders LR to be given KVO, or 30 ml/hr. You are using a 15 gtt IV tubing set. How many gtts/ minute will you give?

- 8 gtts/ minute

Drip Rates

- You have started an IV of 0.9% Sodium Chloride and a physician request that you give 150 mL/ hr. You are using a 15 gtt IV tubing set. How many gtts/ minute will you give?

- 38 gtts/ minute

Drip Rates

- A patient that you have established an IV on is to receive LR KVO, or 30 mL/ hour. You have a 60 gtt/ set. How many gtts/ minute will you give?

- 30 gtts/ minute

Dopamine

- Dopamine, in order to give the correct dose, you must first find the concentration. Remember to use a 60 gtt IV tubing set when you are giving medications.
- Although there are several ways to determine gtts/ minute, the easiest way to determine gtts/ minute of dopamine, if using a 1600 mcg/ mL concentration is:
- (mcg x Kg) / 25

Dopamine

- A patient with impaired renal function is to receive 2 mcg/kg/min. You have 800 mg of Dopamine and a 500 mL IV bag of Normal Saline, along with a 60 gtt IV tubing set. Your patient weighs 250 Lbs. How many gtts/ minute will you give?

- 9 gtts/ minute

Dopamine

- A patient with bradycardia is to receive 5 mcg/kg/min. Your premixed Dopamine is 1600 mcg/mL and you have a 60 gtt IV tubing set. Your patient weighs 175 Lbs. How many gtts/ minute will you give?

- 16 gtts/ minute

Dopamine

- A hypotensive patient is to receive 10 mcg/kg/min. You have 400 mg of Dopamine and 250 mL Normal Saline, along with a 60 gtt set. Your patient weighs 220 Lbs. How many gtts/ minute will you give?

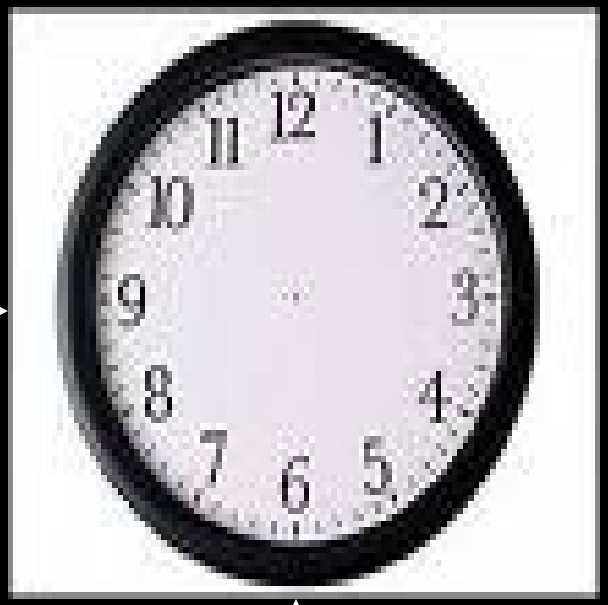
- 40 gtts/ minute

Lidocaine

- The use of the Lidocaine clock is easiest to use. The use of a 60 gtt/ set is required to use the clock. You concentration must also be 4 mg/mL.

Lidocaine Clock

4 mg= 60 gtts



3 mg= 45 gtts

2 mg= 30 gtts

Lidocaine

- A patient with multiple PVC's is to receive 2 mg/ minute of Lidocaine. You have 1g and a 250 mL bag of Normal Saline,along with a 60 gtt set. How many gtts/ minute will you give?

- 30 gtts/ minute

Lidocaine

- After successful resuscitation of a patient in V Tach, you are ordered to start a Lidocaine drip at 3 mg/ min. Your premixed Lidocaine is packaged 2g/500 mL. You also have a 60 gtt set. How many gtts/ min will you give?

- 45 gtts/ minute

Lidocaine

- A patient is to receive 4 mg/ minute of Lidocaine. You have Lidocaine 4g/ 1000 mL, and a 60 gtt IV tubing. How many gtts/ min will you give?

- 60 gtts/ minute

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