DIMENSIONAL ANALYSIS EXAMPLES

Complete the following calculations using formulas or dimensional analysis

1. The physician orders an IV infusion of D5W 1 L to infuse over the next eight hours. The IV tubing that you are using delivers 15 gtt/mL. What is the correct drip rate of flow?

2. 1,000mL solution of D5NS with 20,000 units of Heparin is infusing at 20mL per hour. How many units of Heparin is the patient receiving each hour?

3. Thorazine 37.5 mg oral solution has been ordered for your patient. The only available dosage is 25 mg/mL. What amount will you give?

4. You are to give 90 mg of Inderal. The available dosage strength is a scored 60mg. tablet. What amount will you give?

5. Digoxin 0.5 mg is ordered; available tablets contain 250 mcg per tablet. How many tablets will you give?

6. Administer Dopamine 5 mcg/kg/min. Dopamine is mixed 400 mg in 250 mL. The patient weighs 164 lbs. How many mL per hour will be administered?

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ANSWER KEY

1 The physician orders an IV infusion of D5W 1 L to infuse over the next eight hours. The IV tubing that you are using delivers 15 gtt/mL. What is the correct drip rate of flow?

$$\frac{\text{gtt}}{\text{min}} = \frac{15\ \text{gtt}}{\text{mL}} \left| \frac{1{,}000\ \text{mL}}{1\ \text{L}} \right| \frac{1\ \text{L}}{8\ \text{hr}} \left| \frac{1\ \text{hr}}{60\ \text{min}} \right. = \text{31 gtt/min}$$

2 1,000mL solution of D5NS with 20,000 units of Heparin is infusing at 20mL per hour. How many units of Heparin is the patient receiving each hour?

$$\frac{\text{units}}{\text{hr}} = \frac{20{,}000\ \text{units}}{1{,}000\ \text{mL}} \left| \frac{20\ \text{mL}}{1\ \text{hr}} \right. = \text{400 units/hr}$$

3 Thorazine 37.5 mg oral solution has been ordered for your patient. The only available dosage is 25 mg/mL. What amount will you give?

$$\frac{\text{mL}}{\text{dose}} = \frac{1\ \text{mL}}{25\ \text{mg}} \left| \frac{37.5\ \text{mg}}{\text{dose}} \right. = \text{1.5 mL}$$

4 You are to give 90 mg of Inderal. The available dosage strength is a scored 60mg. tablet. What amount will you give?

$$\frac{\text{tabs}}{\text{dose}} = \frac{1\ \text{tab}}{60\ \text{mg}} \left| \frac{90\ \text{mg}}{\text{dose}} \right. = \text{1.5 tabs}$$

5 Digoxin 0.5 mg is ordered; available tablets contain 250 mcg per tablet. How many tablets will you give?

$$\frac{\text{tabs}}{\text{dose}} = \frac{1\ \text{tab}}{250\ \text{mcg}} \left| \frac{1{,}000\ \text{mcg}}{1\ \text{mg}} \right| \frac{0.5\ \text{mg}}{\text{dose}} = \text{2 tabs}$$

6 Administer Dopamine 5 mcg/kg/min. Dopamine is mixed 400 mg in 250 mL. The patient weighs 164 lbs. How many mL per hour will be administered?

$$\frac{\text{mL}}{\text{hr}} = \frac{250\ \text{mL}}{400\ \text{mg}} \left| \frac{1\ \text{mg}}{1{,}000\ \text{mcg}} \right| \frac{5\ \text{mcg}}{1\ \text{kg}/1\ \text{min}} \left| \frac{60\ \text{min}}{1\ \text{hr}} \right| \frac{1\ \text{kg}}{2.2\ \text{lb}} \left| \frac{164\ \text{lb}}{} \right. = \text{14 mL/hr}$$