

NUR230
Med Math
Review Packet

Calculating IV Dosage and Flow Rate Based on Body Weight

IV medications may be ordered according to a *specified amount* (e.g., mcg per kg of body weight) to be administered within a *specified unit* of time (e.g., per minute). The medication is added to a *specified volume* and type of IV solution. The total desired dose per minute must first be determined and then the infusion rate calculated that will administer the correct mL per hr or gtt per min.

EXAMPLE Order: Infuse Nipride (nitroprusside sodium) 50 mg in 250 mL D5W at 3 mcg/kg/min.
Weight: 215 lb
Drop Factor: 60 gtt per mL

1. How many mcg per min must be administered?

$$215 \text{ lb} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} \times \frac{3 \text{ mcg per min}}{1 \text{ kg}} = 293.2 \text{ mcg per min}$$

2. How many mL per hr will provide the required dose?

$$1 \text{ hr} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{293.2 \text{ mcg}}{1 \text{ min}} \times \frac{1 \text{ mg}}{1000 \text{ mcg}} \times \frac{250 \text{ mL}}{50 \text{ mg}} = 87.9 = 88 \text{ mL per hr}$$

3. How many gtt per min will provide the required dose?

$$1 \text{ min} \times \frac{293.2 \text{ mcg}}{1 \text{ min}} \times \frac{1 \text{ mg}}{1000 \text{ mcg}} \times \frac{250 \text{ mL}}{50 \text{ mg}} \times \frac{60 \text{ gtt}}{1 \text{ mL}} = 87.9 = 88 \text{ gtt per min}$$

*OR

$$215 \text{ lb} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} \times \frac{3 \text{ mcg}}{1 \text{ kg}} \times \frac{1 \text{ mg}}{1000 \text{ mcg}} \times \frac{250 \text{ mL}}{50 \text{ mg}} \times \frac{60 \text{ gtt}}{1 \text{ mL}} = 87.9 = 88 \text{ gtt per min}$$

4. How many mcg per gtt will be administered?

$$1 \text{ gtt} \times \frac{1 \text{ min}}{88 \text{ gtt}} \times \frac{293.2 \text{ mcg}}{1 \text{ min}} = 3.3 \text{ mcg per gtt}$$

***Note:** When calculating gtt per min, the step of calculating mcg per min can be omitted.

EXAMPLE Order: Infuse Heparin 10,000 units in 250 mL D5W at 0.4 units/kg/min.
Weight: 59 kg
Drop Factor: 60 gtt per mL

1. How many units per min must be administered?

$$59 \text{ kg} \times \frac{0.4 \text{ units per min}}{1 \text{ kg}} = 23.6 \text{ units per min}$$

2. How many mL per hr will provide the required dose?

$$1 \text{ hr} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{23.6 \text{ units}}{1 \text{ min}} \times \frac{250 \text{ mL}}{10,000 \text{ units}} = 35 \text{ mL per hr}$$

3. How many gtt per min will provide the required dose?

$$1 \text{ min} \times \frac{23.6 \text{ units}}{1 \text{ min}} \times \frac{250 \text{ mL}}{10,000 \text{ units}} \times \frac{60 \text{ gtt}}{1 \text{ mL}} = 35 \text{ gtt per min}$$

OR

$$59 \text{ kg} \times \frac{0.4 \text{ units}}{1 \text{ kg}} \times \frac{250 \text{ mL}}{10,000 \text{ units}} \times \frac{60 \text{ gtt}}{1 \text{ mL}} = 35 \text{ gtt per min}$$

4. How many units per gtt will be administered?

$$1 \text{ gtt} \times \frac{1 \text{ min}}{35 \text{ gtt}} \times \frac{23.6 \text{ units}}{1 \text{ min}} = 0.7 \text{ units per gtt}$$

3. *Order:* Infuse Nitroprusside 50 mg in 250 mL D5W at 1.5 mcg/kg/min.

Weight: 198 lb

Drop Factor: 60 gtt per mL

a. How many mcg per min must be administered?

b. How many mL per hr will provide the required dose?

c. How many gtt per min will provide the required dose?

d. How many mcg per gtt will be administered?

4. *Order:* Intropin (dopamine hydrochloride) 800 mg in 250 mL D5W at 8 mcg/kg/min

Weight: 72.8 kg

Drop Factor: 60 gtt per mL

a. How many mcg per min must be administered?

b. How many mL per hr will provide the required dose?

c. How many gtt per min will provide the required dose?

d. How many mcg per gtt will be administered?

5. **Order:** Infuse Dobutamine 250 mg in 150 mL D5W at 5 mcg/kg/min.

Weight: 83.2 kg

Drop Factor: 60 gtt per mL

a. How many mcg per min must be administered?

b. How many mL per hr will provide the required dose?

c. How many gtt per min will provide the required dose?

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NURS 230 Management of Patient Care

1. Order: Solu-Medrol 250 mg IV every 6 hours
Supply: Each 2 mL contain methylprednisolone sodium succinate equivalent to 125 mg
Give: _____ mL Solu-Medrol
Drug handbook states "give by direct IV at a rate of 500 mg or fraction thereof over 60 seconds."
How many mL per minute should be administered?

2. Order: Digoxin 0.25mg IV daily
Supply: Digoxin 500 mcg in 2 mL
Give: _____ mL Digoxin
Drug handbook states "may be administered diluted in 4 mL sterile water."
Administer each direct IV dose at least over 5 minutes.
How many mL per minute should be administered?

3. Order: Tetracycline Elixir QID for a child weighing 50 lbs at a dose of 8 mg/kg/day in equally divided doses.
Supply: Tetracycline 50 mg per 7 mL
How many mL should be administered?
How many mg should each dose contain?

4. Order: Ampicillin IVPB for a child weighing 55 lbs at a dosage of 20 mg/kg/day in 4 equally divided doses
Supply: Ampicillin 250 mg in 1.5 mL after reconstitution
How many mg should be administered at each dose?

5. When you come on duty at 0700 hours there are 300 mL remaining in your patient's IV bag. It is infusing at 75 mL/hr on the PLUM infusion pump. At what time do you anticipate needing a new IV bag?

6. At 1130 hours your patient has 150 mL remaining in his IV bag. It is infusing at 30 gtt/min. Drop factor is 15 gtt/mL. Do you have enough solution left to lunch (30 min) now, without changing the IV bag?

7. Order: 300 mg Kanamycin IV in 100 mL D₅W to infuse over 30 minutes. Drop factor: 15 gtt/mL.
Flow rate gtts/min mL/hr

8. Order: Quinidine 0.6 gms po every 4 hours
Available: Quinidine 200 mg tablets
Give: _____ tab(s)
9. A patient has a confirmed pulmonary embolus and the physician has ordered a heparin drip. The initial rate is ordered at 1000 units per hour. Premixed heparin infusions are 25,000 units in 250 mL D₅W.
What is rate of infusion using a PLUM infusion pump? _
10. You are to change a heparin drip rate on your patient to 17 mL/hr. A premixed heparin infusion bag of 25,000 units heparin in 250 mL D₅W is currently infusing via a PLUM infusion pump. How much heparin will the patient now be receiving per hour?

Manhattan Area Technical College
NURS 230
Med Math Worksheet

1. Order: Infuse Nipride (nitro prusside sodium) 50 mg in 500 mL D₅W at 3mcg/kg/min
Weight: 215 lb
gtt factor: 60 gtt/mL

A. How many mcg/min must be administered?

B. How many mL/hr will provide the required dose?

C. How many gtt/min will provide the required dose?

D. How many mcg/gtt will be administered?

E. How long will it take the IV to infuse?

2. Order: Infuse Heparin 10,000 U in 250 mL D₅W at 0.4 U/kg/min
Weight: 59 kg
Drop factor: 60 gtt/mL

A. How many U/min must be administered?

B. How many mL/hr will provide the required dose?

C. How many gtt/min will provide the required dose?

D. How many U/gtt will be administered?

E. How long will it take the IV to infuse?

3. Order: Infuse Amrinone 250 mg in 500mL D₅W at 5 mcg/kg/min
Weight: 202 lbs
Drop factor: 60 gtt/mL

A. How many mcg/min must be administered?

B. How many mL/hr will provide the required dose?

C. How many gtt/min will provide the required dose?

D. How many mcg/gtt will be administered?

E. How long will it take the IV to infuse?

4. Order: Infuse Dobutamine 250 mg in 250 mL D₅W at 7 mcg/kg/min
Weight: 73.6 kg
Drop factor: 60 gtt/mL

A. How many mcg/min must be administered?

B. How many mL/hr will provide the required dose?

C. How many gtt/min will provide the required dose?

D. How many mcg/gtt will be administered?

E. How long will it take the IV to infuse?

5. Order: Infuse Nitro Prusside 50 mg in 250 mL D₅W at 1.5 mcg/kg/min
Weight: 198 lbs
Drop factor: 60 gtt/mL

A. How many mcg/min must be administered?

B. How many mL/hr will provide the required dose?

C. How many gtt/min will provide the required dose?

D. How many mcg/gtt will be administered?

E. How long will it take the IV to infuse?

6. Order: Intropin (dopamine HCL) 800 mg in 250 mL D₅W at 8 mcg/kg/min
Weight: 72.8 kg
Drop factor: 60 gtt/mL

A. How many mcg/min must be administered?

B. How many mL/hr will provide the required dose?

C. How many gtt/min will provide the required dose?

D. How many mcg/gtt will be administered?

E. How long will it take the IV to infuse?

7. Order: Infuse Dobutamine 250 mg in 150 mL D₅W at 5 mcg/kg/min
Weight: 83.2 kg
Drop factor: 60 gtt/mL

A. How many mcg/min must be administered?

B. How many mL/hr will provide the required dose?

C. How many gtt/min will provide the required dose?

D. How many mcg/gtt will be administered?

E. How long will it take the IV to infuse?

