

IM 7 Math Module

Complete the required math problems and check your answers.

Drop Factor Problems

1. Infuse 1.5 gram of a medication over 3 hours. The drug is supplied as 1.5 gram/250mL.

The drip factor is 15. How many gtt/min will you infuse? (Round to the nearest whole number)

$$\frac{1.5g \cdot 250mL \cdot 15 \frac{gtt}{min}}{3hr \cdot 1.5g} = 20.83 \frac{gtt}{min} \approx 21 \frac{gtt}{min}$$

2. An order has been written to give 1 gram of a medication over 30 minutes. The drug is supplied as 1 gram/50mL. The gtt factor is 60. How many gtt/min will you infuse?

$$\frac{1g \cdot 50mL \cdot 60 \frac{gtt}{min}}{30min \cdot 1g} = 100 \frac{gtt}{min}$$

3. The nurse is to give 500mg IV of a medication over 1 hr. The drug is supplied as 1 gram/250mL. The gtt factor is 15. How many gtt/min will you infuse? (Round to the nearest whole number)

$$\frac{500mg \cdot 250mL \cdot 15 \frac{gtt}{min}}{60min \cdot 1000mg} = 31.25 \frac{gtt}{min} \approx 31 \frac{gtt}{min}$$

4. The patient is to receive 400 mg IV of a medication over 1 hour. You receive an IV bag from the pharmacy labeled 400 mg in 100 mL D5W. The IV tubing delivers 12 gtt/mL.

How many drops per minute (gtt/min) will the nurse deliver?

$$\frac{400mg \cdot 100mL \cdot 12 \frac{gtt}{mL}}{60min \cdot 400mg} = 20 \frac{gtt}{min}$$

mL/hr Infuse over time

5. The physician writes an order to give 1000mL of intravenous fluid over 8hrs. How many mL/hr will you infuse?

$$\frac{1000mL}{8hr} = 125 \frac{mL}{hr}$$

6. Infuse 1000 mLs of intravenous fluid over 4 hrs. How many mL/hr will you set on the pump?

$$\frac{1000mL}{4hr} = 250 \frac{mL}{hr}$$

7. A physician orders 1000 mg of a medication to be given every 6 hours over 1.5 hours. The medication is delivered with 1000 mg in 250 mL. How many mL/hr will you set the pump? (Round to the nearest whole number)

$$\frac{1000mg \cdot 250mL}{1.5hr \cdot 1000mg} = 166.7 \frac{mL}{hr} \approx 167 \frac{mL}{hr}$$

IV Push

8. An order is received for 75mcg IV push of a medication now. The drug is supplied as 100mcg/2mL. How many mL will you give?

$$\frac{75mcg \cdot 2mL}{100mcg} = 1.5mL$$

9. The patient is to receive 5mg of a medication IV push. The drug is supplied as 20mg/5mL. How many mL will you give? (Do not round your final answer)

$$\frac{5mg \cdot 5mL}{20mg} = 1.25mL$$

10. The order is to give 2mg IV push of a medication now. The drug is supplied as 10mg/1mL. How many mL will you give?

$$\frac{2mg \cdot 1mL}{10mg} = 0.2mL$$

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Mcg/kg/min or Mcg/min

$$\frac{175 \text{ lbs}}{2.2 \text{ lbs}} \cdot 1 \text{ kg} = 79.5 \text{ kg}$$

11. The patient is receiving an intravenous medication currently infusing at 142 mL/hr. The IV bag of reads 50 mg in 500 mL D5W. The patient weighs 175 lbs. How many mcg/kg/min are infusing? (Round to the nearest tenth)

$$\frac{142 \text{ mL} \cdot 50000 \text{ mcg}}{500 \text{ mL} \cdot 60 \text{ min}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \cdot 79.5 \text{ kg} = 3.98 \frac{\text{mcg}}{\text{kg} \cdot \text{min}} \approx 3 \frac{\text{mcg}}{\text{kg} \cdot \text{min}}$$

12. The physician has ordered a medication that states to start at 1 mcg/kg/min and titrate as needed. The IV bag of medication contains 250 mg in 500 mL D5W. The patient weighs 70 kg. How many mL/hr should the IV pump be set at to achieve the starting dose? (Round to the nearest whole number)

$$\frac{\text{mL}}{\text{hr}} = \frac{1 \frac{\text{mcg}}{\text{kg} \cdot \text{min}} \cdot 500 \text{ mL} \cdot 70 \text{ kg}}{250000 \text{ mcg} \cdot \frac{1 \text{ hr}}{60 \text{ min}}} = 8.4 \frac{\text{mL}}{\text{hr}} \approx 8 \frac{\text{mL}}{\text{hr}}$$

13. The patient is currently receiving a medication at 12 mL/hr. The bottle reads 100 mg in 250 mL D5W. How many mcg/min is the patient receiving?

$$\frac{\text{mcg}}{\text{min}} = \frac{12 \text{ mL}}{\text{hr}} \cdot \frac{100000 \text{ mcg}}{250 \text{ mL}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} = 80 \frac{\text{mcg}}{\text{min}}$$

14. The physician has ordered a medication to start at 2 mcg/kg/min. The patient weighs 165 lbs. The IV bag reads 800 mg in 500 mL D5W. What rate would the nurse set on the infusion pump? (Round to the nearest tenth)

$$\frac{165 \text{ lbs}}{2.2 \text{ lbs}} = 75 \text{ kg}$$

$$\frac{\text{mL}}{\text{hr}} = \frac{2 \frac{\text{mcg}}{\text{kg} \cdot \text{min}} \cdot 500 \text{ mL} \cdot 75 \text{ kg}}{800000 \text{ mcg} \cdot \frac{1 \text{ hr}}{60 \text{ min}}} = 5.6 \frac{\text{mL}}{\text{hr}}$$

15. The physician has written an order to increase the medication to 4 mcg/kg/min. The IV bag reads 64 mcg/mL. What rate would the nurse set on the IV pump? (Round to the nearest tenth)

$$\frac{\text{mL}}{\text{hr}} = \frac{4 \frac{\text{mcg}}{\text{kg} \cdot \text{min}} \cdot 1 \text{ mL} \cdot 60 \text{ min}}{64 \text{ mcg}} \approx 3.8 \frac{\text{mL}}{\text{hr}}$$

16. The patient is on a medication drip infusing at 15 mL/hr. The label reads 50 mcg/mL. The patient weighs 65 kg. How many mcg/min is the patient receiving? (Do not round)

Heparin/Insulin or mg/hr

17. The physician orders a heparin infusion at 500 units/hr. The IV bag of medication reads 25,000 units in 250 mL D5W. How many mL/hr should be showing on the IV pump?

$$\frac{500 \text{ units}}{\text{hr}} \cdot \frac{250 \text{ mL}}{25000 \text{ units}} = 5 \frac{\text{mL}}{\text{hr}}$$

18. The patient is on a regular insulin drip infusing at 5 units/hr. The bag is labeled 100 units in 250 mL NS. At what rate should the pump be infusing? Round to the nearest whole number.

$$\frac{\text{mL}}{\text{hr}} = \frac{5 \text{ units} \cdot 250 \text{ mL}}{\text{hr} \cdot 100 \text{ units}} = 12.5 \frac{\text{mL}}{\text{hr}}$$

Burns (Parkland Formula) Do not round weights

19. A 200-pound patient presents to the emergency department with 50% total body surface area (TBSA) burn. How many liters of fluid would be given in the first 24 hours? (Round to the nearest whole number)

$$\frac{200 \text{ lbs} \cdot 1 \text{ kg}}{2.2 \text{ lbs}} = 90.9 \text{ kg}$$

$$4 \text{ mL} \cdot 50 \cdot 90.9 \text{ kg} = 18180 \text{ mL} = 18.18 \text{ L} \approx 18 \text{ L}$$

20. A 150-pound patient presents to the emergency department with 75% total body surface area (TBSA) burn. How many liters of fluid would be given in the first 24 hours? (Round to the nearest whole number)

$$\frac{150 \text{ lbs} \cdot 1 \text{ kg}}{\text{lbs}} = 68.2 \text{ kg}$$

$$4 \text{ mL} \times 75 \times 68.2 \text{ kg} = 20460 \text{ mL} \approx 20 \text{ L}$$