

## 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)

$$\frac{\text{Volume} \times \text{df}}{\text{min}} \quad \frac{250\text{mL} \times 15}{180} = 20.8 = 21 \text{ gtt/min}$$

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?

$$\frac{\text{Volume} \times \text{df}}{\text{min}} \quad \frac{50\text{mL} \times 60}{30\text{min}} = \frac{3000}{30} = 100 \text{ gtt/min}$$

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)

$$\frac{\text{Volume} \times \text{df}}{\text{min}} \quad \frac{250 \times 15}{60} = \frac{3750}{60} = 62.5 = 63 \text{ gtt/min}$$

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?

$$\frac{\text{Volume} \times \text{df}}{\text{min}} \quad \frac{100\text{mL} \times 12}{60} = \frac{1200}{60} = 20 \text{ gtt/min}$$

## 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?

$$1000\text{mL} / 8\text{hr} = 125 \text{ mL/hr}$$

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

$$1000\text{mL} / 4 = 250 \text{ mL/hr}$$

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)

$$\frac{1000}{4} = 250 \quad \frac{250\text{mL}}{1\text{hr}} = 250 \text{ mL/hr} \quad 4 = \frac{1000 \text{ mg Concentration}}{250 \text{ mL}}$$

$$= 250 \text{ mL/hr}$$

## 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?

$$\frac{\text{desired}}{\text{have}} \times \text{mL} \quad \frac{75}{100} \times 2 = 1.5 \text{ mL}$$

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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)

$$\frac{\text{desired}}{\text{have}} \times \text{ml} = \frac{5\text{mg} \times 5\text{ml}}{20\text{mg}} = 1.25\text{ml} \\ = 1.3\text{ml}$$

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?

$$\frac{\text{desired}}{\text{have}} \times \text{ml} \quad \frac{2\text{ml} \times 1}{10\text{mg}} = 0.2\text{mL}$$

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Mcg/kg/min or Mcg/min

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)

$$\frac{175}{2.2} = 79.5 \text{ kg} \quad \text{Concentration} = \frac{50 \text{ mg}}{500} = 0.1 \times 100 \phi = 100 \text{ mcg/ml}$$

$$\frac{100 \times 142 \text{ ml/hr}}{79.5 \times 60} = \frac{14,200}{4,770} = 2.9 = 3 \text{ mcg/kg/min}$$

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)

$$\frac{70 \text{ kg} \times 1 \times 60}{40} = \frac{4200}{40} = 105 \text{ mL/hr}$$

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?

$$\frac{100 \text{ mg}}{250 \text{ ml}} = 0.4 \times 100 \phi = 400 \text{ mcg/ml} \times 12 \text{ ml/hr} = \frac{4800}{60} = 80 \text{ mcg/min}$$

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)

$$\frac{165}{2.2} = 75 \text{ kg} \quad \frac{800}{500} = 1.6 \times 100 \phi = 1600$$

$$\frac{75 \times 2 \times 60}{1600} = \frac{9000}{1600} = 5.6 \text{ mL/hr}$$

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)

$$\frac{\text{weight} \times \text{mcg/kg/min} \times 60}{\text{med con}} = \frac{4 \times 60}{64} = 3.8 \text{ mL/hr}$$

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)

$$\frac{\text{Concentration} \times \text{Infusion rate}}{60} = \frac{50 \times 15}{60} = \frac{750}{60} = 12.5 \text{ mcg/min}$$

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?

$$\frac{\text{dose}}{\text{concentration}} = \frac{500}{25,000} \times 250 = \frac{500}{100} = 5$$

$$\frac{25,000}{250} = 100$$

$$5 \times 100 = 500$$

$$\frac{500}{100} = 5 \text{ mL/hr}$$

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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.

$$\frac{100}{250} = 0.4 \qquad \frac{5}{0.4} = 12.5 \text{ ml/hr}$$

$= 13 \text{ ml/hr}$

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)

not to weight

$$200 / 2.2 = 90.9$$

$$4 \times 90.9 \times 0.50 = 181.8 \times 0.182 = 18.2 \times 1000 = 18200 \text{ ml} = 18.2 \text{ L}$$

$= 18 \text{ L}$

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)

$$150 / 2.2 = 68.2 \times 0.75 \times 4 \text{ ml} = \frac{2046}{1000} \times 0.2$$

20 L

$$68.2 \times 75 \times 4 = \frac{20460}{1000}$$

20.46

$= 20 \text{ L}$

19.  $4 \times 50 \times 90.9 = \frac{18180}{1000} = 18.18$

18.18