

Module 1-10 questions Module 2-10 questions
Worksheet

Name Daniella Toledo

Worksheet 1 Answers

1. 17 gtt/min
2. 125 mL/hr
3. 21 gtt/min
4. 100gtt/min
5. 31 gtt/min
6. 1.5mL
7. 250mL/hr
8. 1.25mL
9. 0.2mL
10. 13 gtt/min

Worksheet 2 Answers

1. 3 mcg/kg/min
2. 8mL/hr
3. 80 mcg/min
4. 5mL/hr
5. 5.6mL/hr
6. 11.3 mL/hr
7. 13 mL/hr
8. 7.5 mcg/kg/min
9. 25 gtt/min
10. 20gtt/min

ALL OF MY WORK IS SHOWN IN THE FOLLOWING PAGES
ALL ANSWERS ARE HIGHLIGHTED IN BLUE

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WORKSHEET 1

1. Infuse ceftriaxone 1 gram over 45 minutes. The drug is supplied as 1gram/50ml. The drip factor is 15. How many gtt/min will you infuse?

- $50 \text{ mL} \times 15 = 750$ total drops
- $750 \text{ drops} / 45 \text{ minutes} = 16.667$ drops
- **Answer: 17 drops**

2. The physician writes an order to give 1000mL of normal saline over 8hrs. How many mL/hr will you infuse?

- $1000 \text{ mL} / 8 \text{ hours} = 125$
- **Answer: 125mL/hr**

3. Infuse vancomycin hydrochloride 1.5 gram over 3 hours. The drug is supplied as 1.5 gram/250mL. The drip factor is 15. How many gtt/min will you infuse?

- Drops: $250 \text{ mL} \times 15 \text{ gtt/mL} = 3750$ total drops
- Minutes: $3 \text{ hours} \times 60 \text{ minutes} = 180$ total minutes
- $3750 \text{ drops} / 180 \text{ minutes} = 20.8333$ gtt/min
- **Answer: 21 gtt/min**

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

- Drops: $50 \text{ mL} \times 60 \text{ gtt} = 3000$ total drops
- $3000 \text{ drops} / 30 \text{ minutes} = 100 \text{ gtt/min}$
- **Answer: 100gtt/min**

5. The nurse is to give Ciprofloxacin 500mg IV over 1 hr. The drug is supplied as 1gram/250mL. The gtt factor is 15. How many gtt/min will you infuse?

- $500 \text{ mg} / 1000 \text{ mg} = 0.5 \times 250 = 125 \text{ mL}$. $500 \text{ mg} / 125 \text{ mL}$
- Drops: $125 \text{ mL} \times 15 \text{ gtt} = 1875$ total drops
- $1875 \text{ drops} / 60 \text{ minutes} = 31.25$ gtt/min
- **Answer: 31 gtt/min**

6. An order is received for Fentanyl 75mcg IV now. The drug is supplied as 100mcg/2mL. How many mL will you give?

- $75 / 100 = 0.75 \times 2 = 1.5$

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- Answer: 1.5mL

7. Infuse 1000 mLs normal saline over 4 hrs. How many mL/hr will you set on the pump?

- $1000/4 = 250$
- Answer: 250mL/hr

8. The patient is to receive metoprolol 5mg for chest pain. The drug is supplied as 20mg/5mL. How many mL will you give? (Do not round your final answer)

- $5/20 \times 5 = 1.25$
- Answer: 1.25mL

9. The order is to give midazolam 2mg IV now. The drug is supplied as 10mg/mL. How many mL will you give?

- Answer: 0.2mL

10. Infuse Doripenem 500mg IV over 8 hrs. The drug is supplied as 500mg/100mL. The drip factor is 60. How many gtt/min will you infuse?

- $100\text{mL} \times 60 = 6000$ total drops
- $8 \times 60 = 480$ total minutes
- $6000/480 = 12.5$
- Answer: 13 gtt/minute

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WORKSHEET 2

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

- **Kg:** $175/2.2 = 79.5454$ kg
- **Concentration:** $50\text{mg}/500\text{mL} = 0.1\text{mg/mL}$
- **Change mg \square mcg:** $0.1\text{mg} \square \text{mcg}$ **if** $1\text{mg}=1000\text{mcg}$ **then** $0.1\text{mg}=100\text{mcg}$
- **Real concentration:** 100mcg/mL
- **Plug into Formula:** $\frac{\text{concentration (mcg/mL)} \times \text{infusion rate (mL/hr)}}{\text{wt (kg)} \times 60 \text{ (min/hr)}}$

$$\text{Plug } \frac{100\text{mcg/mL} \times 142\text{mL/hr}}{79.5\text{kg} \times 60\text{min/hr}}$$

$$\text{Simplify } \frac{14,200 \text{ mcg/hr}}{4770\text{kg/min/hr}}$$

$$\text{Simplify } \frac{14,200 \text{ mcg/hr}}{4770\text{kg/min/hr}}$$

$$\text{Simplify } 2.9769392 \text{ mcg/kg/min}$$

Answer: 3 mcg/kg/min

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2. The physician has ordered Dobutrex for a patient. The order states to start the Dobutrex at 1 mcg/kg/min, and titrate as needed. The IV bag of Dobutrex 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.

- Weight: 70kg
- Concentration: $250\text{mg}/500\text{mL} = 0.5\text{mg/mL} \square 500\text{mcg/mL}$
- Formula:
$$\frac{70\text{kg} \times 1\text{mcg/kg/min} \times 60\text{min/hr}}{500\text{mcg/mL}}$$

$$\frac{70\text{kg} \times 1\text{mcg/kg/min} \times 60\text{min/hr}}{500\text{mcg/mL}}$$

$$4,200\text{mcg/hr} \div 500\text{mcg/mL}$$

$$4200\text{mcg/hr} \times 1\text{mL}/500\text{mcg}$$

$$4200\text{mL}/500\text{hr}$$

$$=8.4\text{mL/hr}$$

Answer: 8mL/hr

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

- **Concentration:** $100\text{mg}/250\text{mL} = 0.4\text{mg/mL}$
- **Convert Concentration to MCG:** if $1\text{mg} = 1000\text{mcg}$ then $0.4\text{mg} = 400\text{mcg}$
- **Real Concentration:** 400mcg/mL
- **Formula:**
$$\frac{\text{concentration (mcg/mL)} \times \text{infusion rate (mL/hr)}}{60 \text{ min/hr}}$$

Plug
$$\frac{400\text{mcg/mL} \times 12\text{mL/hr}}{60 \text{ min/hr}}$$

Simplify
$$\frac{4,800 \text{ mcg/hr}}{60 \text{ min/hr}}$$

Simplify
$$80 \text{ mcg/min}$$

Answer: 80 mcg/min

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

- Concentration: $25,000/250\text{mL} = 100\text{units/mL}$
- Formula: dosage (units/hr) / concentration
- Plug: $500\text{units/hr} \div 100\text{units/mL} = 5\text{mL/hr}$
- Answer: **5mL/hr**

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

- **Change weight:** $165/2.2 = 75 \text{ kg}$
- **Concentration:** $800\text{mg}/500\text{mL} = 1.6\text{mg/ml}$
- **Convert Concentration to MCG:** if $1\text{mg}=1000\text{mcg}$ then $1.6\text{mg}=1,600$
- **Real Concentration:** $1,600\text{mcg/mL}$
- **Formula:**
$$\frac{\text{wt (kg)} \times \text{dose (mcg/kg/min)} \times 60 \text{ (min/hr)}}{\text{drug concentration (mcg/mL)}}$$

Plug
$$\frac{75\text{kg} \times 2\text{mcg/kg/min} \times 60\text{min/hr}}{1600\text{mcg/mL}}$$

Simplify
$$\frac{75\cancel{\text{kg}} \times 2\cancel{\text{mcg/kg/min}} \times 60\cancel{\text{min/hr}}}{1600\text{mcg/mL}}$$

Simplify
$$\frac{9,000\text{mcg/hr}}{1600\text{mcg/mL}}$$

KSF
$$9,000\text{mcg/hr} \times 1\text{mL}/1600\text{mcg}$$

Cancel Out
$$9,000\cancel{\text{mcg}}/\text{hr} \times 1\text{mL}/1600\cancel{\text{mcg}}$$

Solve
$$9000\text{mL}/1600\text{hr}$$

Simplify
$$5.625\text{mL/hr}$$

Answer: 5.6mL/hr

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6. The physician in the previous questions has now written an order to **increase the Dopamine to 4 mcg/kg/min**. Using the information in the previous question, what rate would the nurse set on the IV pump? Round to the nearest tenth.

- **Change weight:** $165/2.2 = 75 \text{ kg}$
- **Concentration:** $800\text{mg}/500\text{mL} = 1.6\text{mg}/\text{ml}$
- **Convert Concentration to MCG:** if $1\text{mg}=1000\text{mcg}$ then $1.6\text{mg}=1,600$
- **Real Concentration:** $1,600\text{mcg}/\text{mL}$
- **Formula:** $\frac{\text{weight} \times \text{dose} \text{ mcg}/\text{kg}/\text{min} \times 60 \text{ min}/\text{hr}}{\text{Concentration}}$

Plug	$\frac{75\text{kg} \times 4\text{mcg}/\text{kg}/\text{min} \times 60\text{min}/\text{hr}}{1,600 \text{ mcg}/\text{mL}}$
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Cancel Out & Multiply	$\frac{75\text{kg} \times 4\text{mcg}/\text{kg}/\text{min} \times 60\text{min}/\text{hr}}{1,600 \text{ mcg}/\text{mL}}$
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Simplified	$\frac{18,000\text{mcg}/\text{hr}}{1,600\text{mcg}/\text{mL}}$
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KSF	$18,000\text{mcg}/\text{hr} \times 1\text{mL}/1,600\text{mcg}$
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Cancel out	$18,000\text{mcg}/\text{hr} \times 1\text{mL}/1,600\text{mcg}$
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Simplify	$18,000\text{mL} / 1,600\text{hr}$
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Solve	$11.25 \text{ mL}/\text{hr}$
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Answer: 11.3 mL/hr

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

- Concentration: $100\text{units}/250\text{mL} = 0.4\text{units/mL}$
- Formula: dosage $5\text{units/hr} \div \text{concentration } 0.4 \text{ units/mL}$
- KSF: $5\text{units/hr} \times 1\text{mL}/0.4\text{units}$
- Cancel out: $5\text{mL}/0.4\text{hr} = 12.5\text{mL/hr}$
- **answer 13 mL/hr**

8. The patient is on a Dopamine drip infusing at 35 mL/hr. The label reads 400 mg dopamine in 500 mL D5W. The patient weighs 62 kg. How many mcg/kg/min is the patient receiving? Round to the nearest tenth.

- **Kg:** 62
- **Concentration:** $400\text{mg}/500\text{mL} = 0.8\text{mg/mL}$
- **Change mg to mcg:** 0.8mg if 1mg=1000mcg then 0.8mg=800mcg/mL
- **Find Formula:**
$$\frac{\text{concentration (mcg/mL)} \times \text{infusion rate (mL/hr)}}{\text{Weight (kg)} \times 60 \text{ (min/hr)}}$$

Plug
$$\frac{800\text{mcg/mL} \times 35\text{mL/hr}}{62\text{kg} \times 60\text{min/hr}}$$

Simplify
$$\frac{28,000\text{mcg/hr}}{3720\text{kg/min/hr}}$$

Simplify 7.5268 mcg/kg/min

Answer: 7.5 mcg/kg/min

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9. The physician has ordered Rocephin 1 gram IV over 30 minutes. Pharmacy has sent a bag labeled Rocephin 1 gram in 50 mL/ D5W. The IV tubing delivers 15 gtt/mL. How many drops per minute (gtt/min) will the nurse deliver?

- **Total drops:** $50\text{mL} \times 15\text{gtt/mL} = 750\text{gtt total}$
- **Solve:** $750\text{gtt} \div 30 \text{ minutes} = 25 \text{ gtt/min}$
- **Answer:** 25 gtt/min

10. The patient is to receive Cipro 400 mg IV over 1 hour. You receive a bag from the pharmacy labeled Cipro 400 mg in 100 mL D5W. The IV tubing delivers 12 gtt/mL. How many drops per minute (gtt/min) will the nurse deliver?

- **Total drops:** $100\text{mL} \times 12\text{gtt/mL} = 1,200 \text{ total drops}$
- **Minutes:** 60
- **Solve:** $1200 \text{ gtt} \div 60\text{min} = 20 \text{ gtt/min}$
- **Answer:** 20gtt/min