

Intravenous Calculations Answer Key

1. 83.33mL/hr
2. 133.33mL/hr
3. 88.88mL/hr
4. 21gtts/min
5. 25gtts/min
6. 27gtts/min
7. 42gtts/min
8. 106gtts/min
9. 37gtts/min
10. 33gtts/min
11. 13gtts/min
12. a. 38gtts/min
b. 150mL/hr
13. 12.5g
14. 700mL
15. 10mL
16. 60mL/hr
17. 4mL/hr
18. 31gtts/min
19. 33gtts/min
20. 63mL/hr

1. The physician orders 2 L D₅0.45% NaCl IV in 24 hours by infusion pump.
Calculate the flow rate in mL/hr. 83.33mL/hr

$$\frac{V}{T} \frac{2000\text{mL}}{24\text{hrs}} = \underline{83.33\text{mL/hr}}$$

2. The physician orders Rocephin 1g IV in 100 mL NS IVPB to be infused in 45 minutes by infusion pump.
Calculate the flow rate in mL/hr. 133.33mL/hr

$$\frac{V}{T} \frac{100\text{mL}}{45\text{min}} = \frac{x\text{mL}}{60\text{min}} \quad 45x = 6000 \quad x = \frac{6000}{45} = \underline{133.33\text{mL/hr}}$$

3. The physician orders 1600mL D₅W IV in 18 hours by infusion pump.
Calculate the flow rate in mL/hr. 88.88mL/hr

$$\frac{V}{T} \frac{1600\text{mL}}{18\text{hrs}} = \underline{88.88\text{mL/hr}}$$

4. Calculate the flow rate for 500mL of D₅0.2% NS IV to be infused in 8 hours.
The drop factor is 20gtts/mL.
What will the flow rate be in gtts/min? 21gtts/min

$$\frac{V}{T} \frac{500\text{mL}}{8\text{hrs}} = 62.5\text{mL/hr} = 63\text{mL/hr}$$

$$\frac{V}{C} \frac{63\text{mL}}{3} = \underline{21\text{gtts/min}}$$

5. The physician has ordered 1000mL Lactated Ringers IV to infuse in 10 hours.
The drop factor is 15gtts/mL.
What will the flow rate be in gtts/min? 25gtts/min

$$\frac{V}{T} \frac{1000\text{mL}}{10\text{hrs}} = 100\text{mL/hr}$$

$$\frac{V}{C} \frac{100\text{mL}}{4} = \underline{25\text{gtts/min}}$$

6. The physician orders 650mL of D5W 0.45 NS to infuse in 4 hours.
The drop factor is 10gtts/mL.
What will the flow rate be in gtts/min? 27gtts/min

$$\frac{V}{T} \frac{650mL}{4hrs} = 162.5 \text{ or } 163mL/hr$$

$$\frac{V}{C} \frac{163mL}{6} = \underline{27gtts/min}$$

7. The physician orders 1000mL of NSR to infuse in 6 hours.
The drop factor is 15gtts/mL.
What will the flow rate be in gtts/min? 42gtts/min

$$\frac{V}{T} \frac{1000mL}{6hrs} = 166.67mL/hr = 167mL/hr$$

$$\frac{V}{C} \frac{167mL}{4} = 41.7gtts/min = \underline{42gtts/min}$$

8. The physician orders 850mL of D5½ NS to infuse in 8 hours.
The drop factor is 60gtts/mL.
What will the flow rate be in gtts/min? 106gtts/min

$$\frac{V}{T} \frac{850mL}{8hrs} = 106.25mL/hr = 106mL/hr$$

$$\frac{V}{C} \frac{106mL}{1} = \underline{106gtts/min}$$

9. The order reads 3000mL D₅NS IV in 24 hours.
The drop factor is 15gtts/mL and the IV is correctly set at 31gtts/min.
After the seventh hour, you find 2500mL remaining.
Compute a new flow rate for the remaining 17 hours in gtts/min. 37gtts/min

$$\frac{V}{T} \frac{3000mL}{24hrs} = \frac{125mL/hr}{4} = 31.25gtts/min = 31gtts/min$$

$$\frac{V}{T} \frac{2500mL}{17hrs} = 147.05mL/hr = 147mL/hr$$

$$\frac{V}{C} \frac{147mL}{4} = 36.75gtts/min = \underline{37gtts/min}$$

10. The physician orders Mandol 2g in 100mL D₅W IV to be infused in 1 hour.
The drop factor is 20gtts/mL.
What will the flow rate be in gtts/min? 33gtts/min

$$\frac{V}{C} \frac{100mL}{3} = 33.33gtts/min = \underline{33gtts/min}$$

11. The physician orders ampicillin 500mg in 50mL NS IV to infuse in 40 minutes.
The drop factor is 10gtts/mL.
What will the flow rate be in gtts/min? 13gtts/min

$$\frac{V}{T} \frac{50mL}{40min} \times 10 = 12.5 = \underline{13gtts/min}$$

or

$$\frac{V}{T} \frac{50mL}{40min} = \frac{xmL}{60min} \quad 40x = 3000mL \quad x = \frac{3000mL}{40} = 75mL/hr$$

$$\frac{V}{C} \frac{75}{6} = 12.5 = \underline{13gtts/min}$$

12. The physician orders IV Kefzol 1g in 50mL D₅W to infuse in 20 minutes.
The drop factor is 15gtts/mL.

- a. Calculate the IVPB flow rate in gtts/min. 38gtts/min
b. What is the flow rate if an infusion pump is used? 150mL/hr

a. $\frac{V}{T} \frac{50mL}{20min} \times 15 = 37.5gtts/min = \underline{38gtts/min}$

b. $\frac{V}{T} \frac{50mL}{20min} = \frac{xmL}{60min}$

$$20x = 3000mL \quad x = \frac{3000mL}{20} = \underline{150mL/hr}$$

13. Calculate the amount of dextrose and sodium chloride in 250mL of D₅NS.

- a. 12.5g of Dextrose b. 2.25g of NaCl

a. D₅ = 5g/100mL $\frac{5g}{100mL} = \frac{xg}{250} \quad 100x = 1250 \quad x = \frac{1250}{100} = \underline{12.5g \text{ of dextrose}}$

b. NS – 0.9g/100mL $\frac{0.9g}{100mL} = \frac{xg}{250mL} \quad 100x = 225 \quad x = \frac{225}{100} = \underline{2.25g \text{ NaCl}}$

14. The patient has an order for 1L D5/0.45 NS with 20 mEq KCl q. 10h.
At 0700, the start of the shift, there was 700mL of IV fluid in the IV bag.
The IV infiltrated at 1130 and was restarted at 1230.
What is the IV fluid intake for the 0700-1500 shift? 700mL

$$\frac{1000mL}{10hrs} = 100mL/hr$$

$$0700 - 1130 \quad 4 \frac{1}{2} \text{ hrs} \times 100mL = 450mL$$

$$1230 - 1500 \quad 2 \frac{1}{2} \text{ hrs} \times 100mL = 250mL$$

$$250 + 450 = \underline{700mL} - 0700 - 1500 \text{ shift}$$

15. The patient has an order for morphine sulfate 2mg/hr via volumetric pump.
The IV sent from the pharmacy is labeled 100mg morphine sulfate in 500mL D5W.
How many mL/hr will the patient receive? 10mL

$$x = \frac{500mL}{100mg} = \frac{xmL}{2mg} \quad 100x = 1000mL \quad x = \frac{1000mL}{100} = \underline{10mL}$$

16. The patient is to receive an IV drip of Regular insulin at 6U/hr.
The pharmacy has added 50U of regular insulin to a bag of 500mL 0.45/NS.
How many mL/hr should the patient receive? 60mL/hr

$$x = \frac{500mL}{50u} = \frac{xmL}{6u} \quad 50x = 3000mL \quad x = \frac{3000mL}{50} = \underline{60mL/hr}$$

17. The patient is to receive an IV infusion of midazolam HCl at 1mg/hr.
The pharmacy sends an IV of 100mL D5NS with 25mg of midazolam HCl.
How many mL/hr will the nurse set on the IV pump? 4mL/hr

$$x = \frac{25mg}{100mL} = \frac{1mg}{xmL} \quad 25x = 100mL \quad x = \frac{100mL}{25} = \underline{4mL/hr}$$

18. You have an order for aminophylline 250mg in 250mL NS to run for 8 hrs.
The drop factor is 60gtts/mL.
What is the flow rate in gtts/min? 31gtts/min

$$\frac{V}{T} \frac{250mL}{8hrs} = 31.25mL/hr = 31mL/hr$$

$$\frac{31mL}{1} = \underline{31gtts/min}$$

19. 300mL of D₅W¹/₂ NS is delivered in 90 min.
 Your drop factor is 10gtts/mL.
 Calculate the flow rate in gtts/min. 33gtts/min

$$\frac{V}{T} \frac{300mL}{90min} \times 10 = 33.33 \text{ gtts/min} = \underline{33gtts/min}$$

or

$$\frac{300mL}{90min} = \frac{xmL}{60min} \quad 90x = 1800 \quad x = 200mL/hr$$

$$\frac{V}{C} \frac{200mL}{6} = 33.33gtts/min = \underline{33gtts/min}$$

20. 1L of NS runs for 16 hours.
 Calculate the flow rate in mL/hr. 63mL/hr

$$\frac{V}{T} \frac{1000 \text{ mL}}{16.hr} = 62.5mL/hr = \underline{63mL/hr}$$