Infusion Rate Calculations

1. A patient, admitted with a head injury, has an order for D5NS at 25 mL/hour. The IV tubing has a calibration of 10 gtt/mL. What is the correct rate of flow for this patient? (Answer in gtt/min rounded to the nearest whole number).
   a. 2 gtt/min
   b. 4 gtt/min
   c. 6 gtt/min
   d. 8 gtt/min

2. 1000 cc solution of D5NS with 20,000 units of Heparin is infusing at 20 mL per hour. The IV set delivers 60 gtts per cc. How many units of Heparin is the patient receiving each hour?
   a. 200 units/h
   b. 400 units/h
   c. 600 units/h
   d. 800 units/h

3. Your patient has an order to infuse 100 mL of D51/2NS with 40 MEq of KCl over the next 60 minutes. The set calibration is 15 gtt/mL. What is the correct rate of flow for this patient? (Answer in gtt/min rounded to the nearest whole number).
   a. 15 gtt/min
   b. 10 gtt/min
   c. 25 gtt/min
   d. 35 gtt/min

4. The physician order 1.5 litres of Lactated Ringers solution to be administered intravenously to your patient over the next 12 hours. Calculate the rate of flow if the IV tubing delivers 15 gtt per cubic centimeter (cc). (Answer in gtt/min rounded to the nearest whole number).
   a. 23 gtt/min
   b. 37 gtt/min
   c. 42 gtt/min
   d. 31 gtt/min
5. The physician reduced an IV to 30 mL/h. The IVAC indicates that 270 mL are remaining in the present IV bag. You notice that it is exactly 10:30 am. At what time will the infusion be completed?
   a. 19:30 or 7:30 pm
   b. 21:30 or 9:30 pm
   c. 17:30 or 5:30 pm
   d. 14:30 or 2:30 pm

6. An intravenous line has been inserted into a patient. Fluid is being delivered at a rate of 42 mL/h. How much fluid will the patient receive in 8 hours?
   a. 6 mL
   b. 168 mL
   c. 336 mL
   d. 420 mL

7. A female patient is receiving Hartmann's solution at a rate of 125 mL/h. How much solution will she receive over 12 hours?
   a. 750 mL
   b. 1500 mL
   c. 1250 mL
   d. 1625 mL

8. A male patient is to receive 500 mL of normal saline. The drip rate is adjusted to deliver 25 mL/h. How long will the fluid last?
   a. 25 hours
   b. 15 hours
   c. 30 hours
   d. 20 hours

9. What is the required flow rate of a volumetric infusion pump to deliver one litre of normal saline over 8 hours? (Answer in mL/h rounded to the nearest whole number).
   a. 75 mL/h
   b. 125 mL/h
   c. 150 mL/h
   d. 225 mL/h
10. What is the required flow rate of a volumetric infusion pump to deliver 1 litre of normal saline over 6 hours? (Answer in mL/h rounded to the nearest whole number).
   a. 167 mL/h
   b. 87 mL/h
   c. 197 mL/h
   d. 60 mL/h

11. What is the required flow rate of a burette to infuse 80 mL of fluid over half an hour? (Answer in mL/h rounded to the nearest whole number).
   a. 80 mL/h
   b. 40 mL/h
   c. 120 mL/h
   d. 160 mL/h

12. What is the correct setting for a burette pump to administer 100 mL of fluid containing 1 g of flucloxacillin in 30 minutes? (Answer in mL/h rounded to the nearest whole number).
   a. 100 mL/h
   b. 200 mL/h
   c. 300 mL/h
   d. 4 mL/h

13. What is the correct setting for a burette pump to administer 75 mL of fluid containing 75 mg of gentamicin in 40 minutes? (Answer in mL/h rounded to the nearest whole number).
   a. 65 mL/h
   b. 75 mL/h
   c. 113 mL/h
   d. 150 mL/h

14. A patient is to receive 0.5 litre of dextrose 4% in 1/5 normal saline in 12 hours. The administration set delivers 20 drops/mL. What is the required drip rate in drops per minute? (Round answer to the nearest whole number).
   a. 14 gtt/min
   b. 18 gtt/min
   c. 20 gtt/min
   d. 25 gtt/min
15. A patient is to have the remaining 300 mL of dextrose 5% run through in 50 minutes. The administration set gives 20 drops/mL. What is the required drip rate in drops per minute? (Round answer to the nearest whole number).

a. 78 gtt/min  
b. 112 gtt/min  
c. 100 gtt/min  
d. 120 gtt/min

16. Towards the end of the transfusion, the doctor orders that the remaining half unit of packed cells is to be administered over one hour. A full unit of packed cells is 250 mL. The I.V. giving set delivers 20 drops per mL. What is the required drip rate in drops per minute for the blood infusion? (Round answer to the nearest whole number).

a. 38 gtt/min  
b. 42 gtt/min  
c. 48 gtt/min  
d. 36 gtt/min

17. An administration set which emits 15 drops/mL is to be used to give a 480 mL unit of autologous blood over 3½ hours. What is the required drip rate in drops per minute for the blood infusion? (Round answer to the nearest whole number).

a. 24 gtt/min  
b. 38 gtt/min  
c. 34 gtt/min  
d. 28 gtt/min

18. At 2100 hours on a Monday, one litre of dextrose 5% is set up to run at 50 mL/h. When will the flask be finished?

a. 1300 h Tuesday  
b. 1500 h Tuesday  
c. 1700 h Tuesday  
d. 0800 h Wednesday

19. A one litre I.V. flask of normal saline has been running for 6 hours at a rate of 75 mL/h. The doctor orders the remaining contents to be run through in the next five hours. Calculate the new flow rate.

a. 110 mL/h  
b. 55 mL/h  
c. 120 mL/h  
d. 85 mL/h
20. A male patient is receiving dextrose 5% at a rate of 55 mL/h. How much fluid will he receive in 11 hours?
   a. 300 mL  
   b. 450 mL  
   c. 505 mL  
   d. 605 mL

21. 100 mL of fluid containing vancomycin 400 mg has been added to a burette. The infusion is to be given over 45 minutes. What is the required pump setting in mL/h?
   a. 113 mL/h  
   b. 133 mL/h  
   c. 143 mL/h  
   d. 123 mL/h

22. A female patient is to receive one litre of Hartmann's solution over 12 hours. What is the drip rate if the administration set gives 15 drops/mL.
   a. 17 drops/min  
   b. 19 drops/min  
   c. 21 drops/min  
   d. 23 drops/min

23. At 0300 hours, a 2 L of normal saline is set running through an infusion pump at 85 mL/h. After 8 hours, the rate is increased to 120 mL/h. At what time will the infusion be completed?
   a. 1600 h  
   b. 2200 h  
   c. 2330 h  
   d. 1800 h

24. The order is for D5RL 200 mL to be infused over a 24 hour period. The drop factor is 60 gtt/mL. What is the appropriate flow rate? (Answer to the nearest whole number).
   a. 8 gtt/min  
   b. 10 gtt/min  
   c. 12 gtt/min  
   d. 60 gtt/min

25. The order is for 0.45% NaCl IV for 90 mL/h for 4 hours. The drop factor is 10 gtt/mL. What is the total volume?
   a. 480 mL  
   b. 320 mL  
   c. 180 mL  
   d. 360 mL
### Answer Key to Infusion: Quiz 2

| Q01  | b | \((25 \text{ mL/h} \times 10 \text{ gtt/mL}) \div 60 \text{ min} = 4.16 \Rightarrow 4 \text{ gtt/min}\) |
| Q02  | b | \((20,000 \text{ units} \div 1000 \text{ mL}) \times 20 \text{ mL/h} = 400 \text{ units/h}\) |
| Q03  | c | \((100 \text{ mL} \times 15 \text{ gtt/mL}) \div 60 \text{ min} = 25 \text{ gtt/min}\) |
| Q04  | d | \(1.5 \text{ L} \times 1000 = 1500 \text{ mL}; (1500 \text{ mL} \times 15 \text{ gtt/mL}) \div (12 \text{ hrs.} \times 60 \text{ min}) = 31.25 \Rightarrow 31 \text{ gtt/min}\) |
| Q05  | a | \((270 \text{ mL} \div 30 \text{ mL/h}) = 9 \text{ hours} + 10:30 = 19:30 \text{ or} 7:30 \text{ pm}\) |
| Q06  | c | \(42 \text{ mL/h} \times 8 \text{ hrs.} = 336 \text{ mL}\) |
| Q07  | b | \(125 \text{ mL/h} \times 12 \text{ hrs.} = 1500 \text{ mL}\) |
| Q08  | d | \(500 \text{ mL} \div 25 \text{ mL/h} = 20 \text{ hours}\) |
| Q09  | b | \(1000 \text{ mL} (1 \text{ litre}) \div 8 = 125 \text{ mL/h}\) |
| Q10  | a | \(1000 \text{ mL} (1 \text{ litre}) \div 6 \text{ hrs.} = 166.6 \Rightarrow 167 \text{ mL/h}\) |
| Q11  | d | \(80 \text{ mL} \times (60 \text{ min} \div 30 \text{ min}) = 160 \text{ mL/h}\) |
| Q12  | b | \(100 \text{ mL} \times (60 \text{ min} \div 30 \text{ min}) = 200 \text{ mL/h}\) |
| Q13  | c | \(75 \text{ mL} \times (60 \text{ min} \div 40 \text{ min}) = 112.5 \Rightarrow 113 \text{ mL/h}\) |
| Q14  | a | \((500 \text{ mL} \times 20 \text{ gtt/mL}) \div (12 \text{ hrs.} \times 60 \text{ min}) = 13.8 \Rightarrow 14 \text{ gtt/min}\) |
| Q15  | d | \((300 \text{ mL} \times 20 \text{ gtt/mL}) \div (50 \text{ min}) = 120 \text{ gtt/min}\) |
| Q16  | b | \(((250 \times 0.5) \text{ mL} \times 20 \text{ gtt/mL}) \div (1 \text{ hrs.} \times 60 \text{ min}) = 41.6 \Rightarrow 42 \text{ gtt/min}\) |
| Q17  | c | \((480 \text{ mL} \times 15 \text{ gtt/mL}) \div (3.5 \text{ hrs.} \times 60 \text{ min}) = 34.2 \Rightarrow 34 \text{ gtt/min}\) |
| Q18  | c | \(1 \text{ L} \times 1000 = 1000 \text{ mL}; 1000 \text{ mL} \div 50 \text{ mL/h} = 20 \text{ hours}; 2100 + 20 \text{ hours} = 1700 \text{ hours on Tuesday}\) |
| Q19  | a | \(1000 \text{ mL} - (75 \text{ mL/hr.} \times 6 \text{ hrs.}) = 550 \text{ mL remaining}; 550 \text{ mL} \div 5 \text{ hours} = 110 \text{ mL/h}\) |
| Q20  | d | \(55 \text{ mL/h} \times 11 \text{ hrs.} = 605 \text{ mL}\) |
| Q21  | b | \(100 \text{ mL} \div 0.75 \text{ hrs.} = 133.3 \Rightarrow 133 \text{ mL/h}\) |
| Q22  | c | \(1 \text{ L} \times 1000 = 1000 \text{ mL}; (1000 \text{ mL} \times 15 \text{ gtt/mL}) \div (12 \text{ hrs.} \times 60 \text{ min}) = 20.8 \Rightarrow 21 \text{ drops/min}\) |
| Q23  | b | \(2 \text{ L} \times 1000 = 2000 \text{ mL}; 2000 \text{ mL} - (85 \text{ mL/h} \times 8 \text{ hrs.}) = 1320 \text{ mL remaining}; 1320 \text{ mL} \div 120 \text{ mL/h} = 11 \text{ hours}; 0300 + 8 \text{ hours} + 11 \text{ hours} = 2200 \text{ h}\) |
| Q24  | a | \((200 \text{ mL} \times 60 \text{ gtt/mL}) \div (24 \text{ hrs.} \times 60 \text{ min}) = 8.3 \Rightarrow 8 \text{ gtt/min}\) |
| Q25  | d | \(90 \text{ mL/h} \times 4 \text{ hrs.} = 360 \text{ mL}\) |