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ATI: Dosage Calculation: Case Studies:

Activity 1

Q

A nurse is preparing to administer 0.9% NaCl 450 mL IV to infuse over 30 min. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

900

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

[Math Processing Error]

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

[Math Processing Error]

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

[Math Processing Error]

Step 4

Solve for X.

[Math Processing Error]

Step 5

Round if necessary.

667

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

[Math Processing Error]

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

[Math Processing Error]

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

[Math Processing Error]

Step 4

Solve for X.

[Math Processing Error]

Step 5

Round if necessary.

666.666666 mL/hr rounds to 667 mL/hr.

Step 6

Determine if the IV flow rate makes sense.

A nurse is preparing to administer lactated Ringer's (LR) 250 mL IV to infuse over 30 min. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

500

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

[Math Processing Error]

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

[Math Processing Error]

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

[Math Processing Error]

Step 4

Solve for X.

[Math Processing Error]

Step 5

Round if necessary.

500 is already a whole number, so rounding is not necessary.

Step 6

Q

A nurse is preparing to administer lactated Ringer's (LR) 1,000 mL IV to infuse over 1.5 hr. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

667

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

[Math Processing Error]

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

[Math Processing Error]

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

[Math Processing Error]

Step 4

Solve for X.

[Math Processing Error]

Step 5

Round if necessary.

Q

A nurse is preparing to administer 0.9% sodium chloride (0.9% NaCl) 750 mL IV to infuse over 2 hr. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

375

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

[Math Processing Error]

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

[Math Processing Error]

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

[Math Processing Error]

Step 4

Solve for X.

[Math Processing Error]

Step 5

Round if necessary.

Activity 2

Q

A provider prescribes heparin 18 units/kg/hr by continuous IV infusion for a client who weighs 132 lb. Available is heparin 50 units in 1 mL of 0.9% NaCl. Determine how many mL/hr to administer. (Round the answer to the nearest tenth.)

21.6

Step 1

What is the unit of measurement to the nurse should calculate? (Place the unit of measure being calculated on the left side of the equation.)

[Math Processing Error]

Step 2

Determine the ratio that contains the same unit as the unit being calculated? (Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.)

[Math Processing Error]

Step 3

Place any remaining rations that are relevant to the item on the right side of the equation, along with any conversion factors to cancel out unwanted units of measurement.

[Math Processing Error]

Step 4

Solve for X.

[Math Processing Error]

Step 5

A provider prescribes magnesium sulfate 0.5 g/hr by continuous IV infusion. Available is magnesium sulfate 4,000 mg in 50 mL of D_5W. Determine how many mL/hr to administer. (Round the answer to the nearest whole number.)

6

Step 1

What is the unit of measurement the nurse should calculate? (Place the unit of measure being calculated on the left side of the equation.)

[Math Processing Error]

Step 2

Determine the ratio in the item that contains the same unit as the unit being calculated. (Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.)

[Math Processing Error]

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation, along with any conversion factors that are needed to cancel out unwanted units of measurements.

[Math Processing Error]

Step 4

Solve for X.

[Math Processing Error]

Step 5

Round if necessary.

6.25 mL/hr rounds to 6 mL/hr.

A provider prescribes magnesium sulfate 0.75 g/hr by continuous IV infusion. Available is 2,000 mg in 100 mL of D_5W. Determine how many mL/hr to administer. (Round the answer to the nearest tenth.)

37.5

Step 1

What is the unit of measurement the nurse should calculate? (Place the unit of measure being calculated on the left side of the equation.)

[Math Processing Error]

Step 2

Determine the ratio that contains the same unit as the unit being calculated. (Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.)

[Math Processing Error]

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation, along with any needed conversion factors to cancel out unwanted units of measurements.

[Math Processing Error]

Step 4

Solve for X.

[Math Processing Error]

Step 5

Round if necessary.

37.5 is already at the tenth place so no further rounding is necessary.

120

Step 1

What is the unit of measurement the nurse should calculate? (Place the unit of measure being calculated on the left side of the equation.)

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

Step 2

Determine the ratio that contains the same unit as the unit being calculated. (Place the ratio on the right side of the equation ensuring that the unit in the numerator matches the unit being calculated.)

$$X\ \text{mL/hr} = \frac{200\ \text{mL}}{200\ \text{mg}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measurement.

$$X\ \text{mL/hr} = \frac{200\ \text{mL}}{200\ \text{mg}} \times \frac{2\ \text{mg}}{1\ \text{min}} \times \frac{60\ \text{min}}{1\ \text{hr}}$$

Step 4

Solve for X.

$$X\ \text{mL/hr} = 120\ \text{mL/hr}$$

Step 5

Round if necessary.

120 is already a whole number, so no further rounding is necessary.

Q

A nurse is preparing to administer dopamine 2 mcg/kg/min by continuous IV infusion for a client who weighs 110 lb. Available is dopamine 400 mg in 250 mL of D_5W. The nurse should set the IV pump to deliver how many mL/hr administer? (Round the answer to the nearest tenth.)

37.5

Step 1

What is the unit of measurement the nurse should calculate? (Place the unit of measure being calculated on the left side of the equation.)

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

Step 2

Determine the ratio that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation ensuring that the unit in the numerator matches the unit being calculated.)

$$X \text{ mL/hr} = \frac{250 \text{ mL}}{400 \text{ mg}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measurements.

$$X \text{ mL/hr} = \frac{250 \text{ mL}}{400\text{mg}} \times \frac{1\text{mg}}{1,000\text{mcg}} \times \frac{2\text{mcg}}{1\text{kg}} \times \frac{1\text{kg}}{2.2\text{lb}} \times \frac{110\text{lb}}{1\text{min}} \times \frac{60\text{min}}{1 \text{ hr}}$$

Step 4

Solve for X.

$$X \text{ mL/hr} = 3.75 \text{ mL/hr}$$

Activity 3

Q

A nurse is preparing to administer heparin 14 units/kg/hr by continuous IV infusion for a client who weighs 70 kg. Available is heparin 25,000 units in 0.9% sodium chloride (0.9% NaCl) 500 mL. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest tenth.)

19.6

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

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

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

$$X \text{ mL/hr} = \frac{500 \text{ mL}}{25,000 \text{ mL}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

$$X \text{ mL/hr} = \frac{500 \text{ mL}}{25,000\text{units}} \times \frac{14\text{units}}{1\text{kg}} \times \frac{70\text{kg}}{1 \text{ hr}}$$

Step 4

Solve for X.

$$X \text{ mL/hr} = 19.6 \text{ mL/hr}$$

A nurse is preparing to administer heparin 16 units/kg/hr by continuous IV infusion for a client who weighs 56 kg. Available is heparin 25,000 units in 0.9% sodium chloride (0.9% NaCl) 500 mL. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest tenth.)

17.9

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

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

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

$$X \text{ mL/hr} = \frac{500 \text{ mL}}{25,000 \text{ mL}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

$$X \text{ mL/hr} = \frac{500 \text{ mL}}{25,000\text{units}} \times \frac{16\text{units}}{1\text{kg}} \times \frac{56\text{kg}}{1 \text{ hr}}$$

Step 4

Solve for X.

$$X \text{ mL/hr} = 17.92 \text{ mL/hr}$$

Step 5

Q

A nurse is preparing to administer magnesium sulfate 1.5 g/hr by continuous IV infusion. Available is magnesium sulfate 20 g in dextrose 5% in water (D_5W) 500 mL. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

38

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

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

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

$$X \text{ mL/hr} = \frac{500 \text{ mL}}{20 \text{ g}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

$$X \text{ mL/hr} = \frac{500 \text{ mL}}{20 \text{ g}} \times \frac{1.5 \text{ g}}{1 \text{ hr}}$$

Step 4

Solve for X.

Q

A nurse is preparing to administer magnesium sulfate 2 g via IV bolus over 3 hr. Available is magnesium sulfate 2 g in 100 mL of 0.9% NaCl solution. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

33

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

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

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

$$X \text{ mL/hr} = \frac{100 \text{ mL}}{3 \text{ hr}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

$$X \text{ mL/hr} = \frac{100 \text{ mL}}{3 \text{ hr}}$$

Step 4

Solve for X.

$$X \text{ mL/hr} = 33.333333 \text{ mL/hr}$$

Step 5

Activity 4

A nurse is preparing to administer lidocaine 2 mg/min by continuous IV infusion. Available is lidocaine 1,000 mg in D_5W 250 mL. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

30

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

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

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

$$X\ \text{mL/hr} = \frac{250\ \text{mL}}{1,000\ \text{mg}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

$$X\ \text{mL/hr} = \frac{250\ \text{mL}}{1,000\text{mg}} \times \frac{2\text{mg}}{1\text{min}} \times \frac{60\text{min}}{1\ \text{hr}}$$

Step 4

Solve for X.

$$X\ \text{mL/hr} = 30\ \text{mL/hr}$$

Step 5

A provider increases the rate of lidocaine to 4 mg/min by continuous IV infusion. Available is lidocaine 1,000 mg in 250 mL of D_5W. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

60

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

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

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

$$X\ \text{mL/hr} = \frac{250\ \text{mL}}{1,000\ \text{mg}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

$$X\ \text{mL/hr} = \frac{250\ \text{mL}}{1,000\text{mg}} \times \frac{4\text{mg}}{1\text{min}} \times \frac{60\text{min}}{1\text{hr}}$$

Step 4

Solve for X.

$$X\ \text{mL/hr} = 60\ \text{mL/hr}$$

Step 5

A nurse is preparing to administer esmolol 50 mcg/kg/min by continuous IV infusion for a client who weighs 80 kg. Available is esmolol 2,500 mg in 250 mL. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

24

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

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

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

$$X \text{ mL/hr} = \frac{250 \text{ mL}}{2,500 \text{ mg}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

$$X \text{ mL/hr} = \frac{250 \text{ mL}}{2,500\text{mg}} \times \frac{1\text{mg}}{1,000\text{mcg}} \times \frac{50\text{mcg}}{1\text{kg}} \times \frac{80\text{kg}}{1\text{min}} \times \frac{60\text{min}}{1 \text{ hr}}$$

Step 4

Solve for X.

$$X \text{ mL/hr} = 24 \text{ mL/hr}$$

Step 5

Round if necessary.

Step 6

A provider increases the rate of esmolol to 100 mcg/kg/min. The nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

48

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

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

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

$$X \text{ mL/hr} = \frac{250 \text{ mL}}{2,500 \text{ mg}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

$$X \text{ mL/hr} = \frac{250 \text{ mL}}{2,500\text{mg}} \times \frac{1\text{mg}}{1,000\text{mcg}} \times \frac{100\text{mcg}}{1\text{kg}} \times \frac{80\text{kg}}{1\text{min}} \times \frac{60\text{min}}{1 \text{ hr}}$$

Step 4

Solve for X.

$$X \text{ mL/hr} = 48 \text{ mL/hr}$$

Step 5

Round if necessary.

nurse should set the IV pump to deliver how many mL/hr? (Round the answer to the nearest whole number.)

60

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

$$X\,\text{mL/hr} =$$

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

$$X\,\text{mL/hr} = \frac{250\text{ mL}}{1\text{ mg}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

$$X\,\text{mL/hr} = \frac{250\text{ mL}}{1\text{mg}} \times \frac{1\text{mg}}{1,000\text{mcg}} \times \frac{4\text{mcg}}{1\text{min}} \times \frac{60\text{min}}{1\text{ hr}}$$

Step 4

Solve for X.

$$X\,\text{mL/hr} = 60\text{ mL/hr}$$

Step 5

Round if necessary.

Step 6

7.2

Step 1

What is the unit of measurement the nurse should calculate? Place the unit of measure being calculated on the left side of the equation.

$$X\,\text{mL/hr} =$$

Step 2

Find the ratio in the item that contains the same unit as the unit being calculated. Place the ratio on the right side of the equation, ensuring that the unit in the numerator matches the unit being calculated.

$$X\,\text{mL/hr} = \frac{250\text{ mL}}{400\text{ mg}}$$

Step 3

Place any remaining ratios that are relevant to the item on the right side of the equation along with any needed conversion factors to cancel out unwanted units of measure.

$$X\,\text{mL/hr} = \frac{250\text{ mL}}{400\text{mg}} \times \frac{1\text{mg}}{1,000\text{mcg}} \times \frac{3\text{mcg}}{1\text{kg}} \times \frac{64\text{kg}}{1\text{min}} \times \frac{60\text{min}}{1\text{ hr}}$$

Step 4

Solve for X.

$$X\,\text{mL/hr} = 7.2\text{ mL/hr}$$

Step 5

Round if necessary.

Step 6

Determine if the amount to administer makes sense.