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Pediatric Medication Calculations

Comprehensive Review for NCLEX

Calculating a Single Pediatric Dose by Body Weight

1. Multiply child's weight in kilograms by dosage ordered per kilogram.
Example: A pediatrician orders a dose of 15 mg of a drug per kilogram of body weight (15 mg/kg).

$$20 \text{ kg weight} \times \frac{15 \text{ mg of drug}}{1 \text{ kg}} = 300 \text{ mg of drug should be given as the dose}$$

2. Calculate volume (tablets, solution) using a standard pharmaceutical math calculation (such as "desired over have multiplied by quantity" or ratio and proportion; see Chapter 29).

Calculating a Single Pediatric Dose from a Total Daily Dose Using Body Weight

1. Multiply child's weight in kilograms by daily dosage ordered per kilogram.
Example: A pediatrician orders a dose of 45 mg of a drug per kilogram of body weight per day (45 mg/kg/day).

$$20 \text{ kg weight} \times \frac{45 \text{ mg of drug per day}}{1 \text{ kg}} = 900 \text{ mg of drug should be given per day}$$

2. Divide total daily dose by number of doses per day to calculate amount of a single dose.
Example (continued from above): 900 mg of drug per day divided by 3 doses per day = 300 mg per dose.

Calculating a Single Pediatric Dose Ordered by Body Surface Area

1. Multiply recommended dosage (in milligrams or micrograms per m²) by body surface area (m²).
Example:
 $2.5 \text{ (mg per m}^2) \times 0.8 \text{ (m}^2) = 2 \text{ mg dose}$
2. Calculate dose volume (tablets, solution) using a standard pharmaceutical math calculation (such as "desired over have multiplied by quantity," ratio and proportion, or dimensional analysis; see Chapter 29).

Calculating a Single Pediatric Dose from an Adult Dose Using Body Surface Area

1. Divide child's body surface area (m²) by 1.73 (m²) and then multiply it by adult dose.
Example:

$$\frac{0.8 \text{ m}^2}{1.73 \text{ m}^2} \times 25 \text{ mg (adult dose)} = 11.56 \text{ mg (child's dose)}$$

2. Calculate volume (tablets, solution) using a standard pharmaceutical math calculation (such as "desired over have multiplied by quantity," ratio and proportion, or dimensional analysis; see Chapter 29).

1 A 4-month-old client has D₅ ½ NS IV prescribed to run at a rate of 40 mL/hr. While the unlicensed assistant obtains an infusion pump, the nurse sets the drip rate at how many drops/minute, using a Soluset with microdrip tubing (drop factor of 60 gtt/mL)? Provide a numerical answer. Record your answer rounding to the nearest whole number.

Fill in your answer below:
Answer: _____ drops/min

2 A 3½-month-old infant has an order for acetaminophen suspension 45 mg by mouth q4h prn. The product label lists a concentration of 500 mg/5 mL. After determining that the dosage is safe, the nurse should administer how many mL? Record your answer, rounding to two decimal places.

Fill in your answer below:
Answer: _____ mL

3 A 4-year-old client's medication prescription reads cefotaxime 1380 mg IV every 8 hours. The client weighs 13.8 kg. Which nursing action is appropriate if the safe dosage range for a child from 1 month to 12 years of age is listed as 100–200 mg/kg/day given in divided doses?

1. Give the dose as scheduled and document it appropriately.
2. Question the order for the excessively high dose.
3. Administer the slightly high dose but give it at half the recommended rate.
4. Withhold the dose and question the prescriber, since it is below the recommended range.

4 A 6-year-old client who weighs 18 kg has a prescription for vancomycin 240 mg IV every 6 hours. The safe dose range for a child is listed as 40 mg/kg/day, with divided doses given every 6 hours. What is the best nursing action?

1. Question the dosage of the order.
2. Question the frequency of the order.
3. Administer the dose, being sure to use an infusion pump.
4. Give the dose over at least 60–90 minutes to avoid adverse effects.

5 A 5-year-old client has an order for baclofen one-half of a 10-mg tablet by mouth three times per day. The safe dose range for a 2- to 7-year-old child is 10–15 mg/day in divided doses. Which nursing action is most appropriate?

1. Question the total daily dose ordered.
2. Question the single dose ordered.
3. Refuse to give the dose because the child's weight is not factored into the dose.
4. Administer the dose as ordered.

6 A 3-year-old client has a prescription for 120 mg acetaminophen every 4–6 hours prn for pain. The maximum total dose is 2.6 grams/day for a child of 2–3 years. The nurse could legally administer how many doses per 24-hour period? Record your answer as a whole number.

Fill in your answer below:
Answer: _____ doses/24 hours

7 A client has a prescription for cefotaxime 1180 mg IV q6h. The reconstituted medication vial is labeled as having a concentration of 95 mg/mL. The nurse should draw up _____ milliliters of solution to add to the bag of IV solution for the intermittent infusion. Record your answer, rounding to one decimal place.

Fill in your answer below:
Answer: _____ mL

8 A 6-year-old client has a prescription for fexofenadine one-half of a 60 mg tab by mouth twice daily. The nurse calculates the child's total daily dose as _____ milligrams. Record your answer rounding to the nearest whole number.

Fill in your answer below:
Answer: _____ mg

9 A nurse is reviewing insulin administration techniques with a 13-year-old client who has uncontrolled diabetes. The nurse evaluates that the client is using proper procedure after noting that the client performs which action during self-injection?

1. Aspirates before injection but does not massage the site following injection
2. Uses a 45-degree injection angle and aspirates before injection
3. Uses a 90-degree angle and massages the site following injection
4. Uses a 90-degree injection angle and does not massage the site following injection

10 A 15-year-old client admitted with dehydration is prescribed a bolus infusion of 0.9% sodium chloride (normal saline, NS) 500 mL IV for 1 hour. An infusion device is available that counts the number of drops per minute delivered. The IV tubing has a drop factor of 10 drops/mL. If the bolus is to infuse on time, the nurse should set the drip rate to _____ drops per minute. Record your answer, rounding to the nearest whole number.

Fill in your answer below:
Answer: _____ drops/minute

11 A 6-year-old postoperative client who weighs 44 pounds has a medication order for cefazolin 500 mg IV every 6 hours. The safe dose range of cefazolin for a child is 25–100 mg/kg/day in three to four divided doses. To determine whether the child's dose is within the safe dose range, the nurse first calculates that this child's prescribed dose is _____ mg/kg/day? Record your answer, rounding to the nearest whole number.

Fill in your answer below:
Answer: _____ mg/kg/day

12 A child who sustained a head injury is prescribed mannitol 20 grams IV. Available is a bag of 20% solution that contains 20 grams mannitol in 100 mL volume. If infusing the dose over 90 minutes using an infusion pump that can be set to tenths of a milliliter, the nurse should set the infusion pump at how many mL/hour? Record your answer, rounding to one decimal place.

Fill in your answer below:

Answer: _____ mL/hr

13 A child who weighs 55 pounds is prescribed ceftazidime 250 mg IV every 8 hours. The safe dose range of ceftazidime for a child is 30–50 mg/kg/day in three divided doses. What is the total daily dose ordered for this client in mg/kg/day? Record your answer, rounding to the nearest whole number.

Fill in your answer below:

Answer: _____ mg/kg/day

14 A child is prescribed a bolus of 0.9% sodium chloride (normal saline, NS) 400 mL by the IV route. To infuse this volume over 90 minutes, the nurse should set the infusion pump at ____ mL/hour. Record your answer, rounding to the nearest whole number.

Fill in your answer below:

Answer: _____ mL/hr

15 A nurse is about to administer a dose of acetaminophen 200 mg via nasogastric tube to a child. Available is a suspension with a concentration of 80 mg per 5 mL. The nurse should administer how many mL to give the dose? Record your answer, rounding to one decimal place.

Fill in your answer below:

Answer: _____ mL