Spring

Pediatric Math

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Administering Medications to Children

- Children birth to one year have a greater percentage of body water – causing a decrease in absorption of water-soluble drugs
- Ages 1-12 years metabolize drugs more readily than adults
- Immature physiological processes related to absorption, distribution, metabolism, and excretion – places the child at risk for overdose, toxic reactions, and possible death

Pediatric Dosage Calculation

- When medications prescribed
  - Weight
  - Height
  - Body surface
  - Age
  - Condition of the child
- 2 methods
  - Body weight
  - Body surface area

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Remember

- The 6 Rights of medication administration
  - Right client
  - Right medication
  - Right dose
  - Right route
  - Right time
  - Right documentation
- Always use 2 identifiers
  - Name and date of birth

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Verifying Safe Dosages

- To verify safe dosing
  - Convert weight from pound to kilogram
  - Calculate safe dose in mg/kg or mcg/kg (most common)
  - Compare ordered dosage to recommended dosage and decide if dosage is safe
  - If safe, calculate the amount given and administer
  - If dosage seems unsafe/non-therapeutic, contact ordering provider

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Lb to Kg Conversions

- 1 kg = 2.2 lb
- 1 lb = 16 oz
- When converting pound to kilogram
  - Round kilogram to one decimal place (tenth)
    - 16.25 kg = 16.3 kg
- What about when there are oz's? Example: 10 lb 12 oz
  - 12 oz: 12 divided by 16 = 0.75
  - Now you attach the 0.75 to 10 = 10.75
  - Take the 10.75 and divide by 2.2 = 4.9 kg

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Practice

- Convert weight to kilogram
  - 22 lb 14 oz
    - 10.4 kg
  - 70 lb 2 oz
    - 31.9 kg
  - 45 lb 6 oz
    - 20.6 kg
  - 30 lb 10 oz
    - 13.9 kg
  - 10 lb 4 oz
    - 4.7 kg
  - 62 lb 5 oz
    - 28.3 kg
  - 37lb 8 oz
    - 17 kg

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Practice

A physician's order reads: Amoxicillin 200 mg/kg po every 8 hours. The child weighs 22 lb.

- What is the child's weight in kg?

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Practice

A physician's order reads: Amoxicillin 200 mg/kg po every 8 hours. The child weighs 22 lb.

- How many mg will be administered per dose?

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Practice

A physician's order reads: Amoxicillin 200 mg/kg po every 8 hours. The child weighs 22 lb.

- How many mg will be administered per day?

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Practice

A pediatrician has ordered ampicillin 50 mg/kg/day po in divided doses every 6 hours for a child who weighs 24 lb.

- How many kg does the child weigh?

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Practice

A pediatrician has ordered ampicillin 50 mg/kg/day po in divided doses every 6 hours for a child who weighs 24 lb.

- How many mg should the child receive per day?

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Practice

A pediatrician has ordered ampicillin 50 mg/kg/day po in divided doses every 6 hours for a child who weighs 24 lb.

- How many mg should the child receive per dose?

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Practice

The licensed prescriber orders diphenhydramine 28.4 mg IV Q 6 hrs. You have available diphenhydramine 12.5 mg/mL. The recommended daily dosage is 5 mg/kg/day in four divided doses. The child weighs 50 lbs.

- What is the child's weight in kg?

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Practice

The licensed prescriber orders diphenhydramine 28.4 mg IV Q 6 hrs. You have available diphenhydramine 12.5 mg/mL. The recommended daily dosage is 5 mg/kg/day in four divided doses. The child weighs 50 lbs.

- What is the safe dose per day for this child?

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Practice

The licensed prescriber orders diphenhydramine 28.4 mg IV Q 6 hrs. You have available diphenhydramine 12.5 mg/mL. The recommended daily dosage is 5 mg/kg/day in four divided doses. The child weighs 50 lbs.

- What is the safe single dose for this child?

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Practice

The licensed prescriber orders diphenhydramine 28.4 mg IV Q 6 hrs. You have available diphenhydramine 12.5 mg/mL. The recommended daily dosage is 5 mg/kg/day in four divided doses. The child weighs 50 lbs.

- Is the order within the safe dose range?
- If so, calculate the amount to be given.

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Practice

A physicians order reads: Amoxicillin 200 mg po every 8 hours. The child weighs 22 lb.

The drug reference book indicates the recommended dosage as 20-40 mg/kg/day in divided doses every 8 hours.

- What is the child's weight in kg?

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Practice

A physicians order reads: Amoxicillin 200 mg po every 8 hours. The child weighs 22 lb.

The drug reference book indicates the recommended dosage as 20-40 mg/kg/day in divided doses every 8 hours.

- Calculate the minimum dosage per day.

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Practice

A physicians order reads: Amoxicillin 200 mg po every 8 hours. The child weighs 22 lb.

The drug reference book indicates the recommended dosage as 20-40 mg/kg/day in divided doses every 8 hours.

- Calculate the minimum dosage for each single dose.

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Practice

A physicians order reads: Amoxicillin 200 mg po every 8 hours. The child weighs 22 lb.

The drug reference book indicates the recommended dosage as 20-40 mg/kg/day in divided doses every 8 hours.

- Calculate the maximum dosage per day.

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Practice

A physicians order reads: Amoxicillin 200 mg po every 8 hours. The child weighs 22 lb.

The drug reference book indicates the recommended dosage as 20-40 mg/kg/day in divided doses every 8 hours.

- Calculate the maximum dosage for each single dose.

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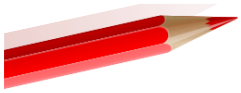
Practice

Is the ordered dose safe?



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Review

- Converting lb to kg
  - Lb divided by 2.2
  - Round to the nearest tenth place
    - 16.25 = 16.3 kg
- When calculating pediatric dose
  - Round to institutional policy – in this course to the nearest tenth unless it specifies something different
    - To the tenth – 65.7 mg
    - To the hundredth – 65.67 mg

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Not Done Yet…

- Remember basic dosage calculation
  - Desire dose / Available x Quantity
- Example –

Doctor orders amoxicillin 500 mg every 8 hours. You have on hand amoxicillin 1000 mg/tablet.

  - How many tablets will you administer per dose?
  - How many tablets will you administer per day?

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Rounding Liquid/Parenteral Medications

- Dosage < 1 mL – round to the 100th
  - 0.646 mL = 0.65 mL
  - 0.643 mL = 0.64 mL
- Dosage > 1 mL – round to the 10th
  - 1.86 mL = 1.9 mL
  - 1.82 mL = 1.8 mL

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Review

- IV Calculations
  - mL/hr
    - Total volume
      Total time equals mL/hr
  - gtt/min
    - Total volume
      Total time in minutes x Drop factor = gtt/min
- Remember no “trailing zeros”
- If the answer is .5, must write 0.5
- Drip rate round to whole number – gtt/min
- Flow rate round to whole number – mL/hr

Practice

A client with herpes simplex virus 1 has acyclovir 700 mg in 200 mL of D5W order to infuse over 30 minutes. Drop factor is 60 gtt/mL.

- How many mL per hour?
- How many gtt/min?

Practice

A client with herpes simplex virus 1 has acyclovir 700 mg in 200 mL of D5W order to infuse over 4 hours. Drop factor is 20 gtt/mL.

- How many mL per hour?
- How many gtt/min?

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PCA Question

- You have a patient come from the PACU with Demerol PCA prescription for pain. Prescription reads:
- Basal rate: 4 mg/hour
- PCA dose: 2 mg/10 minutes
- How many mg can the patient receive in 8 hour?

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Insulin Sliding Scale

- The Healthcare Provider has prescribed sliding scale insulin for Ms. Jones. You perform a chemstick at 1130 and her glucose level is 245. Based on the chart below, how much regular insulin will Ms. Jones receive? **Circle your answer on the chart.**

Sliding Scale		Insulin Dosage
Blood Sugar:	0-150	Zero unit
Blood Sugar:	151-250	8 unit
Blood Sugar:	251-350	13 unit
Blood Sugar:	351-400	18 unit
Blood Sugar:	>400	Call Doctor

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Reconstitution of Medications

- Powdered medications that are not stable in liquid form for prolong periods of time
- Rules:
  - Must determine both the type and amount of diluent to be used (on med label)
  - Must determine the volume in mL of diluent to be used for the route ordered (on med label)
- Once medication is reconstituted – note the resulting supply dosage on the vial or what it "yields"

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Reconstitution of Medications

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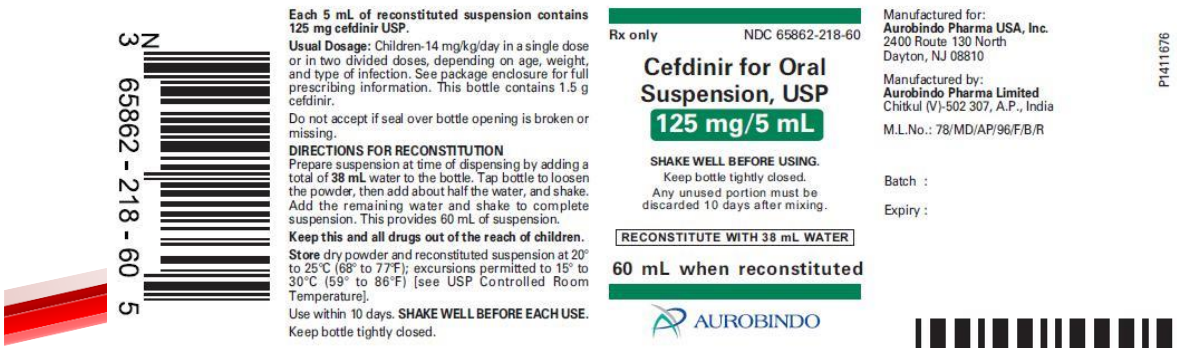
Reconstitution of Medications



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Reconstitution

- Steps
  - The type and amount of diluent
  - The resulting volume after powder has been reconstituted
    - Example: added 2 mL of diluent to vial – resulting volume 2.2 mL
- So let's say the dosage of medication ends up being 125 mg/2.2 mL. The order is for 100 mg every 8 hours. How would you set this up?

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