Pediatric & Adult Dosages Based on Body Weight

Calhoun Community College
**REMEMBER!!!!!**

- Even though the doctor, dentist, PA or NP prescribes the dosage for medication administration, **YOU**, the health care provider administering the medication, are **LEGALLY** responsible for recognizing incorrect and unsafe dosages and for alerting the ordering health care provider....

- Micrograms are used frequently *(hint hint)*

- IM doses for small children and older infants are usually 0.5-1.0 mL; *doses for small infants are not more than 0.5 mL*

- Medications in pediatrics may be administered via tuberculin syringe *(1 mL syringe which is measured in hundredths)* to ensure accuracy
Remember....... Weight Conversions

- 1 lb = 16 oz
- 1 kg = 2.2 lb
- 1 kg = 1000 g

- Weight in kilograms (kg) is approximately ½ of weight in pounds (lbs).
- When converting pounds to kilograms, round kilogram weight to one decimal place to the nearest tenth
- Example:
  - 13.63 kg would round to 13.6 kg
  - 13.65 kg would round to 13.7 kg
• **Convert Pounds to Kilograms**
  - Think small to large, **DIVIDE**
  - A child weighs 65 lb. Convert to kilograms
  - \(65 \text{ lbs} = 65 \div 2.2 = 29.54 = 29.5 \text{ kg}\) *(round to the nearest tenth)*

• **Sample Problems:**
  - 23 lb = _____kg  
    20 lb = _____kg
  - 12 lb = _____kg  
    133 lb = _____kg
  - 48 lb = _____kg  
    249 lb = _____kg

  “Answers in notes section”
• **Convert Kilograms to Pounds**
  – Think large to small, **MULTIPLY**
  – A child weighs 24.7 kg, Convert to pounds.
  – \(24.7 \text{ kg} = 24.7 \times 2.2 = 54.34 = 54.3 \text{ lbs}\)
    
    *(round to the nearest tenth)*

• **Sample Problems:**
  – 22.2 kg = _____lb  13 kg = _____lb
  – 89 kg = _____lb  34 kg = _____lb
  – 21.3 kg = _____lb  10 kg = _____lb
• **Convert Kilograms to Pounds**
  – Think large to small, **MULTIPLY**
  – A child weighs 24.7 kg, Convert to pounds.
  – 24.7 kg = 24.7 x 2.2 = 54.34 = **54.3 lbs**
    
    *(round to the nearest tenth)*

• **Sample Problems:**
  – 22.2 kg = 48.84 lb  13 kg = 28.6 lb
  – 89 kg = 195.8 lb  34 kg = 74.8 lb
  – 21.3 kg = 46.86 lb  10 kg = 22 lb
• **Convert Grams to Kilograms**
  
  - **Divide by 1000 or move** the decimal point three \((3)\) places to the left then round.....
  
  ➢ \(2250/1000 = 2.25 = 2.3 \text{ kg}\)
  
  ➢ \(2250 \text{ g} = 2.250 \text{ g} = 2.3 \text{ kg}\)
  
  \((round \ to \ the \ nearest \ tenth)\)

• **Sample Problems:**

  - \(2222 \text{ g} = \___\text{kg}\)  \(1350 \text{ g} = \___\text{kg}\)
  
  - \(4000 \text{ g} = \___\text{kg}\)  \(3445 \text{ g} = \___\text{kg}\)
• **Convert Grams to Kilograms**
  
  – Divide by 1000 or move the decimal point three (**3**) places to the left then round…..
  
  ➢ 2250/1000 = 2.25 = 2.3 kg
  
  ➢ 2250 g = 2.250 g = 2.3 kg

  *(round to the nearest tenth)*

• **Sample Problems:**
  
  – 2222 g = **2.2** kg  1350 g = **1.4** kg
  
  – 4000 g = **4** kg  3445 g = **3.4** kg
• **Convert Pounds and Ounces to Kilograms**

1. Convert the ounces to the nearest tenth of a pound
2. Add this to the total pounds
3. Convert the total pounds to kilograms, think small to large, **DIVIDE** by 2.2 and then round to the nearest tenth

• A child weighs 10 lb 2 oz

1) \[2 \text{ oz} \div 16 = 0.12 = 0.1 \text{ oz or 0.1 lb}\]
2) \[10 \text{ lb} + 0.1 \text{ lb} = 10.1 \text{ lb}\]
3) \[10.1 \div 2.2 = 4.59 = 4.6 \text{ kg}\]
Convert Pounds and Ounces to Kilograms Sample Problems:

• 8 lb 4 oz = _______ kg

• 6 lb 6 oz = _______ kg

• 12 lb 1 oz = _______ kg

• 7 lb 14 oz = _______ kg
Convert Pounds and Ounces to Kilograms

Sample Problems:

• **8 lb 4 oz = ______ kg**
  
  $4/16 = 0.25$ (round to tenths place) = $0.3 \text{ lb}$
  
  $8 + 0.3 = 8.3 \text{ lb} / 2.2 = 3.77$ (round to tenths place) = **3.8 kg**

• **6 lb 6 oz = ______ kg**
  
  $6/16 = 0.375$ (round to tenths place) = $0.4 \text{ lb}$
  
  $6 + 0.4 = 6.4 \text{ lb} / 2.2 = 2.9 \text{ kg}$

• **12 lb 1 oz = ______ kg**
  
  $1/16 = 0.0625$ (round to tenths place) = $0.1 \text{ lb}$
  
  $12 + 0.1 = 12.1 \text{ lb} / 2.2 = 5.48$ (round up to tenths place) = **5.5 kg**

• **7 lb 14 oz = ______ kg**
  
  $14/16 = 0.875$ (round to tenths place) = $0.8 \text{ lb}$
  
  $7 + 0.8 = 7.8 \text{ lb} / 2.2 = 3.54$ (round up to tenths place) = **3.5 kg**
REVIEW.......... 

• Converting Pounds to kilograms  
  – Divide # pounds by 2.2 kg  
  – Express the total to nearest tenth  

• Converting Kilograms to pounds  
  – Multiply by 2.2, express to nearest tenths  

• Convert Grams to Kilograms  
  – Divide by 1000 or move the decimal point three (3) places to the left.  
  – Express to the nearest tenth.  

• Converting Pounds and ounces to kilograms  
  – Convert ounces to parts of a pound  
  – Convert total pounds to kilograms  
  – Express the total to nearest tenth
Verifying Safe Pediatric Dosages: Body Weight Method

1. Convert the child’s weight from pounds to kilograms (rounded to tenths).

2. Calculate the safe dosage in mg/kg or mcg/kg (rounded to hundredths) for a child of this weight, as recommended by a reputable drug reference: multiply mg/kg by child’s weight in kg.

3. Compare the ordered dose to the recommended dose, and decide if the dosage is safe.

4. If safe, calculate the amount to give and administer the dose; if the dosage seems unsafe, consult with the ordering practitioner before administering the drug.

NOTE: The dosage per kg may be: mg/kg, mcg/kg, g/kg, mEq/kg, U/kg, mU/kg, etc.
Example:

- **Order:** Biaxin 200 mg p.o. q 12 h for a child who weighs 45 lb. Is this dosage safe?
- **Have:** Biaxin 125 mg per 5 mL

1. **First step:** Convert lbs to kgs
   - Think: 1/2 of 45 = 22.5 (so it should be close to this amount)
   - 45 lb = 45 ÷ 2.2 = 20.45 = **20.5 kg**
2. **Step two: Calculate recommended dosage.**

- Look at the label Biaxin. The label describes the recommended dosage as

  "15 mg/kg/day in two (2) equal doses"

You multiply $15 \text{ mg/gm/day} \times 20.5 \text{ kg} = 307.5 \text{ mg/day}$

You divide by two (2) since it is recommended to be given twice a day: $307.5 \text{ mg} \div 2 = 153.75 \text{ mg}$ per dose

Your round to the hundredths place, so a single safe recommended dose would be 153.75 mg
3. **Decide if the ordered dosage is safe.**

The ordered dosage is **Biaxin 200 mg p.o. q 12 h** and the allowable, safe dosage is 153.75 mg per dose.

**NO...** the ordered dosage is higher than what is safe, therefore, it would be toxic if given.

4. **Contact the physician to discuss the order.**
Calculate the minimum and maximum dosage for each single dose.

Min total daily dosage: 20 mg/kg/day × 10 kg = 200 mg/day
Max total daily dosage: 40 mg/kg/day × 10 kg = 400 mg/day

Min dosage for each single dose: 200 mg ÷ 3 doses = 66.7 mg/dose
Max dosage for each single dose: 400 mg ÷ 3 doses = 133.3 mg/dose

The single dosage range is 66.7 to 133.3 mg/dose

Decide if the ordered dosage is safe. The ordered dosage is 200 mg q 8 hr, and the allowable, safe dosage is 66.7 to 133.3 mg/dose. NO... this dosage is too high and is considered not safe.

Contact the physician to discuss the order.
Another example…

Child’s weight: 42 lbs
Physician’s Order: Administer 100 mg PO q 6 h
Available: see label
What is solution and amount you will use for the diluent?
- ________________________________

What is the manufacturers recommended dosage range for children?
- ________________________________

What is the recommended dose range for your client?
- First convert to kg
  - Calculate recommended dose

- Is the ordered dose safe? Yes _____ No _____
- If yes, how many mL will you prepare to administer? ______________
- If no, what would your next action be? _________________________

“Answers below in the notes section”
Another example...
Childs Weight:  8 lbs 4 oz
Physician’s Order:  Administer Erythromycin 50 mg PO q 8 h
Available: see label
What is the manufacturers recommended dosage range for this child?

• ________________________________________________________________

What is the recommended dose range for your client?
• Frist convert to kg

• Calculate recommended dose

• Is the ordered dose safe? Yes _____ No _____

• If yes, how many mL will you prepare to administer?

• If no, what would your next action be? __________________________
• What is the manufacturers recommended dosage range for children?  **30 to 50 mg per kg per day**
• What is the recommended dose range for your client?

First convert to kg = **8 lb 4 oz** (first convert 4 oz to lbs, 4/16 = 0.25 lb + 8 = 8.25 (round to tenth place) = 8.3 lb / 2.2 = 3.77 = 3.8 kg
• Calculate recommended dose

30 x 3.8 = 114 mg per day (divided x 3 times per day = 38 mg per dose)
50 x 3.8 = 190 mg per day (divided x 4 times per day = 63.3 mg per dose)
• Is the ordered dose safe?  Yes  X  No ___ (ordered dose of 50 mg is between 38 mg and 63.3 mg, so the dose is safe)
• If yes, how many mL will you prepare to administer?
• **50 mg** x 2.5 mL = 1.25 = 1.3 mL

• If no, what would your next action be?   **100 mg**