TEACH FOR NURSES LESSON PLAN

Chapter 01: Fractions

CHAPTER OBJECTIVES

1. Compare the size of fractions
2. Add fractions
3. Subtract fractions
4. Divide fractions
5. Multiply fractions
6. Reduce fractions to lowest terms

STUDENT RESOURCES

understand	• Textbook Chapter 01
apply	• Review Questions (Evolve) • Student Practice Problems (Evolve)

INSTRUCTOR RESOURCES

before class	• Nursing Curriculum Standards (below) • Clinical Judgment Classroom Tools (above)
in class	• PowerPoint Presentations (Evolve) • Image Collection (Evolve) • Learning Activities (below) • Discussion Topics (below)
after class	• Test Bank (Evolve)

TEACHING STRATEGIES

Content Focus	Content Highlights	Learning Activities	Resources
TYPES OF FRACTIONS **CONVERTING FRACTIONS** **COMPARING FRACTIONS** **REDUCING FRACTIONS**	Discuss how to differentiate among and identify proper, improper, and complex fractions and mixed and whole numbers. Emphasize that the denominators of fractions must be the same in order to compare them or to add them together. Examine how fractions are easier to comprehend when reduced to their lowest terms. Proper fractions Improper fractions Mixed number Complex fraction Whole numbers	• **Activity #1:** For Small Group Activity, Large Group Activity, Clinical Activity, or Remediation Activity. Have the students bring their text to class. Divide the students up into groups of two and practice solving 10 practice questions from Chapter 2. • **Online Activity:** Continue the online journal by answering the question: "What types of fractions do I see in the clinical setting?" • **Activity #2:** Clinical Activity. Bring needles of different lengths: 3/8, 1/2, and 5/8. Have the students change the fractional lengths to a common denominator so they can determine which needle is the shortest and then the longest based on the fractions.	• PPT slides 5-10
ADDING FRACTIONS **SUBTRACTING FRACTIONS** **Subtracting a Fraction from a Whole Number** **Subtracting Fractions Using Borrowing**	Practice both adding and subtracting fractions using examples from recent student experiences. Review how to change a whole number to a fraction to easily subtract another fraction.	• **Activity #3:** For Small Group Activity, Large Group Activity, Clinical Activity, or Remediation Activity. Bring needles of different lengths: 3/8, 1/2, and 5/8. Have the students draw three circles and divide one pie into two parts and two "pies" into eight parts. Shade the pies to represent the needle lengths. For example, one of the "pies" with eight parts will have three parts shaded and so on. Have the students compare and contrast the three "pies."	• PPT slides 11-13
MULTIPLYING FRACTIONS	Show how, unlike fractions being added and	• **Discussion Topic:** Ask the students	• PPT slides 14-15

TEACHING STRATEGIES

Content Focus	Content Highlights	Learning Activities	Resources
DIVIDING FRACTIONS	subtracted, fractions being multiplied or divided do not need the same denominator.	to identify a problem with which they had an issue and discuss it with the class to find the proper solution.	

NURSING CURRICULUM STANDARDS

QSEN / NLN COMPETENCIES

- Informatics/Nursing Judgment
  - Comparing Fractions

NURSING CONCEPTS

The following conceptual themes and specific concepts match those presented in Giddens, J. R. (2021). *Concepts for nursing practice* (3rd ed.). St. Louis: Elsevier. The specific exemplars chosen and listed below for each concept have been tailored specifically to correspond to the Morris textbook.

A full *Concept-Based Curriculum Map* covering the entire book can be found in the "Download by Resource Type" folder on Evolve.

THEME: Care Competencies

- Concept: Technology and Informatics
  - Exemplar: Comparing Fractions

BSN ESSENTIALS

- Essential I: Liberal Education for Baccalaureate Generalist Nursing Practice
  - Comparing Fractions

INTERPROFESSIONAL COLLABORATIVE PRACTICE CORE COMPETENCIES

- Domain 2: Roles/Responsibilities
  - Comparing Fractions

NGN Unfolding case study: Pediatric calculations and safety

Objectives:

- Evaluate orders for minimum and maximum pediatric safe dosage range (SDR) doses
-Performing pediatric dosage calculations
-Converting weight from pounds to kilograms
-Calculate 24-hour drug doses and divided doses for specific weights for oral and parenteral medications

Case Study:

M.S. is a 6-month old male that was born at 26 weeks. The infant was discharged 2 weeks ago after a 14 week stay in the neonatal intensive care unit NICU. He currently weighs 6 pounds and is 19 inches long. His current vital signs are HR 145, RR 26, B/P 90/60, T 101.6 F His parents brought the infant to the emergency department because he has not been eating and is continuously fussy. The healthcare provider assessed a bulging left tympanic membrane and diagnosed the infant with an ear infection. Orders include: amoxicillin 113 mg PO q12h. Safe dosing for amoxicillin is 80-90 mg/kg/day divided every 12 hours for 5-7 days.

Highlight the information that is needed for the nurse to administer the ordered medication safely.

The nurse is preparing to discharge M.S. **Which nursing action is required to ensure the amoxicillin dose is safe for M.S.? (Select all that apply)**

1. Calculate the infant' s weight as 2.7 Kg
2. Calculate the infant's weight as 13.2 Kg
3. Calculate the safe dosage range for amoxicillin as: 216-243 mg/day or 108-121.5 mg/dose every 12 hours
4. Calculate the safe dosage range for amoxicillin as 480-540 mg/day or 240-270 mg/dose every 12 hours

Choose the *most likely* options for the information missing from the statement below by selecting from the lists of options provided.

The amoxicillin dose of 113 is _____**1**_____ and _____**2**_____. The nurse would _____**3**_____.

1	2	3
Too high	Safe	Call the physician
Too low	Unsafe	Call the pharmacy
Within range	Lethal	Give the parents the medication

M.S. is brought back to the emergency department by his parents because he appears to have difficulty breathing, 12 hours after being discharged. The parents report this happened after M.S. received his second dose of amoxicillin. The healthcare provider believes M.S. is having an allergic reaction to the

amoxicillin. The healthcare provider orders epinephrine 0.01 mg/kg IM now and a normal saline intravenous fluid bolus of 20 mL/kg. The infant weighs 6 pounds.

Choose the *most likely* option for the missing information from the statements below by selecting from the list of options provided.

The nurse will administer epinephrine to the infant by _____**1**_____ IM into the _____**2**_____. The infant will also receive _____**3**_____ of normal saline after an intravenous line has been stated.

1	2	3
Using a 1 mL syringe to draw up 0.13 mL of epinephrine 1 mg/mL solution	Vastus Lateralis (Anterolateral thigh)	264 mL
Using a 3 mL syringe to draw up 0.06 mL of epinephrine 1 mg/mL solution	Gluteus maximus	54 mL
Using a 1 mL syringe to draw up 0.03 mL of epinephrine 1 mg/mL solution	Deltoid	20 mL

M.S. was admitted to the hospital for monitoring after receiving the epinephrine and fluid bolus. Current vital signs include: temperature 39 degrees Celsius, HR 150, RR 26, B/P 94/68, sat 99% on room air

The healthcare provider makes morning rounds and orders the following:

Ceftriaxone 50 mg/kg IV daily.

ibuprofen 20 mg PO q8h PRN for temperature greater than 37.5 (include parameter – degrees Celsius)

acetaminophen 64 mg PO q4h PRN for temperature greater than 37.5.

The safe dose range for ibuprofen is 5-10 mg/kg PO q6-8h PRN.

The safe dose range for acetaminophen is 10-15 mg/kg q4-6h PRN.

Use an "X" (or drag and drop) to indicate which nursing actions listed in the left column would be indicated or contraindicated.

Actions	Indicated	Contraindicated
Administer Ceftriaxone 300 mg IV		
Administer Ceftriaxone 135 mg IV		
Calculate the safe dosage range for ibuprofen as 13.5-27 mg per dose. The dose of 20 mg PO Q8h PRN is safe and should be administered.		
Calculate the safe dosage range for ibuprofen as 66-132 mg per dose. The dose of 20 mg PO q8H PRN is low and the healthcare provider should be notified.		

Calculate the safe dosage range for acetaminophen as 27-40.5 mg per dose. The dosage of 64 mg PO q4h PRN is too high and the healthcare provider should be notified.		
Calculate the safe dosage range for acetaminophen as 60-90 mg per dose. The dosage of 64 mg PO q4h PRN is safe and should be administered.		

Four hours pass after administration of ibuprofen and acetaminophen. The infant currently has a temperature of 38.8 degrees Celsius. Blood pressure one hour ago was 94/62. Current blood pressure is 60/30

M.S. received a fluid bolus of 108 mL of normal saline for a blood pressure of 60/30and his blood pressure after the fluid bolus is 68/34. The provider suspects early sepsis and orders norepinephrine 0.05 mcg/kg/min and another normal saline fluid bolus of 20 mL/kg.

M.S. weighs 6 pounds. The initial dose of norepinephrine for septic patients is 0.05-0.1 mcg/kg/min. The safe dose for fluid boluses for septic patients is 20-60 mL/kg. The pharmacy provides norepinephrine as 1 mg in 250 mL D5W. Round all values to the nearest tenth. **Use an "X" for the nursing actions listed below that are indicated (necessary), contraindicated (could be harmful), or non-essential (makes no difference or not necessary). Only one selection can be made for each nursing action.**

Nursing Action	Indicated	Contraindicated	Non-Essential
Administer a normal saline fluid bolus of 120 mL			
Administer a normal saline fluid bolus of 54 mL			
Calculate the norepinephrine dose as 1mL/hr			
Calculate the norepinephrine dose as 2.3 mL/hr			
Administer acetaminophen			

After 5 days in the hospital, M.S. has a temperature of 37 degrees Celsius and is off of the norepinephrine drip. The infant's parents want to take the baby home. The healthcare provider assesses a minor infection remains in the left ear and orders continued antibiotic therapy at home. Orders include

azithromycin 25 mg PO daily for 3 days. M.S. currently weighs 5.5 pounds. The safe dose for azithromycin is 10 mg/kg daily for 3 days. **Highlight the information necessary for the nurse to determine if the azithromycin dose is safe for M.S. before sending him home.**

Answers and Rationales:

Rationale:

Phase 1

M.S. is a 6-month old male that was born at 26 weeks. The infant was discharged 2 weeks ago after a 14 week stay in the neonatal intensive care unit NICU. He currently weighs 6 pounds and is 19 inches long. His current vital signs are HR 145, RR 26, B/P 90/60, T 101.6 F His parents brought the infant to the emergency department because he has not been eating and is continuously fussy. The healthcare provider assessed a bulging left tympanic membrane and diagnosed the infant with an ear infection. Orders include: amoxicillin 113 mg PO q12h. Safe dosing for amoxicillin is 80-90 mg/kg/day divided every 12 hours for 5-7 days.

Highlight the information that is needed for the nurse to administer the ordered medication safely.

Amoxicillin is ordered in mg/kg/dose, so it is important toknow how much M.S. weighs. Convert pounds to kilograms using the conversion factor: 2.2 pounds = 1 kilogram.

It is important to know how much amoxicillin was ordered for M.S. by the healthcare provider and what the safe dosing range is for M.S. to help determine if the ordered dose is appropriate and safe.

The nurse is preparing to discharge M.S. **Which nursing action is required to ensure the amoxicillin dose is safe for M.S.? (Select all that apply)**

1. Calculate the infant' s weight as 2.7 Kg
2. Calculate the infant's weight as 13.2 Kg
3. Calculate the safe dosage range for amoxicillin as: 216-243 mg/day or 108-121.5 mg/dose every 12 hours
4. Calculate the safe dosage range for amoxicillin as 480-540 mg/day or 240-270 mg/dose every 12 hours

1. Calculate M.S.'s weight as 2.7 kg
2. Calculate M.S.'s weight as 13.2 mg
3. Calculate the safe dosage range for amoxicillin as: 216-243 mg/day or 108-121.5 mg/dose every 12 hours
4. Calculate the safe dosage range for amoxicillin as 480-540 mg/day or 240-270 mg/dose every 12 hours

To figure out M.S.'s weight convert pounds to kilograms:

$\frac{6 \text{ pounds} \times 1 \text{ kg}}{} = 2.72 = 2.7$ (using round rules: 4 or less round down and 5 or higher round up)

NGN Unfolding case study: Pediatric calculations and safety

1 2.2 pounds **the 1 underneath 6 pounds is a place holder and is not significant

The safe dosage range for amoxicillin is 80-90 mg/kg/day:

$\frac{2.7\ kg}{1} \times \frac{80\ mg}{kg} = 216\ mg$ The safe dosage would be between 216-243 mg/day every 12 hours

$\frac{2.7\ kg}{1} \times \frac{90\ mg}{kg} = 243\ mg$

* divide the safe dosage per day 216-243 by the number of doses being given per day. If a medication is given q12h, then it will be given twice a day [24 hours divided by 12 hours = 2]

216 divided by 2 = 108 A dose between 108-121.5 mg every 12 hours is safe
243 divided by 2 = 121.5

113 mg PO q12h is a safe dose because it is within the safe dosage range of 108-121.5 mg PO q12h. The nurse can comfortably dispense the medication to the parents and show them how much amoxicillin to draw up into the syringe.

-You would get 13.2 kilograms if you mixed up the conversion of pounds to kilograms:

$\frac{6\ pounds}{1} \times \frac{2.2\ kg}{1\ pound} = 13.2\ kilograms$

**this would result in an overdose of any medication that is based on weight. Most medications given to a pediatric patient are based on weight, making it extremely important to understand the appropriate conversion.

The correct conversion is:
$\frac{6\ pounds}{1} \times \frac{1\ kg}{2.2\ pounds} = 2.72 = 2.7$ (using round rules: 4 or less round down and 5 or higher round up)
**the 1 underneath 6 pounds is a place holder and is not significant

-480-530 mg/day or 240 -270 mg/dose is incorrect because M.S.'s weight was not coverted into kilograms and 6 pounds was used as the weight. This would be equivalent to M.S. weighing a little over 13 pounds. Be careful to make sure the weight used is in kilograms and not pounds. Using the incorrect weight can result in an overdose of medication for pediatric patients.

The safe dosage range for amoxicillin is 80-90 mg/kg/day:

$\frac{6\ kg}{1} \times \frac{80\ mg}{kg} = 480\ mg$ The safe dosage would be between 480-540 mg/day every 12 hours

$\frac{6\ kg}{1} \times \frac{90\ mg}{kg} = 540mg$

* divide the safe dosage per day 216-243 by the number of doses being given per day. If a medication is given q12h, then it will be given twice a day [24 hours divided by 12 hours = 2]

480 divided by 2 = 240
540 divided by 2 = 270

A dose between 240-270 mg is not safe because it is an overdose because an incorrect weight was used

Choose the *most likely* options for the information missing from the statement below by selecting from the lists of options provided.

The amoxicillin dose of 113 is _____**1**_____ and _____**2**_____. The nurse would _____**3**_____.

1	2	3
Too high	Safe	Call the physician
Too low	Unsafe	Call the pharmacy
Within range	Lethal	Give the parents the medication

113 mg PO q12h is a safe dose based on M.S.'s weight of 6 pounds, the healthcare provider would not need to be called and the nurse can dispense the medication to the parents after showing them how much amoxicillin to draw up into the syringe.

The correct conversion is

$\frac{2.7\ kg}{1} \times \frac{80\ mg}{kg} = 216\ mg$

$\frac{2.7\ kg \times 90\ mg}{1\ kg} = 243\ mg$

The safe dosage would be between 216-243 mg/day every 12 hours

* divide the safe dosage per day 216-243 by the number of doses being given per day. If a medication is given q12h, then it will be given twice a day [24 hours divided by 12 hours = 2]

216 divided by 2 = 108
243 divided by 2 = 121.5

A dose between 108-121.5 mg every 12 hours is safe

113 mg PO q12h is a safe dose because it is within the safe dosage range of 108-121.5 mg PO q12h. The nurse can comfortably dispense the medication to the parents and show them how much amoxicillin to draw up into the syringe.

1	2	3
Use a 1 mL syringe to draw up 0.13 mL of epinephrine 1 mg/mL solution	Vastus Lateralis (Anterolateral thigh)	264 mL
Use a 3 mL syringe to draw up 0.06 mL of epinephrine 1 mg/mL solution	Gluteus maximus	54 mL
Use a 1 mL syringe to draw up 0.03 mL of epinephrine 1 mg/mL solution	Deltoid	20 mL

-begin by converting M.S.'s weight of 6 pound to kilograms:

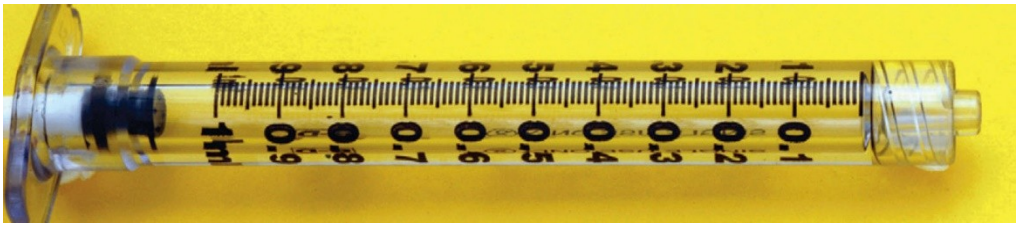
$\frac{6 \text{ pounds}}{1} \times \frac{1 \text{ kg}}{2.2 \text{ pounds}} = 2.72 = 2.7$ (using round rules: 4 or less round down and 5 or higher round up)

**the 1 underneath 6 pounds is a place holder and is not significant

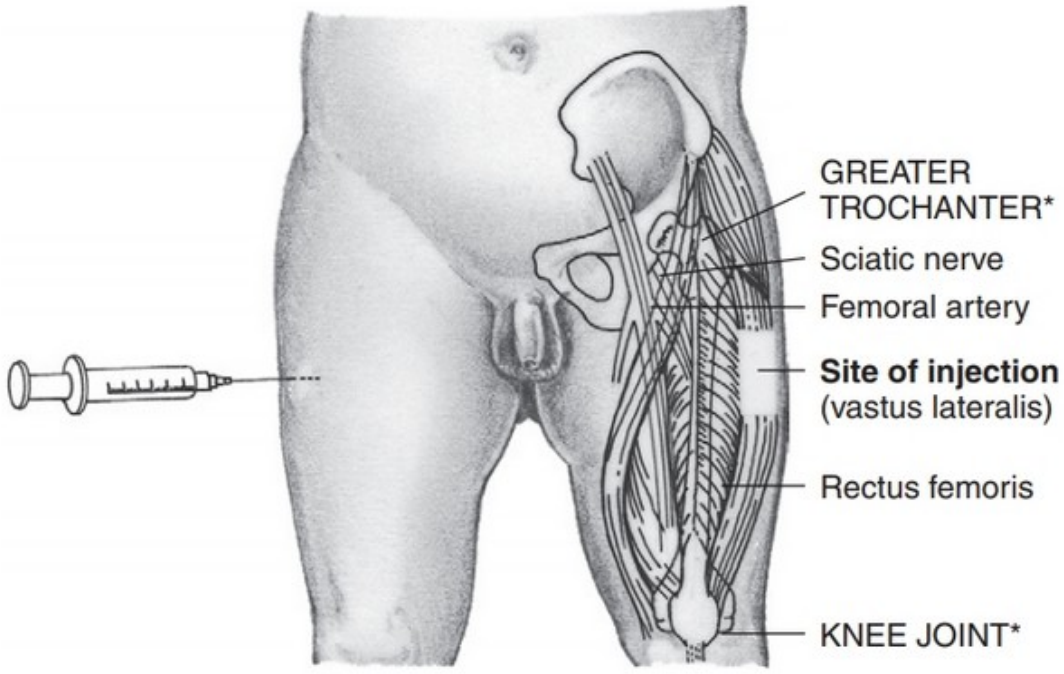
-next figure out the dose of epinephrine to give (1mg/1mL is the standard concentration used for allergic reactions).

$\frac{0.01 \text{ mg}}{\text{Kg}} \times \frac{2.7 \text{ kg}}{1} = 0.027 \text{ mL} = 0.03$ (use rounding rules)

** use a 1 mL syringe to draw up the dose because of the small volume, the marking for 0.1 mL and the smaller markings above it indicated 0.01 mL per marking. The smaller markings allow 0.03 mL to be drawn up with accuracy



For an infant, the preferred muscle to use for an intramuscular injection is the vastus lateralis (anterolateral thigh) muscle because it will tolerate the volume the best.



M.S.'s weight has already been calculated to be 2.7 kg, calculate the amount of normal saline he would receive as a fluid bolus. The healthcare provider ordered 20 mL/kg of normal saline:

$\frac{20 \text{ mL} \times 2.7 \text{ kg}}{\text{Kg} \quad 1} = 54 \text{ mL}$

- give M.S. 54 mL of normal saline over 60 minutes as a fluid bolus once an intravenous line has been started.

Be careful of the conversion from pounds to kilograms. You would get a volume 0.13 mL is you converted pounds to kilograms using the incorrect conversion factor (2.2 kilogram = 1 pound)

$\frac{6 \text{ pounds} \times 2.2 \text{ kg}}{1 \text{ pound}} = 13.2 \text{ kilograms}$

The correct conversion is:

$\frac{6 \text{ pounds} \times 1 \text{ kg}}{1 \quad 2.2 \text{ pounds}} = 2.72 = 2.7$ (using round rules: 4 or less round down and 5 or higher round up)

**the 1 underneath 6 pounds is a place holder and is not significant

This would give you and incorrect dosage of epinephrine:

$\frac{0.01 \text{ mg} \times 13.2 \text{ kg}}{} = 0.132 \text{ mL} = 0.13$ (use rounding rules)

Kg 1

**this would result in an overdose of epinephrine which can lead to extreme tachycardia and severe hypertension.

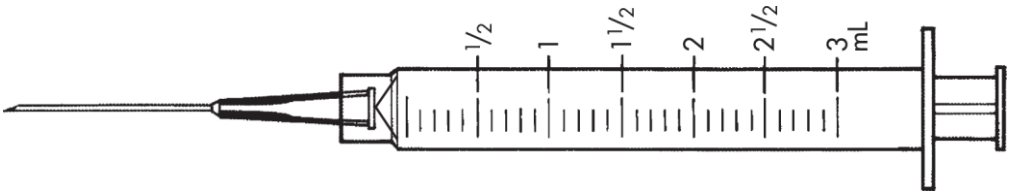
The correct dosage is:

$\frac{0.01 \text{ mg}}{\text{Kg}} \times \frac{2.7 \text{ kg}}{1} = 0.027 \text{ mL} = 0.03$ (use rounding rules)

A dose of 0.06 mL would be calculated if you did not convert 6 pounds to kilograms. It is important to make sure you have the correct weight in the unit needed. Most medications are dosed in kilograms, so make sure the weight is in kilograms. A kilogram is smaller than a pound, so you can determine if the weight is in the correct units.

$\frac{0.01 \text{ mg}}{\text{Kg}} \times \frac{6 \text{ kg}}{1} = 0.06 \text{ mL} =$ (this would result in giving the M.S. twice the prescribed dose)

You would not be able to accurately draw up 0.06 mL in a 3 mL syringe, the markings at 0.1 mL, 0.06 mL would be between the first marking and the end of the syringe, making it almost impossible to accurately draw up the correct dose.



The correct dosage is: 0.03 mL

The gluteus maximus and the deltoid muscle are not developed enough at 6 months of age to be able to absorb an intramuscular injection. The preferred muscle is the vastus lateralis in the anterolateral thigh for children 6 months and under. It is important to make you are giving intramuscular injections into a muscle that is able to handle the volume and be able to appropriately absorb the medication.

-The correct weight and units is important when calculating pediatric dosages.

$\frac{20 \text{ mL}}{\text{Kg}} \times \frac{13.2 \text{ kg}}{1} = 264 \text{ mL}$ (you mixed up the conversion and use 2.2 kg = 1 pound) this would give M.S. significantly more fluid than was ordered and it could lead to pulmonary edema and breathing problems

$\frac{20 \text{ mL}}{\text{Kg}} \times \frac{6 \text{ kg}}{1} = 120 \text{ mL}$ (you did not convert 6 pounds to kilograms and used 6 pounds in place of the ordered kilograms). This would give M.S. more fluid than was

ordered by the physician. It is important to make sure you have the correct weight in the correct units.

The correct calculation is:

$\frac{20 \text{ mL} \times 2.7 \text{ kg}}{\text{Kg} \quad 1} = 54 \text{ mL}$

Actions	Indicated	Contraindicated
Administer Ceftriaxone 300 mg IV		x
Administer Ceftriaxone 135 mg IV	x	
Calculate the safe dosage range for ibuprofen as 13.5-27 mg per dose. The dose of 20 mg PO Q8h PRN is safe and should be administered.	x	
Calculate the safe dosage range for ibuprofen as 66-132 mg per dose. The dose of 20 mg PO q8H PRN is low and the healthcare provider should be notified.		x
Calculate the safe dosage range for acetaminophen as 27-40.5 mg per dose. The dosage of 64 mg PO q4h PRN is too high and the healthcare provider should be notified.	x	
Calculate the safe dosage range for acetaminophen as 60-90 mg per dose. The dosage of 64 mg PO q4h PRN is safe and should be administered.		x

-begin by calculating how many kilograms M.S. weighs:

$\frac{6 \text{ pounds} \times 1 \text{ kg}}{1 \quad 2.2 \text{ pounds}} = 2.72 = 2.7$ (using round rules: 4 or less round down and 5 or higher round up)

**the 1 underneath 6 pounds is a place holder and is not significant

The physician ordered Ceftriaxone 50 mg/kg IV daily:

$\frac{50 \text{ mg} \times 2.7 \text{ kg}}{\text{Kg} \quad 1} = 135 \text{ mg}$

NGN Unfolding case study: Pediatric calculations and safety

The safe dose for ibuprofen is 5-10 mg/kg per dose PO q6-8h PRN. Calculate the safe dosage range for M.S.

$\frac{5\text{ mg}}{\text{Kg}} \times \frac{2.7\text{ kg}}{1} = 13.5\text{ mg}$

$\frac{10\text{ mg}}{\text{Kg}} \times \frac{2.7\text{ kg}}{1} = 27\text{ mg}$

The safe dosage range for ibuprofen would be 13.5-20 mg
20 mg PO Q8h is within the safe dosage range for M.S. and should be administered to help with M.S.'s fever

The safe dose for acetaminophen is 10-15 mg/kg per dose q4-6h PRN. Calculate the safe dosage range for M.S.

$\frac{10\text{ mg}}{\text{Kg}} \times \frac{2.7\text{ kg}}{1} = 27\text{ mg}$

$\frac{15\text{ mg}}{\text{Kg}} \times \frac{2.7\text{ kg}}{1} = 40.5\text{ mg}$

The safe dosage range for acetaminophen would be 27-40.5 mg
64 mg PO q4h is NOT within the safe dosage range for M.S. and should NOT be administered, the s
healthcare provider should be called to clarify t
the order

Be careful of the conversion from pounds to kilograms. a volume 0.13 mL is calculated when the incorrect conversion factor for pounds to kilograms is used(2.2 kilogram = 1 pound)

$\frac{6\text{ pounds} \times 2.2\text{ kg}}{1\text{ pound}} = 13.2\text{ kilograms}$

Make sure to convert 6 pounds to kilograms. Pounds and kilograms are not the same unit. The pound is a larger unit than the kilogram. The correct conversion factor is 2.2 pounds = 1 kilogram. If 6 pounds is assumed to be the same a 6 kilograms, the patient is getting at least twice the ordered dose.

The healthcare provider ordered Ceftriaxone 50 mg/kg IV daily:

$\frac{50\text{ mg} \times 6\text{ kg}}{\text{Kg} \quad 1} = 300\text{ mg}$

(convert 6 pounds to kilograms. Kilograms and pounds are not the same unit, be careful to make appropriate conversions.)

The correct conversion is:

$\frac{6\text{ pounds} \times 1\text{ kg}}{1 \quad 2.2\text{ pounds}} = 2.72$ = 2.7 (using round rules: 4 or less round down and 5 or higher round up)

**the 1 underneath 6 pounds is a place holder and is not significant

NGN Unfolding case study: Pediatric calculations and safety

The safe dose for ibuprofen is 5-10 mg/kg per dose PO q6-8h PRN. Calculate the safe dosage range for M.S.

$\frac{6 \text{ pounds}}{1 \text{ pound}} \times \frac{2.2 \text{ kg}}{} = 13.2$ kilograms (the conversion of pounds to kilogram. 1 kilogram = 2.2 pounds. The kilogram is smaller than the pound)

$\frac{5 \text{ mg}}{\text{Kg}} \times \frac{13.2 \text{ kg}}{1} = 66$ mg — The safe dosage range for ibuprofen is not 66-132 mg

20 mg PO Q8h is low according to this calculation.

$\frac{10 \text{ mg}}{\text{Kg}} \times \frac{13.2 \text{ kg}}{1} = 132$ mg — This dose would be an overdose

The correct dosage calculation is:

The safe dose for ibuprofen is 5-10 mg/kg per dose PO q6-8h PRN. Calculate the safe dosage range for M.S.

$\frac{5 \text{ mg}}{\text{Kg}} \times \frac{2.7 \text{ kg}}{1} = 13.5$ mg — The safe dosage range for ibuprofen would be 13.5-20 mg

20 mg PO Q8h is within the safe dosage range for M.S. and

$\frac{10 \text{ mg}}{\text{Kg}} \times \frac{2.7 \text{ kg}}{1} = 27$ mg — should be administered to help with M.S.'s fever

The safe dose for acetaminophen is 10-15 mg/kg per dose q4-6h PRN. Calculate the safe dosage range for M.S.

You did not covert 6 pounds to kilograms. You used 6 pounds as an equivalent to kilograms. The kilogram is a smaller unit the than pound and it is important to make sure correct conversion are completed for pediatric patients.

$\frac{10 \text{ mg}}{\text{Kg}} \times \frac{6 \text{ kg}}{1} = 60$ mg — The safe dosage range for acetaminophen is not 60-90 mg

64 mg PO q4h is NOT within the safe dosage range for M.S. and

$\frac{15 \text{ mg}}{\text{Kg}} \times \frac{6 \text{ kg}}{1} = 90$ mg — should NOT be administered, the healthcare provider should be called to clarify

the order. This would result in an overdose and could lead to liver damage

The safe dose for acetaminophen is 10-15 mg/kg per dose q4-6h PRN. Calculate the safe dosage range for M.S.

$\frac{10 \text{ mg}}{\text{Kg}} \times \frac{2.7 \text{ kg}}{1} = 27$ mg — The safe dosage range for acetaminophen would be 27-40.5 mg

64 mg PO q4h is NOT within the safe dosage range for M.S. and

$\frac{15 \text{ mg}}{\text{Kg}} \times \frac{2.7 \text{ kg}}{1} = 40.5$ mg — should NOT be administered, the healthcare provider should be called to clarify the order

NGN Unfolding case study: Pediatric calculations and safety

Nursing Action	Indicated	Contraindicated	Non-Essential
Give a normal saline fluid bolus of 120 mL		**x**	
Give a normal saline fluid bolus of 54 mL	**x**		
Calculate the norepinephrine dose as 1mL/hr	**x**		
Calculate the norepinephrine dose as 2.3 mL/hr		**x**	
Give acetaminophen to help with the fever	**x**		

-begin by calculating how many kilograms M.S. weighs:

$\frac{6 \text{ pounds}}{1} \times \frac{1 \text{ kg}}{2.2 \text{ pounds}} = 2.72 = 2.7$ (using round rules: 4 or less round down and 5 or higher round up)

**the 1 underneath 6 pounds is a place holder and is not significant

The healthcare provider ordered 20 mL/kg of normal saline:

$\frac{20 \text{ mL}}{\text{Kg}} \times \frac{2.7 \text{ kg}}{1} = 54 \text{ mL}$ *you would want to give M.S. 54 mL of normal saline over 60 minutes per the physician order

Norepinephrine is ordered as 0.05 mcg/kg/min. Calculate the dose in mL/hr

$\frac{2.7 \text{ kg}}{1} \times \frac{0.05 \text{ mcg}}{\text{mcg/min}} \times \frac{1 \text{ mg}}{1000 \text{ mcg}} \times \frac{250 \text{ mL}}{2 \text{ mg}} \times \frac{60 \text{ min}}{1 \text{ hour}} = 1.01 \text{ mL/hr} = 1 \text{mL/hr}$ (rounding rules)

* start the norepinephrine at 1 mL/hr and monitor M.S. very closely for changes in blood pressure. A patient that requires blood pressure support and vasopressor medications is in an intensive care unit to allow for close monitoring.

Controlling fever is an essential part of managing sepsis, so after blood pressure medication as been started, acetaminophen should be given to help decrease fever.

You need to make sure your patient is breathing, has a heart rate, and an adequate blood pressure before addressing any other issues. The patient needs to be able to sustain life and then you address the non-life threatening issues.

NGN Unfolding case study: Pediatric calculations and safety

$\frac{20\ mL}{Kg} \times \frac{6\ kg}{1} = 120\ mL$

* give M.S. 120 mL of normal saline over 60 minutes because 6 pounds was not converted to kilograms
It is very important to make sure correct units are used

Norepinephrine is ordered as 0.05 mcg/kg/min. You need to calculate the dose in mL/hr

$\frac{6\ kg}{1} \times \frac{0.05\ mcg}{mcg/min} \times \frac{1\ mg}{1000\ mcg} \times \frac{250\ mL}{2\ mg} \times \frac{60\ min}{1\ hour} = 2.25\ mL/hr = 2.3\ mL/hr$ (rounding rules)

Six pounds was not converted to kilograms, giving the patient too much norepinephrine. Giving too much of the medication could result in a significantly higher blood pressure and a significant increase in heart rate. It is very important to make sure the correct weight and the correct units are used before administering any medication.

The correct calculation is:

$\frac{2.7\ kg}{1} \times \frac{0.05\ mcg}{mcg/min} \times \frac{1\ mg}{1000\ mcg} \times \frac{250\ mL}{2\ mg} \times \frac{60\ min}{1\ hour} = 1.01\ mL/hr = 1mL/hr$ (rounding rules)

After 5 days in the hospital, M.S. has a temperature of 37 degrees Celsius and is off of the norepinephrine drip. The infant's parents want to take the baby home. The healthcare provider assesses a minor infection remains in the left ear and orders continued antibiotic therapy at home. Orders include azithromycin 25 mg PO daily for 3 days. M.S. currently weighs 5.5 pounds. The safe dose for azithromycin is 10 mg/kg daily for 3 days.

Highlight the information necessary for the nurse to determine if the azithromycin dose is safe for M.S. before sending him home.

To determine if a dose is safe for M.Sdetermine how much M.S. weighs in kilograms.

$\frac{5.5\ pounds}{1} \times \frac{1\ pound}{2.2\ kg} = 2.5\ kg$

-determine if the dose is safe. The safe dose is azithromycin 10 mg/kg daily

$\frac{2.5\ kg}{} \times \frac{10\ mg}{kg} = 25\ mg$

The dose is safe of M.S. and the nurse can teach the parents how to draw up the appropriate amount of azithromycin to give to M.S.

to determine safe dosages, you need to know what the safe dose is and the patient's weight in the correct units

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