

PHM-1751: MEDICATION CALCULATIONS FOR STERILE PREPARATIONS

Cuyahoga Community College

Viewing: PHM-1751 : Medication Calculations for Sterile Preparations

Board of Trustees:

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Academic Term:

Fall 2022

Subject Code

PHM - Pharmacy Technology

Course Number:

1751

Title:

Medication Calculations for Sterile Preparations

Catalog Description:

Applications and activities to build skills in medication calculations related to sterile preparations for pharmacy, nursing, and allied health. Includes metric system, formula manipulation, solving algebraic equations and systems, body surface area (BSA), and weight-based dose calculations. Basic skill reviews for metric system, fractions, ratios and percentages.

Credit Hour(s):

1

Lecture Hour(s):

1

Requisites

Prerequisite and Corequisite

Eligibility for MATH-1190 Algebraic and Quantitative Reasoning or higher or departmental approval.

Outcomes

Course Outcome(s):

Perform mathematical calculations essential to personnel in health care settings where sterile medications are handled, dosed, stored, dispensed, and administered.

Essential Learning Outcome Mapping:

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):

1. Apply dimensional analysis and proportions to perform unit conversions and dose calculations for sterile preparations.
2. Apply an understanding of the metric system to calculations used in health care and pharmacy.
3. Perform calculations related to preparation, storage, and administration of sterile dosage forms.

Course Outcome(s):

Identify and apply appropriate methods to obtain solutions to problems presented in medication orders for sterile preparations.

Essential Learning Outcome Mapping:

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

Objective(s):

1. Relate concentrations expressed in ratio, percent, or unit/volume to one another and convert between the expressions.

2. Determine whether solutions are reasonable and appropriate to the application.
3. Manipulate and solve equations generated by the mathematical models related to medication use and sterile dosage forms.
4. Evaluate and manipulate formulas (including reducing and enlarging) for sterile preparations.
5. Use appropriate technology to assist in solving problems related to sterile dosage forms.

Methods of Evaluation:

1. Quizzes.
2. Homework.
3. In class collaborative work.
4. Comprehensive final exam.
5. Online coursework

Course Content Outline:

1. Using ratios, percentages, and proportions
 - a. Numerical ratios
 - b. Percentages
 - c. Proportions
2. Applying metric measurements and calculating doses
 - a. Review of decimal notation
 - b. Basic metric units
 - c. Conversions within the metric system
 - d. Temperature measurement and conversion
 - e. Problem solving using ratio/proportion and dimensional analysis
 - f. Calculating customized doses based on weight and body surface area
 - g. Estimating expected results from calculations
 - h. Evaluating whether calculated values are reasonable.
3. Applied calculations for injectable medications
 - a. Volumes and quantities for injectable liquids
 - b. Specialized units of measurement (milliequivalents, activity units)
 - c. Percentage and ratio-strength dilutions
 - d. Flow rates and infusion rates
 - e. Dosing schedules
4. Applied calculations for medication preparation
 - a. Formulae
 - b. Alligations
 - c. Special dilutions

Resources

Sakai JB and Kasun L. *Pharmacy Calculations*. 1st ed. Bethesda MD: ASHP, 2012.

Bachenheimer BS. *Manual for Pharmacy Technicians*. 5e. Bethesda MD: ASHP, 2019.

Powers MF and Wakelin JB. (2016) *Pharmacy Calculations*, Englewood CO: Morton.

Resources Other

Lexicomp Online: <http://online.lexi.com/lco/action/hom> (<http://online.lexi.com/lco/action/hom/>) (subscription content for Pharmacology Department students) : collection of clinical databases
Global RPh Clinician Resource (<http://www.globalrph.com/>)