Medical Dosage Calculations

Course Information

Division
Allied Health

Course Number
HCE 116

Title
Medical Dosage Calculations

Credits
2

Developed by
Diane Knapp/Revised by John Clegg

Lecture/Lab Ratio
2 Lecture/0 Lab

Transfer Status

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Activity Course
No

CIP Code
51.0800

Assessment Mode
Pre/Post Test (50 Questions/50 Points)

Semester Taught
Fall and Spring

GE Category
None

Separate Lab
No

Awareness Course
No

Intensive Writing Course
No

Diversity and Inclusion Course
No

Prerequisites
None

Educational Value
This course is designed to prepare nursing students to calculate medication dosages. Assist students in understanding the importance of safety controls pertaining to administering medication in order to prevent medication errors, provide patient education and involving the patient in their care in regards to their medication regimen. It is intended for students and community members who are interested in nursing or any healthcare professional who is responsible for administering medications.

Description
This course involves reading medication documents and accurate calculation of medical dosages and solutions. The content includes math review, systems of measurements, medication administrations, dosage calculations, and unit conversions.

Supplies
Calculator
Competencies and Performance Standards

1. Review math.
   
   **Learning Objectives**
   
   *What you will learn as you master the competency:*
   
   a. Compare fractions; add, subtract, divide, and multiply fractions; and reduce fractions.
   b. Compare decimals; add, subtract, divide, multiply, and round off decimals.
   c. Change fractions to decimals and decimals to fractions.
   d. Convert and compare fractions to percentages and ratios.

   **Performance Standards**
   
   *Competence will be demonstrated:*
   
   o on assigned activities
   o on written exams in class or on WebStudy

   *Criteria - Performance will be satisfactory when:*
   
   o learner demonstrates the ability to solve the variety of math problems

2. Convert within and between systems of measurements.
   
   **Learning Objectives**
   
   *What you will learn as you master the competency:*
   
   a. Convert metric measures to their equivalents in metric.
   b. Identify symbols and interpret measures in the apothecaries' and household systems.
   c. Convert a unit of measure to its equivalent in another system of measure (for example, metric to apothecaries').
   d. Calculate intake and output.

   **Performance Standards**
   
   *Competence will be demonstrated:*
   
   o on assigned activities
   o on written exams in class or on WebStudy

   *Criteria - Performance will be satisfactory when:*
   
   o learner demonstrates the ability to convert units within and between systems of measurements

3. Demonstrate methods of administration and calculation.
   
   **Learning Objectives**
   
   *What you will learn as you master the competency:*
   
   a. State the six "rights" of safe medication administration.
   b. Identify common routes for medication administration.
   c. Identify important critical thinking skills necessary in medication administration.
   d. Identify home care considerations in relation to medication administration.
   e. Interpret a given medication order.
   f. Interpret medication labels.
   g. Calculate doses using ratio-proportion.
   h. Calculate doses using the formula method.
i. Calculate doses using dimensional analysis.

**Performance Standards**

*Competence will be demonstrated:*

- on assigned activities
- on written exams in class or on WebStudy

*Criteria - Performance will be satisfactory when:*

- learner responds correctly to questions related to methods of administration and calculation

4. **Calculate oral and parenteral dose forms, insulin, and pediatric dosage.**

**Learning Objectives**

*What you will learn as you master the competency:*

a. Calculate oral medications.

b. Calculate parenteral medications.

c. Reconstitute medications with more than one direction for mixing.

d. Measure insulin in single doses and combined insulin doses.

e. Calculate pediatric doses using the body surface area and weight.

f. Differentiate between various devices used to administer I.V. solutions (Example: Patient-controlled analgesia (PCA) pumps, electronic pumps).

g. Calculate infusion time.

h. Calculate the flow rate for medications ordered I.V. over a specified time period.

i. Calculate flow rates for pediatric I.V. therapy.

j. Calculate heparin doses being administered I.V. and s.c.

**Performance Standards**

*Competence will be demonstrated:*

- on assigned activities
- on written exams in class or on WebStudy

*Criteria - Performance will be satisfactory when:*

- learner demonstrates the ability to calculate oral and parenteral dose forms

**Types of Instruction**

Classroom Presentation with possible WebStudy supplementation, or online only on WebStudy.

**Grading Information**

**Grading Rationale**

A pretest will be administered at the beginning of the course, which will not count as part of the final grade. The final written exam (posttest) will count as 25% of the final grade. All other written exams will count as 50% and assignments will count as 25% of the final grade.
Grading Scale

A   91-100%
B   83-90.99%
C   75-82.99%
D   68-74.99%
F   0-67.99%