VT 114 : PHARMACEUTICAL MATH

Transcript title

Pharmaceutical Math

Credits

3

Grading mode

Standard letter grades

Total contact hours

30

Lecture hours

30

Prerequisites

VT 101, VT 102, VT 103, VT 117 and MTH 095 or MTH 111 (or higher) or minimum placement Math Level 18.

Corequisites

VT 108, VT 110, VT 118.

Course Description

Covers pharmacological mathematics, including drug dosage calculations and fluid calculations. Introduces prescription terminology and labeling.

Course learning outcomes

1. Perform calculations to convert between and within the household, apothecary, and metric systems.
2. Perform calculations for dilution and concentration of solutions.
3. Perform calculations to determine dose, number of doses, and amount of drug to dispense.
4. Perform fluid administration calculations.
5. Interpret prescription orders and properly prepare medication for both administration and dispensing.

Content outline

I. Routes of Administration; Administration Supplies: A. Know and understand the advantages and disadvantages of each of the following routes of fluid administration. 1. Oral 2. Intravenous 3. Subcutaneous 4. Intraperitoneal 5. Intraosseous B. Know the following methods and equipment used in medicating animals by oral and parenteral administration. 1. Tuberculin syringe 2. Pre-filled syringe 3. Calibrated dropper 4. Dose syringe 5. 3cc-60cc syringe (luer slip and lock tip) and needles 6. Insulin syringes (U-40 and U-100) 7. Multidose syringes II. Measurement Systems: A. Know the following units and abbreviations: 1. teaspoon tsp 2. tablespoon tbsp 3. gram Gm or g 4. milligram mg 5. microgram ug 6. kilogram kg 7. liter L 8. milliliter ml or cc 9. minim m 10. grain gr 11. pound lb 12. dram dr 13. ounce oz 14. pint pt 15. quart qt 16. drop gt 17. units u 18. milliequivalent meq B. Know the approximate equivalents: 1. 1 gram=1000 milligrams 2. 1 milligram= 1000 micrograms 3. 15 grams= 4 drams= 1 tablespoon= 3 teaspoons= 15 milliliters 4. 30 grams= 1 ounce= 2 tablespoons = 30 milliliters 5. 16 ounces= 1 pound=454 grams 6. 1 kilogram= 1000 grams= 2.2 pounds 7. 1 quart= 946 milliliters 8. 1 pint= 473 milliliters 9. 1 milliliter= 15 minims= 15 drops C. Convert within the metric system. D. Apply the factor label method to conversion between metric, apothecaries and household systems. E. Convert between Celsius and Fahrenheit temperature. F. Calculate drug dosages in dry or liquid measure based on body weight. III. Ratio and Proportion: A. Using Ratio and Proportion solve for x. IV. Dimensional analysis: A. Identify conversion factors B. Convert units of measurements to one form to another. V. Oral Medications: A. Know the following types of oral medications 1. Tablets 2. Capsules 3. Liquid 4. Powder B. Determine the amount of drug to administer given the mg/ml of the drug and mg/kg of the animal. VI. Medication Labels: A. Explain the following parts of a drug label 1. Generic name 2. Brand name 3. Name of manufacturer 4. Total volume of container 5. Administration route 6. Dosage strength 7. dosage form 8. Supply dosage 9. Directions for mixing 10. Expiration date VII. Parental Medications: A. Convert percent concentrations B. Reconstitute powders for injections C. Calculate clinical problems using dosing calculations D. Insulin administration and calculations VIII. Solutions: A. Single-ingredient solutions B. Making weaker solutions from a stock solution C. Making mixed solutions D. Define each of the following terms as they relate to percentage solutions. 1. 100% solution concentration (mg/ml) 2. Percent weight in volume (w/v) 3. Percent weight in weight (w/w) 4. Percent volume in volume (v/v) E. Calculate the percentage of solutions, the volume of concentrate or the volume of diluent using the formula method. IX. Intravenous Fluids: A. Calculate the amount and rate of fluid administration B. Calculate drip rates C. Calculate the amount of fluid needed to rehydrate, maintain and replace ongoing losses in a dehydrated animal D. Understand the use of the following: 1. IV Fluid pump 2. Standard and pediatric drip set 3. Buretrol IV set E. Know the formula method for calculating the IV flow rate F. Know the advantages and disadvantages of each of the following routes of fluid administration. 1. Intravenous 2. Subcutaneous 3. Oral 4. Intraperitoneal 5. Intraosseous X. Constant Rate Infusions: A. Determine rates of drug infusion B. Determine amount of drug to add to fluids XI. Dilutions: A. Determine the final concentration in a dilution B. Determine and calculate a series of dilutions C. Know the applications for dilutions for the following: 1. Immunology 2. Microbiology 3. Hematology XII. Cancer Drugs: A. Calculate cancer drugs based on surface area of patient (BSA = M^2) B. Know routes of administration of cancer drugs 1. IV 2. Oral 3. Topical 4. SQ 5. Intra-lesional XIII. Interpret veterinary prescription labels: A. Describe how a veterinarian writes drug orders and how to interpret them; create a label in a form a client can understand. B. Define symbols and abbreviations used in prescription writing. C. Describe how to read and write a prescription and it component parts.

General education/Related instruction lists

- Computation