Handling & Administering Medications

Floron C. Faries, Jr., DVM, MS
Objectives

- Discuss the measurement of calculated dosages of medication
- Define routes of administration of medications
- Describe the instruments used in administration of medications
Handling medication
- Storage
- Dispensing
- Measuring

Administering medication
- Instruments
- Routes
Storage

- READ THE LABEL!
  - Storage instructions
  - Expiration date
    - Void for opened containers

- Store products at
  - Room temperature
    - 60°- 80°F
  - Refrigeration temperature
    - 35°- 45°F
  - In dry environment
  - In dark environment
In sanitary conditions to prevent contamination
- Lose effectiveness
- Source of infection

In non-transparent containers
- Not in translucent containers
- Not in direct sunlight
- Not in indirect sunlight

So why is the sun bad?
- UV rays reduce effectiveness
  - Vaccines
  - Antibiotics
  - Hormones
Dispensing

- Types of dispensing
  - Over-the-counter (OTC) products
  - Prescription products
- Properly labeled
  - Manufacturer’s label
  - Veterinarian’s label
- Regulated by
  - FDA
  - State boards of veterinary medical examiners
<table>
<thead>
<tr>
<th>LABELING INFORMATION FOR A DISPENSED DRUG</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Name, address, and telephone of the veterinarian dispensing</td>
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<tr>
<td>- Date of delivery or dispensing</td>
</tr>
<tr>
<td>- Client name, (and address if drug is a controlled substance)</td>
</tr>
<tr>
<td>- Species of animal</td>
</tr>
<tr>
<td>- Patient name/animal identification numbers</td>
</tr>
<tr>
<td>- Active ingredients</td>
</tr>
<tr>
<td>- Name, strength, and quantity of drug dispensed</td>
</tr>
<tr>
<td>- Directions for use as specified by the veterinarian (for example, dosage, route, class of animals, disease conditions, duration of therapy)</td>
</tr>
<tr>
<td>- The veterinarian's prescribed withholding time</td>
</tr>
<tr>
<td>- Cautionary statements as required by law, i.e., not for human consumption, poisonous, a requirement to test milk or urine for residues prior to shipment, not for use in pregnant cows, etc.</td>
</tr>
</tbody>
</table>
A Veterinarian's Drug Label

Address                  Name of Clinic                  Telephone

Date         Client         Dr.
Rx#            Case#        Animal ID   Species

Directions:

Active Ingred./Concentration
Indications       Storage
Quantity         Expiration Date Lot #
Drug Withdrawal Time: Milk ___ hours Slaughter ___ days
Test for residues: Milk ___ Urine ___ Blood ___

FOR VETERINARY USE ONLY
Measuring

- Drugs and chemicals
  - Body weight determines dose per animal
    - Based on dosage (amount per weight)

- Biologicals (vaccines)
  - Same dose for all labeled species
Dosage is on the label
Dose is calculated from dosage

Dose measurements
- Liquids
  - Cubic centimeters (cc) or milliliters (ml)
  - Ounces (oz)
- Solids
  - Milligrams (mg)
  - Grams (g)
  - Ounces (oz)
  - Pounds (lb)
  - Pills
  - Tablets (tab)
  - Boluses
Animal weight

- Kilograms (kg): 1 kg = 2.2 lb
- Pounds (lb): 1 lb = 0.45 kg
Body weight conversions

Pounds to kilograms

\[ lb \times \frac{kg}{2.2lb} = kg \]

or

\[ lb \times \frac{.45\,kg}{lb} = kg \]
Kilograms to pounds

\[ \text{kg} \times \frac{2.2\text{lb}}{\text{kg}} = \text{lb} \]

or

\[ \text{kg} \times \frac{\text{lb}}{.45\text{kg}} = \text{lb} \]
Convert dosage of mg/kg to mg/lb

\[
\frac{mg}{kg} \times \frac{kg}{2.2lb} = mg/\text{lb}
\]
Calculate dose:
- Dosage x body weight

\[
\frac{mg}{lb} \times \text{body wt in lb} = \text{Total dose (mg)}
\]

\[
\frac{mg}{kg} \times \text{body wt in kg} = \text{Total dose (mg)}
\]
Convert solid dose to liquid dose:
- Liquid concentration (mg/cc) \times \text{solid dose (mg)}

\[
\frac{cc}{mg} \times mg = cc
\]
For example:

A drug concentration is 25 mg per cc.

The liquid drug dosage is 5 mg per kg.

The weight of dog is 44 pounds.
Calculate dose (method a)

Convert dog wt in lb to kg

\[\frac{44 \text{ lb}}{1} \times \frac{\text{kg}}{2.2 \text{ lb}} = 20 \text{ kg}\]

Total solid dose

\[\frac{5 \text{ mg}}{\text{kg}} \times \frac{20 \text{ kg}}{1} = 100 \text{ mg}\]

Total liquid dose

(convert mg to cc)

\[\frac{\text{cc}}{25 \text{ mg}} \times \frac{100 \text{ mg}}{1} = 4 \text{ cc}\]
Calculate dose (method b)

Convert dosage in kg to lb

\[
\frac{5\ mg}{kg} \times \frac{kg}{2.2\ lb} = 5\ mg / 2.2\ lb
\]

Total solid dose

\[
\frac{5\ mg}{2.2\ lb} \times \frac{44\ lb}{1} = 100\ mg
\]

Total liquid dose

(convert mg to cc)

\[
\frac{cc}{25\ mg} \times \frac{100\ mg}{1} = 4\ cc
\]
Instruments

- For drug administration depends on
  - Drug
  - Dose quantity
  - Route of administration
Syringe and needle

- Syringes
  - Measured in
    - cc
    - ml
  - 1 to 60 cc in size
Needles

- Gauge
  - 24 to 14 G

- Length
  - ¼ to 5 inches

- Higher the gauge the smaller the caliber

- Dogs and cats
  - 20 x ½

- Horses
  - 18 x 1

- Cattle
  - 16 x 1 ½
Drench syringe

- Large syringe with a nozzle instead of a needle
- Administer
  - Liquids
    - Oral
    - Rectal
- Balling Gun
  - Administer
    - Bolus
    - Pills
- Paste gun/syringe
- Administer paste
  - Oral
  - Anus
  - Intra-mammary
  - Intra-uterine
Routes

- Parenteral route
  - Clean aseptic conditions
  - Sterile instruments
  - Clean surface
  - Remove debris
Subcutaneous (SQ)........... inject under skin
Intramuscular (IM).............. inject in muscle
Intravenous (IV)............... inject in vein
Intradermal (ID)................. inject between layers of skin
Intracardial (IC)................. inject in heart chamber
Intrapерitionial (IP)............. inject in peritoneal cavity
Intraarticular (IA).............. inject in bone joint cavity
Intrathoracic (IT).............. inject in thoracic cavity
Intraocular (IO)............... inject under eyelid
Intranasal (IN)................ inject in nasal passage
Intrauterine (IU).............. inject in uterus
Epidural (ED).................... inject in spinal cavity
Topical (Top).................... apply on tissue surface
Inhalation (IH)............... inhale by lungs
Subconjunctival
(Subconj).................. inject under conjunctiva
Intramammary (IMM)......... inject into teat canal of mammary gland
Enteral routes

- Disinfect instruments between animals
- Clean conditions
Oral or Per OS (PO)............. administered in mouth or in stomach via stomach tube through nose or mouth

Rectal or Per Rectum (PR)........................................ administered in the rectum, through the anus as an enema

Intraruminal (IR)................. injected into the stomach (rumen) of ruminants through the abdominal wall