
Applying Animal Health Practices

Unit: Animal Science and Services 4

Problem Area: Florida Animal Science and Services 4

Lesson: Applying Animal Health Practices

- **Student Learning Objectives.** Instruction in this lesson should result in students achieving the following objectives:

- 1 Explore how instruments and supplies are sterilized.**
- 2 Discuss the prescribed methods for the disposal of empty chemical and medical containers.**
- 3 Explain the disposal of biomedical waste and by-products.**

- **Resources.** The following resources may be useful in teaching this lesson:

E-unit(s) corresponding to this lesson plan. CAERT, Inc.
<<http://www.mycart.com>>.

- **Equipment, Tools, Supplies, and Facilities**

- ✓ Overhead or PowerPoint projector
- ✓ Visual(s) from accompanying master(s)
- ✓ Copies of sample test, lab sheet(s), and/or other items designed for duplication
- ✓ Materials listed on duplicated items
- ✓ Computers with printers and Internet access
- ✓ Classroom resource and reference materials

■ **Key Terms.** The following terms are presented in this lesson (shown in bold italics):

- ▶ antiseptic
- ▶ aseptic techniques
- ▶ biomedical waste
- ▶ disinfectants
- ▶ sharps container
- ▶ sterilization

■ **Interest Approach.** Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

Open with a discussion about the different types of disposal containers that may be found at a doctor's office, veterinary clinic, or hospital. Ask students questions like: Why is there a need for a specific container? or Why can't all trash be thrown in one common garbage container? Continue discussing medical waste and establish a link to animal health practices that occur in livestock operations. Should these operations be as cautious as hospitals (with needles, scalpel blades, and other medicines and tools)? Lead into objective one of the lesson.

CONTENT SUMMARY AND TEACHING STRATEGIES

Objective 1: Explore how instruments and supplies are sterilized.

Anticipated Problem: How are instruments and supplies sterilized?

- I. Instruments and supplies used in animal health practices should be sterilized before use. ***Sterilization*** is a procedure by which all microorganisms are destroyed. The two common methods of sterilization are by applying pressurized steam and chemicals. An autoclave is used to sterilize instruments with pressurized steam. Steam penetrates the tools that are packaged with a special wrap. The wraps can be handled without contaminating the instruments. Stainless steel instruments are sterilized using steam that reaches temperatures of 250° to 275°F for 15 to 30 minutes. Other instruments and supplies are sterilized by chemical means, such as by using ethylene oxide. It is a toxic gas and requires special chambers to expose the instruments without contaminating the environment.
 - A. Another way to prepare for animal health practices and procedures is to disinfect. ***Disinfectants*** are agents used to kill bacteria or other microorganisms.

Disinfectants are used to clean facilities and objects. These chemicals are too sensitive for skin and are only used to clean equipment. By using disinfectants to clean equipment and facilities before animal health procedures, the exposure of animals to bacteria is decreased.

- B. The individual performing the health practice or procedure should always follow **aseptic techniques**, which are general practices used to minimize the risk of infection. These techniques include the use of disinfectants to ensure that all instruments and supplies are sterilized. An **antiseptic** is also used, which is a substance that kills or reduces the growth of microorganisms on external body surfaces. Often an antiseptic soap is used to thoroughly clean the skin. An antiseptic soap is safe for skin and helps to remove dirt and oil. The scrubbing of the skin also greatly decreases the number of bacteria present.

Teaching Strategy: Have students read appropriate sections in the E-unit and assist in providing information as the content is summarized on the writing surface. Discuss with students the importance of sterilization during the care of animals. Use VM–A to review basic approaches to sterilize instruments and supplies. Explore with students the scrubbing technique doctors and surgeons use. Explain why they keep their hands up and elbows pointing down after they are sterilized.

Objective 2: Discuss the prescribed methods for the disposal of empty chemical and medical containers.

Anticipated Problem: How should the disposal of empty chemical and medical containers be done?

- II. All waste disposal methods should comply with federal, state, and local laws. A common procedure to prepare chemical and medical containers for disposal includes a triple rinse with water or other appropriate solvent and then air drying before disposal. Containers used for explosive organic solvents, like ethanol, should be emptied and allowed to air dry in a ventilated area without triple rinsing. After appropriate preparation, containers may be disposed of through a trash collecting service. Glass containers should be triple rinsed and sent to a recycling center. There are hazardous material removal companies that specialize in the proper disposal of chemical containers and hazardous materials.

Teaching Strategy: Have students read appropriate sections in the E-unit and assist in providing information as the content is summarized on the writing surface. Have students research landfill disposal policies to determine appropriate guidelines for empty containers. Have students interview a local veterinarian to determine how he or she disposes of empty chemical and medical containers.

Objective 3: Explain the disposal of biomedical waste and by-products.

Anticipated Problem: How should the disposal of biomedical waste and by-products be done?

- III. Biomedical waste disposal is regulated by the Department of Environmental Protection in the state of Florida. Biomedical waste can be generated by hospitals, laboratories, veterinary clinics, and other medical clinics and/or facilities. These facilities should train personnel who handle biomedical waste about the proper procedures in segregating, labeling, packaging, transporting, storing, and treating biomedical waste. Facilities should also have plans for biomedical waste spills and emergencies. A **biomedical waste** is any solid or liquid waste that could pose a threat of infection to humans and other primates. There are several specific guidelines and codes that must be followed in the handling and disposing of biomedical waste. Below is a summary of the steps that should be taken:
- A. Storage and containment of biomedical waste should be labeled with the international biological hazard symbol and sealed until treatment or disposal. A **sharps container** is a receptacle that provides protection from used needles, scalpel blades, and other sharp objects. These containers should be puncture- and leak-resistant and clearly labeled. Biomedical waste should be treated with steam or incinerated before disposal takes place. Written logs should be maintained during treatment that provide detailed information about the materials prior to disposal (for example, operator name, date, time, amount of waste, temperature/pressure/time of treatment, and so on). Disposal of some liquids or semi-solid forms of waste may be legal to dispose of in a sanitary sewer system. All waste disposal must follow the guidelines of the Department of Environmental Protection. Transportation of biomedical waste must be registered with the department and follow strict procedures. The department inspects facilities that generate biomedical waste, takes applications, collects fees, distributes permits, and enforces penalties.
 - B. Another form of biomedical waste can be outdated medicines. Typically, pharmaceutical company representatives will pick up these medicines and containers. If not, these representatives can provide the ways and means of handling unused medicines.

Teaching Strategy: *Have students read appropriate sections in the E-unit and assist in providing information as the content is summarized on the writing surface. Use VM-B to review common steps taken in the disposal of biomedical waste. Discuss with students the hazards of sharp objects (used needles, scalpel blades, and so on). Lead a discussion about the safety measures that should be taken in a livestock operation when using needles, scalpel blades, medicines, and other tools. Discuss what could occur if these items are not disposed of or cleaned properly.*

Review/Summary. Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can

be used in determining which objectives need to be reviewed or taught from a different angle. The anticipated problems can be used as review questions.

- **Application.** Use the included visual master(s) and lab sheet(s) to apply the information presented in the lesson.
- **Evaluation.** Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is provided.
- **Answers to Sample Test:**

Part One: Matching

1. e
2. a
3. c
4. d
5. b
6. f

Part Two: Completion

1. autoclave
2. decreased
3. triple
4. air dry
5. puncture and leak
6. Department of Environmental Protection

Part Three: Short Answer

A common procedure to prepare chemical and medical containers for disposal includes a triple rinse with water or other appropriate solvent and air drying before disposal. Explosive organic solvents, like ethanol, containers should be emptied and allowed to air dry in a ventilated area without triple rinsing. After appropriate preparation, containers may be disposed of through a trash collecting service. Glass containers should be triple rinsed and sent to a recycling center.

Applying Animal Health Practices

► Part One: Matching

Instructions: Match the terms with the correct definition.

- | | |
|-----------------------|---------------------|
| a. aseptic techniques | d. antiseptic |
| b. biomedical waste | e. sterilization |
| c. disinfectants | f. sharps container |

- ____ 1. A procedure where all microorganisms are destroyed
- ____ 2. General practices used to minimize the risk of infection
- ____ 3. Agents used to kill bacteria or other microorganisms
- ____ 4. Safe for skin and helps to remove dirt and oil
- ____ 5. Any solid or liquid waste that could pose a threat of infection to humans and other primates
- ____ 6. Provides protection from needles, scalpel blades, and other sharp objects

► Part Two: Completion

Instructions: Provide the word or words to complete the following statements.

1. An _____ is used to sterilize instruments with pressurized steam.
2. By using disinfectants and cleaning equipment and facilities before animal health procedures, the exposure of animals to bacteria is _____.
3. A common procedure to prepare chemical and medical containers for disposal includes a _____ rinse.
4. Explosive organic solvents containers, like ones that have held ethanol, should be emptied and allowed to _____ in a ventilated area.
5. Sharps containers should be _____ resistant and clearly labeled.
6. Biomedical waste disposal is regulated by the _____.

▶ **Part Three: Short Answer**

Instructions: Answer the following.

How should empty chemical or medical containers be disposed of?

STERILIZE INSTRUMENTS AND SUPPLIES

- ◆ Use an autoclave
 - Steam penetrates the tools

- ◆ Other instruments and supplies are sterilized by chemical means
 - Ethylene oxide is a toxic gas; a chemical used to sterilize instruments and supplies

DISPOSING BIOMEDICAL WASTE

- ◆ Storage and containment
 - Sharps container
 - Puncture and leak resistant
 - Labeled
 - International biological hazard symbol
 - Sealed
- ◆ Treatment
 - With steam or incineration
- ◆ Written logs
 - Provide detailed information prior to disposal
- ◆ Disposal
 - Follow the guidelines of the Department of Environmental Protection
- ◆ Transportation
 - Follow the guidelines of the Department of Environmental Protection

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Purpose

The purpose of this activity is to identify and describe the proper disposal of chemical and medical containers as well as biomedical waste, such as needles, scalpel blades, and unused medicines.

Objectives

1. Research the ways and means of disposing of chemical and medical containers.
2. Identify the steps to dispose of biomedical waste such as needles, scalpel blades, and unused medicines.
3. Create a brochure outlining the proper methods of disposal.

Materials

- ◆ paper
- ◆ pen

Procedure

1. You are currently employed at the local veterinarian office as a marketing assistant. You have been requested to develop a three-fold brochure. This brochure will be placed on display in the lobby area and will be used as an educational tool to inform customers.
2. You will need to further research the ways and means of disposing of chemical and medical containers as well as biomedical waste, such as needles, scalpel blades, and unused medicines. Develop a three-fold brochure that will educate customers of the local veterinarian about the basics of disposing of medical supplies.
3. Brochures will need to be well-focused, well-organized, and well-detailed. A three-fold brochure will need to have information on both sides of the paper.
4. You should be prepared to present your brochures orally.