Instructor Manual

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Chapter 1: Introduction to Anesthesia

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# Purpose and Perspective of the Chapter

The word anesthesia, derived from the Greek word *anaisthesia* meaning “without feeling or sensibility,” was introduced by the prominent physician Oliver Wendell Holmes in the 1840s to describe part or entire loss of sensation to the body. Anesthesia has evolved since then, and the accompanying changes have made the practice of anesthesia more than simply giving drugs for immobilization so that surgeries and painful procedures can be performed. Increased knowledge of veterinary anatomy, physiology, and pharmacology, along with development of specialized techniques, has improved delivery of anesthetic agents to veterinary patients as well as the management of patients under anesthesia during surgery. Today, anesthesia includes many techniques and procedures performed by highly skilled and trained veterinarians and veterinary technicians.

This text provides the fundamentals of anesthesia for students of veterinary technology. The techniques and information presented will equip students to provide the best possible care for their patients. Veterinary technicians competent in the practice of anesthesia must know the anatomy and physiology of veterinary patients and understand how medications administered and equipment used in practice will affect patients. Veterinary technicians must also perform physical assessments of their patients, take accurate and detailed medical histories, and care for and advocate for their patients by being keen observers of patients’ health status and reactions to drugs given to them. Veterinary technicians must work together with the veterinarian and client to formulate an individualized anesthesia and analgesia plan and thereby ensure that each patient receives the most appropriate and best possible care.

# Cengage Supplements

The following product-level supplements provide additional information that may help you in preparing your course. They are available in the Instructor Resource Center.

* Test Bank (contains assessment questions and problems)
* Solution and Answer Guide (offers solutions, answers, and feedback)
* PowerPoint (provides text-based lectures and presentations)

# Chapter Objectives

The following objectives are addressed in this chapter:

01.01 Recognize the importance of and need for well-trained professionals in the field of veterinary anesthesia

01.02 Describe the veterinary technician’s role in anesthesia

01.03 Identify the role veterinary anesthesia organizations have in enhancing the practice of veterinary anesthesia

01.04 Define common terminology used in the field of veterinary anesthesia

# Complete List of Chapter Activities and Assessments

For additional guidance refer to the Teaching Online Guide.

* Textbook: Review Questions
* Instructor Manual: Discussion Questions
* Instructor Manual: Additional Activities and Assignments
* PowerPoint: Polling Activity
* PowerPoint: Knowledge Check Activities
* PowerPoint: Case Study
* PowerPoint: Self-Assessment
* Test Bank

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# Key Terms

**Analgesia:** Relief of pain without loss of consciousness; absence of pain or noxious stimulation.

**Anesthesia:** Without pain; part or entire loss of sensation to the body.

**Anesthetic depth:** The degree to which the central nervous system (CNS) is depressed by a general anesthetic agent.

**American Society of Anesthesiologists (ASA) physical status:** The American Society of Anesthesiologists classification system rating patient risk during anesthesia based on the patient’s health.

**Balanced anesthesia:** Theory in which general anesthesia is produced by administering several drugs with the goal of exploiting each drug’s positive actions while avoiding potential adverse effects associated with large doses of a single drug. The philosophy encourages the use of several agents, each designed to affect a different function (e.g., providing muscle relaxation and amnesia or blocking pain and motor function); also known as multimodal anesthesia.

**Dissociative anesthesia:** Anesthesia that produces a catalepsy-like state, in which the patient feels dissociated from its environment, and good somatic analgesia but poor visceral analgesia.

**General anesthesia:** A reversible state of unconsciousness produced by anesthetic agents, with absence of pain perception over the entire body and a greater or lesser degree of muscular relaxation; the drugs producing this state are most commonly administered by inhalation, intravenously, or intramuscularly.

**Local anesthesia:** Anesthesia produced in a limited area, as by injection of a local anesthetic, topical application, or freezing. Examples include infiltration, topical, regional block, spinal, epidural techniques.

**Regional anesthesia:** Anesthesia caused by interrupting the sensory nerve conductivity of any region of the body. Regional anesthesia may be produced by a field block (encircling the operative field by means of injections of a local anesthetic) or by a nerve block (making multiple injections in close proximity to the nerves supplying the area).

**Sedation:** The state characterized by CNS depression accompanied by sleepiness/ drowsiness and some degree of relaxation.

**Surgical anesthesia:** The degree of anesthesia at which a response to surgical stimulus does not occur.

**Tranquilization:** Administration of any of a group of compounds that calm and relax an anxious patient but do not induce sleep.

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# Chapter Outline

*In the outline below, each element includes references (in parentheses) to related content. “CH.##” refers to the chapter objective. Review learning objectives for Chapter 1.*

I. Introduction (01.01)

a. Veterinary technicians prepare, operate, and maintain anesthetic equipment; administer anesthetic drugs under the veterinarian’s direction;

and monitor and recover patients of a variety of species.

b. Veterinary technicians must possess an advanced knowledge and skill level to monitor and assess the patient, and initiate or suggest an appropriate response to the changing physiological status of an anesthesia patient and complications that may arise.

II. Veterinary Technician’s Role in Anesthesia (01.02, PPT Slide #, certification standard)

a. Veterinary technician duties are delegated under veterinarian supervision and are under the authority of the state and/or local veterinary exam board. Veterinary technicians should be sufficiently trained and evaluated by the delegating veterinarian to possess the essential knowledge and psychomotor and critical thinking skills to perform anesthetic procedures that provide positive patient outcomes.

b. **Discussion Activity: 10 minutes total. Chapter 1 Reading. Describe eight actions to develop the** **knowledge and skills necessary to confidently practice anesthesia** **and discuss strategies for how to meet the eight actions as a student learning anesthesia and pain management as well as throughout one’s career.**

* + - List the eight actions to develop to become competent in the practice of anesthesia.
    - List strategies for memorizing normal values for veterinary patients including using resources provided in other courses.
    - List strategies for assessing veterinary patients for changes in mentation, vital signs, and reaction to medications while under anesthesia.
    - Practice ways to effectively communicate to veterinarians and other veterinary staff including ways to relay concerns about anesthetized patients and differences in how veterinarians may provide anesthesia to their patients.
    - List strategies for learning anesthetic and analgesic drugs used for veterinary patients.
    - Describe how practicing drug and fluid calculations can prevent medication errors in anesthetized patients.
    - List equipment used in veterinary anesthesia including monitoring equipment and technical skills.
    - List strategies for learning the parts and functions of anesthesia equipment.
    - List opportunities for continued education in the field of veterinary anesthesiology.

III. Anesthesia Associations (01.03)

a. The importance of veterinary technicians in anesthesia has led to the formation of a specialty group that certifies technicians as a Veterinary Technician Specialist (VTS) in Anesthesia/Analgesia

b. Veterinary organizations such as the American Animal Hospital Association and American Veterinary Medical Association support the practice of veterinary anesthesia and pain management through the development of standard of care guidelines and publication of research and clinical recommendations for veterinary professionals.

IV. Anesthesia Terminology (01.04)

1. General anesthesia: a reversible state of unconsciousness produced by anesthetic agents, with absence of pain perception over the entire body and a greater or lesser degree of muscular relaxation; the drugs producing this state are most commonly administered by inhalation, intravenously, or intramuscularly.
2. Surgical anesthesia: that degree of anesthesia at which a response to surgical stimulus does not occur.
3. Balanced anesthesia: theory in which general anesthesia is produced by administering several drugs with the goal of exploiting each drug’s positive actions while avoiding potential adverse effects associated with large doses of a single drug. The philosophy encourages the use of several agents, each designed to affect a different function (e.g., providing muscle relaxation and amnesia or blocking pain and motor function).
4. Local anesthesia: anesthesia produced in a limited area, as by injection of a local anesthetic, topical application, or freezing. Examples include infiltration, topical, regional block, spinal, and epidural techniques.
5. Regional anesthesia: anesthesia caused by interrupting the sensory nerve conductivity of any region of the body. Regional anesthesia may be produced by a field block (encircling the operative field by means of injections of a local anesthetic) or by a nerve block (making multiple injections in close proximity to the nerves supplying the area).
6. Dissociative anesthesia: anesthesia that produces a catalepsy-like state, in which the patient feels dissociated from its environment and good somatic analgesia, but poor visceral analgesia.
7. Analgesia: relief of pain without loss of consciousness; absence of pain or noxious stimulation.
8. Sedation: the state characterized by central nervous system (CNS) depression accompanied by sleepiness/drowsiness and some degree of relaxation.
9. Tranquilization: administration of any of a group of compounds that calm and relaxes an anxious patient but does not induce sleep.
10. ASA status: the American Society of Anesthesiologists classification system rating patient risk during anesthesia based on the patient’s health (see Chapter 2 Cardiovascular and Respiratory Physiology Review).
11. **Video and Discussion Activity: 30 minutes total. Anesthesia and Your Pet Video in PPT (**<https://acvaa.org/pet-owners/care-for-your-pet/>**) and related discussion questions below.** Play the video on Anesthesia and Your Pet using the URL in the slide notes. After watching the video, discuss the following questions in class or direct students to view the video, answer the questions in a document, and submit via the learning management system (LMS):
    * + What is anesthesia?
      + When do animals need anesthesia?
      + What procedures or tests should be done before an animal receives anesthesia? Provide examples listed in the video or from personal experience/observation.
      + Describe some of the processes that occur to anesthetize animals. Provide examples listed in the video or from personal experience/observation.
      + List 2 areas of risk when a pet undergoes anesthesia.
      + Describe how animals are recovered from anesthesia.
      + Describe ways veterinary technicians can communicate to clients about the safe administration of anesthesia in animals.
      + When might a Board Certified Specialist in Veterinary Anesthesia and Analgesia be recommended or consulted?

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# Discussion Questions

You can assign these questions several ways: in a discussion forum in your LMS; as whole-class discussions in person; or as a partner or group activity in class.

1. Discussion: Fear of Anesthesia (Introduction, 01.02)
   1. Many students are concerned that they will not be able to perform anesthesia properly due to the level of knowledge they must possess as well as the significant amount of high-level skills they must perform to achieve this goal. Think about other educational situations in which you’ve lacked the confidence to learn difficult material or been hesitant to perform a more challenging skill. Using past examples of personal experience, describe why these concerns exist and how they have been overcome in previous situations.
      1. Your initial post should be a minimum of 150 words. Your answer should describe your experience in enough detail to clearly identify why the lack of confident was present and how these concerns were rectified.
      2. You must respond to 1 other student. In your response, acknowledge the other person’s concern and offer alternative ways to rectify their concern.
      3. Your grade will be based on the rubric provided.

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# Additional Activities and Assignments

1. **Definition**: The terms *anesthesia* and *analgesia* are often seen together in the text. Why is this case? Can you explain the difference between the two?
   1. The terms anesthesia and analgesia are related; while analgesia refers to pain relief without loss of consciousness, it can also mean the absence of pain or noxious stimulation.
   2. Anesthesia, on the other hand, refers to a number of specialized techniques and procedures used to create a loss of sensation of varying types, including in a limited area (local) and full unconsciousness (general).
2. **Equipment limitations**: How reliable is the equipment?
   1. Anesthesia equipment is reliable, so long as it is properly maintained. Equipment should be calibrated and inspected regularly according to manufacturers’ recommendations. In addition, calibration of equipment should be documented and part of the clinic’s records.
   2. As reliable as anesthesia equipment is, the veterinary technician should not rely on instrument values alone when monitoring anesthetized patients. Veterinary technicians should be able to rely on their interpretation of these values in conjunction with the animal’s parameters they obtain. For example, if the electrocardiograph (ECG) determines that the patient’s heart rate is 30 beats per minute yet the veterinary technician auscults a heart rate of 100 beats per minute and palpates a strong, regular pulse rate, the technician should trust their assessment of the patient, not the instrument.
3. **Professional associations**: The text refers to a number of professional organizations to which the veterinary anesthesiologist might belong. Name a few of these and describe how they might be useful to you in your career.
   1. Examples of professional organizations include the American College of Veterinary Anesthesia and Analgesia (ACVAA), which is the American Veterinary Medical Association’s (AVMA) recognized, non-profit specialty board for veterinarians. The Academy of Veterinary Technicians in Anesthesia and Analgesia (AVTAA) is the NAVTA certifying body for veterinary technician specialists in anesthesia. Becoming an VTS (Anesthesia/Analgesia) requires formal education and credentialing. To become a VTS (Anesthesia/Analgesia) and member of the Academy of Veterinary Technicians in Anesthesia and Analgesia (AVTAA), veterinary technicians must complete formal education that leads to becoming a credentialed veterinary technician, complete and document extensive postgraduate experience in high quality anesthesia and analgesia, receive letters of recommendation, obtain and document continuing education in anesthesia, submit case reports and case logs, and demonstrate advanced psychomotor skills and submit all of these as part of the application process. Once the application is accepted, veterinary technicians must subsequently pass a multiple-choice and practical examination.
   2. ACVAA sponsors local and national events, and both the ACVAA and AVTAA provide educational opportunities for members. Career advancement can be facilitated through continuing education courses and website employment opportunity listings. Members can network with others in their field at events and on social media pages for the organizations.

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# Additional Resources

## Internet Resources

* **Choosing Specialty Anesthetic Care for Your Pet**: https://acvaa.org/pet-owners/care-for-your-pet/

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