Course Information Form (CIF)

Course Code: DHG 211

Course Title: Local Anesthesia

Department: Allied Health
Effective Date: Summer 2026
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 51.0601
Repeatability: 0

Credit Hours

Catalog Notation: 1.5-0.5-1.5
Credit Hour Distribution:

Lecture: 1.5	Lab: 0	Clinical: 0.5	**Total: 1.5**

General Course Information

Catalog Description

Integration of patient pre-evaluation, pharmacology, recordkeeping, anatomy/neuroanatomy/physiology, techniques, complications, postoperative instructions, and clinical experience in the administration of local anesthesia. Clinical sessions are included for students to develop competency in their administration.

General Course Objectives

1. Identify anatomical landmarks important for the safe and effective administration of intraoral local anesthetic.
2. Utilize the concepts of the physiology of pain to reduce or eliminate pain during dental procedures.
3. Identify the tissues innervated by each sensory nerve serving the oral cavity.
4. Describe the physiology of the peripheral nervous system and the effects of local anesthesia on neurotransmission.
5. Explain the pharmacology of local anesthetic and vasoconstrictor solutions and apply this knowledge to clinical administration.
6. Compare, describe, and evaluate various agents used for intraoral local anesthesia.
7. Describe and evaluate various agents used to manage dental pain during treatment.
8. Assemble, describe, evaluate, maintain, and utilize the armamentaria for intraoral local anesthesia, including infiltration and block techniques.
9. Maintain infection control protocols and properly dispose of sharps.
10. Perform preoperative evaluations to identify indications, contraindications, or necessary modifications for using local dental anesthetics.
11. Conduct comprehensive patient assessments, including medical history, current medications, and potential allergies to ensure safe administration of local anesthesia.
12. List potential complications associated with local anesthesia, implement risk reduction strategies, and describe management protocols.
13. Provide postoperative care instructions and manage complications related to local dental anesthesia.

Minimum Placement Levels

English	Reading	Math
Placement out of ENG 099	Placement out of CCS 099	None

Prerequisites

Credit in DHG 118 and DHG 119
Admission into the Dental Hygiene program

Methods of Evaluation

2-6 objective multiple choice quizzes, 1 final exam, 8-10 end-of-chapter assignments, 1 critical thinking discussion post, and 1 final proficiency.

Instructional Materials and Additional Supplies

Local Anesthesia for the Dental Hygienist, Logothetis, D.D., St. Louis, MO: Elsevier. 9780323718561

Course Content

General Learning Outcomes (GLOs)

- Communication: Students will demonstrate the ability to read, write, listen, and speak effectively.
- Global Awareness and Cultural Reasoning: Students will demonstrate their understanding of global issues, gender and sexual orientation, and multicultural perspectives.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Local Anesthesia Delivery Devices, Patient Assessment for Local Anesthesia, Fundamentals for Administration of Local Anesthesia Agents, and Injections for Mandibular Pain Control	1. Review and assemble the basic armamentarium needed for anesthetic injections. 2. Review the anatomy of a dental syringe. 3. Explain the function of each component of the dental syringe. 4. Identify the components of the dental needle. 5. Discuss the factors to consider when selecting needles. 6. Describe the components of a local anesthetic cartridge. 7. List and describe the purpose and contents of a dental cartridge. 8. Review the local anesthetic labeling system. 9. Discuss safe needle recapping and disposal procedures. 10. Identify and discuss the responsibilities associated with the delivery of regional anesthesia. 11. Discuss patient assessment tools for the evaluation of physical and psychological tolerance to local anesthesia. 12. Discuss the implications of patient evaluation in obtaining informed consent. 13. Identify contraindications to the use of local anesthesia. 14. Discuss treatment modifications that can be made to increase patient safety and comfort with local anesthesia. 15. Discuss situations that require a medical consultation prior to treatment. 16. Identify signs and symptoms of undiagnosed medical conditions that can affect local anesthetic administration. 17. Discuss the importance of post-anesthetic care. 18. Understand the general principles and elements of informed consent. 19. Identify and discuss key factors that impact the successful delivery of local anesthetic agents.	6	0	4

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Local Anesthesia Delivery Devices, Patient Assessment for Local Anesthesia, Fundamentals for Administration of Local Anesthesia Agents, and Injections for Mandibular Pain Control (cont'd)	20. Identify and discuss stress and anxiety factors that impact patients and clinicians during local anesthesia delivery. 21. Discuss the importance of clinician/patient communications before, during, and after the delivery of local anesthetic. 22. Differentiate between the three basic types of injections. 23. List and describe the basic steps involved in the delivery of local anesthetic injections. 24. Identify and discuss the general principles of ergonomics during the delivery of local anesthetic injections. 25. Describe and discuss the indications, relevant anatomy, and technique features of the injections discussed in this chapter. 26. Demonstrate the basic technique steps for safe and effective administration of the following injections: inferior alveolar nerve block, lingual nerve block, buccal nerve block, mental nerve block, incisive nerve block, periodontal ligament injection, intraseptal injection.			
Fundamentals of Pain Management, The Neuroanatomy and Neurophysiology of Pain Control, and Injections for Maxillary and Palatal Pain Control	1. Discuss the value of pain as a protective response. 2. Discuss factors that can contribute to an individual's response to a painful experience. 3. Discuss the three general types of pain. 4. Define acute and chronic pain. 5. Explain the differences between pain perception and nociception. 6. Discuss the physiological reactions of the sympathetic nervous system related to pain. 7. Discuss anxiety and fear as they relate to successful anesthesia. 8. Discuss strategies that can help patients cope with fear and anxiety. 9. Discuss the influence of previous pain experiences on the ability to administer local anesthetic injections. 10. Explain the normal mechanisms of nerve impulse generation and conduction. 11. Define the events in successful nerve impulse generation, including the resting state, slow depolarization, firing threshold, rapid depolarization, and recovery. 12. Describe and explain the significance of Schwann cell sheaths and nodes of Ranvier on the ability of local anesthetic agents to work. 13. Describe the significance of the anatomical differences between sensory and motor neurons. 14. Identify and discuss the different types of nerve fibers and the differences in how they relate to pain perception, and be familiar with those that normally transmit pain sensations from dental and periodontal structures. 15. Compare anatomically and functionally between myelinated and unmyelinated nerves. 16. Discuss what is meant by anatomic barriers to the diffusion of anesthetic solutions and those that present the greatest challenges to diffusion. 17. Define the term dental plexus and describe where these structures are located. 18. Discuss the actions and effects of local anesthetic drugs on neural membranes.	5.5	0	4

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Fundamentals of Pain Management, The Neuroanatomy and Neurophysiology of Pain Control, and Injections for Maxillary and Palatal Pain Control (cont'd)	19. Describe and discuss the indications, relevant anatomy, and technique features of the injections discussed in this chapter. 20. Describe the basic technique steps for safe and effective administration for the following injections: infiltrations, ASA, MSA, and PSA. 21. Describe and discuss the indications, relevant anatomy, and technique features of the injections discussed in this chapter. 22. Demonstrate the basic technique steps for safe and effective administration of the following injections: NP, AMSA, and GP.			
Pharmacology Basics, Dental Local Anesthetic Drugs, Vasoconstrictors in Dentistry, Dose Calculations for Local Anesthetic Solutions, and Topical Anesthetics	1. Discuss the pharmacologic properties of local anesthetic drugs and vasoconstrictors. 2. Discuss the specific receptor theory and membrane expansion theory. 3. Explain why tissue inflammation affects the success of local anesthesia. 4. Discuss the clinical relevance of pH and pKa. 5. Discuss the pharmacodynamics and pharmacokinetics of local anesthetic drugs. 6. Discuss the effects of local anesthetics on the CNS. 7. Discuss the effects of local anesthetics on the CVS. 8. Discuss the biotransformation pathways of amides and esters and the concept of elimination half-life. 9. Discuss similarities and differences between dental local anesthetic drugs. 10. Apply this knowledge to clinical situations in which the choice of local anesthetic and/or vasoconstrictor may directly affect safety and success. 11. Discuss and determine some situations in which specific drugs are indicated or contraindicated. 12. Discuss which local anesthetic solutions work reasonably well without vasoconstrictors and why they are more effective in those clinical situations. 13. Discuss when and why solutions with epinephrine and levonordephrine are indicated or contraindicated. 14. Discuss the overall similarities and differences among vasoconstrictors. 15. Discuss clinical situations in which the choice of vasoconstrictors may directly affect anesthetic success. 16. Discuss and determine situations in which specific vasoconstrictors may be indicated or contraindicated. 17. Discuss the difference in potency between epinephrine and levonordephrine. 18. Define and discuss the significance of the maximum recommended dose of a drug. 19. List maximum recommended doses for each local anesthetic drug and vasoconstrictor.	5.5	0	4

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Pharmacology Basics, Dental Local Anesthetic Drugs, Vasoconstrictors in Dentistry, Dose Calculations for Local Anesthetic Solutions, and Topical Anesthetics (cont'd)	20. Identify and discuss the relevant information and mathematical operations required to calculate drug dose. 21. Demonstrate accurate calculations of recommended doses for local anesthetic drugs and vasoconstrictors in clinical situations. 22. Demonstrate accurate calculations of recommended doses when multiple drugs with differing concentrations are administered. 23. Define dose modification for vasoconstrictors in patients with significant cardiovascular compromise. 24. Demonstrate accurate calculations of recommended doses for local anesthetic drugs and vasoconstrictors for patients with significant cardiovascular compromise. 25. Demonstrate accurate calculation of recommended doses for children using Clark's Rule and Young's Rule.			
Topical Anesthetics, Troubleshooting Inadequate Anesthesia, and Local Anesthesia Complications and Management	1. Identify the clinical applications of topical anesthetic drugs. 2. Discuss the most common methods of application. 3. Understand indications and contraindications of topical anesthetic drugs. 4. Discuss maximum recommended doses when provided by manufacturers and safe application habits when they are not provided. 5. Describe and recognize the signs and symptoms of adverse topical anesthetic drug reactions, both local and systemic. 6. Define and discuss eutectic mixtures including factors that determine their effectiveness. 7. Discuss what is meant by compounded drugs and proper guidelines for their use. 8. Discuss the primary reasons for inadequate local anesthesia. 9. Understand the physiologic and anatomic basis of inadequate anesthesia. 10. Develop critical thinking skills to help overcome frustrating anesthetic challenges. 11. Develop strategies for addressing inadequate anesthesia. 12. Discuss the most common adverse local events that may occur during and after local anesthetic drug administration. 13. Discuss the categories of adverse systemic events that may occur during and after local anesthetic drug delivery. 14. Discuss appropriate responses and management of adverse local events. 15. Discuss appropriate responses and management of adverse systemic events. 16. Discuss protocols for the management of overdose and allergic events. 17. Identify idiosyncratic events and discuss their management.	5.5	0	4

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
22.5	0	16