DEN6250 Pain and Anxiety Control in Dental Patients

Spring 2021

Course Description:

This course acquaints the undergraduate with the academic aspects of administration of local anesthetics, inhalation analgesia, and anxiety control.

I. General Information

Course Director:

Course Director: M. Franklin Dolwick, D.M.D, Ph.D.
Office: OMFS D7
Email: FDOLWICK@dental.ufl.edu
Phone: (352) 352-2736
Course Credits: 1
Semester: Spring

Contributing Faculty

John Hardeman (352) 294-5548 JHardeman@dental.ufl.edu
Hamad Alharbi (352) 273-6720 HAlharbi@dental.ufl.edu
Danielle Freburg-Hoffmeister (352) 273-6750 DFreburg-Hoffmeister@dental.ufl.edu
Clay Hamrick (352) 273-6754 chamrick@dental.ufl.edu
Ernest Lado (352) 273-6857 ELADO@dental.ufl.edu
Allison Sley (352) 273-6750 ASley@dental.ufl.edu

Support Staff

Jennifer A Miller (352) 273-6720 JMiller@dental.ufl.edu TA/Grade Administrator
Kristi W. Duncan (352) 273-6708 KDUNCAN@dental.ufl.edu TA/Grade Administrator
Gail Childs (352) 273-5952 GCHILDS@dental.ufl.edu
II. Course Goals

The goals of this class are to assist the dental student to become:

1) Knowledgeable in the use and administration of local anesthetics
2) Knowledgeable in the pharmacology, neurophysiology, neurochemistry and anatomy related to the administration of local anesthetics
3) Knowledgeable and competent in the physical and psychological evaluation of the patient prior to receiving local anesthetic, sedation or dental treatment.
4) Knowledgeable in the side effects, complications and the management of those problems associated with local anesthetics and sedative agents
5) Introduce the techniques for administration of nitrous oxide/oxygen sedation
6) Understand the appropriate indications and contraindications for the use of nitrous oxide / oxygen sedation
7) Understand the appropriate indications and contraindications for the use of IV, IM, PO sedation and the medications frequently used for such sedations

III. Course Overview

The course represents the foundation for the day-to-day practice of dentistry. Although the course is presented early in the curriculum, it still provides the student with the required training and information to safely and effectively relieve pain and reduce anxiety in the dental patient. It requires that the student apply knowledge from pharmacology, biochemistry, physiology and anatomy acquired during their first year. The student should also realize that competency, and ultimately proficiency, in the administration of local anesthesia and nitrous oxide requires repeated administration and periodic self-reeducation.

IV. Course Outline

A. Scope of pain and anxiety control
B. Neurophysiology of anxiety / pain conduction / pain control
C. Pharmacology of local anesthetics / vasoconstrictors
D. Armamentarium
E. Physical and psychological evaluation
F. Anatomic considerations, clinical application and supplemental local anesthetic techniques
G. Local and systemic complications
H. Nitrous oxide / oxygen sedation
I. Pharmacology of sedative agents – PO, IM, IV.

Course Material

Required Textbooks: (Students must purchase):


Videos: See Document Section:

- Mandibular Anesthesia: Increasing the Success of Injection Techniques, Astra.
- Maxillary Anesthesia: Increasing the Success of Injection Techniques, Astra.
- Dental Lib Guide: [http://guides.uflib.ufl.edu/dental](http://guides.uflib.ufl.edu/dental)

VI. Course Objectives

A. Scope of pain and anxiety control
   1. Discuss the differences between the types of sedation / anesthesia
   2. Discuss the pros and cons of each method of sedation / anesthesia
   3. Describe the risks and benefits of each method of sedation / anesthesia
   4. Summarize the requirements of state law regarding the administration of local anesthesia, sedation and general anesthesia.
   5. Discuss the legal ramifications of administration of local anesthesia, sedation and general anesthesia

B. Neurophysiology
   1. Discuss the desirable properties of local anesthetics.
   2. Discuss the fundamentals of impulse generation and transmission.
   3. Discuss the mode and site of action of local anesthetics.
   4. Discuss the active forms of local anesthetics.
   5. Discuss the kinetics of local anesthetic onset and duration of action.

C. Pharmacology of local anesthetics and vasoconstrictors
1. Discuss the pharmacokinetics of local anesthetics, including uptake, distribution, metabolism, and excretion.

2. Discuss the systemic actions of local anesthetics on the following:
   a. Central nervous system
   b. Cardiovascular system
   c. Respiratory system
   d. Other miscellaneous actions

3. Describe the indications for using a vasoconstrictor in a local anesthetic solution.
   Consider the following:
   a. Mechanism of action
   b. Metabolism
   c. Maximum dosage
   d. Toxic effects
   e. Contraindications

4. Discuss the following information for lidocaine, mepivacaine and bupivacaine:
   a. Type of anesthetic, ester or amide
   b. Brand name(s)
   c. Onset and duration of action
   d. Metabolism, including uptake, redistribution, inactivation, and excretion
   e. Common concentrations used in dentistry
   f. Maximum dosage

5. Name the two general categories of topical anesthetics discuss benzocaine, lidocaine, and tetracaine topical anesthetics.

6. Calculate the amount of anesthetic and vasoconstrictor contained in the various types of anesthetic solutions.

D. Armamentarium

   1. Identify the components of the breech-loading aspirating syringes, needles, and carpules. Identify the problems that can occur with the syringes, needles and carpules.

   2. Discuss the component chemicals contained within the cartridge and their function.

   3. Recognize when local anesthetic is no longer safe to administer.

E. Physical and psychological evaluation

   1. Discuss the evaluation of the patient prior to administration of local anesthesia or sedation, including the following:
      a. Medical history
      b. Physical evaluation
      c. Psychological evaluation

   2. Recognition of signs and symptoms of anxiety.

   3. List the ASA classification.
4. Demonstrate how to monitor the central nervous system, respiratory system and cardiovascular system for adverse reactions.

F. Anatomic considerations, clinical application and supplemental injection techniques

1. Discuss the following types of administration of anesthetic:
   a. Maxillary anesthesia
   b. Mandibular anesthesia
   c. Gow-Gates
   d. Akinosi
   e. PDL
   f. Interosseous
   g. Electronic
   h. Controlled delivery devices

G. Local and systemic complications

1. Discuss the causes, problems, prevention and management of the following local complications:
   a. Needle breakage
   b. Pain on injection
   c. Persistent anesthesia: paresthesia
   d. Trismus
   e. Hematoma
   f. Infection
   g. Tissue sloughing
   h. Lip chewing
   i. Facial nerve paralysis

2. Discuss the causes, problems, prevention and management of the following systemic complications:
   a. Local anesthetic overdose
   b. Epinephrine overdose
   c. Allergy
   d. Idiosyncratic reaction
   e. Side effects

H. Nitrous Oxide/Oxygen Sedation

1. Discuss the pharmacology of nitrous oxide / oxygen sedation.
2. Discuss the equipment safety features
3. Discuss patient preparation
4. Discuss the clinical effects
5. Discuss the potential side effects.
I. Pharmacology of Sedative Agents – PO, IM, IV

1. Discuss the risks, benefits and complications associated with each route of sedation.

2. Discuss the pharmacological properties, therapeutic effects and side effects of each of the following sedative agents:
   a. Benzodiazepines
   b. Narcotics
   c. Barbiturates
   d. Chloral hydrate
   e. Phenothiazines
   f. Phenergan

J. Early Clinical Experience

1. Following all HIPAA, infection control, patient safety and biomedical waste guidelines:
   a. Utilize professional behaviors in all patient clinical experiences.
   b. Set up and break down an operatory.
   c. Review and update the patient's medical and dental history.
   d. Obtain the patient's vital signs.
   f. Administer local anesthetic to a peer patient
   g. Administer and monitor nitrous oxide sedation to a peer patient.

VII. Course Competencies

This course teaches the following competencies in the "Competencies for the New Dental Graduate"

Domain I: Critical Thinking

3: Apply biomedical science knowledge in the delivery of patient care.

Domain III: Communication and Interpersonal Skills

7: Communication Skills: Apply the fundamental principles of behavioral sciences using patient-centered approaches for promoting, improving and maintaining oral health.

A. Assessment, Diagnosis, and Treatment

12: Patient Assessment, Diagnosis, Treatment Planning and Informed Consent: Provide oral health care within the scope of general dentistry to include patient assessment, diagnosis, comprehensive treatment planning, prognosis, and informed consent.

B. Establishment and Maintenance of Oral Health

21: Provide oral health care within the scope of general dentistry to include local anesthesia and pain and anxiety control, including consideration of the impact of prescribing practices and substance use disorder.
VIII. Evaluation

Laboratory Preparation:

**Laboratory 1: Basic Injection Techniques**

Students must bring their own dental charts/medical history, stethoscopes, safety glasses, a sterilized syringe and dental mirror for their assigned lab. Anesthetics, topical, needles and the required supplies will be provided. Students must make an appropriate chart entry.

- **Review:** Injection Videos in the document section, prior to your lab session.
- **Review:** Chapters 5-15, *Malamed* (Local Anesthesia) (Armamentarium, Anatomy technique to supplement videos) Chapters 2, 3, 5, 6 *Malamed* (Medical Emergencies) (Basic Emergency Information)

Demonstrate the following injection techniques:

- ASA
- MSA
- PSA
- Greater palatine
- Inferior alveolar
- Lingual
- Long buccal
- Demonstrate the mental foramen injection and mandibular anterior infiltration

**Clinical Assessment: Nitrous Oxide / Oxygen Sedation**

The students will administer nitrous oxide/oxygen sedation on OMFS Clinic patients under direct supervision of OMFS faculty. They will learn the technique of how to administer nitrous oxide/oxygen sedation safely and efficiently as well as the effects of and the potential complications and therapeutic ranges of nitrous oxide/oxygen sedation. Students must make an appropriate chart entry.

**Quizzes:** Quizzes may be administered at the discretion of the faculty.

**Cognitive Assessment:** Students will be evaluated by a mid-term and final examination.

**Laboratory/Clinical Assessment:** Attendance and participation is required.

**Grade Weights:**

- Midterm: 50%
- Cumulative Final: 50%
- Lab activities: S=Satisfactory/based on attendance and participation
Grades will be determined by the student's scores on their examinations. Attendance and participation in the scheduled local anesthetic and nitrous oxide/oxygen laboratories are required to obtain your final grade.

Remediation:

Remediation for this course will consist of a written assignment (using the Malamad textbook) and then an oral examination with the course director. Students not receiving a "satisfactory" in the lab session must remediate by participating in a remediation lab session.

Honorlock:

Honorlock will proctor your exams this semester. Honorlock is an online proctoring service that allows you to take your exam from the comfort of your home. You DO NOT need to create an account, download software or schedule an appointment in advance. Honorlock is available 24/7 and all that is needed is a computer, a working webcam, and a stable Internet connection. To get started, you will need Google Chrome and to download the Honorlock Chrome Extension. You can download the extension at www.honorlock.com/extension/install.

When you are ready to test, log into the LMS, go to your course, and click on your exam. Clicking Launch Proctoring will begin the Honorlock authentication process, where you will take a picture of yourself, show your ID, and complete a scan of your room. Honorlock will be recording your exam session by webcam as well as recording your screen. Honorlock also has an integrity algorithm that can detect search-engine use, so please do not attempt to search for answers, even if it's on a secondary device. Good luck! Honorlock support is available 24/7/365. If you encounter any issues, you may contact us by live chat, phone (844-243-2500), and/or email (support@honorlock.com). If you encounter issues within the LMS, you may contact Your School's Online Support Services team at their number.

IX. Administrative Practices

Administrative practices for all UFCD courses are universally applied. Exceptions to or deviations from these practices are stated in the individual syllabi by the course director. When not individually stated in the syllabus, course administrative practices default to those identified under "Course Policies" on the DMD Student Website:

https://dental.ufl.edu/education/dmd-program/course-policies/
X. Grade Scale

<table>
<thead>
<tr>
<th>Method</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>100</td>
</tr>
<tr>
<td>Tolerance</td>
<td>0.5 (Final letter grades within this range will be rounded up.)</td>
</tr>
<tr>
<td>A</td>
<td>95 - 100</td>
</tr>
<tr>
<td>A-</td>
<td>90 - 94</td>
</tr>
<tr>
<td>B+</td>
<td>87 - 89</td>
</tr>
<tr>
<td>B</td>
<td>84 - 86</td>
</tr>
<tr>
<td>B-</td>
<td>80 - 83</td>
</tr>
<tr>
<td>C+</td>
<td>76 - 79</td>
</tr>
<tr>
<td>C</td>
<td>72 - 75</td>
</tr>
<tr>
<td>E</td>
<td>0 - 72</td>
</tr>
</tbody>
</table>