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Dental Hygiene (DNTL) 2020 Local Anesthesia and Nitrous Oxide (2 Units) CSU  
[formerly Dental Hygiene 20]

Prerequisite: Successful completion of all first semester Dental Hygiene Program courses and Chemistry 1520 with a “C” or higher

Prerequisite knowledge/skills:

Before entering the course the student should be able to:

1. Draw and name structures containing common mono-functional organic molecules and differentiate functional groups when they appear in an organic structure, relate the physical and chemical properties of compounds containing these groups with the structure of each functional classification;
2. Distinguish roles of four major classes of bio-molecules in living cells,
3. Compare and contrast the processes of DNA replication and transcription, RNA translation, and common types of mutations; and
4. Demonstrate knowledge of major biochemical components in metabolism.

Total Hours: 16 hours lecture; 48 hours lab (64 hours total)

Catalog Description: This course emphasizes pharmacology, anatomy and physiology of local anesthetic agents and their proper use. Preparation for and the administration of local anesthesia techniques used in dental hygiene procedures. Also included in this course is the study and administration of nitrous oxide sedation used in dentistry and the prevention and management of medical emergencies.

Type of Class/Course: Degree Credit

Text: Stanley F. Malamed, *Handbook of Local Anesthesia*. 6th ed. St. Louis: Mosby, 2012, Print. and accompanying DVD. Print

Additional Instructional Materials:

Harold L. Crossley, et al, *Dental Office Medical Emergencies: A Manual of Office Response Protocols*. 5th ed. Hudson: Lexi-Comp, 2013. Print.

Course Objectives:

By the end of the course, a successful student will be able to:

1. prepare the proper armamentarium for administration of local anesthesia and nitrous oxide-oxygen sedation and the current technology available for each,
2. Know the proper infection control procedures according to the provisions of Title 16, Division 10, Chapter 1 , Article 4, Section 1005 of the California Code of Regulations,

3. understand the fundamentals of impulse generation and transmission and where and how anesthetics work,
4. discuss the pharmacologic properties of local anesthetic drugs and vasoconstrictors, local anesthetic reversal agents, and nitrous oxide-oxygen analgesia,
5. understand the pharmacokinetics and the vasoactivity of each of the local anesthetics,
6. know the clinical actions of each local anesthetic agent and their effect on different systems in the body,
7. select the appropriate local anesthetic based on the health of the patient and the procedure,
8. know indications and contraindications to the administration and reversal of local anesthetic agents for all patients,
9. know indications and contraindications to the administration of nitrous oxide –oxygen analgesia agents on all patients,
10. trace or locate the nerves supplying the maxilla and mandible and the areas and structures innervated,
11. demonstrate accurate calculations of recommended doses for local anesthetic drugs and vasoconstrictors in clinical situations,
12. demonstrate physical and psychological evaluations procedures,
13. understand the theory and psychological aspects of pain and anxiety control,
14. select appropriate pain control modalities,
15. discuss recovery from and post-procedure evaluation of local anesthesia and nitrous oxide –oxygen analgesia,
16. demonstrate competency in the basic techniques and steps for effective administration of each of the following injections:
  - Inferior Alveolar Nerve Block to include (to include Gow Gates Technique)
  - Lingual Nerve Block
  - Mental Nerve Block
  - Incisive Nerve Block
  - Buccal Nerve Block
  - Intraseptal Injection
  - Anterior Superior Alveolar (ASA) Nerve Block (infraorbital)
  - Middle Superior Alveolar (MSA) Nerve Block
  - Anterior Middle Superior Alveolar (ASMA) Nerve Block
  - Greater Palatine (GP) Nerve Block
  - Nasopalatine NP and (P-ASA) Nerve Block
  - Superperiosteal Infiltration
17. Discuss the most common local and system complications related to administration of local anesthesia and nitrous oxide-oxygen and management of each
18. Explain procedures for the prevention of medical emergencies,
19. Identify medical and dental emergencies and proper management of each,
20. Demonstrate competency in the administration of nitrous oxide,
21. Know the indications and the contraindications to the use of nitrous oxide sedation, and
22. Identify appropriate patients to administer nitrous oxide sedation
23. Complete patient documentation that meet the standard of care, including but not limited to, computation of maximum recommended dosages for local anesthetic and the tile volume, percentage and amount of the gases and duration of administration of nitrous oxide-oxygen analgesia,
24. Understand medical and legal considerations including patient consent, standard of care and patient privacy.

Course Scope and Content: (Lecture)

Unit I                    Armamentarium  
                                   A. The Syringe

- B. The Needle
- C. The Cartridge
- D. Additional Armamentarium
- E. Preparation of the Armamentarium
- F. Infection Control Procedures

- Unit II            The Drugs
- A. Neurophysiology
  - B. Pharmacology of Local Anesthetics
  - C. Pharmacology of Vasoconstrictors
  - D. Clinical Actions of Specific Agents
- Unit III           Techniques of Regional Anesthesia
- A. Physical and Psychological Evaluation
  - B. Basic Injection Technique
  - C. Anatomical Considerations
  - D. Techniques of Mandibular Anesthesia
  - E. Techniques of Maxillary Anesthesia
- Unit IV            Complications
- A. Local Complications
  - B. Systemic Complications
  - C. Management
- Unit V            New Trends in Pain Control
- A. Computer Controlled Local Anesthesia Delivery
  - B. Anesthetic Reversal Agents (OraVerse)
  - C. Oraqix
  - D. Onset
  - E. Cetacaine
- Unit VI            Nitrous Oxide Sedation
- A. Armamentarium
  - B. Nitrous Oxide Equipment and Armamentarium
  - C. Nitrous Oxide Administration
- Unit VII           Medical Emergencies
- A. Anesthesia and Nitrous Oxide Sedation Related Emergencies
  - B. Management
- Unit XIII          Legal Considerations
- A. Patient Consent
  - B. Standard of Care
  - C. Patient Privacy

Course Scope and Content: (Laboratory)

- Unit I            Armamentarium
- A. Proper Assembling of Needle, Cartridge and Syringe
  - B. Scoop Technique

- C. Proper Disposal of Needle and Cartridge
- D. Care and Maintenance of Syringe

- Unit II            Basic Injection Technique
- A. Steps and Sequence
  - B. Aspiration
  - C. Deposition
  - D. Charting
  - E. Calculations

- Unit III           Administration of Local Anesthesia on Partners
- A. Inferior Alveolar Nerve Block (to include Gow Gates Technique)
  - B. Lingual Nerve Block
  - C. Mental Nerve Block
  - D. Incisive Nerve Block
  - E. Buccal Nerve Block
  - F. Intraseptal Injection
  - G. Anterior Superior Alveolar (ASA) Nerve Block (infraorbital)
  - H. Middle Superior Alveolar (MSA) Nerve Block
  - I. Anterior Middle Superior Alveolar (AMSA) Nerve Block
  - J. Greater Palatine (GP) Nerve Block
  - K. Nasopalatine (NP/P-ASA) Nerve Block
  - L. Supraperiosteal Infiltration

- Unit IV           Administration of Nitrous Oxide Sedation on Partners
- A. Titration Method
  - B. Signs and Symptoms of Sedation
  - C. Calculations
  - D. Equipment

- Unit V            Medical Emergencies
- A. Management of Medical Emergencies in the Dental Office course from [www.dentalcare.com](http://www.dentalcare.com)
  - B. Role Playing

- Unit VI           Chart Documentation
- A. Computation of Maximum Recommended Dosages for Local Anesthesia
  - B. Tidal Volume
  - C. Percentage and Amount of Gases
  - D. Duration of Nitrous Oxide Administration
  - E. Patient Response

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 2 hours per week outside of the regular class time doing the following:

1. Independent reading and study

Methods of Instruction:

1. Lecture
2. Class discussions
3. Audio-visual presentations
4. Lab exercises designed to prepare student for administration of local anesthetics
5. Demonstration of injection techniques
6. Demonstration of nitrous oxide administration
7. Student participation in clinical administration of local anesthetics
8. Student participation in clinical administration of nitrous oxide sedation
9. Role playing of medical emergencies

Methods of Evaluation:

1. Examinations and quizzes to include:
  - a. multiple choice questions
  - b. matching questions
  - c. true/false questions
  - d. case study questions
  - e. short answer essay
3. Observation of mock medical emergencies
4. Evaluation of injection techniques on partners
5. Evaluation of nitrous oxide administration on partners

Laboratory Category: Extensive Laboratory

Pre delivery criteria: All of the following criteria are met by this lab.

1. Curriculum development for each lab.
2. Published schedule of individual laboratory activities.
3. Published laboratory activity objectives.
4. Published methods of evaluation.
5. Supervision of equipment maintenance, laboratory setup, and acquisition of lab materials and supplies.

During laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is physically present in lab when students are performing lab activities.
2. Instructor is responsible for active facilitation of laboratory learning.
3. Instructor is responsible for active delivery of curriculum.
4. Instructor is required for safety and mentoring of lab activities.
5. Instructor is responsible for presentation of significant evaluation.

Post laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is responsible for personal evaluation of significant student outcomes (lab exercises, exams, practicals, notebooks, portfolios, etc.) that become a component of the student grade that cover the majority of lab exercises performed during the course.
2. Instructor is responsible for supervision of laboratory clean up of equipment and materials.

Supplemental Data:

TOP Code:	124020: Dental Hygienist
SAM Priority Code:	C: Clearly Occupational
Distance Education:	Not Applicable
Funding Agency:	Y: Not Applicable(funds not used)
Program Status:	1: Program Applicable
Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not applicable
Cooperative Work Experience:	N: Is not part of a cooperative work experience education program
Eligible for Credit by Exam:	NO
Eligible for Pass/No Pass:	NO
Taft College General Education:	NONE