

BERGEN COMMUNITY COLLEGE
DIVISION OF HEALTH PROFESSIONS
DENTAL HYGIENE DEPARTMENT

STUDENT SYLLABUS

<u>TERM</u>	SUMMER II, 2014
<u>COURSE NUMBER/ TITLE</u>	DHY-220 – LOCAL ANESTHESIA
<u>MEETING TIMES and LOCATION</u>	Tuesday and Thursday, 9am, room # S-111 July 29 through August 7, 8:30am room #S-327
<u>INSTRUCTORS</u>	Dr. H. Ephros

COURSE DESCRIPTION

This course is designed to provide the student with the necessary knowledge and skills to properly administer local anesthesia to patients who require pain management during dental hygiene treatment. Special emphasis will be given to the pharmacology of local anesthetic pain control, injection fundamentals and the clinical administration of local anesthesia. Local and systemic complications along with legal considerations will also be presented.

3 Labs; 1 Credit

<u>PREREQUISITES</u>	BIO209, DHY201, DHY205, DHY209
<u>COREQUISITE</u>	DHY200

COURSE OBJECTIVES

Upon completion of this local anesthesia course, the student will be able to:

1. Understand the theoretical, practical and pharmacological aspects of local anesthesia.
2. Evaluate a patient's medical history, physical status, indications and contraindications for the use of local anesthesia.
3. Identify and locate the anatomical structures related to the administration of local anesthesia.
4. Gain clinical proficiency in the administration of the following types of injections: mandibular nerve block, mental nerve block, long buccal nerve block and infiltrations of the mandible and maxilla.
5. Recognize and manage any adverse reactions and medical emergencies related to the administration of local anesthesia.
6. Demonstrate proper record keeping, current acceptable infection control protocols and quality assurance procedures in both clinical and laboratory settings.

Core Competencies (C)

- C.1 Apply a professional code of ethics in all endeavors.
- C.2 Adhere to state and federal laws, recommendations, and regulations in the provision of oral health care.
- C.3 Use critical thinking skills and comprehensive problem-solving to identify oral health care strategies that promote patient health and wellness.
- C.4 Use evidence-based decision making to evaluate emerging technology and treatment modalities to integrate into patient dental hygiene care plans to achieve high-quality, cost-effective care.
- C.5 Assume responsibility for professional actions and care based on accepted scientific theories, research, and the accepted standard of care.
- C.6 Continuously perform self-assessment for lifelong learning and professional growth.
- C.7 Integrate accepted scientific theories and research into educational, preventive, and therapeutic oral health services.
- C.8 Promote the values of the dental hygiene profession through service-based activities, positive community affiliations, and active involvement in local organizations.
- C.9 Apply quality assurance mechanisms to ensure continuous commitment to accepted standards of care.
- C.10 Communicate effectively with diverse individuals and groups, serving all persons without discrimination by acknowledging and appreciating diversity.
- C.11 Record accurate, consistent, and complete documentation of oral health services provided.
- C.12 Initiate a collaborative approach with all patients when developing individualized care plans that are specialized, comprehensive, culturally sensitive, and acceptable to all parties involved in care planning.
- C.13 Initiate consultations and collaborations with all relevant health care providers to facilitate optimal treatments.
- C.14 Manage medical emergencies by using professional judgment, providing life support, and utilizing required CPR and any specialized training or knowledge.

Health Promotion and Disease Prevention (HP)

- HP.1 Promote positive values of overall health and wellness to the public and organizations within and outside the profession.
- HP.2 Respect the goals, values, beliefs, and preferences of all patients.
- HP.3 Refer patients who may have physiological, psychological, or social problems for comprehensive evaluation.
- HP.4 Identify individual and population risk factors, and develop strategies that promote health-related quality of life.
- HP.5 Evaluate factors that can be used to promote patient adherence to disease prevention or health maintenance strategies.
- HP.6 Utilize methods that ensure the health and safety of the patient and the oral health professional in the delivery of care.

Community Involvement (CM)

- CM.1 Assess the oral health needs and services of the community to determine action plans and availability of resources to meet the health care needs.
- CM.2 Provide screening, referral, and educational services that allow patients to access the resources of the health care system.
- CM.3 Provide community oral health services in a variety of settings.

- CM.4 Facilitate patient access to oral health services by influencing individuals or organizations for the provision of oral health care.
- CM.5 Evaluate reimbursement mechanisms and their impact on the patient's access to oral health care.
- CM.6 Evaluate the outcomes of community-based programs, and plan for future activities.
- CM.7 Advocate for effective oral health care for underserved populations.

Patient Care (PC)

Assessment

- PC.1 Systematically collect, analyze, and record diagnostic data on the general, oral, and psychosocial health status of a variety of patients using methods consistent with medico-legal principles.
- PC.2 Recognize predisposing and etiologic risk factors that require intervention to prevent disease.
- PC.3 Recognize the relationships among systemic disease, medications, and oral health that impact overall patient care and treatment outcomes.
- PC.4 Identify patients at risk for a medical emergency, and manage the patient care in a manner that prevents an emergency.

Dental Hygiene Diagnosis

- PC.5 Use patient assessment data, diagnostic technologies, and critical decision making skills to determine a dental hygiene diagnosis, a component of the dental diagnosis, to reach conclusions about the patient's dental hygiene care needs.

Planning

- PC.6 Utilize reflective judgment in developing a comprehensive patient dental hygiene care plan.
- PC.7 Collaborate with the patient and other health professionals as indicated to formulate a comprehensive dental hygiene care plan that is patient-centered and based on the best scientific evidence and professional judgment.
- PC.8 Make referrals to professional colleagues and other health care professionals as indicated in the patient care plan.
- PC.9 Obtain the patient's informed consent based on a thorough case presentation.

Implementation

- PC.10 Provide specialized treatment that includes educational, preventive, and therapeutic services designed to achieve and maintain oral health. Partner with the patient in achieving oral health goals.

Evaluation

- PC.11 Evaluate the effectiveness of the provided services, and modify care plans as needed.
- PC.12 Determine the outcomes of dental hygiene interventions using indices, instruments, examination techniques, and patient self-reports as specified in patient goals.
- PC.13 Compare actual outcomes to expected outcomes, reevaluating goals, diagnoses, and services when expected outcomes are not achieved.

Professional Growth and Development (PGD)

- PGD.1 Pursue career opportunities within health care, industry, education, research, and other roles as they evolve for the dental hygienist.
- PGD.2 Develop practice management and marketing strategies to be used in the delivery of oral health care.
- PGD.3 Access professional and social networks to pursue professional goals

Reference: American Dental Education Association, House of Delegates, (2111),
Competencies for Entry into the Profession of Dental Hygiene

REQUIRED TEXTBOOK

Malamed, J.I. and Howerton, L.J. *Handbook of Local Anesthesia* 5th edition. Elsevier, St. Louis. 2004.

SUPPLEMENTAL TEXTBOOKS

Wilkins, E. M., *Clinical Practice Of The Dental Hygienist*, 11th edition, Williams and Wilkins, 2012, Philadelphia

American Heart Association. BLS for Healthcare Providers. American Heart Association, Dallas. 2010.

TEACHING METHODS

The following teaching methods will be utilized in this course:

1. Preclinical preparation of students for local anesthesia administration
2. Kinesthetic learning through patient experiences in clinic
3. Web based enhancement of materials for review and preparation for test

LEARNING EXPERIENCES / ACTIVITIES

The following learning experiences and activities will be utilized in this course:

1. Visual, auditory, and tactile assessment of patients
2. Analysis of all patient data/assessments to formulate a dental hygiene diagnosis, care plan, and determination of local anesthesia to be administered
3. Visual, auditory, and tactile implementation of treatment utilizing various infiltration and block administration techniques
4. Discussion and documentation of all patient injections/treatment
5. Evaluation of patient's response to local anesthesia at time of appointment and/or subsequent visits

CLINICAL EXPERIENCE

Student will complete a minimum of twenty-five injections during the semester.

Of these, student will complete five maxillary / mandibular infiltrations, five mandibular nerve blocks, five mental nerve blocks, and five long buccal nerve blocks.

Course Evaluation

Clinical Grade

25 Competencies	65%
3 Quizzes	30%
Professionalism	5%

GRADING SCALE

92 - 100	A
89 - 91	B+
83 - 88	B
80 - 82	C+
75 - 79	C
Below 75	R
Incomplete	N All requirements not fulfilled

MEDICAL CLEARANCE

All medical records must be complete and up-to-date. If notification is received from the medical office that a student record is not complete, the student will not be permitted to attend clinical sessions.

ABSENCE OF INSTRUCTOR

From the college catalog: students are expected to wait 20 minutes for a faculty member to come to class. If at the end of 20 minutes the faculty member does not come, the students should sign an attendance sheet which indicates course, date, and time. One student should delivery the attendance sheet to the dental hygiene office. Students cannot be penalized by faculty for not waiting longer than 20 minutes.

POLICY ON COURSE PREPARATION

- A current **CPR card** in basic life support for health care providers is a prerequisite before enrolling in this course.
- All students are expected to attend all class sessions for the entire session. Class will begin promptly at 9:00am. Clinic will begin promptly at 8:30am. Students must arrive on time to all sessions.
- During the clinical sessions, all students will work first on local anesthesia models, progress to a student partner and then to actual clinical patients. The student will:
 1. Review the patient medical history
 2. Prepare the clinical treatment area
 3. Select appropriate armamentarium
 4. Utilize proper chairside administration techniques as discussed in class and seen in the demonstration videos
- The clinical session will demonstrate anesthesia techniques including:
 - Maxillary and mandibular infiltrations
 - Anterior Superior Alveolar
 - Middle Superior Alveolar and Posterior Superior Alveolar Nerve Blocks
 - Inferior Alveolar Nerve Block

- Long Buccal Block
 - Mental Nerve Block
- A small amount of local anesthetic will be deposited at each site to demonstrate proper target achieved for each injection
- Post-operative instructions will be given and the patient will be monitored during and after the session.
 - Student should complete all learning modules according to the assigned schedule
 - Student must achieve 75% or better in order to pass the course.

SESSION SCHEDULE AND READING ASSIGNMENT

SESSION	TOPIC	READING ASSIGNMENT
SESSION I	Course Introduction And Requirements Patient Pre-Op Assessment/Physiological Considerations	Chapter 10
SESSION II	Local Anesthetic Use In Dental Specialties Prevention And Management Of Medical Emergencies Basic Life Support/CPR Review	Chapter 16 Chapter 18 Chapter 19
SESSION III	Neurophysiology Pharmacology Of Local Anesthetics Pharmacology Of Local Vasoconstrictors	Chapters 1-3
SESSION IV	Clinical Action Of Specific Agents Local And Systemic Complications Of Local Anesthesia	Chapter 4 Chapter 17
SESSION V	Armamentarium For Local Anesthesia	Chapter 5-8
SESSION VI		Chapter 8

	Topical Anesthetics	
SESSION VII	Anatomical Considerations	Chapter 12
SESSION VIII	Basic Injection Techniques	Chapter 11
SESSION IX	Maxillary Injection Technique	Chapter 13
SESSION X	Mandibular Anesthetic Technique	Chapter 14
SESSION XI	Supplemental Injection Technique	Chapter 15
SESSSION XII	Documentation/Legal Issues	Chapter 19

**CLINICAL SESSION OUTLINE
EACH SESSON WILL BE (3.5) HOURS**

FIVE (5) OF EACH OF THE FOLLOWING INJECTIONS MUST BE COMPLETED:

1. Maxillary/Mandibular infiltrations
2. Maxillary PSA,MSA,ASA
3. Mandibular nerve block
4. Mental nerve block
5. Long buccal nerve block

Session I-III

1. Set up clinical area with appropriate armamentarium
3. Review basic anatomy of Cranial nerve V
4. Identify Injection sites prior to injecting local anesthetics

Session IV-VI

1. Set up of clinical area with appropriate armamentarium
2. Review medical history of student partner
3. Record vital signs of student partner
4. Review of basic anatomy of Cranial Nerve V
5. Administer the above listed injections on student partner

Session VII-XII

1. Set up clinical area with appropriate armamentarium
2. Review medical history of clinical patients
3. Record vital signs of patients
4. Administer the above listed injections as required by the patient

Students will administer a minimum of 5 of each of the required injections as indicated by the NJ State Board of Dentistry.

TOPICAL OUTLINE AND OBJECTIVES

- I. Preoperative Assessment/Physiological Considerations
 - A. Recording the Medical History
 1. Past experiences with dental treatment
 2. Anesthetic History
 3. Current Medications
 4. History of Allergies
 - B. Cardiovascular Disease
 1. Ischemic Heart Disease
 2. Congestive Heart Failure
 3. Hypertension
 4. Valvular Heart Disease
 5. Cardiac Pacemakers
 6. Cardiac Risk
 - C. Respiratory Disease
 1. Asthma
 2. Chronic Obstructive Pulmonary Disease
 - D. Liver and Kidney Disease
 - E. Infectious Diseases
 1. AIDS
 2. Hepatitis A
 3. Hepatitis B
 4. Hemophilia
 - G. Endocrine Derangements
 1. Diabetes Mellitus
 2. Thyroid Disorders
 3. Adrenocortical Derangements
 - H. Epilepsy or seizures
 - I. Psychiatric Disorders
 - J. Physical Examination
 1. Visual Inspection
 2. Vital signs
 3. Determination of Medical Risk (ASA Classification)
 - K. Drug-Drug Interactions
 - L. Malignant Hyperthermia
 - M. Typical Plasma Cholinesterase
 - N. Methemoglobinemia
- II. Use of Local Anesthetics in Dental Specialties
 - A. Endodontics
 - B. Pedodontics
 - C. Periodontics

- D. Oral and Maxillofacial Surgery
- E. Fixed Prosthodontics
- F. Long-Duration Local Anesthesia
- G. Dental Hygiene

III. CPR review

Identify and describe the protocols for:

CPR “CABDs”

Assessment

Adult one rescuer and two rescuer CPR

Child one rescuer and two rescuer CPR

Infant one rescuer and two rescuer CPR

Use of Automated Electronic Defibrillator AED

Heimlich maneuver for conscious and unconscious adult, child, & infant

IV. Basic Life Support review

Identify and differentiate between adverse reactions for:

Respiratory Failure

Mild and Severe Airway Obstructions

Hyperventilation Syndrome

Heart Failure

Cardiac Arrest

Asthma Attack

Syncope

Shock

Stroke

Angina Pectoris

Myocardial Infarction

Adrenal Crisis

Insulin Reaction

Diabetic Coma

Epileptic Seizures

Allergic Reactions – delayed and anaphylactic shock

Local Anesthesia Reactions – psychogenic, allergic, toxic

V. Neurophysiology

- A. Fundamentals of Impulse Conduction
- B. Mode and Site of Action Of Local Anesthetics
- C. Active Forms of Local Anesthesia
- D. Kinetics and Duration of Action of Local Anesthetic

VI. Local Anesthetics

- A. Types of Local Anesthetics
 - 1. Amides
 - 2. Esters
 - 3. Others
 - 4. Choice of Local Anesthetic

- b. duration
 - c. dosage
 - d. vasoconstrictor
 - e. articaine
 - 5. Topical Anesthetics
 - a. types
 - b. usage
 - c. contraindications
 - B. Types of Vasoconstrictors
 - Drug Interactions
 - C. Mechanism of Action of Local Anesthetics
 - D. Uptake, Distribution, and Elimination of Local Anesthetics
 - E. Systemic Effects of local anesthetics
 - 1. Central Nervous System
 - 2. Cardiovascular System
 - 3. Local Tissue Toxicity
 - 4. Respiratory System
 - 5. Miscellaneous Effects
- VII. Armamentarium for Local Anesthesia
 - A. Types of Syringes in dentistry
 - 1. Nondisposable Systems
 - a. Breech-loading, metallic, Cartridge-type, Aspirating
 - b. Breech-loading, plastic, Cartridge-type, Aspirating
 - c. Breech-loading, metallic, Cartridge-type, Self-aspirating
 - d. Pressure Syringe
 - e. Jet injector (“needleless syringe”)
 - B. Disposable Syringes
 - C. Safety Syringes
 - D. Computer-Controlled local Anesthetic Delivery Systems
 - E. Care and Handling of Syringes
 - 1. Leakage during injection
 - 2. Broken Cartridge
 - 3. Bent Harpoon
 - 4. Disengagement of the Harpoon from the Plunger
 - 5. Surface Deposits
 - F. Needle
 - 1. Types
 - 2. Parts
 - 3. Gauge
 - a. Color-coding by needle gauge
 - b. Minimizing Needle Deflection: Rotational Insertion Technique
 - 4. Length
 - 5. Care and Handling
 - 6. Problems
 - a. Pain on Insertion
 - b. Breakage
 - c. Pain on Withdrawal
 - d. Injury to the Patient or Administrator
 - G. Cartridge
 - 1. Components

2. Cartridge Contents
3. Care and Handling
4. Problems
 - a. Bubble in the Cartridge
 - b. Extruded Stopper
 - c. Burning on Injection
 - d. Sticky Stopper
 - e. Corroded Cap
 - f. Rust on the Cap
 - g. Leakage during Injection
 - h. Broken Cartridge
- H. Additional Armamentarium
 1. Topical Antiseptic
 2. Topical Anesthetic
 3. Applicator Sticks
 4. Cotton Gauze
 5. Hemostat
- I. Preparation of the Armamentarium
 1. Assembly of the Syringe
 2. Recapping the Needle
 3. Placing an Additional Cartridge in a Syringe

VIII. Basic Injection Techniques

IX. Anatomical Considerations

- A. Overview of the Nervous System
 1. Central Nervous System
 2. Peripheral Nervous System
 3. Cranial Nerves
- B. Nerves to the Oral Cavity
- C.
 1. Trigeminal Nerve
 - a. V1
 - b. V2
 - c. V3
 2. Facial Nerve
- D. Maxillary Osteology
- E. Mandibular Osteology

X. Maxillary anesthetic Technique

- A. Local Infiltration (supraperiosteal injections)
- B. Field Block
- C. Nerve Block
 1. Posterior Superior Alveolar (PSA)
 2. Middle Superior Alveolar (MSA)
 3. Anterior Superior Alveolar (ASA)
 4. Greater (Anterior) Palatine Nerve Block
 5. Nasopalatine Nerve Block
- D. Local Infiltration of the palate

XI. Mandibular Anesthetic Techniques

- A. Inferior Alveolar Nerve Block (IANB)
- B. Mental Nerve Block
- C. Incisive Block
- D. Buccal Nerve Block
- E. Local infiltrations

XII. Management of Complications and Emergencies

- A. Local Complications
 - 1. Needle Breakage
 - 2. Persistent Anesthesia and Paresthesia
 - 3. Facial Nerve Paralysis
 - 4. Trismus
 - 5. Soft-Tissue Injury
 - 6. Hematoma
 - 7. Pain On Injection
 - 8. Burning On Injection
 - 9. Infection
 - 10. Edema
 - 11. Sloughing Of Tissues
 - 12. Postanesthetic Intraoral Lesions
- B. Systemic Complications
 - 1. Overdose of Local Anesthetic
 - 2. Overdose To Vasoconstrictor
 - 3. Allergy
 - a. Sodium Bisulfate Allergy
 - b. Epinephrine Allergy
 - c. Latex allergy
 - d. Topical Anesthetic allergy

XIII. Documentation and Legal Issues

- A. Type Of Local Anesthesia
- B. Calculation Of Dose Of Local Anesthesia
- C. With Or Without Vasoconstrictor
- D. Pre And Post-Op Vitals
- E. Legalities Of Proper Documentation
- F. Patient Consent
- G. HIPAA
- H. Legal Issues Of Overdose
- I. Legal Issues Of Allergic Reactions
- J. Legal Issues Of Local Reactions To Local Anesthetic Administrations
 - 1. Lip Chewing
 - 2. Subcutaneous Emphysema
 - 3. Vascular Penetration
 - 4. Neural Penetration
 - 5. Chemical Nerve Injury
 - 6. Drug Interactions
 - 7. Psychogenic Reactions
- K. Post Procedure Evaluations
- L. Respondiat Superior
- M. Statute Violations
- N. Existence Of Malpractice

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STUDENT ACKNOWLEDGEMENT VERIFICATION

I, _____ acknowledge that I have read and understand the requirements for DHY-220 Local Anesthesia as stated in this course syllabus. I agree to abide by the protocols and requirements set forth in this course syllabus, the *Bergen Community College Dental Hygiene Student Handbook*, *The Bergen Community College Clinic Manual*, and the *Bergen Community College Catalog*.

Student Signature/Date

Faculty Signature/Date