El Paso Community College
Syllabus
Part II
Official Course Description

SUBJECT AREA	**Dental Hygiene**
COURSE RUBRIC AND NUMBER	**DHYG 1235**
COURSE TITLE	**Pharmacology for the Dental Hygienist**
COURSE CREDIT HOURS	**2 2 : 0** **Credits Lec. Lab**

I. Catalog Description

Classification of drugs and their uses, actions, interactions, side effects, contraindications, with emphasis on dental applications. A grade of "C" or better is required in this course to take the next course. **Prerequisites: DHYG 1239 and DHYG 1301 and DHYG 1304 and DHYG 1431. Corequisites: DHYG 1219 and DHYG 1261 and DHYG 1311 and DHYG 2201. (2:0).**

II. Course Objectives

Part One: GENERAL PRINCIPLES

A. Unit 1. Information, Sources, Regulatory Agencies, Drug Legislation, and Prescription Writing

1. Discuss the history of pharmacology.
2. Define the role of the dental hygienist in pharmacologic patient education.
3. List where detailed and updated sources of information on medication can be found.
4. Define the way in which drug are named.
    a. Define generic equivalence.
    b. Explain how generic equivalence is related to drug substitution.
5. Describe the acts and agencies within the federal government designated to regulate drugs.
    a. Harrison Narcotic Act
    b. Food and Drug Administration (FDA)
    c. Federal Trade Commission (FTC)
    d. Drug Enforcement Administration (DEA)
    e. Omnibus Budget Reconciliation Act of 1990 (OBRA)
6. Identify the four phases of clinical evaluation involved in new drug approval.
7. Discuss drug legislation.
    a. Describe the historical evolution of drug legislation.
    b. List the five schedules of controlled substances.
    c. Explain package inserts and black box warnings.
    d. Differentiate between labeled and off-label uses
    e. Explain orphan drugs and drug recalls.
8. Identify the correct steps to prescription writing.
9. Explain the importance of patient adherence to medication therapy.

B. Unit 2. Drug Action and Handling

1. Differentiate dose, potency, and efficacy in the context of the actions of drugs.

2. Explain the pharmacologic effect of a drug.
3. Discuss the major steps of pharmacokinetics:
    a. Absorption.
    b. Distribution.
    c. Metabolism.
    d. Excretion.
4. Explain how altering absorption, distribution, metabolism, and excretion can affect clinical pharmacokinetics.
5. Explain how half-life relates to clinical pharmacokinetics.
6. Provide example of factors that may alter the effect of a drug.
7. Summarize the various routes of drug administration and the common dose forms used.

C. Unit 3. Adverse Reactions

1. Define an adverse drug reaction and name five categories of reaction.
2. Discuss the risk-to-benefit ratio of the use of a drug for therapeutic effect and its potential adverse reactions.
3. Explain how the toxic effects of drugs are evaluated.
4. Discuss the importance of recognizing adverse drug effects.

Part Two: DRUGS USED IN DENTISTRY

D. Unit 4. Autonomic Drugs

Autonomic Nervous System

1. Identify the major components and functional organization of the autonomic nervous system.
2. Discuss the pharmacologic effects, adverse reactions, contraindications, and dental considerations of cholinergic agents which are part of the parasympathetic autonomic nervous system.
3. Discuss the pharmacologic effects, adverse reactions, contraindications, and dental considerations of anticholinergic agents which are part of the parasympathetic autonomic nervous system.
4. Discuss the major neurotransmitters in the sympathetic autonomic nervous system and the importance of receptors.

Adrenergic and Adrenergic Blocking Agents

5. Discuss the pharmacologic effects, adverse reactions, contraindications, and dental considerations of adrenergic agents and list several specific adrenergic agents.
6. Explain the workings of adrenergic blocking agents and neuromuscular blocking agents.

E. Unit 5. Nonopioid (Nonnarcotic) Analgesics

Analgesic Agents and Aspirin

1. Describe pain and its purpose and main components.
2. Discuss the classification of analgesic agents and the chemistry, pharmacokinetics, pharmacologic effects, adverse reactions, toxicity, drug interactions, and uses of aspirin.

Nonsteroidal Anti-inflammatory Drugs (NSAIDs), Acetaminophen, and Agents Used to Treat Gout

3. Define the term nonsteroidal anti-inflammatory drug and discuss the chemistry, pharmacokinetics, pharmacologic effects, adverse reactions, toxicity, drug interactions, uses, and several examples of these drugs.
4. Discuss the properties, pharmacologic effects, adverse reactions, drug interactions, uses, and dosing of acetaminophen.
5. Explain the disease known as gout and summarize the drugs used to treat it.

F. Unit 6. Opioid (Narcotic) Analgesics and Antagonists

1. Explain the classification, mechanism of action, and pharmacokinetics of opioids.
2. List and describe the pharmacologic effects and potential adverse reactions of opioids.
3. Discuss the addiction potential of opioids, including treatment.
4. Name and explain the analgesic actions of the most common opioid agonists.
5. Discuss the actions of and provide examples of the mixed opioids.
6. Summarize the mechanism of action and adverse reactions of tramadol.
7. Apply the use of opioids to dentistry.

G. Unit 7. Antiinfective Agents

Purpose and Use of Antiinfective Agents

1. Outline the history and basic principles of infection and its relevance to dentistry, including:
    a. Define the terms pertinent to a discussion about infection.
    b. Identify the factors that determine the likelihood of an infection.
    c. Describe the importance of cultures and sensitivity in relation to infections.
    d. Discuss the reasons an understanding of "resistance" is important with regard to infections.
2. Summarize the principal indications for the use of antimicrobial agents.
3. Name and describe the major adverse reactions and disadvantages associated with the use of anti-infective agents.
4. Discuss penicillins, macrolides, tetracyclines, cephalosporins—their chemical makeup, properties, mechanisms of action, uses, and potential adverse reactions—and name several specific types of each.
5. Name and describe two other types of antibiotics and anti-infective, including their chemical makeup, properties, mechanisms of action, potential adverse reactions, and uses.

Dental Drug Considerations

6. Discuss the rationale for the use of anti-infective agents in dentistry.
7. Discuss antimicrobial agents for nondental uses including their pharmacokinetics, mechanism of action, adverse reactions, and spectrum of use.
8. Describe the drugs used to treat tuberculosis and the difficulties this disease presents.
9. Discuss the use of topical antibiotics in dentistry.
10. Summarize the concept and practice of antibiotic prophylaxis in dentistry.

H. Unit 8. Antifungal and Antiviral Agents

1. Name several types of antifungal agents and discuss their indications in dentistry and potential adverse reactions.
2. Discuss the use of antiviral agents in the treatment of herpes simplex.
3. Describe the various drugs and drug combinations used to treat acquired immunodeficiency syndrome.
4. Describe the various drugs used to treat chronic hepatitis.

I. Unit 9. Local Anesthetics

History and Purpose of Anesthetics

1. Discuss the history and reasons for the use of local anesthetics in dentistry, including:
    a. List the properties an ideal local anesthetic would possess.
    b. Describe the importance of understanding the chemistry involved in local anesthetic agents.
2. Explain the mechanism of action, pharmacokinetics, pharmacologic effects, and adverse reactions of local anesthetics.

Local Anesthetic Agents and Their Use in Dentistry

3. Describe the composition of each of the drugs used in local anesthetic solutions and summarize the factors involved in the choice of a local anesthetic.
4. Briefly discuss the use, types, and doses of topical anesthetics used in dentistry.

J. Unit 10. General Anesthetics

1. Summarize the history of general anesthesia in dentistry.
2. Describe how general anesthesia works and the stages and planes involved, as well as possible adverse reactions associated with its use.
3. Compare and contrast the classifications of general anesthesia.
4. Discuss the use of nitrous oxide in dentistry, including how it works, the pharmacologic effects, adverse reactions, and contraindications.
5. Name and describe several types of halogenated hydrocarbons.
6. List the goals of surgical anesthesia and the importance of using balanced general anesthesia.

K. Unit 11. Antianxiety Agents

1. Discuss the value of patient relaxation in dentistry.
2. Describe the pharmacokinetics, mechanism of action, pharmacologic effects, adverse reactions, drug interactions, medical uses and dental relevance of the benzodiazepines and barbiturates.
3. Name and briefly describe the mechanism of action of the nonbenzodiazepine-nonbarbiturate sedative-hypnotics and the nonbenzodiazepine-nonbarbiturate receptor agonists.
4. Name a melatonin receptor agonist and summarize its actions.
5. Explain the workings of the centrally acting muscle relaxants and how they are used.
6. Name and briefly describe a few of the miscellaneous muscle relaxant agents that can be used.
7. Discuss some general precautions about which the dental practitioner should be aware with the use of antianxiety agents.

L. Unit 12. Oral Conditions and Their Treatment

1. Name several common infectious lesions of the oral cavity and summarize the treatments for each.
2. Describe immune reactions resulting in canker sores and lichen planus and discuss the treatments for each.
3. Name several oral conditions that result from inflammation and the measures used to treat them.
4. Discuss treatment options for xerostomia and name several other possible drug-induced oral side effects.
5. Discuss the pharmacologic agents most commonly used to treat oral lesions.

Part Three: DRUGS THAT MAY ALTER DENTAL TREATMENT

M. Unit 13. Drugs for the Treatment of Cardiovascular Disease

Cardiovascular Agents

1. Identify the dental implications of cardiovascular disease including the contraindications to treatment, vasoconstrictor use and its relationship to periodontal disease.
2. Describe heart failure and identify drugs commonly used to treat it, including the mechanisms of action, pharmacologic effects, and adverse reactions.
3. Discuss the use of digoxin and the management of dental patients taking it.
4. Define arrhythmia and dysrhythmia and describe how the heart maintains its normal rhythm.

5. Describe the classifications, mechanisms of action, adverse reactions, and uses of antiarrhythmic agents and identify the issues to consider in dental treatment.
6. Define angina pectoris and describe the types of drugs used to treat it; identify the dental implications of these drugs.

Antihypertensive Agents That Alter Dental Treatment

7. Define hypertension, describe the categories it is divided into and identify its treatment with the various types of antihypertensive agents, including:
    a. Describe the mechanisms of action, pharmacologic effects, adverse reactions, and uses of the various antihypertensive agents.
    b. Identify potential drug interactions and the dental implications of these drugs.
    c. Discuss the management of dental patients taking these drugs.

Antihyperlipidemic and Blood Coagulation Agents That Alter Dental Treatment

8. Define hyperlipidemia and hyperlipoproteinemia and summarize the types of drugs used to restore cholesterol homeostasis in the body including the dental implications of their use.
9. Describe the role of warfarin in blood coagulation and the potential adverse reactions and interactions associated with its use.
10. Identify several other drugs that affect blood coagulation.

N. Unit 14. Drugs for the Treatment of Gastrointestinal Disorders

1. Summarize the most common types of gastrointestinal diseases and their impact on oral health care.
2. Name and describe the types of drugs used to treat gastrointestinal diseases, their uses, adverse reactions, drug interactions and any implications to dentistry, including,
    a. Discuss the role of H2-receptor blockers in the treatment of peptic ulcer disease and gastroesophageal reflux disease.
    b. Discuss the role of proton pump inhibitors and antibiotics in the treatment of peptic ulcer disease and gastroesophageal reflux disease.
    c. Describe the role of antacids in the treatment of peptic ulcer disease and gastroesophageal reflux disease.
3. Discuss several miscellaneous gastrointestinal drugs that can be used and their possible side effects.
4. List the different types of laxatives and know the advantages and disadvantages of each.
5. List the medications used to treat diarrhea.
6. Define the term antiemetic and give examples of drugs used to treat vomiting and nausea.
7. Discuss the medications used to manage chronic inflammatory bowel disease (IBD).

O. Unit 15. Drugs for the Treatment of Seizure Disorders

1. Define epilepsy and briefly summarize the various types of seizures.
2. Discuss drug therapy of patients with epilepsy and describe the general adverse reactions to antiepileptic agents.
3. Summarize the pharmacologic effects, adverse reactions, and drug interactions of the main antiepileptics—valproate, lamotrigine, levetiracetam, oxcarbazepine, carbamazepine, and phenytoin.
4. Discuss ethosuximide and benzodiazepines (two miscellaneous antiepileptics) and describe the workings of each.
5. Provide several examples of new types of antiepileptics, including the mechanism of action, indications, and adverse reactions of each.
6. Outline the dental treatment of patients with epilepsy.

P. Unit 16. Drugs for the Treatment of Central Nervous System Disorders

1. Name and describe the three categories of functional disorders discussed in this chapter.

2. Outline some basic precautions that the dental health care professional should keep in mind when treating patients with psychiatric disorders.
3. Discuss antipsychotic agents and their mechanism of action as well as the following:
    a. Identify first generation antipsychotics and their adverse reactions.
    b. Identify second generation antipsychotics, their adverse effects, drug interactions, uses and dental implications.
4. Discuss antidepressant agents, including:
    a. Describe the mechanism of action and adverse reactions of selective serotonin reuptake inhibitors.
    b. Describe the mechanism of action and adverse effects of serotonin norepinephrine reuptake inhibitors.
    c. Describe the mechanism of action, adverse reactions, and drug interactions of the tricyclic antidepressants.
5. Name several other types of antidepressants and their possible adverse reactions and dental implications.
6. List several drugs used to treat bipolar disorder.

Q. Unit 17. Adrenocorticosteroids

1. Define adrenocorticosteroids and describe how the body releases them.
2. Summarize the classification, administration, mechanism of action, and pharmacologic effects of adrenocorticosteroids.
3. Describe the various adverse reactions and uses of adrenocorticosteroids, including their application to dentistry.
4. List several examples of corticosteroid products and describe the ways in which they are differentiated.
5. List several dental implications to the use of steroids.

R. Unit 18. Drugs for the Treatment of Respiratory Disorders

1. Summarize the two groups of respiratory diseases.
2. Name and describe the mechanisms of action of several types of drugs used to treat respiratory diseases.
3. Discuss the types of drugs used to treat respiratory infections, including the implications to dentistry.

S. Unit 19. Drugs for the Treatment of Allergic Rhinitis

1. Define allergic rhinitis and describe the dental implications, pharmacologic effects, adverse reactions, and toxicity of antihistamines.
2. Describe the dental implications, pharmacologic effects, and adverse reactions of the intranasal corticosteroids.
3. Discuss montelukast, cromolyn sodium, and ipratropium bromide and describe their role in treating allergic rhinitis. Also describe the adverse reactions of ipratropium bromide.
4. Describe the use of decongestants, including:
    a. Discuss the pharmacologic effects, adverse reactions and uses in treating allergies.
    b. Discuss the use of intranasal decongestants as an alternative to oral decongestants.

T. Unit 20. Drugs for the Treatment of Diabetes Mellitus

1. Define diabetes mellitus.
2. List and describe the two types of this disease, its complications, and issues involving dentistry as well as cautions and contraindications in the treatment of patients with diabetes.
3. List and describe the effects of drugs on the complications of diabetes.
4. Name and describe the types of drugs used to treat diabetes.

5. Discuss the dental concerns associated with antidiabetic therapy.

U. Unit 21. Drugs for the Treatment of Endocrine Disorders

1. Discuss pituitary hormones, the functions of the anterior and posterior pituitary glands and describe the negative feedback mechanism that takes place in endocrine glands.
2. Provide an overview of the thyroid hormones, conditions known as hypothyroidism and hyperthyroidism and antithyroid drugs.
3. Summarize the major female and male sex hormones and describe several types of hormonal contraceptives.
4. Discuss other agents that affect sex hormone systems.

V. Unit 22. Antineoplastic Drugs

1. Discuss antineoplastic agents and summarize their use, mechanisms of action, and classification.
2. Describe several adverse drug effects associated with antineoplastic agents.
3. Discuss the dental implications of patients planning to take or actively taking antineoplastic drugs.

Part Four: SPECIAL SITUATIONS

W. Unit 24. Emergency Drugs

1. Summarize the general measures a dental professional should follow to train for an emergency, including:
    a. Describe the necessary preparation for treatment in the event of an emergency.
    b. List what can be done to help minimize the occurrence of an emergency in the dental office.
    c. List the steps that should be followed if an emergency does occur in the dental office.
2. Name and describe several categories of emergencies and provide common examples within each category.
3. List the critical drugs to include in a dental office emergency kit and several examples of second- or third-level drugs that would be optional.
4. Name several pieces of equipment that would be included in the emergency kit.

X. Unit 25. Pregnancy and Breastfeeding

1. List the two main concerns in the administration of drugs during pregnancy.
2. Describe the pregnancy trimesters in relation to dental treatment, define teratogenicity, outline the Food and Drug Administration's pregnancy categories for drugs, and discuss how breastfeeding affects dental drug use.
3. Name several types of local anesthetic, anti-infective, and antianxiety agents and state their indications or contraindications for pregnant women.

Y. Unit 27. Natural/Herbal Products and Dietary Supplements

1. Discuss why people choose herbal products over traditional medicine.
2. Discuss the federal legislation governing herbal and dietary products.
3. Discuss the safety of herbal and nutritional products and explain the adverse effects associated with their use and their impact on oral health care.
4. Explain the drug interactions associated with herbal products and their impact on oral health care.
5. Discuss the standardization of herbal products and the Good Manufacturing Practice standard introduced by the FDA.

6. Discuss the herbal supplements that are used in oral health care.

III. THECB Learning Outcomes (WECM)

1. Differentiate the classification of drugs; identify the uses, actions, and contraindications of drugs.
2. Recognize systemic and oral manifestations associated with their use.

IV. Evaluation

A. Examinations
Chapter quizzes and five (5) examinations will be administered throughout the semester. There will also be a Midterm and Final examination. Students will also complete weekly homework assignments and a term paper.

B. Grading Scale
A = 93 – 100
B = 83 – 92
C = 75 – 82
D = 74 – 70
F = 69 and below

** The minimum acceptable numerical number is a 75% as determined by the program's promotion and graduation policies. In the event a grade is borderline, class attendance and participation will be considered in the final computation.*

V. Disability Statement (Americans with Disabilities Act [ADA])

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Rm C-112 (831-2426); TM Rm 1400 (831-5808); RG Rm B-201 (831-4198); NWC Rm M-54 (831-8815); and MDP Rm A-125 (831-7024).

VI. 6 Drop Rule

Students who began attending Texas public institutions of higher education for the first time during the Fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.

VII. Title IX and Sex Discrimination

Title 9 (20 U.S.C. 1681 & 34 C.F.R. Part 106) states the following "No person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any educational program or activity receiving Federal financial assistance." The Violence Against Women Act (VAWA) prohibits stalking, date violence, sexual violence, and domestic violence for all students, employees and visitors (male and female). If you have any concerns related to discrimination, harassment, or assault (of any type) you can contact the Assistant to the Vice President for Student and Enrollment Services at 915-831-2655. Employees can call the Manager of Employee Relations at 915-831-6458. Reports of sexual assault/violence may also be reported to EPCC Police at 915-831-2200.

VIII. Dental Hygiene Entry-Level Competencies

C.3 Use critical thinking skills and comprehensive problem-solving to identify oral health care strategies that promote patient health and wellness.

C.7 Integrate accepted scientific theories and research into educational, preventive, and therapeutic oral health services.