

**CYPRESS COLLEGE
SYLLABUS**

COURSE: 250 PHARMACOLOGY

CRN # 10876

SEMESTER: FALL 2017

INSTRUCTOR: George F. Green, D.D.S., B.A.

PHONE/VOICE MAIL:

Department Secretary (714) 484-7298

OFFICE HOURS: Arranged as needed

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ggreen@cypresscollege.edu

PREREQUISITE: Enrollment in the Dental Hygiene Program, Second Year Standing

CATALOG DESCRIPTION: This course presents information on medications, including mechanisms of action, indications for use, pharmacology, adverse effects, drug interactions, indications and contraindications, with an emphasis on medications commonly encountered in the dental setting. The effects of medications on dental health are also reviewed with a focus on consumer education.

LECTURE: 2 HOURS

LAB: NONE

COURSE UNITS: 2

REQUIRED TEXTS:

Applied Pharmacology for the Dental Hygienist, 7th edition, Haveles
C.V. Mosby Co., ISBN-13: 978-0-323-17111-3

Drug Information Handbook for Dentistry, 22nd edition, Wynn, Meiller, Crossley, Wolters
Kluwer Health, 2013, ISBN: 978-1-59195-356-2

SUPPLEMENTAL REFERENCES:

- **RxList.com**
- **Review questions and answers**
(access at faculty website): <http://www.cypresscollege.edu/ad/adjunct.aspx?ID=ggreen>

INSTRUCTIONAL OBJECTIVES

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

1. Explain the drug receptor and the sequela to drug-receptor interaction.
2. Discuss the concept of a dose-response curve.
3. Explain the concepts governing drug pharmacokinetics: drug absorption, distribution, and metabolism.
4. Explain drug synergism and drug antagonism.
5. Identify the components of the drug prescription and write a prescription.
6. Describe the federal and state laws regarding drug prescription and the medico-legal ramifications of such laws.
7. Explain the placebo effect and its clinical uses.
8. Discuss the concept of neurohumoral nerve impulse transmission.
9. Classify and explain drugs affecting the autonomic nervous system.
10. Classify and explain drugs affecting the neuromuscular junction.
11. Describe and explain drugs employed in the management of anxiety: sedative-hypnotics and benzodiazepines.
12. Explain the concepts of pain perception and pain reaction.
13. List and describe non-narcotic and narcotic analgesics: non-steroidal anti-inflammatory agents, acetaminophen, and opioids.
14. Demonstrate an understanding of the principles of local anesthesia and local anesthetic agents used in dentistry.
15. Demonstrate an understanding of the principles of inhalation general anesthesia and list representative general anesthetic agents.
16. Discuss the chemical etiology of emotional disorders.
17. Describe the pharmacology of drugs used in mental disease: antipsychotic neuroleptics, antidepressants, and antimania agents.
18. Describe the personal, medical, and social consequences of ethyl alcohol.
19. List the various categories of drugs used to treat cardiovascular disease and describe the basic pharmacology of each group.
20. Discuss the ramifications of cardiovascular drugs in the dental patient.
21. Discuss the principles of the etiology and management of orofacial infections.
22. List the types of dental patients at risk for dentally induced bacteremias and the principles of antibiotic prophylaxis to prevent such infections.
23. Write correct prescriptions for antibiotic prophylaxis according to the American Heart Association.
24. Discuss the pharmacology and use of antibiotics for orofacial infections including penicillins, macrolides, lincosamides, tetracyclines, and quinolones.
25. Discuss the use of histamine antagonists in the management of asthma, allergy, and peptic ulcers.
26. Explain the principles of anticancer chemotherapy as it applies to dental patients.
27. Discuss the physiological effects of adrenal steroids, oral contraceptives, and antidiabetic agents.
28. Explain the fundamental principles of drug toxicity and allergy.
29. Discuss the current social and personal problems with drug dependence and abuse and the management of the chemically dependent patient.
30. Explain the potential harmful effects of drugs on the developing fetus (teratology) and list known teratogenic drugs.
31. List the drugs required for management of medical and dental emergencies in the dental office and explain the proper use of each antidotal agent.

TOPIC OBJECTIVES DH 255 ANESTHESIA, ANXIETY, AND PAIN CONTROL

1. Topic: Information, Sources, Regulatory Agencies, Drug Legislation, Prescription Writing

Discuss the history of pharmacology and its relationship to the oral health care provider. Define the ways in which drugs are named and the significance of each. Describe the acts and agencies within the federal government designed to regulate drugs. Identify the four phases of clinical evaluation involved in drug approval and the five schedules of drugs. Describe the elements of a drug prescription.

2. Topic: Drug Action and Handling

Differentiate dose, potency, and efficacy in the context of the actions of drugs. Explain the pharmacologic effect of a drug. Discuss the major steps of pharmacokinetics. Summarize the various routes of drug administration. Provide examples of factors that may alter the effects of drugs.

3. Topic: Adverse Reactions

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

4. Topic: Autonomic Drugs

Identify the major components and functional organization of the autonomic nervous system, including the parasympathetic system and the sympathetic system. Discuss the pharmacologic effects, adverse reactions, contraindications, and dental considerations of cholinergic agents, anticholinergic agents, adrenergic agents, and adrenergic blocking agents. Explain the workings of the adrenergic blocking agents and the neuromuscular blocking agents.

5. Topic: Nonopioid Analgesics

Describe pain and its purpose and main components. Discuss the chemistry and pharmacokinetics, pharmacologic effects, adverse reactions, toxicity, drug interactions, and uses of aspirin and acetaminophen. Define the term *nonsteroidal antiinflammatory drug*, and discuss the chemistry and pharmacokinetics, pharmacologic effects, adverse reactions, toxicity, drug interactions, and uses of these drugs.

6. Topic: Opioid Analgesics

Explain the classification, mechanisms of action, and pharmacokinetics of opioids. List and describe the pharmacologic effects and potential adverse reactions of opioids. Discuss the addiction potential of opioids, including treatment. Name and explain the analgesic actions of the

most common opioid agonists. Discuss the action and provide examples of the mixed opioids. Summarize the mechanism of action of tramadol. Apply the use of opioids in dentistry.

7. Topic: Antiinfective Agents

Outline the history and basic principles of infection and its relevance to dentistry. Summarize the principle indications for the use of antimicrobial agents. Name and describe the major adverse reactions and disadvantages associated with the use of antiinfective agents. Discuss penicillin, macrolides, tetracyclines, lincosides, and cephalosporins - their chemical makeup, properties, mechanisms of action, uses and potential adverse reactions - and name several specific types. Name and describe several other types of antibiotics and antiinfectives. Discuss the use of antiinfectives in dentistry. Describe the drugs used to treat tuberculosis and the difficulties this disease presents. Summarize the concept and practice of antibiotic prophylaxis in dentistry.

8. Topic: Antifungal and Antiviral Agents

Name several types of antifungal agents and discuss their indications in dentistry and potential adverse reactions. Discuss the treatment of herpes simplex. Describe the various drugs and drug combinations used to treat AIDS.

9. Topic: Local Anesthetics

Discuss the history and reasons for the use of local anesthetics in dentistry. Explain the mechanism of action, pharmacokinetics, pharmacologic effects, and adverse reactions of local anesthetics. Describe the types and workings of each of the drugs used in local anesthetic solutions and summarize the factors involved in the choice of a local anesthetic. Briefly discuss the use of and types of topical anesthetics used in dentistry.

10. Topic: General Anesthetics

Summarize the history of general anesthesia in dentistry. Describe how general anesthesia works and the stages and planes involved. Compare and contrast the classifications of general anesthesia. Discuss the use of nitrous oxide in dentistry, including how it works, the pharmacologic effects, adverse reactions, and contraindications. Name and describe several types of halogenated hydrocarbons. Identify and describe other types of general anesthesia.

11. Topic: Antianxiety Agents

Discuss the value of patient relaxation in dentistry. Describe the mechanism of action, interactions, and dental relevance of the benzodiazepines and barbiturates. Name and briefly describe the mechanism of action of the nonbenzodiazepine nonbarbiturate sedative-hypnotics and the nonbenzodiazepine-nonbarbiturate receptor agonists. Name a melatonin receptor agonist and summarize its actions. Explain the workings of the centrally acting muscle relaxants and how they are used. Discuss some general precautions about which the general practitioner should be aware with the use of antianxiety agents.

12. Topic: Vitamins and Minerals

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13. Topic: Oral Conditions and Their Treatment

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

14. Topic: Hygiene-Related Oral Disorders

Discuss the nonpharmacologic therapies that are effective in preventing caries. Discuss the proper methods that patients should use when brushing and flossing. Discuss the role of fluoride in preventing caries. Differentiate between acute and chronic fluoride toxicity and know how to treat both. Compare and contrast both professionally applied and at-home fluoride preparations. Discuss the proper methods that patients should use regarding at-home fluoride preparations. Discuss the proper method for administering professionally applied fluoride preparations. Discuss the pathology and incidence of gingivitis. Compare and contrast the available treatments for gingivitis. Discuss the pathophysiology of tooth hypersensitivity. Compare and contrast the at-home and in-office therapies for the treatment of tooth hypersensitivity. Discuss the dental hygiene considerations associated with caries, gingivitis, and tooth hypersensitivity.

15. Topic: Cardiovascular Drugs

Identify several dental issues in the treatment of patients with cardiovascular disease. Describe heart failure and identify drugs commonly used to treat it, including the mechanisms of action, pharmacologic effects, adverse reactions, and uses of each. Define arrhythmia and dysrhythmia and describe how the heart maintains its normal rhythm. Describe the mechanisms of action, pharmacologic effects, adverse reactions, and uses of antiarrhythmic agents and identify the issues to consider in dental practice. Define angina pectoris and describe the types of drugs used to treat it; identify the dental implications of these drugs. Describe the various types of antihypertensive agents, including the mechanisms of action, pharmacologic effects, adverse reactions, and uses of each. Also identify potential drug interactions and the dental implications of these drugs. Define hyperlipidemia and hyperlipoproteinemia and summarize the types of drugs used to restore cholesterol homeostasis in the body. Describe the role of warfarin in blood coagulation and the potential adverse reactions and interactions associated with its use. Identify several other drugs that affect blood coagulation.

16. Topic: Anticonvulsants

Define epilepsy and briefly summarize the various types of seizures. List and describe adverse reactions to the anticonvulsants. Summarize the pharmacologic effects, adverse reactions, and drug interactions of the main anticonvulsants - carbamazepine, valproate, phenobarbital, and

phenytoin. Name two miscellaneous anticonvulsants and describe the workings of each. Provide several examples of new types of anticonvulsants, including the mechanisms of action, indications, and adverse reactions of each. Outline the dental treatment of patients with epilepsy.

17. Topic: Psychotherapeutic Agents

Name and describe the three categories of functional disorders. Outline some basic precautions that the dental health care professional should keep in mind when treating patients with psychiatric disorders. Summarize the basic mechanism of action, pharmacologic effects, adverse reactions, drug interactions, uses of the antipsychotic agents. Describe the basic mechanism of action, pharmacologic effects, adverse reactions, drug interactions, uses, and dental implications of the tricyclic antidepressants. Describe the basic mechanism of action, pharmacologic effects, adverse reactions, drug interactions, uses, and dental implications of the selective serotonin reuptake inhibitors. Name several other types of antidepressants. List several drugs used to treat bipolar disorder.

18. Topic: Autocoids and Antihistamines

Define histamine and discuss its pharmacologic effects, adverse reactions, and uses. Describe the dental implications, pharmacologic effects, adverse reactions, toxicity, and uses of the antihistamines. Name and discuss the mechanism of action of non-sedating H₁-receptor antagonists. Categorize the prostaglandins and thromboxanes and outline their pharmacologic effects, uses, and dental implications. List several other types of autocoids and describe how they work.

19. Topic: Adrenocorticosteroids

Define adrenocorticosteroids and describe how the body releases them. Summarize the classification, administration, mechanism of action, and pharmacologic effects of the adrenocorticosteroids. Describe the various adverse reactions and uses of adrenocorticosteroids, including their application to dentistry. Differentiate several examples of corticosteroids. List several dental implications to the use of steroids.

20. Topic: Other Hormones

Outline the functions of the anterior and posterior pituitary gland. Provide an overview of the thyroid hormones and the conditions known as hypothyroidism and hyperthyroidism and the antithyroid drugs. Define diabetes mellitus, list and describe the two types of this disease, its complications, issues involving dentistry, cautions and contraindications in the treatment of patients with the diabetes, and the effects of drugs on complications of diabetes. Name and describe the types of drugs used to treat diabetes. Summarize the major male and female sex hormones and name and describe several types of hormonal contraceptives.

21. Topic: Antineoplastic Drugs

Define antineoplastic agents. Summarize the use, mechanism of action, and classification of antineoplastic agents. Describe several adverse drug effects associated with antineoplastic agents. Discuss the dental implications of patients planning to take or actively taking antineoplastic drugs.

22. Topic: Respiratory and Gastrointestinal Drugs

Summarize the two groups of respiratory disease. Name and describe the mechanism of action of several types of drugs used to treat respiratory diseases. Discuss the types of drugs used to treat respiratory infections, including the implications to dentistry. Summarize the most common types of gastrointestinal diseases. Name and describe the types of drugs used to treat gastrointestinal diseases, including any implications to dentistry.

23. Topic: Emergency Drugs

Summarize the general measures a dental professional should follow to train for an emergency and the preparation for treatment in the event of an emergency. Name and describe several categories of emergencies and provide common examples within each category. List the critical drugs to include in a dental office emergency kit and several examples of second and third level drugs that would be optional. Name several pieces of equipment that would be included in the emergency kit.

24. Topic: Pregnancy and Breast Feeding

List the two main concerns in the administration of drugs during pregnancy. Define teratogenicity and outline the FDA categories of drugs for pregnancy. Name several types of local anesthetic, antiinfectives, and anxiety agents and state their indications or contraindications for pregnant women.

25. Topic: Drug Abuse

Define addiction, dependence, tolerance, and withdrawal in relation to drug abuse. Name several types of CNS depressants that are commonly abused and outline the typical pattern of abuse, treatment, adverse reactions, management of overdose and withdrawal, and dental treatment implications of each. Identify several types of CNS stimulants that are commonly abused. Describe the pattern of abuse and treatment options associated with tobacco use, and summarize the role of the dental health care worker in tobacco cessation. Discuss ways in which the dental health care worker can identify patients or colleagues who may be abusing drugs.

26. Topic: Natural/Herbal Products and Dietary Supplements

Discuss why people choose herbal products over traditional medicine. Discuss the federal legislation governing herbal and dietary products. Discuss Good Manufacturing Practice and the standardization of herbal products. Explain the adverse effects and drug interactions associated with herbal products and their impact on oral health care. Discuss the herbal supplements that are

used in oral health care. Explain the dental hygiene considerations associated with the use of herbal products.

STUDENT LEARNING OUTCOMES FOR DH 250

A. Outcome: Upon the completion of the course the student will be able to identify and/or explain the components of a drug prescription, Federal and State laws regarding prescription drugs and medico-legal ramifications of such laws, drugs affecting the autonomic and neuromuscular junction by classification, the pharmacology of drugs employed in the management of anxiety, mental disorders, cardiovascular disease, diabetes, oro-facial infections and adrenal disease, and the fundamental principles of drug toxicity and allergy at a level of 75% or greater.

Assessment: Student will attain a grade of 75% or greater on tests, assignments, and presentations.

B. Outcome: Upon completion of the course the student will be able to identify the top 20 prescription drugs and their relation to dental treatment with regard to contra-indications for or modifications of specific dental treatment and list and describe non-narcotic and narcotic analgesics, non-steroidal anti-inflammatory agents, and acetaminophen and opiates at a level of 75% or greater.

Assessment: Student will attain a grade of 75% or greater on tests, assignments, and presentations.

SUPPLIES IDENTIFIED: None

INSTRUCTIONAL METHODOLOGIES:

1. Lecture
2. Group Discussion
3. Written Assignments
4. Audio-visual presentation
5. Case studies, cooperative learning

GRADING CRITERIA:

Grading will be based upon a combination of quizzes (10 minutes), exams (60 minutes), and a final examination (120 minutes).

Quizzes (10 at 5 points each)
Exams (2 at 100 points each)
Final Exam (1 at 200 points)

Quizzes: Five points each. Keep ten highest scores, throw out lowest score.

Exam #1	100	pts	A=	414 - 450
Exam #2	100	pts	B=	378 - 413
			C=	338 - 377
Quizzes	50	pts	D=	293 - 337
Final	<u>200</u>	pts		
	450	pts		

GRADING POLICIES:

1. Examinations will be based upon all lecture and material presented as well as on all reading assignments.
2. **Students absent more than one time may receive an instructor withdrawal from the course.**
3. Examinations will be comprehensive and include a combination of essay, short answer and multiple choice questions, true-false, fill-in, and problem solving.
4. **In the event of an absence**, it is the student's responsibility to make up all assignments and course work. The assignments must be made up immediately upon the students return to classes. Make up exams will be given for an excused absence only (doctor's note) and will be given at the convenience of the instructor.
5. **Academic Honesty Policy must be followed (see Academic policy statement in the college catalog).**

REQUIREMENTS PERTAINING TO ALL STUDENTS:

1. Students must provide text books, pencils, pens, and scantron forms (as needed) for quizzes, midterm exams and final exams.
2. Participation in all class and sessions is required.
3. **Students must complete assigned readings from textbooks, references and handouts. It strongly recommended to read the reading assignments prior to the lecture in each subject area.**

ACADEMIC ACCOMMODATIONS: A student who feels he or she may need an accommodation based on the impact of a disability should contact Disabled Students Program & Services at 714-484-7104 or visit DSPS on the first floor of the Cypress College Complex, Room 100. For students who have already been determined eligible for DSPS services, please provide the instructor with the proper DSPS form at the beginning of the semester and at least one week prior to the verified and identified need. Students will otherwise be expected to adhere to the information included on this course syllabus. <http://www.cypresscollege.edu/services/dsps>

SEXUAL HARASSMENT AND DISCRIMINATION: It is the policy of the North Orange County Community College District to provide an educational, employment, and business environment in which no person shall be unlawfully subjected to discrimination or sexual harassment, nor unlawfully denied full and equal access to the benefits of District programs or activities on the basis of ethnic group identification, national origin, religion, age, gender, race, color, ancestry, sexual orientation, marital status, or physical or mental disability as defined and prohibited by state and federal statutes. Any student who engages in unlawful discrimination or sexual harassment in violation of this policy will be subject to disciplinary action, which may include suspension or expulsion. Students who believe they have been subjected to unlawful discrimination, including sexual harassment, or who seek information regarding the District's Unlawful Discrimination Policy, should contact the Office of the District Director of Human Resources at (714) 808-4818.

The following person is designated by the North Orange County Community College District as the Responsible Officer/Section 504 and Title IX Coordinator for receiving and coordinating the investigation of all unlawful discrimination complaints filed pursuant to section 59328 of Title 5 of the California Code of Regulations, and for coordinating compliance with section 504 of the Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act of 1990, Title IX of the Education Amendments of 1992, and response to discrimination complaints related there to:

Name: Jeffrey O. Horsley
Position: Vice Chancellor, Human Resources
Address: 1830 W. Romneya Drive
Anaheim, CA 92801-1819
Telephone: (714) 808-4822

EVACUATION/EMERGENCY PROCEDURE: When the fire alarm system sounds, strobes activate or when told to evacuate by a supervisor or Floor Marshall, students must stop all activities and promptly evacuate to the far south parking lot area. Stay with your class so the instructor can complete an accurate head count. Stay calm, do not panic or run. The blue emergency lights in the parking lots are for your use in case of an emergency; please make note of its location. Remember to secure your vehicle and belongings. The Cypress Campus Security Office may be reached at (714) 484-7387. Take all personal belongings with you. Do not use cell phones during evacuation unless necessary to get medical attention.

STUDENT SERVICE RESOURCES: Visit <http://www.cypresscollege.edu/services/azServices> for complete list of student services.

LIBRARY AND LEARNING RESOURCE CENTER: for tutoring, computer access and more
<http://www.cypresscollege.edu/academics/academicPrograms/LibraryLearningResourceCenter>

STUDENT HEALTH CENTER : <http://www.cypresscollege.edu/services/HealthCenter>

PAGERS AND CELL PHONES: Are to be turned off while a class is in session.

FOOD AND BEVERAGE: Are not permitted in the classrooms.

COLLEGE CATALOG: Refer to the College Catalog as the official publication addressing and guiding academic and student services policies.

SYLLABUS (LECTURE TOPICS AND CLASS ASSIGNMENTS)

<u>Lect</u>	<u>Date</u>	<u>Subject</u>	<u>Chapters</u>	<u>Quiz/Exam</u>
1	8/31	Introduction Principles of Pharmacology Prescription Writing	Preface (vii) How to Be . . . (xi) 1, 2, 3	None
2	9/07 9/07	Principles of Pharmacology (continued) Autonomic Drugs	4	Quiz #1
3	9/14	Analgesics	5,6	Quiz #2
4	9/21	Anti-infectives	7,8	Quiz #3
5	9/28	Exam #1 (Chapters 1-8) Local Anesthetics General Anesthetics Anti-anxiety agents	9 10 11	Exam #1
6	10/05	Review Exam #1 Anti-anxiety agents (continued) Oral Conditions and Their Treatment Hygiene-Related Oral Disorders	11 12 13	Quiz #4
7	10/12	Cardiovascular Drugs	14	Quiz #5
8	10/19	Cardiovascular Drugs (continued)	14	Quiz #6
9	10/26	GI Drugs	15	Quiz #7

		Seizure Disorder Drugs	16	
10	11/02	Exam #2		
		Drugs for CNS Disorders	17	
11	11/09	Adrenocorticosteroids	18	Quiz #8
12	11/16	Respiratory Drugs	19	Quiz #9
		Diabetes Drugs	21	
13	11/30	Diabetes Drugs (continued)	21	Quiz #10
		Other Endocrine Drugs	22	
14	12/07	Antineoplastic Drugs	23	Quiz #11
		Emergency Drugs	24	
		Pregnancy and Breast Feeding	25	
		Drug Abuse	26	
		Natural/Herbal Products / Supplements	27	
15	12/14	Final Exam		Final Exam