Acronym/Number  **DHY 133**  

**Title**  
Dental Pharmacology

**Credit Breakout**  
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**PREREQUISITE(S):**  
CHM 132, DHY 114, DHY 181, DHY 182

**COURSE DESCRIPTION:**  
The study of drugs and their action on living tissue including their use as an aid in the diagnosis, treatment, and prevention of disease or to control or improve any physiological or pathological condition.

**COURSE COMPETENCIES:**  
*During this course, the student will be expected to:*

1. Demonstrate behavior congruent with the American Dental Hygienists’ Association Code of Ethics.
   1.1 Demonstrate accountability and responsibility for own professional behavior and development.
   1.2 Demonstrate accountability and responsibility reflecting professional values.
   1.3 Demonstrate professional behavior by being on time for class.

2. Discuss the history of pharmacology.

3. Describe the role of pharmacology in the dental hygiene process of care.

4. Define the ways in which drugs are named and the significance of each.

5. Identify the four phases of clinical evaluation in drug approval and the five schedules of drugs.

6. Describe the elements of a drug prescription.
   6.1 State the necessities for the dental hygienist’s understanding of the basics of prescription writing.
   6.2 Name those persons who may write prescriptions.
   6.3 Recognize units of measure for the:
      6.3.1 metric system
      6.3.2 household

7. Recount reliable sources of information about drugs.
8. Compare the differences between pharmacodynamics and pharmacokinetics.
   8.1 Describe the drug-receptor interaction and types of drug receptors.
   8.2 Differentiate dose, potency, and efficacy in the context of the actions of drugs.
   8.3 Explain the pharmacologic effect of a drug and factors that cause variations in individual response.
   8.4 Discuss the major steps in pharmacokinetics: absorption, distribution, metabolism, and excretion.
   8.5 Summarize the various routes of drug administration.
   8.6 Distinguish between a loading dose and a maintenance dose.


10. Describe actions dental hygienists should take to avoid adverse drug reactions in the patients they treat.

11. Review the anatomy and physiology of the nervous system.
    11.1 Describe the neurophysiology of nerve stimulus transmission.
    11.2 Elaborate on the autonomic nervous system, including functional organization and neurotransmitters.

12. Discuss the pharmacologic effects, adverse reactions, contraindications, and dental considerations of cholinergic agents.

13. Discuss the pharmacologic effects, adverse reactions, contraindications, and dental considerations of anticholinergic agents.

14. Discuss the pharmacologic effects, adverse reactions, contraindications, and dental considerations of adrenergic agents.

15. Explain adrenergic and adrenergic-receptor blocking agents.

16. Describe nociception.

17. Explain the differences in mechanism of action of opioid and nonopioid analgesics.

18. Discuss commonly used pharmacologic agents used for the treatment of odontogenic and orofacial pain including:
    18.1 the primary line of treatment.
    18.2 secondary line of treatment
    18.3 tertiary line of treatment
    18.4 adverse drug events

19. Understand the concept of bacteriocidal versus bacteriostatic antibacterial drugs.
20. Understand the pharmacodynamics of the following antibacterial drugs:
   20.1 bacterial cell wall inhibitors
   20.2 inhibitors of DNA synthesis and repair
   20.3 inhibitors of translation and transcription

21. Discuss bacterial resistance to antibiotic drug therapy and factors that influence its development.

22. Identify antibacterial agent and the dosage regimen for the treatment of odontogenic infections.

23. Summarize the concept and practice of antibiotic prophylaxis in dentistry.
   23.1 Identify indications for and describe the prophylactic antibiotic regimen for TJR patents.
   23.2 Identify indications for and describe the prophylactic antibiotic regimen to prevent infective endocarditis in susceptible clients.
   23.3 List dental procedures which require and which do not require antibiotic prophylaxis in TJR or IE susceptible clients.

24. Name several types of antifungal agents and discuss their indications in dentistry and potential adverse reactions.

25. Discuss the treatment of herpes simplex.

26. Describe the various drugs and drug combinations used to treat acquired immunodeficiency syndrome.

27. Explain the mechanism of action, pharmacokinetics, pharmacologic effects, and adverse reactions of local anesthetics.
   27.1 Recall characteristics of an ideal local anesthetic.
   27.2 Classify the local anesthetics chemically.
   27.3 Discuss local anesthetics and vasoconstrictors with regard to:
       27.3.1 mechanism of action
       27.3.2 pharmacokinetics
           27.3.2.1 absorption
           27.3.2.2 distribution
           27.3.2.3 metabolism
       27.3.3 pharmacologic effects
       27.3.4 adverse reactions
           27.3.4.1 toxicity, influencing factors and symptoms
           27.3.4.2 local effects
           27.3.4.3 malignant hyperthermia
           27.3.4.4 pregnancy and nursing
       27.3.5 medical emergencies associated with their use
   27.4 Name the ingredients in a local anesthetic solution.
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27.5 Distinguish between infiltration, field block, and nerve block injections.
27.6 Identify names, pharmacologic and clinical effects, and duration of action for:
   27.6.1 lidocaine
   27.6.2 mepivacaine
   27.6.3 prilocaine
   27.6.4 bupivacaine
   27.6.5 etidocaine
   27.6.6 procaine
   27.6.7 propoxycaine
   27.6.8 tetracaine
   27.6.9 septocaine

27.7 Recall suggestions for choosing an anesthetic agent.
27.8 Identify agents for and application of topical anesthetics.
27.9 Prepare to administer local anesthesia utilizing the Handbook of Local Anesthesia by Malamed.
27.10 Practice administration of local anesthesia for the following injections:
     supraperiosteal, anterior superior alveolar nerve block, infraorbital nerve block,
     middle superior alveolar nerve block, posterior superior alveolar nerve block,
     greater palatine nerve block, nasopalatine nerve block, inferior alveolar nerve
     block, lingual nerve block, buccal nerve block, mental nerve block, incisive nerve
     block, Gow Gates nerve block.

27.11 Demonstrate proper record keeping on patient chart following administration of
     local anesthesia.
27.12 Recall that the local anesthetic must be ordered by the dentist and the
     administration performed under direct supervision.

28. Summarize the history of general anesthetics in dentistry.

29. Describe how general anesthesia works and the stages involved.

30. Name and describe several types of general anesthetics and their adverse effects.

31. Discuss the use of nitrous oxide in dentistry, including how it works, the pharmacological
    effects, adverse reactions, and contraindications using Clark and Bunnick, Handbook of
    Nitrous Oxide and Oxygen Sedation as your primary text.
   31.1 Describe pain and anxiety management in dentistry.
   31.2 Recall the physical properties and pharmacokinetics of N₂O.
   31.3 Describe the manufacturing and packaging of N₂O/O₂.
   31.4 Describe the delivery systems available for N₂O/O₂ delivery in the dental office.
   31.5 Recall the steps from the protocol list necessary for client assessment, preparation,
    N₂O/O₂ titration, and complete recovery from analgesia.
   31.6 Identify the signs and symptoms of appropriate minimal sedation and
    oversedation.
   31.7 Identify potential biohazards for healthcare personnel associated with chronic
    exposure to N₂O.
   31.8 Identify ethical and legal considerations regarding N₂O administration.
   31.9 Identify all components of the DMACC nitrous-oxide-oxygen equipment.
31.10 Demonstrate proper documentation of nitrous oxide-oxygen delivery to a DMACC client.

32. Describe anticaries, antigingivitis, and desensitizing agents used in dentistry and their application.

33. Review common oral mucous membrane lesions and conditions including signs, symptoms and treatments.

34. Compare the indications and effects of the available drugs used to treat diabetes mellitus.
   34.1 Explain the management of diabetic dental clients.
   34.2 Describe the various drug-drug interactions of diabetic medications.

35. State the uses for glucocorticosteroids and the management of clients on these drugs.

36. List drugs taken for thyroid disorders and state the management of clients taking these drugs.

37. Summarize the components of oral contraceptives and dental concerns.

38. Summarize the components of hormone replacement therapies and dental concerns.

39. Chose from a list all drugs that are contraindicated during pregnancy.

40. Describe the etiology and treatment of gastroesophageal reflux disorder and peptic ulcer disease.
   40.1 Explain the differences in treatment between GERD and PUD.
   40.2 Discuss any contraindications or precautions in dental clients with GI disorders.

41. Discuss the treatments for constipation and diarrhea.

42. Define the term antiemetic and be able to give examples of them.

43. Briefly define the terms asthma and chronic obstructive pulmonary disease.

44. Briefly review the classification of asthma.

45. List the different types of medications available to treat the different types of cough.

46. Define the terms antitussive, expectorant, and decongestant.

47. Discuss the pathophysiology, prevalence and risk factors associated with asthma and COPD.

48. Review the different classes of medications used to treat asthma including mechanism of action, adverse reactions, and drug interactions.
49. Discuss the dental concerns associated with cardiovascular disease and how metabolic equivalents can be used to assess risks.
50. Describe hypertension and the stepped-up approach to treating it.
51. List the different classes of antihypertensive medications including pharmacologic effects and adverse reactions.
52. Define the term angina and review the classes of medications used to treat it.
53. Describe the factors that may place one at risk for hyperlipidemic disorders.
54. List the categories of drugs used to treat high cholesterol including pharmacologic effects and adverse reactions.
55. Define the term arrhythmia and list its causes.
56. Describe the four classifications of antiarrhythmics and the ADEs and drug interactions associated with them.
57. Briefly review the coagulation process and drugs used to treat coagulopathies.
58. Describe congestive heart failure and the pharmacologic effects and adverse reactions of cardiac glycosides.
59. List other drugs used to treat congestive heart failure.
60. Discuss the dental concerns associated with the drugs used to treat cardiovascular disorders.
61. Describe the mechanism of action, interactions, and dental relevance of the benzodiazepines barbiturates, nonbarbiturate sedatives and antihistamines used as anxiolytics or sleep aids.
62. Summarize the mechanism of action, pharmacologic effects, adverse reactions, drug interactions, and management considerations of the antidepressants.
63. Summarize the mechanism of action, pharmacologic effects, adverse reactions, drug interactions, and management considerations of the antipsychotics.
64. Summarize the mechanism of action, pharmacologic effects, adverse reactions, drug interactions, and management considerations of the drugs used to treat Parkinson Disease.
65. Describe the two categories of seizures and give a brief description of the different classifications of seizure disorders.
66. Summarize the mechanism of action, pharmacologic effects, adverse reactions, drug interactions, and management considerations of the drugs used to treat seizure disorders.
67. Review and council patients on the dental concerns associated with all antiseizure medications.

68. Discuss why people choose herbal products over traditional medicine.

69. Discuss the federal legislation governing herbal and dietary products.

70. List several reliable sources of information on supplements.

71. Discuss good manufacturing practices and the standardization of herbal products.

72. Discuss herbal products used in dentistry as well as common alternative dental products and their efficacy.

73. Define antineoplastic agents and discuss their use and adverse drug effects.
   73.1 Summarize the use, mechanisms of action, and classification of antineoplastic agents.
   73.2 Describe several adverse drug effects associated with antineoplastic agents.
   73.3 Discuss the dental implications of clients planning to take or actively taking antineoplastic drugs.

74. Define several types of inflammatory arthropathies and gout.
   74.1 Summarize the use, mechanisms of action, and classifications of drugs used to treat arthropathies and gout.
   74.2 Describe considerations in the dental hygiene management of clients with arthropathy.

75. Define addiction, dependence, tolerance, and abstinence syndrome in relation to drug abuse.

76. Identify several types of central nervous system depressants and stimulants that are commonly abused.

77. Describe the three stages of substance abuse treatment.

78. Describe dental hygiene management for the substance-abusing client.

79. Discuss ways in which the dental health care worker can identify clients or colleagues who may be abusing drugs.
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COMPETENCIES REVIEWED AND APPROVED BY: Deborah Penney

DATE: March 2012

FACULTY:
1.
2.
3.

COMPETENCIES REVIEWED AND APPROVED BY: Deborah Penney

DATE: July 2010

FACULTY:
1.
2.
3.

COMPETENCIES REVIEWED AND APPROVED BY: Deborah Penney

DATE: January 2007

FACULTY:
1.
2.
3.

Effective date August 2012

by: Deb Penney

Campus: A B C U N W OC
extension: 6582

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