Mount Wachusett Community College
Department of Dental Hygiene

DHY202: PHARMACOLOGY FOR THE DENTAL HYGIENIST

Credit Hrs. 3 cr
Instructor: Jane Doe
E-mail: @mwcc.mass.edu
Phone: (978) 630-9415 or Secretary (978) 630-9413
Instructor available during office hours (posted on door) and by appointment

Course Texts:

Reference Texts:

Course Description:
This course will address the interaction of pharmacologic agents on the body system. This course provides students with the understanding of the pharmacological management of patients, the mechanisms of action of drugs and interactions associated with dental treatment. Drugs commonly used in dentistry and the drug effects in care planning and treatment planning will be addressed. Emphasis is placed on mechanisms of action, common usages, side effects, implications for dental treatment and case studies.

MWCC General Education Competencies addressed in this course:
1. Competence in written and oral communication in English.
2. Competence in quantitative reasoning and scientific modes of inquiry.
3. Competence in critical thinking.
5. Competence in understanding self and community.

Leveled Program Competencies for Semester III:
(*indicates those competencies addressed in this course)
The student will:
1. *Communicate effectively and accurately through oral, written and electronic means with guidance in the care of individuals.
2. *Demonstrate the application of theory to practice for complex patients with guidance.
3. *Develop complete plans of care with guidance, which demonstrate understanding of scientific principles, for complex patients.
4. *Implement a comprehensive education plan that promotes health and identifies risk behaviors of individuals and groups in the clinic setting with assistance.
5. *Demonstrate the role of the dental professional within the legal and ethical realm of practice in caring for patients with complex needs.
6. *Pursue opportunities to enhance one’s own learning and demonstrate this in the effective care of patients.
**Course Objectives:**
1. List and describe the therapeutic use(s), major pharmacological effects, and pharmacokinetics for each drug group.
2. Describe the factors that influence a drug’s absorption, distribution, metabolism and excretion.
3. Describe common routes of drug administration and pharmacological dosage forms.
4. Write and interpret a prescription.
5. State and discuss important adverse reactions, contraindications and cautions of drugs and their management or minimization.
6. Apply pharmaceutical knowledge to medical and dental history from assessment in clinical setting.
7. Use PDR and drug reference sources for application in the clinical setting.
9. Describe “patient instructions” for each drug group that could be described.
10. Determine “dental implications” of each drug group.
11. Determine whether any dental drugs are likely to have drug interactions with classes of drugs.
12. State changes in Care of Treatment Plan that would be required for patients taking medications.

**Teaching Methods:**
Lecture, powerpoint, You Tube and other video, case studies, class discussions, class activities, examinations, internet research, individual and team group quizzes and classroom writing are utilized.

**Course Requirements:**
Grades on assignments and examinations must average C+ or above (77).

**Attendance Policy:**
Attendance is expected at all lectures. Absence may adversely affect the final grade. Students should notify Dental Hygiene Secretary at (978) 630-9413 if they are unable to attend. Students are responsible for all missed lecture material. All work is due on dates assigned and 5 points will be deducted for each day late.

**Grading:**
- Exams 1-6: 50% of grade
- Media Project: 5-10 pts. Added to lowest test grade (not to exceed 100%)
- Case Study: 10%
- Research pamphlet: 10%
- Comprehensive Final Examination: 30%

**Statement on Disabilities:**
If you have a disability, a medical or emotional issue that might impact on your class performance, please consult with me in the privacy of my office so that the college may provide the required and appropriate accommodations for you. It is most beneficial if the disclosure is made early in the semester. This could include learning disabilities, brain injury, and hearing impairments, etc. just to name a few.

Students with documented disabilities who believe that they may need accommodations in this class are encouraged to contact the Counselor for Students with Disabilities, in Room 135, (978) 630-9120, as soon as possible to ensure that such accommodations are implemented in a timely fashion.

In addition to the instructor, the college employs other staff to which you may go to for support. They are:
- Nancy Kennedy, Director of Counseling, Room 141B
- Diane King, College Nurse/Health Educator, the Health and Wellness Office Rm 133

**Plagiarism:**
Plagiarism on any assignment will result in a grade of 0. If plagiarism is identified, a conference will be scheduled with the student and the instructor. The student may have one chance to re-write the assignment, based on the discretion of the instructor. Faculty will review written assignments for plagiarism on Blackboard through “Safe-Assign.” Student may seek help in the writing labs at the Gardner Campus, if needed, with written assignments.

**Policies and Procedures:**
This course follows all policies and procedures listed in the MWCC Dental Hygiene Student Handbook 2010-2011.
## Pharmacology Class Schedule

<table>
<thead>
<tr>
<th>DATE</th>
<th>READING ASSIGNMENT</th>
<th>CONTENT &amp; LECTURE OBJECTIVES</th>
</tr>
</thead>
</table>
| **Module 1**  
9/8  
20 Minutes | Ch 1  
Review Syllabus and Course Requirements | 1. Define Pharmacology  
2. List the most common sources of pharmacological resources.  
3. State how the various US Federal Statutes and agencies regulate the use of drugs in the USA.  
4. Read and write a prescription using common terminology and abbreviations.  
5. Explain all the components of a modern written prescription  
6. List the common abbreviations used in prescription writing.  
7. List the features associated with writing prescriptions of schedule II drugs.  
8. Explain the log dose curve.  
9. Define efficacy.  
10. Explain how drugs alter communication between cells.  
11. List the ten common ways drugs are delivered to the body.  
12. Contrast the various drugs are formulated for delivery.  
13. Explain the components of pharmacokinetics.  
15. Explain how drug delivery is altered due to first pass effect.  
16. List the factors that alter drug effects.  
17. Given the adult dose of medication, calculate the child’s dose.  
18. Describe the most common adverse effects of drugs on the human body, these will include toxic effects, nontarget tissue effects on unborn children.  
19. List the most common signs & symptoms of allergic reactions caused by delivered medications  
20. Describe common idiosyncratic reactions caused by drugs.  |
| **Activity/Experience**  
Lecture/Slides/Activities: Writing Prescriptions  
Looking up drugs in reference books/internet |
| **Module 2**  
9/15  
EXAM #1 | Ch. 4  
Autonomic Nervous System  
Autonomic Drugs | 1. Describe the role of the autonomic nervous systems.  
2. Compare and contrast the Sympathetic and parasympathetic nervous systems.  
3. Name the neurotransmitters associated with the PANS and the SANS.  
4. List the drugs that are used to alter the ANS and explain how each one has its effect.  |
| **Activity/Experience**  
Test and review – 45 minutes/Lecture/Slides  
Case study/Discussion/Video | Module 1 (Ch. 1,2,3) |
| **Module 2**  
9/15  
EXAM #1 | Ch. 15  
Review of the Anatomy & Physiology of the Heart | 1. Describe the normal heart anatomy and explain it healthy function.  
2. Define cardiac arrhythmia and list drugs commonly used to treat it. |
### Module 2
#### 9/22
**Heart Disease and Cardiovascular Drugs**

3. List the cardiovascular diseases that will contraindicate dental care.
4. Explain bacterial endocarditis, its causes, treatment, and prevention.
5. Describe the general characteristics of
   a. hypertension
   b. angina pectoris
   c. CVA (cerebrovascular accident)
   d. congestive heart failure
   e. myocardial infarction
   f. hypercholesterolemia
6. List the drugs and explain their modes of action for the following cardiac diseases.
   a. hypertension
   b. angina pectoris
   c. CVA (cerebrovascular accident)
   d. congestive heart failure
   e. myocardial infarction
   f. hypercholesterolemia
7. Explain diuresis and list the drugs used to reduce fluid volume.
8. Explain the mechanism of action of the calcium channel blockers and list the most common drugs used.
9. Discuss how blood pressure is controlled in the human body.
10. Explain the role of angiotensin modifying drugs in blood pressure control.
11. State the modifications of dental treatment necessary for patients taking antihypertensive medications.
12. List the medications most commonly used to lower serum lipids and their mechanism of action.
13. Describe the process of blood clotting, the drugs modifying the process and the mechanism of each.
14. State the dental considerations necessary for patients taking anticoagulants.

<table>
<thead>
<tr>
<th>Activity/Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes: 20 minutes per class</td>
</tr>
<tr>
<td>Lecture/Slides/Video/Discussion/Case Studies</td>
</tr>
<tr>
<td>Activity: Drop of blood trip</td>
</tr>
</tbody>
</table>

### Module 3
#### 9/29
**EXAM #2**

**Module 2 (Ch. 5, 15)**

1. Compare the modes of action, pharmacokinetics, desired actions and adverse actions of salicylates, NSAIDs, and acetaminophen.
2. List the drugs used to treat gout and how they function.

<table>
<thead>
<tr>
<th>Activity/Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 3 (Ch. 5, 15)</td>
</tr>
</tbody>
</table>

1. Explain how opioid analgesics function differently compared to non-narcotic medications.
2. Explain how opioid analgesics function and how they move through the system.

#### 9/29
**Module 3**

**Ch. 5**
**Nonopioid Analgesics**

**Ch. 6**
**Opioid Analgesics and Antagonists**
<table>
<thead>
<tr>
<th>Date</th>
<th>Module</th>
<th>Topic</th>
<th>Activities/Experiences</th>
</tr>
</thead>
</table>
| 10/6 | Module 3 | Anti-infective Agents | Describe the role of opioid antagonists and list the most common.  
**Activity/Experience** Test and Review  
Quiz: 20 min./Lecture/Slides/Case Studies/Discussion |
| 10/13 | | | 1. Describe the significant historical events that lead to the use of modern antibacterial medications.  
2. Contrast bactericidal and bacteriostatic medications.  
3. State how antibacterial drugs are effective against various microbes.  
4. List the therapeutic and prophylactic indications for antibacterial drugs.  
5. Describe common adverse reactions of antibacterial medications.  
6. List the pharmacologic features of the following medications:  
   a. penicillin  
   b. Macrolides  
   c. Tetracycliners  
   d. Clindamycin  
   e. Metronidazole  
   f. Cephalosporins  
7. Explain how most dental related infections progress and the role of drugs to treat the infection.  
8. List the most common drugs used for nondental infections and explain the salient points associated with each.  
9. Describe the general pathology of tuberculosis, list the most common drugs used in its treatment, and outline the pharmacologic features associated with each drug.  
10. Explain the disease process leading up to bacterial endocarditis.  
11. State needs for prophylactic antibiotic coverage in SBE  
12. Discuss the reasons for prophylactic antibiotic delivery for patients with prosthetic joint replacement.  
**Activity/Experience**  
Quizzes: 20 min./Lecture/Slides  
You Tube/Case Studies/Discussion |
| 10/20 | Module 4 | EXAM #3 | Description of Candida albicans and the drugs commonly employed against it.  
2. Describe the characteristics of Herpes simplex type I and the drugs commonly employed against it.  
3. Describe the characteristics of HIV and the drugs commonly employed against it.  
**Activity/Experience**  
Test and review – 45min./Lecture/Slides  
You Tube/Case Studies/Discussion |
| | | Ch. 8 Antifungal and Antiviral Agents | |
| **Module 4**  
**10/27** | Ch. 11  
Antianxiety Agents | 1. Explain how a patient’s anxiety complicates dental therapy.  
2. List the common drugs to alleviate a patient’s anxiety, specifically  
   a. Benzodiazepines  
   b. Barbiturates  
   c. the nonbarbiturate sedative hypnotics  
3. Describe the role of centrally acting muscle relaxants and outline the pharmacological features of the common drugs.  
4. List the general features of  
   a. Baclofen  
   b. Tizanidine  
   c. Dantrolene  
   d. Buspirone  
   **Activity/Experience** Quiz: 20min./Lecture/Slides  
   Case Studies/Discussion |
| **11/13**  
**Module 4** | Ch. 16  
Review of Seizures  
Anticonvulsants | 1. Describe the clinical features of epilepsy and variants of the disease.  
2. List the mechanism of action, potential adverse reactions of the following drugs:  
   a. carbamazepine  
   b. valproates  
   c. Phenobarbital  
   d. phenytoin  
   e. ethosuximide  
   f. benzodiazepines  
3. Describe how dental therapy is modified for patients taking anticonvulsants  
   **Activity/Expeirence**  
   Quiz: 20 min./Lecture/Slides/Case  
   Studies/Discussion/Video |
| **11/10**  
**Module 5** | Ch. 22  
Respiratory Diseases & Drugs | **Module 4 (Ch. 8, 11, 16)**  
1. Describe the general pathophysiology of asthma and COPD and upper respiratory infections  
2. Explain the general mechanism of action of the following medications:  
   a. sympathethomimetic agents  
   b. Corticosteroids  
   c. Leukotriene-pathway inhibitors  
   d. methylxanthines  
   e. anticholinergics  
   f. econgestants  
   g. expectorants & mucolytics  
   h. antitussives  
3. Describe a metered dose inhaler its use with respiratory medicines.  
4. List the common medications used to treat asthma, their mechanisms of action, and the impact their use has on dental care. |
<table>
<thead>
<tr>
<th>Date</th>
<th>Module</th>
<th>Ch.</th>
<th>Topic</th>
<th>Activity/Experience</th>
</tr>
</thead>
</table>
| 11/10 | Module 5 | Ch. 22 | Gastrointestinal Drugs | 5. List the disease treated and how the medication functions related to the following drugs:  
   a. H2 blockers  
   b. proton pump inhibitors  
   c. dopamine antagonists  
   d. antacids  
   e. laxatives  
   f. prostaglandins  
   g. antiflatulents  
   h. anidiarrheals  
   i. emetics  
   j. antiemetics  
   6. Define Crohn’s Disease and Ulcerative Colitis  
   7. List the common medications used to treat Crohn’s disease and inflammatory bowel Disease.  
   **Activity/Experience**  
   Test and Review 45 min./Lecture/Slides/Activity: Diagram and label the respiratory system |
| 11/17 | Module 5 | Ch. 18 | Autocoids & Antihistamines  
Ch. 19 | Adrenocorticosteroids  
Ch. 9 | Local Anesthetics  
Ch. 10 | General Anesthetics | 1. Define autocoid  
2. Explain the role of histamine in normal physiology.  
3. List the deleterious effects of histamine on a person’s well being.  
4. Compare and contrast the biological effects of histamine and antihistamine medications.  
5. Describe peripheral H1-Receptor antagonists and their action.  
6. List the various functions of prostaglandins and thromboxanes and associated autocoids.  
7. Discuss the role of adrenocorticosteroids in normal physiology.  
8. List the medical used of supplemental corticosteroids.  
9. Describe the “Rule of Twos”, and outline dental treatment modifications for patients taking corticosteroids.  
   **Activity/Experience**  
   Quizzes: 20 min./Lecture/Slides/Video |
| 11/24 | Module 6 | EXAM #5 | Overview of Psychiatric Disorders and Psychotherapeutic Agents | Module 5 (Ch. 9, 10, 18, 19, 22)  
Describe the general psychiatric disorders.  
1. List the antipsychotic drugs, their modes of action, adverse reactions and the dental implications for patients taking these drugs.  
2. Describe drug types used for depression and bipolar disease.  
3. List drug interactions associated with the drugs.  
   **Activity/Experience**  
   Test and Review: 45 min./Lecture/Slides/Case Studies/Discussion |
<table>
<thead>
<tr>
<th>Date</th>
<th>Module 6</th>
<th>Chapter(s)</th>
<th>Research Pamphlet Due/Presentations</th>
</tr>
</thead>
</table>
| 12/1  | Ch. 20   | Hormones  | 1. Describe the functions and hormones of the anterior and posterior pituitary glands.  
                                  2. Name systemic conditions associated with underactive/overactive thyroid and pancreatic hormones.  
                                  3. List conditions resulting form hypothyroidism/hyperthyroidism.  
                                  4. Describe complications of diabetes and effects of drugs on these complications.  
                                  5. Recognize the various classes of drugs used to treat diabetes.  
                                  6. Describe the female/male sex hormones and recognize conditions for their use.  
                                  **Activity/Experience**  
                                  Quizzes: 20 min./Lecture/Slides/Case Studies/Discussion |
| 12/8  | Ch. 21   | Antineoplastics | 1. Define Antineoplastic agents.  
                                  2. Summarize the use, mechanism of action, and classification of antineoplastic agents.  
                                  3. Describe several adverse drug effects associated with antineoplastic agents.  
                                  4. Discuss the dental implications of patients planning to take or actively taking antineoplastic drugs.  
                                  **Activity/Experience**  
                                  Quiz: 20 min./Lecture/Slides/Case Studies/Discussion |
|       | Ch. 25   | Drug Abuse | 1. Define addiction, dependence, tolerance, and withdrawal in relation to drug abuse.  
                                  2. Name several types of nervous system depressants and stimulants that are commonly abused and dental implications of each.  
                                  3. Discuss ways the dental health care worker can identify patients or colleagues who may be abusing drugs.  
                                  **Activity/Experience**  
                                  Quiz: 20 min./Lecture/Slides/Case Studies/Discussion |
|       | Ch. 13   | Oral Conditions and their Treatment | 1. Name several common infectious lesions of the oral cavity and summarize treatments for each.  
                                  2. Describe immune and inflammatory reactions and measures used to treat them.  
                                  3. Discuss xerostomia and other possible drug induced oral side effects.  
                                  4. Discuss the pharmacologic agents most commonly used to treat oral lesions.  
                                  **Activity/Experience**  
                                  Quiz: 20 min./Lecture/Slides/Case Studies/Discussion |
| 12/15 | EXAM #6  |            | **Research Pamphlet Presentations**  
                                  **Review of Comprehensive Final**  
                                  Case Study Due  
                                  Final Examination |