



INSTRUCTIONAL PACKAGE

RES 246

Respiratory Pharmacology

Effective Term
Fall/2018

INSTRUCTIONAL PACKAGE

Part I: Course Information

Effective Term: Fall 2018 (201810)

COURSE PREFIX: RES 246

COURSE TITLE: Respiratory Pharmacology

CONTACT HOURS: 2 Lecture

CREDIT HOURS: 2

RATIONALE FOR THE COURSE:

Respiratory Pharmacology is a foundational course for respiratory care and an important part of the curriculum. In RES 246, you will gain knowledge of the pharmacologic drugs used in the respiratory care field, the basics of pharmacology, and the different drugs used to treat patients with respiratory care disorders.

COURSE DESCRIPTION:

This course includes a study of pharmacologic agents used in cardiopulmonary care.

PREREQUISITES/CO-REQUISITES:

General Education courses BIO 210, 211, 225, MAT 120, ENG 101, PSY 201, and HUM. As well as, admission to the Respiratory Care Program. Required prerequisite courses must be completed with a grade of "C" or better.

REQUIRED MATERIALS:

Gardenhire, D. (2016). Rau's Respiratory Care Pharmacology and Workbook (9th ed). St. Louis, MO: Elsevier ISBN: 9780323299688; Workbook ISBN: 9780323299732

Please visit the Bookstore online site for most current textbook information. Use the direct link below to find textbooks.

[BOOKSTORE](#).

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's student portal for course materials.
WaveNet and D2L email access.

CLASSROOM ETIQUETTE:

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

PLAGIARISM & CHEATING:

Refer to the College catalog & Student handbook [HGTC Handbook](#).

The student may be assigned a failing grade for the course or may be required by the professor to withdraw from the course and/or the respiratory care program. Such actions are deemed to be unprofessional behavior within this program and will not be tolerated.

August 2018

Part II: Student Learning Outcomes

1. Identify pharmacologic terms and drug sources.
2. Discuss the phases of drug action.
3. Perform drug calculations related to respiratory care.
4. Discuss cardiovascular drugs related to respiratory care.
5. Discuss sedatives, analgesics and respiratory stimulants.
6. Discuss Corticosteroids, Antimicrobials and other miscellaneous drugs related to respiratory care.

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

Module I

Material Covered:

Basic Concepts and Principles in Pharmacology

Introduction to Respiratory Care Pharmacology Chapter 1

Principles of Drug Action Chapter 2

Administration of Aerosolized Agents Chapter 3

Calculating Drug Doses Chapter 4

Assessments:

Homework/Quizzes

Case Study Project

Test/Exam

Learning Outcomes:

1. Define pharmacology, drugs, and how they are named.
2. List the various sources of drug information.
3. List the various sources used to manufacture drugs.
4. Differentiate between prescriptions drugs and over-the-counter (OTC) drugs.
5. Describe the therapeutic purpose of each of the major aerosolized drug groups.
6. Identify related drug groups in respiratory care.
7. Define key terms that pertain to principles of drug action.
8. Define the drug administration phase.
9. Describe the various routes of administration available.
10. Define the pharmacokinetic phase.
11. Discuss the key factors in the pharmacokinetic phase (e.g. absorption, distribution, metabolism, and elimination).
12. Describe the first-pass effect.
13. Differentiate between systemic and inhaled drugs in relation to the pharmacokinetic phase.
14. Explain the lung availability/total systemic availability L/T ratio.
15. Define the pharmacodynamics phase.
16. Discuss the importance of structure-activity relationships.
17. Discuss the role of drug receptors.
18. Discuss the importance of dose-response relationships.
19. Describe the importance of pharmacogenetics.
20. Define terms that pertain to administration of aerosol agents.

21. Define aerosol therapy.
22. Select an appropriate aerosol medication nebulizer based on particle size distributions.
23. Discuss aerosol particle size and deposition in the lungs.
24. Differentiate between the types of aerosol devices.
25. Describe the clinical applications of aerosol devices.
26. Recommend the use of various aerosol devices.
27. Define key terms pertaining to calculating drug dose.
28. Use the metric system.
29. Calculate drug doses using proportions.
30. Calculate drug doses using percentage-strength solutions.

Module II

Material Covered:

Drugs Used to Treat the Respiratory System

Central and Peripheral Nervous System Chapter 5

Adrenergic (Sympathomimetic) Bronchodilators Chapter 6

Anticholinergic (Parasympatholytic) Bronchodilators Chapter 7

Xanthines Chapter 8

Mucus-Controlling Drug Therapy Chapter 9

Surfactant Agents Chapter 10

Corticosteroids in Respiratory Care Chapter 11

Nonsteroidal Antiasthma Agents Chapter 12

Aerosolized Anti-infective Agents Chapter 13

Antimicrobial Agents Chapter 14

Cold and Cough Agents Chapter 15

Selected Agents of Pulmonary Value Chapter 16

Skeletal Muscle Relaxants (Neuromuscular Blocking Agents) Chapter 18

Assessments:

Homework/Quizzes

Case Study Project

Test/Exam

Learning Outcomes: (Cognitive-Knowledge)

1. Define key terms pertaining to the central and peripheral nervous systems.
2. Classify the branches of the nervous system.
3. Differentiate among the central, peripheral, and autonomic nervous system.
4. Discuss the use of neurotransmitters.
5. Explain in detail the difference between the parasympathetic and sympathetic branches of the nervous system.
6. Differentiate the effects of cholinergic and anticholinergic agents on the nervous system.
7. Differentiate the effects of adrenergic and antiadrenergic agents on the nervous system.
8. Discuss various receptors of the airways.
9. Differentiate among noradrenergic, noncholinergic inhibitory, and excitatory nerves.
10. Define sympathomimetic and adrenergic.
11. List all currently available B-adrenergic agents used in respiratory therapy.
12. Differentiate between the specific adrenergic agents and formulations.

13. Describe the mechanism of action for each specific adrenergic agent and formulation.
14. Describe the route of administration available for B agonists.
15. Discuss adverse effects of B agonists.
16. Clinically assess B agonist therapy.
17. Define terms for anticholinergic bronchodilators.
18. Differentiate between parasympathomimetic and parasympatholytic, cholinergic and anticholinergic, and muscarinic and antimuscarinic.
19. List all available anticholinergic agents used in respiratory therapy.
20. Discuss the indication for anticholinergic agents.
21. Explain the mode of action for anticholinergic agents.
22. Identify the route of administration available for anticholinergic agents.
23. Discuss adverse effects for anticholinergic agents.
24. Discuss the clinical application for anticholinergic agents.
25. Define Xanthine.
26. List all available Xanthines used in respiratory therapy.
27. Differentiate clinical indications of xanthine.
28. Differentiate between the uses of Xanthines.
29. Discuss the proposed theories of activity for Xanthines.
30. Discuss effects and toxicity of Xanthines.
31. Assess xanthine therapy clinically.
32. Define terms that pertain to mucus-controlling drug therapy.
33. Interpret the physiology and mechanisms of mucus secretion and clearance.
34. Name the types of mucoactive medications and the presumed modes of action.
35. Describe the medications approved for the therapy of mucus clearance disorders and their approved indications.
36. Identify the contraindications to the use of mucoactive medications.
37. Explain the interaction between airway clearance devices or physical therapy and mucoactive medications.
38. Define key terms that pertain to surfactant agents.
39. List all available exogenous surfactant agents used in respiratory therapy.
40. Describe the mode of action for exogenous surfactant agents.
41. Discuss the route of administration for exogenous surfactant.
42. Recognize hazards and complications of exogenous surfactant therapy.
43. Assess the use of surfactant therapy.
44. Discuss indications and terms for inhaled corticosteroid use.
45. List all available inhaled corticosteroids used in respiratory therapy.
46. Describe the route of administration available for corticosteroids.
47. Discuss the effect corticosteroids have on the white blood cell count.
48. Discuss the effect corticosteroids have on B receptors.
49. Differentiate between systemic and local side effects of corticosteroids.
50. Discuss the use of corticosteroids in the treatment of asthma and chronic obstructive pulmonary disease.

51. Be able to clinically assess corticosteroid use in patient care.
52. Discuss the indications for nonsteroidal antiasthma agents.
53. List available nonsteroidal antiasthma agents used in respiratory therapy.
54. Differentiate between the specific nonsteroidal antiasthma agents.
55. Describe routes of administration available for various nonsteroidal antiasthma agents.
56. Describe the mechanism of action for various nonsteroidal antiasthma agents.
57. Discuss the use of nonsteroidal antiasthma agents in the treatment of asthma.
58. Define terms that pertain to aerosolized anti-infective agents.
59. Discuss the indications for inhaled anti-infective agents.
60. List all available inhaled anti-infective agents used in respiratory therapy.
61. Discuss the route of administration available for the various anti-infective agents.
62. Recognize the side effects for the various anti-infective agents.
63. Discuss the use of each anti-infective agent in the treatment of lung disease.
64. Define antimicrobial agents and antibiotic.
65. Describe the process involved in bacterial susceptibility testing.
66. Discuss possible outcomes of antimicrobial combinations.
67. List the various classes of penicillin and cephalosporin.
68. Recognize similarities between members of the macrolides, azalides, and ketolides.
69. Recognize similarities between members of the fluoroquinolones.
70. List four mechanisms of action of antibacterial.
71. List five commonly used azole antifungals.
72. Describe the mechanism of action of the antiretroviral.
73. Differentiate between the common cold, the flu, and specific types of cold and cough agents.
74. Discuss the mechanism of action for each specific cold and cough agent.
75. Define key terms and definitions pertaining to selected agents of pulmonary value.
76. Discuss the indication for Antitrypsin-proteinase inhibitor therapy.
77. List available Antitrypsin-proteinase inhibitors.
78. List three types of formulations for nicotine replacement.
79. Advantages and disadvantages of nicotine replacement.
80. Discuss indication for nitric oxide.
81. Describe the effects of inhaled nitric oxide on a patient.
82. List the two toxic products of nitric oxide.
83. List the two inhaled prostacyclin analogs available in the United States.
84. Name the only insulin product available in the United States.
85. Define terms related to skeletal muscle relaxants, neuromuscular blocking agents (NMBAs).
86. List the use of NMBAs.
87. Describe the physiology of the neuromuscular junction.
88. Describe the makeup of nondepolarizing and depolarizing agents.
89. Identify methods of monitoring neuromuscular blockade.

Module III

Material Covered:

Critical Care, Cardiovascular, and Polysomnography Agents

Diuretic Agents Chapter 19

Drugs Affecting the Central Nervous System Chapter 20

Vasopressors, Inotropes, and Antiarrhythmic Agents Chapter 21

Drugs Affecting Circulation: Antihypertensive, Antianginals, Antithrombotic Chapter 22

Sleep and Sleep Pharmacology Chapter 23

Assessments:

Homework/Quizzes

Case Study Project

Test/Exam

Learning Outcomes:

1. Define terms pertaining to diuretic agents.
2. Describe renal function, filtration, reabsorption, and acid-base balance.
3. List and describe the various groups of diuretics.
4. List some indications for diuretic therapy.
5. List the most common adverse effects associated with the use of diuretics.
6. Describe special situations related to diuretic therapy.
7. Define terms that pertain to the central nervous system (CNS).
8. Recognize the various effects of medications on the CNS and their abilities to modulate neurotransmitters.
9. Comprehend psychiatric medications, including classification, use, and side effect profiles.
10. Recognize the effects of alcohol on the CNS during acute intoxication, chronic use, and after abrupt withdrawal.
11. Distinguish physiologic and psychologic bases of pain and the classes of analgesics used to treat pain.
12. Recognize indications for the use of local and general anesthesia.
13. Describe the concept of conscious sedation and indications and guidelines for use.
14. Distinguish drugs that stimulate the CNS and respiratory system and describe the indications for application.
15. List the various components that make up blood pressure.
16. Compare inotropes and vasopressors.
17. Describe the various drug interactions with vasopressors and inotropes.
18. Describe the normal conduction of the heart.
19. Define the mechanism of action of digoxin.
20. List all the dysrhythmias associated with cardiac arrest.
21. Design an algorithm that may be used in the management of ventricular fibrillation and pulseless ventricular tachycardia.
22. Describe the management of torsade's de pointes and proper dosage technique of intravenous magnesium therapy in the management of torsade's de pointes.
23. List the routes of administering medications during cardiac arrest.
24. Define the terms that pertain to drugs affecting circulation
25. Categorize the stages of normal to high blood pressure.

26. Compare and contrast the clinical pharmacology of the agents used for hypertensive pharmacotherapy.
27. Describe the mechanism of action of angiotensin-converting enzyme inhibitors, calcium channel blockers, and B – blockers.
28. Describe the formation and elimination of an acute coronary thrombus.
29. Describe the pathophysiology of angina and the drugs used to treat angina.
30. List the agents in each of the following antithrombotic classes: anticoagulants, antiplatelet, and thrombolytic.
31. Describe the mechanism of action of heparin.
32. List the laboratory parameters that may be used to monitor for the effects of heparin.
33. Recognize several sleep disorders that are amenable to pharmacotherapy.
34. Describe the rationale for using certain classes of drugs to treat specific sleep-related disorders.

Part III: Grading and Assessment

EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS*

Students' performance will be assessed, and the weight associated with the various measures/artifacts are listed below.

EVALUATION*

Homework/Quizzes	10%
Case Study Project	15%
Test	50%
Final Exam	25%
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	100%

GRADING SYSTEM:

A grade of "C" or better must be achieved in all required respiratory care program courses for a student to progress through the program. A final grade of less than 75 is not passing in the Respiratory Care Program and does not meet the requirements for progression within the program. This policy is different than the Horry Georgetown Technical College Grading Policy.

GRADING SCALE:

- 100-90 = A
- 89-80 = B
- 79-75 = C
- 74-69 = D
- 68 - 0 = F

LATE ASSIGNMENTS:

1. A maximum of one (1) scheduled exam may be made up at the discretion of the course instructor. Any subsequently missed exams will receive a grade of 0.
2. Makeup examinations will be taken in the testing center on campus or a location designated by the instructor.

3. A 10% overall deduction will be applied to the makeup examination score for missed examinations unless faculty are notified in advance (more than 12 hours) or medical documentation is provided.
4. Late Homework assignments will have a deduction of ten points of the total assignment grade.
5. Homework assignments will not be accepted after 5 days of the due date.
6. Quizzes are taken in class and cannot be made up if missed.

Each student must demonstrate safety and competence in required laboratory skill check assessments and laboratory competency practical examinations. Each course with a laboratory component includes skill check assessments that must be mastered within the course.

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the academic calendar for deadlines for add/drop ([ACADEMIC CALENDAR](#)). You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of eighty percent (80%) of his or her classes to be eligible to receive credit for any course. However, due to the varied nature of courses taught at the College, a more rigid attendance policy may be required by individual instructors. At a minimum, a student may be withdrawn from a course(s) after he or she has been absent more than 20 percent (20%) of the total contact hours for a course.

Attendance for Face-to-Face Courses:

For a 15-week course (fall and spring) the allowed number of absences for a M only class is as follows: 3 absences are allowed regardless of reason. After the allowed number of misses, the student will be dropped from the course with a W or a WF.

For a 15-week course (fall and spring) the allowed number of absences for a MW class is as follows: 6 absences are allowed regardless of reason. After the allowed number of misses, the student will be dropped from the course with a W or a WF.

A tardy is given if the student arrives ten minutes after class starts or before class ends. Three tardies are equivalent to one absent.

Part V: Student Resources



The Student Success and Tutoring Center (SSTC)

The SSTC offers to all students the following **free** resources:

1. **Academic coaches** for most subject areas, **Writing Center Support**, and **college success skills**.
2. **On-line student success and academic support resources**.

Visit the SSTC website: [Student Success & Tutoring Center](#) and visit the student services tab in your WaveNet account to schedule appointments using TutorTrac. For more information, call: SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455. Room locations and Live Chat is available on the SSTC website.



Student Information Center: WaveNet Central (WNC)

WNC offers to all students the following **free** resources:

1. **Getting around HGTC**: General information and guidance for enrollment!
2. Use the [Online Resource Center \(ORC\)](#) for COMPASS support, technology education, and online tools.
3. **Drop-in technology support or scheduled training** in the Center or in class.
4. **In-person workshops, online tutorials and more services** are available.

Visit the WNC website: [Wavenet Central](#). Live Chat and Center locations are posted on the website. Or please call one of the following locations: WNC Conway, 349-5182; WNC Grand Strand, 477-2076; and WNC Georgetown, 520-1473.

Disability Services:

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may be directed to Jocelyn Williams, Director of Student Development on the Conway Campus Jaime Davis, Counselor/Advisor on the Georgetown Campus or Kristin Griffin, Counselor on the Grand Strand Campus. These individuals will review documentation of the student's disability and, in a confidential setting with the student, develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided.

Statement of Equal Opportunity/Non-Discrimination Statement

Horry Georgetown Technical College prohibits discrimination and harassment, including sexual harassment and abuse, on the basis of race, color, gender, national or ethnic origin, age, religion, disability, marital status, veteran status, sexual orientation, gender identity, or pregnancy in educational programs and/or activities.

Title IX Requirements

Horry Georgetown Technical College prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking. Any student who believe he or she has experienced or witnessed discrimination including sexual harassment, domestic violence, dating violence, sexual assault or stalking is encouraged to report such incidents to one of the College's Title IX Coordinators.

*Faculty and Staff are required to report incidents to the Title IX Coordinators when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

Inquiries regarding the non-discrimination policies:	
Student and prospective student inquiries concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Associate Vice President for Student Affairs.	Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Associate Vice President for Human Resources.
Dr. Melissa Batten, AVP Student Affairs <i>Title IX Coordinator</i> Building 1100, Room 107A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5228 Melissa.Batten@hgtc.edu	Jacquelyne Snyder, AVP Human Resources <i>Section 504, Title II, and Title IX Coordinator</i> Building 200, Room 212A, Conway Campus PO Box 261966, Conway, SC 29528-6066 843-349-5212 Jacquelyne.Snyder@hgtc.edu