



## Course Number and Title: RCT 120 Pharmacology for Respiratory Care

**Campus Location:**

Georgetown, Wilmington

**Effective Date:**

2020-51

**Prerequisite:**

BIO 120, CHM 110, ENG 101, MAT 153, SSC 100 or concurrent

**Co-Requisites:**

None

**Course Credits and Hours:**

3.00 credits

3.00 lecture hours/week

0.00 lab hours/week

**Course Description:**

This course introduces pharmacological principles and therapeutic applications in relation to healthcare practice. Special emphasis is placed on therapeutic agents used in respiratory care

**Required Text(s):**

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

**Additional Materials:**

All program and policy manuals/handbooks

**Schedule Type:**

Classroom Course

**Disclaimer:**

None

**Core Course Performance Objectives (CCPOs):**

1. Examine the general principles of pharmacology. (CCC 1, 6; PGC 1)
2. Perform calculations associated with pharmacology. (CCC 1, 7; PGC 1)
3. Identify the structure and function of the autonomic nervous system (ANS), including the sympathetic and parasympathetic nervous systems and medications that influence these systems. (CCC 1, 6; PGC 1)
4. Identify the structure and function of the autonomic ganglia and selected medications that affect them. (CCC 1, 6; PGC 1)
5. Describe pharmacological methods of controlling mucous. (CCC 1, 6; PGC 1)
6. Explain the pharmacologic principles and therapeutic applications of surfactants and their role in patient care. (CCC 1, 6; PGC 1)
7. Discuss the pharmacologic principles and therapeutic applications of xanthines and their role in patient care. (CCC 1, 6; PGC 1)
8. Explain the pharmacologic principles and therapeutic applications of corticosteroids and their role in patient care. (CCC 1, 6; PGC 1)
9. Describe the pharmacologic principles and therapeutic applications of anti-allergic and antihistamine medications and their role in patient care. (CCC 1, 6; PGC 1)
10. Explain the pharmacologic principles and therapeutic applications of selected anti-infective medications and their role in patient care. (CCC 1, 6; PGC 1)
11. Discuss the pharmacologic principles and therapeutic applications of selected medications that affect the central nervous system (CNS) and their role in patient care. (CCC 1, 6; PGC 1)
12. Explain the pharmacologic principles and therapeutic applications of selected medications that affect the cardiovascular system and their role in patient care. (CCC 1, 6; PGC 1)
13. Describe the pharmacologic principles and therapeutic applications of selected anticoagulants and their role in patient care. (CCC 1, 6; PGC 1)
14. Explain the pharmacologic principles and therapeutic applications of disinfectants and antiseptics and their role in patient care. (CCC 1, 6; PGC 1)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

**Measurable Performance Objectives (MPOs):**

Upon completion of this course, the student will:

1. Examine the general principles of pharmacology.

1. Define *drug*.
2. Explain three sources of medications.
3. Explain three means of identifying a medication.
4. Differentiate between an agonist and antagonist.
5. Describe three sources of drug information.
6. List and describe four components of pharmacokinetics.
7. Demonstrate common abbreviations used in writing prescriptions.
8. Discuss the drug dosage forms.
9. Explain the five routes of drug administration.
10. Explain the five rights of drug administration.
11. Discuss the factors that contribute to individual response to medication.
2. Perform calculations associated with pharmacology.
  1. List units of measure of the metric system.
  2. Convert from grams to milligrams and liters to milliliters.
  3. Convert between household and metric measurements.
  4. Apply percent solutions and ratios.
  5. Calculate a drug dosage using mg/kg dosing, liquid measurement, and percent and ratio solutions.
3. Identify the structure and function of the autonomic nervous system (ANS), including the sympathetic and parasympathetic nervous systems and medications that influence these systems.
  1. Explain the two divisions of the autonomic nervous system.
  2. Identify the neurotransmitters found in each division of the autonomic nervous system.
  3. Examine agents that destroy neurotransmitters or block receptors.
  4. Differentiate among alpha, beta 1, and beta 2 receptors, and explain where they are located.
  5. Categorize the effects and adverse effects of stimulating different receptors.
  6. Select drugs that represent each class of agonists and antagonists.
4. Identify the structure and function of the autonomic ganglia and selected medications that affect them.
  1. Describe the pharmacological effects of both ganglionic stimulation and ganglionic blockade.
  2. Define the three ganglionic blocking drugs, and describe their clinical use.
  3. Discuss the adverse effects associated with the use of ganglionic blocking agents.
5. Describe pharmacological methods of controlling mucous.
  1. Describe three methods of controlling mucous.
  2. Discuss drugs representing each pharmacological method of controlling mucous.
6. Explain the pharmacologic principles and therapeutic applications of surfactants and their role in patient care.
  1. Describe the purpose of naturally occurring surfactant.
  2. Identify four different surfactants commercially available, and explain how they are classified.
  3. Discuss the adverse effects of surfactants.
7. Discuss the pharmacologic principles and therapeutic applications of xanthines and their role in patient care.
  1. List three xanthine generic drugs.
  2. Describe six pharmaceutical properties of xanthines.
  3. State the therapeutic range of theophylline.
  4. Describe adverse effects of medium and high doses of xanthines.
8. Explain the pharmacologic principles and therapeutic applications of corticosteroids and their role in patient care.
  1. Describe where steroids are secreted.
  2. Describe diseases associated with excess and absence of steroids.
  3. Explain two effects of glucocorticoids on metabolism.
  4. Explain the mechanisms of action of steroids.
  5. Discuss the indications for use of steroids, including asthma.
  6. Describe the adverse reactions associated with steroids given orally versus by aerosol.
  7. Discuss examples of oral and aerosolized steroids by brand and generic names.
9. Describe the pharmacologic principles and therapeutic applications of anti-allergic and antihistamine medications and their role in patient care.
  1. Describe the location of mast cells in the body.
  2. Describe the mechanism for release of histamine from mast cells.
  3. Explain the difference between H<sub>2</sub> and H<sub>1</sub> receptors.
  4. Describe the vascular effects of histamine release.
  5. Describe the smooth muscle effects of histamine.
  6. Provide examples of sedating and non-sedating antihistamines.
  7. Describe the adverse effects of antihistamines.
  8. Describe the mechanism of action of cromolyn sodium.
  9. List dosage forms available of cromolyn sodium.
  10. Discuss the adverse effects of cromolyn sodium.
  11. Identify indications for use of leukotriene blockers.
  12. Discuss the dosage forms available of leukotriene blockers.
  13. Identify frequency of dosing of leukotriene blockers.
  14. Explain the benefits of therapy of leukotriene blockers.
  15. Explain the adverse reactions of leukotriene blockers.
10. Explain the pharmacologic principles and therapeutic applications of selected anti-infective medications and their role in patient care.

1. Explain the difference between colonization and infection.
  2. Explain the methods for classifying bacteria.
  3. Explain the difference between cidal and static agents.
  4. Describe two methods used to identify antibacterial sensitivity.
  5. Describe the mechanisms by which bacteria develop resistance.
  6. Explain the mechanism of action, spectrum of activity, adverse effects, routes of administration, and examples of the different antimicrobials.
  7. Discuss the drug interactions of tetracyclines.
11. Discuss the pharmacologic principles and therapeutic applications of selected medications that affect the central nervous system (CNS) and their role in patient care.
    1. List the neurotransmitters of the CNS.
    2. Describe the adverse reactions to barbiturates.
    3. Discuss the advantages, adverse reactions, and examples of benzodiazepines.
    4. Name the reversal agent used for benzodiazepines.
    5. Describe the adverse reactions to phenothiazines and butyrophenones.
    6. Describe the adverse reactions to tricyclic antidepressants and serotonin re-uptake inhibitors.
    7. Discuss examples and adverse effects of antiepileptic medications.
    8. Describe the pharmacological effects, adverse effects, and examples of narcotics.
    9. Name the reversal agent for narcotic adverse effects.
    10. List and describe examples, uses, adverse effects, and precautions of non-steroidal anti-inflammatory drugs (NSAIDs).
  12. Explain the pharmacologic principles and therapeutic applications of selected medications that affect the cardiovascular system and their role in patient care.
    1. Define the chronotropic and inotropic actions.
    2. Describe the treatment modalities for congestive heart failure.
    3. Describe the symptoms of congestive heart failure.
    4. Explain the mechanisms of action, precautions, drug interactions, and adverse effects of digoxin.
    5. Explain the mechanisms of action, list examples, and describe adverse effects of angiotensin-converting enzyme (ACE) inhibitors.
    6. Describe the causes and treatments of arrhythmias.
    7. Discuss the four properties of cardiac tissue.
    8. List and describe the indications and actions of amrinone, milrinone, and adenosine.
    9. List the agents for the treatment of angina.
    10. Describe the mechanisms of action, adverse effects, and available dosage forms of nitrates.
    11. Describe the mechanisms of action, adverse effects, drug interactions, and examples of beta blockers and calcium channel blockers.
    12. List the agents used in the treatment of hypertension.
    13. Describe the basic anatomy of the nephron.
    14. Discuss the indications for the use of diuretics.
    15. Explain the mechanism of action and examples of osmotic diuretics and potassium sparing diuretics.
    16. Explain the mechanism of action, drug interactions, and examples and adverse effects of loop diuretics.
  13. Describe the pharmacologic principles and therapeutic applications of selected anticoagulants and their role in patient care.
    1. Describe the mechanism by which a blood clot forms and is dissolved.
    2. Explain the two ways the commonly used anticoagulants inhibit clot formation.
    3. Explain why heparin must be administered by injection.
    4. Describe the primary response to anticoagulant overdose.
    5. Explain why clot dissolution is clinically useful.
    6. Describe circumstances under which products are useful to promote clotting.
  14. Explain the pharmacologic principles and therapeutic applications of disinfectants and antiseptics and their role in patient care.
    1. Explain the mechanism of action of antiseptics.
    2. List agents commonly used for cleaning.
    3. Explain the indications for using ethylene oxide and its limitations.

**Evaluation Criteria/Policies:**

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

**Final Course Grade:**

Calculated using the following weighted average

Evaluation Measure	Percentage of final grade
Summative: (4) Exams (equally weighted)	70%
Summative: Project/presentation	15%
Summative: Cumulative Final	10%
Formative: Four Quizzes	5%
TOTAL	100%

**Core Curriculum Competencies (CCCs are the competencies every graduate will develop):**

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

**Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):****AHTAASRCT**

1. Apply theoretical information that leads to an appropriate action in the application or delivery of respiratory care procedures.
2. Perform technical skills in the implementation of respiratory care procedures within a plan of care.
3. Practice behaviors that are consistent with professional and employer expectations/requirements of their employees.

**Disabilities Support Statement:**

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.