

# Basic Respiratory Care Pharmacology

## Class

RSPT 1113

A study of basic pharmacological principles/practices of cardiopulmonary drugs. Emphasis on classification, routes of administration, dosages/calculations, and physiological interaction.

## Course Learning Objectives

Explain the mode of action, clinical indications, dosages, hazards, and side effects of cardiopulmonary drugs; calculate drug dosages; and select optimal drugs used in the practice of respiratory care.

- I. Describe of the basic principles utilized in pharmacology (F1, F2, F5, F6).
  - A. Define the following terms:
    1. Pharmacology
    2. Agonist
    3. Antagonist
    4. Orphan drug
    5. Pharmacokinetic
    6. Pharmacodynamics
    7. Respiratory Care pharmacology
    8. Receptor
  - B. Describe the process involved in naming of drugs.
  - C. Identify the routes of administration of drugs.
  - D. Explain the pharmacokinetics of inhaled aerosols.
  - E. Describe and list the process of drug approval in the U.S.
  - F. The student will identify the necessary information required for a complete medication order in Respiratory Therapy.
  - G. List or define abbreviations and symbols used in prescription writing.
  - H. List and explain the therapeutic purpose and grouping of agents commonly used in respiratory care.
- II. Identify and describe the central and peripheral nervous systems (F1, F2, F5, F6, F10).
  - A. Describe the nervous systems.
  - B. Identify the anatomy of the nervous systems.
  - C. Compare and contrast the parasympathetic and sympathetic nervous systems.
  - D. Explain the function of neurotransmitters.
  - E. Identify the efferent and afferent nerve fibers.
  - F. Define and explain the terminology of the drugs that affect the nervous system.
  - G. Describe the parasympathetic nervous system in relation to the following:
    1. Cholinergic neurotransmitter function
    2. Muscarinic and nicotinic receptors and effects
  - H. Describe the sympathetic nervous system in relation to the following:
    1. Adrenergic neurotransmitter function
    2. Sympathetic receptor types
- III. Describe, classify and explain sympathomimetic bronchodilators (F1, F2, F5, F6).
  - A. Identify the mode of action for adrenergic agents.
  - B. Discuss and classify the following medications:
    1. Catecholamines
    2. Resorcinol Agents
    3. Saligenin Agents
    4. Epinephrine
    5. Racemic Epinephrine
    6. Albuterol
    7. Levalbuterol
    8. Salmeterol
    9. Formoterol
    10. Arformoterol

11. Indacaterol
12. Olodaterol
- C. Discuss drug formulations of these medications.
- D. Identify the routes of administration for these drugs.
- E. Discuss the possible adverse side effects of these medications.
- IV. Describe, classify and explain parasympatholytic bronchodilators (F1, F2, F5, F6).
  - A. Identify the mode of action for anticholinergic bronchodilators.
  - B. Discuss the pharmacologic effects of anticholinergic agents.
  - C. Discuss and classify the following drugs:
    1. Atropine sulfate
    2. Ipratropium bromide
    3. Tiotropium bromide
  - D. Explain the clinical application of these drugs in relation to COPD.
  - E. Discuss the pro and con to combination therapy.
  - V. Describe corticosteroid and mediator antagonist therapy (F1, F2, F5, F6)
    - A. Describe the physiology of corticosteroids.
    - B. Describe the mode of action of corticosteroids.
    - C. Identify the corticosteroids that are available for administration by aerosol.
    - D. List and describe the side effects, hazards, and precautions of corticosteroids.
    - E. Discuss the clinical application of corticosteroids in respiratory care.
    - F. Describe briefly the allergic asthmatic response.
    - G. Describe the mode of action for corticosteroids.
    - H. Identify the various preparations of corticosteroids.
    - I. Describe the clinical application of corticosteroids.
  - VI. Identify and describe combination drugs utilized in Respiratory Care (F1, F2, F5, F6).
    - A. Identify and classify the combination drugs available.
    - B. Describe and explain the indications for the combination medications.
    - C. Identify patient populations that would benefit from combination medications.
  - VII. Describe xanthine agents (F1, F2, F5, F6).
    - A. Discuss the general pharmacologic properties of xanthines.
    - B. Identify the clinical uses for xanthines.
    - C. Explain the mode of action for xanthines.
    - D. Explain the importance of titrating theophylline doses.
    - E. Identify the proper serum levels for theophylline.
    - F. Discuss the side effects of xanthines.
    - G. Discuss the clinical application of xanthines.
  - VIII. Describe mucus controlling agents (F1, F2, F5, F6).
    - A. Discuss the physiology of the mucociliary system.
    - B. Explain the structure and nature of mucus secretions.
    - C. Identify the physical properties of mucus.
    - D. Discuss the following mucus controlling agents:
      1. Acetylcysteine
      2. Dornase
      3. Sodium bicarbonate
    - E. Discuss the effect of bland aerosols on mucus.
    - F. Explain the following terminology.
      1. Mucus
      2. Sputum
      3. Mucoactive
      4. Mucolytic
      5. Mucokinetic
  - IX. Describe nonsteroidal antiasthma agents (F1, F2, F5, F6).
    - A. Identify the clinical application for nonsteroidal agents.
    - B. Describe the mode of action for nonsteroidal agents.
    - C. List and describe adverse effects, indications, and normal doses associated with nonsteroidal agents.
  - X. Describe, list and identify sedatives and analgesics (F1, F2, F5, F6).
    - A. Identify and describe the mode of action for miscellaneous sedatives

- B. Identify and describe the mode of action for miscellaneous analgesics
- C. Identify Nonsteroidal anti-inflammatory drugs
- D. Describe conscious sedation
- E. List and describe narcotic and non-narcotic analgesics
- XI. Describe neuromuscular blocking agents. (F1, F2, F5, F6)
  - A. Describe the physiology of the neuromuscular junction.
  - B. Identify nondepolarizing and depolarizing agents.
  - C. List the clinical applications of neuromuscular blocking
  - D. Describe the mode of action of miscellaneous agents.
  - E. List, describe, and explain the duration of action.
  - F. Identify the methods in which muscle contraction is abolished.
- XII. Describe anti-infective agents (F1, F2, F5, F6)
  - A. List and describe the modes of action of anti-infective
  - B. Identify miscellaneous anti-infective agents and their uses.
  - C. Describe the mode of action for anti-viral agents.
  - D. List and describe specific anti-viral agents.
  - E. Identify the antibiotics that can be administered by aerosol.
  - F. Describe clinical applications, adverse effects, and administration of miscellaneous anti-infective agents.
- XIII. Describe anti-microbial agents (F1, F2, F5, F6)
  - A. List, describe and explain the following:
    1. Antibiotics
    2. Antimycobacterials
    3. Antifungals
    4. Antivirals
  - B. Identify the mode of action and clinical use of the following:
    1. Antibiotics
    2. Antimycobacterials
    3. Antifungals
    4. Antivirals
- XIV. Describe selected agents of pulmonary value (F1, F2, F5, F6).
  - A. Discuss the indications for  $\alpha$ 1-proteinase inhibitor.
  - B. Recognize  $\alpha$ 1-proteinase inhibitor deficiency in a patient.
  - C. List the  $\alpha$ 1-proteinase inhibitors that are available.
  - D. List three types of formulations for nicotine replacement.
  - E. Recognize the advantages and disadvantages of nicotine replacement.
  - F. Discuss medications given to treat pulmonary hypertension.
  - G. Discuss the indications for nitric oxide.
  - H. Describe the effects of inhaled nitric oxide.
- XV. Describe cold and cough agents (F1, F2, F5, F6).
  - A. Differentiate between the common cold and the flu.
  - B. Differentiate between the specific types of colds and cough agents
  - C. Discuss the mode of action for each specific cold and cough agent.
- XVI. Describe diuretic agents. (F1, F2, F5, F6)
  - A. Identify the anatomy of the kidney.
  - B. Discuss the function of the nephron.
  - C. Describe the mode of action of miscellaneous agents.
- XVII. Describe surfactant agents (F1, F2, F5, F6).
  - A. Identify the physical principles of surfactant agents.
  - B. Discuss the physical assessment during the administration of surfactant.
  - C. Discuss mucus wetting agents.
  - D. Discuss exogenous surfactant and identify the clinical uses.
  - E. Identify the different types of surfactant.

### Required Textbooks

Rau's Respiratory Care Pharmacology, 10th ed., Douglas S. Gardenhire, Mosby

## Evaluation Standards

Three Major Examinations 50%

- ♣ Exam 1 (Objectives I, II, III)
- ♣ Exam 2 (Objectives III and IV)
- ♣ Exam 3 (Objectives V, VI, VII, VIII, & IX)
- ♣ Exam 4 (Objectives X, XI, XII, & XIII)

Weekly Study Guide 15%

- ♣ 11 Weekly Study Guide Uploads (Objectives III, IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV, XVI, & XVII)

Assignments 15%

- ♣ Assignment 1 (Objectives I, II, III, IV, V, VI, VIII, VIII, & IX)
- ♣ Assignment 2 (Objectives XIV, XV, XVI, & XVII)

Final Examination: 20%

- ♣ Final Exam (Objectives III, IV, XIV, XV, XVI, XVII)

- A 90-100%
- B 80-89%
- C 75-79%
- F <75%

## Absences

Your attendance is the biggest predictor of your success. Attendance at every class is expected. The student will be allowed to miss 2 days of lecture without affecting their grade (exception of test days). See student handbook. Every absence over the 2 absences will result in a 10% deduction of the student's final grade. Punctuality is of equal importance. If the student is more than 15 minutes late to lecture or lab this will constitute an absence. 3 tardies result in one absence.

## Disabilities

### ADA Statement:

Any student with a documented disability (e.g. learning, psychiatric, vision, hearing, etc.) may contact the Office on the Weatherford College Weatherford Campus to request reasonable accommodations. *Phone:* 817-598-6350  
*Office Location:* Office Number 118 in the Student Services Building, upper floor. *Physical Address:* Weatherford College 225 College Park Drive Weatherford, TX.

## Academic Integrity

Academic Integrity is fundamental to the educational mission of Weatherford College, and the College expects its students to maintain high standards of personal and scholarly conduct. Academic dishonesty of any kind will not be tolerated. Academic dishonesty includes, but is not limited to, cheating on an examination or other academic work, plagiarism, collusion, and the abuse of resource materials including unauthorized use of Generative AI. Departments may adopt discipline specific guidelines on Generative AI usage approved by the instructional dean. Any student who is demonstrated to have engaged in any of these activities will be subject to immediate disciplinary action in accordance with institutional procedures.