

# RESP-1100: INTRODUCTION TO RESPIRATORY CARE

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## Cuyahoga Community College

**Viewing: RESP-1100 : Introduction to Respiratory Care**

**Board of Trustees:**

May 2022

**Academic Term:**

Fall 2022

**Subject Code**

RESP - Respiratory Care

**Course Number:**

1100

**Title:**

Introduction to Respiratory Care

**Catalog Description:**

Introductory overview of the field of Respiratory Care. Areas of concentration include: respiratory care profession, basic physics, states of matter, bedside Pulmonary Function Tests (PFTs), and related measurements/calculations; medical terminology, and related measurements and calculations; mechanics of patient transfers/turning.

**Credit Hour(s):**

1

**Lecture Hour(s):**

1

## Requisites

**Prerequisite and Corequisite**

None.

## Outcomes

**Course Outcome(s):**

Relate basic principles of physics to Respiratory Care.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

**Objective(s):**

1. Differentiate the states of matter and measurements related to each.
2. Assemble equipment and measure bedside PFTs.
3. Perform patient transfer and turning procedures.

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**Course Outcome(s):**

Identify the components of the Respiratory Care profession.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

**Objective(s):**

1. Identify agencies and their goals that support the Respiratory Care Profession.
2. Differentiate areas of employment within the Respiratory Care Profession.
3. Categorize primary patient populations served by Respiratory Care Professionals.

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**Course Outcome(s):**

Differentiate the states of matter and basic related physics principles.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

**Objective(s):**

1. Compare basic physics principles related to the states of matter.
2. Convert SI and English measurements of length, volume, weight, and pressure.
3. Measure barometric pressure.

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**Course Outcome(s):**

Measure bedside PFTs.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Quantitative Reasoning: Analyze problems, including real-world scenarios, through the application of mathematical and numerical concepts and skills, including the interpretation of data, tables, charts, or graphs.

**Objective(s):**

1. Categorize bedside PFTs by measurements of flow, volume and pressure.
2. Assemble equipment and perform bedside PFTs.
3. Calculate related measurements of flow, volume and pressure.

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**Course Outcome(s):**

Perform patient transfer and turning maneuvers.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

**Objective(s):**

1. Identify safe body mechanics necessary for safe patient transfers and turning maneuvers.
2. Demonstrate safe patient transfers and turning maneuvers.
3. Demonstrate proper patient identification.

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**Methods of Evaluation:**

1. Quizzes
2. Exams
3. Comprehensive final

4. Activity worksheets
5. Small group discussions and assignments

**Course Content Outline:**

1. Respiratory Care Profession
  - a. Goal of profession
  - b. Related organizations/agencies goals/function
    - i. American Association for Respiratory Care (AARC)
    - ii. Ohio society for Respiratory Care (OSRC)
    - iii. National Board for Respiratory Care (NBRC)
    - iv. Commission on Accreditation of Respiratory Care (CoARC)
    - v. State of Ohio Medical Board (OH license for Respiratory Care)
  - c. Employment opportunities
    - i. Acute care – adults
    - ii. Neonatal/pediatrics
    - iii. Diagnostics
      1. PFT lab
      2. Bronchoscopy lab
    - iv. Pulmonary rehabilitation
    - v. Homecare
    - vi. Long-term care
      1. Long-term acute care (LTAC)
      2. Skilled nursing home
    - vii. Case management/patient education
      1. Asthma
      2. COPD
      3. Smoking cessation
    - viii. Emergency medicine/patient transport
  - d. Primary patient populations served
    - i. Disease categories
      1. COPD
      2. Asthma
      3. Pediatrics
      4. Neonatal
      5. Post-up
      6. Life-support systems
2. Basic physics principles
  - a. Motion -definition
  - b. Causes of motion
    - i. Newton's Laws
    - ii. Forces of gravity
      1. Mass
      2. Weight
      3. Density
    - iii. Clinical application of gravity
3. States of Matter
  - a. Liquids
    - i. Pressure in liquids
      1. Distribution of pressure
      2. Transmission of pressure
    - ii. Buoyant forces and Archimedes principle
    - iii. Pressure in flowing liquid
  - b. Gases
    - i. Pressure in gases
      1. Distribution of pressure
      2. Transmission of pressure
    - ii. Behavior of ideal gases and related calculations
      1. Boyle's Law
      2. Charles's Law

3. Gay-Lussac's Law
4. Universal Gas Law
- iii. Measurements of pressure
  1. Barometric pressure
  2. Humidity and pressure
  3. Related calculations
  4. Relationship of altitude and barometric pressure
4. Math applications
  - a. Basic math and related calculations
    - i. Order of operations
    - ii. Ratios
    - iii. Percentages
    - iv. Fractions
    - v. Gas pressure calculations
      1. Alveolar-air equation
      2. Gas law equations
  - b. SI – English system conversions
    - i. Length
    - ii. Weight
    - iii. Volume
    - iv. Pressure
5. Bedside Pulmonary Function Tests (PFTs)
  - a. Clinical uses of bedside PFTs
    - i. Trend treatments
    - ii. Evaluate medication use
    - iii. Minimal equipment needed
  - b. Basic terminology and related calculations
    - i. Minute ventilation (VE)
    - ii. Respiratory rate (RR)
    - iii. Peak flow (PF)
    - iv. Tidal volume (VT)
    - v. Maximal inspiratory pressure (MIP)
    - vi. Maximal expiratory pressure (MEP)
  - c. Perform Bedside PFs
    - i. Gather needed equipment
      1. Spirometer
      2. Pressure manometer
      3. One-way valve set-up
      4. PF meter
    - ii. Assemble equipment
    - iii. Patient directions
    - iv. Perform and record measurements
6. Medical terminology
  - a. Body systems
    - i. Respiratory
    - ii. Cardiac
    - iii. Kidney
    - iv. Nervous
  - b. Prefixes and suffixes
  - c. Medication delivery
    - i. Times per day
    - ii. Administration method
    - iii. Measurements
      1. Weights
      2. Volumes
  - d. Patient positions
    - i. Supine
    - ii. Fowler's
    - iii. Semi-Fowlers

7. Patient transfer and turning
  - a. Proper body mechanics
    - i. Back position
    - ii. "lift with legs"
    - iii. Feet position
  - b. Bed
    - i. Position of arm and foot rails
    - ii. Height of bed
  - c. Transfer methods
    - i. Move patient "up in bed"
      1. 1-person
      2. 2-person
      3. Draw sheet
    - ii. Turning patient
      1. Support patient during turn
      2. Position of arms/legs
      3. Frequency of turning
  - d. Demonstrate
    - i. Transfer up in bed
    - ii. Turn patient from side to side

## Resources

Chang, David W. (2019) *Respiratory Care Calculations*, Clifton Park, NY: Delmar Cengage Learning.

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Kacmarek, RM, Stoller JK, Heuer, AJ. (2019) *Egan's Fundamental of Respiratory Care*, St. Louis: Elsevier.

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Cairo, JM. (2021) *Mosby's Respiratory Care Equipment*, St. Louis: Elsevier.

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