

# RESP-2210: INTRODUCTION TO MECHANICAL VENTILATION

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## Cuyahoga Community College

**Viewing: RESP-2210 : Introduction to Mechanical Ventilation**

**Board of Trustees:**

June 2020

**Academic Term:**

Fall 2020

**Subject Code**

RESP - Respiratory Care

**Course Number:**

2210

**Title:**

Introduction to Mechanical Ventilation

**Catalog Description:**

Introduction to mechanical ventilation with special emphasis on ventilator terminology. Covers information necessary to understand basic functions of a life support ventilator.

**Credit Hour(s):**

1

**Lecture Hour(s):**

1

## Requisites

**Prerequisite and Corequisite**

Concurrent enrollment in RESP-2940 Respiratory Care Field Experience I.

## Outcomes

**Course Outcome(s):**

Contrast the different characteristics of Type 1 and Type 2 respiratory failure.

**Objective(s):**

1. Define respiratory failure.
2. Differentiate between the terms Type-I and Type-II respiratory failure.
3. Defend indications for ventilatory support.
4. Explain the differences between negative pressure ventilation vs. positive pressure ventilation.
5. Apply the goals of mechanical ventilation.

**Course Outcome(s):**

Categorize characteristics of mechanical ventilation.

**Objective(s):**

1. Differentiate between the terms trigger vs. cycle.
2. Describe the following components of a mechanical ventilator: circuits, power source, control panel, trigger/cycle mechanisms, full/partial support, and gas source.
3. Compare similarities and differences between modes of ventilation.
4. Identify diagrams of waveform tracing depicting various modes of ventilation.

**Course Outcome(s):**

Initiate mechanical ventilation given patient settings.

**Objective(s):**

1. Set volume, pressure, flow, and time controls given specific patient settings.
  2. Discuss the patient safety aspects related to proper alarm settings.
  3. Calculate and set alarms given specific patient settings.
  4. Calculate tidal volume given a disease state category.
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**Course Outcome(s):**

Assemble a mechanical ventilator given specific settings

**Objective(s):**

1. Assemble mechanical ventilator (circuit and filters).
  2. Perform safety check.
  3. Set all controls (mode, flow, tidal volume, rate, sensitivity, ramp, FIO<sub>2</sub>, PEEP) given a patient scenario.
  4. Adjust alarms/limits to match settings.
  5. Identify the indication for mechanical ventilation given a specific patient scenario.
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**Methods of Evaluation:**

- A. Exams
- B. Quizzes
- C. Skills demonstration

**Course Content Outline:**

1. Definitions related to respiratory failure
  - a. Type-I
    - i. Causes
    - ii. Treatments
  - b. Type-II
    - i. Causes
    - ii. Treatments
2. Terms related to mechanical ventilation
  - a. Trigger
  - b. Cycle
  - c. Limit
  - d. Volume control
  - e. Pressure control
  - f. Modes
  - g. Positive end expiratory pressure (PEEP)
3. Indications to commit to mechanical ventilation
  - a. Physiologic measurements
  - b. Patient assessments
4. Methods/Modes of mechanical ventilation
  - a. Negative pressure
  - b. Positive pressure
    - i. Control
    - ii. Assist
    - iii. Assist/control
    - iv. Synchronized intermittent mandatory ventilation
    - v. Continuous Positive Airway Pressure (CPAP),
    - vi. Positive End-Expiratory Pressure (PEEP)
    - vii. Continuous Mandatory Ventilation (CMV),
    - viii. Intermittent Mandatory Ventilation (IMV),
    - ix. Pressure-controlled (PC) modes
5. Hands on demonstrations
  - a. Ventilator set-up
    - i. Filters
    - ii. Tubing/circuit
  - b. Set ventilator settings

- i. Alarms
- ii. Tidal volume
- iii. Rate
- iv. Flowrate
- v. Inspired oxygen

## Resources

Cairo, JM, et. al. (2017) *Respiratory Care Equipment*, St. Louis: Mosby Elsevier.

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Kacmarek, RM, et. al. (2020) *Egan's Fundamentals of Respiratory Care*, St. Louis: Elsevier Mosby.

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Hess, DR, et.al. (2019) *Respiratory Care Principles and Practice*, New York: McGraw Hill.

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Cairo, JM. (2017) *Pilbeam's Mechanical Ventilation: Physiological and Clinical Applications*, St. Louis: Mosby Elsevier.

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David C Shelledy and Jay I Peters. (2020) *Mechanical Ventilation*, Burlington, MA: Jones & Bartlett Learning.

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## Resources Other

<http://www.rcjournal.com/cpgs/index.cfm> (<http://www.rcjournal.com/cpgs/>)

<http://ventworld.com>

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