# Mechanical Ventilation in Emergency Medicine Online Course

**Author** Dr Peter Stuart FACEM
**Peer Review** Dr J Bament FRACGP FARP, Dr Tim Burrough FRACGP, Dr M Stevens FRACGP, Dr G Oddie FACEM
**Latest Review** February 2025
**Accreditation** RACGP (Activity Number 417705) & ACRRM (Activity Number: 39713) for the 2026-2028 triennium

## Learning Outcomes:

**At the completion of the program participants should be ble to:**

1. List common indications for emergency endotracheal intubation
2. Describe the procedure for patient preparation in ETT
3. List the indications for mechanical ventilation in the emergency patient
4. Identify contraindications for mechanical ventilation in the emergency patient
5. List the indication(s) for intubation and ventilation in the patient with life threatening asthma
6. Describe the potential complications associated with mechanical ventilation
7. Explain the procedure for attaching connections and performing a preop check on a portable ventilator

**Summary of the e-Learning Program**

The e-learning is interactive and requires the clinician to consider a range of the clinical problems and scenarios and provide a response. At the end of each topic a summative quiz is used to evaluate learning and understanding of the topic material. There are four topics with a total course time of 6 hours.

The three topics are:

1. Ventilation: Airway Management
2. Ventilator Mode and Settings
3. Ventilation: Application to Clinical Practice
4. Setting up the Draeger Oxylog 3000 and Hamilton T1 Ventilators for Mechanical Ventilation

# Outline of the Program

## 1. Airway Management in Ventilation

**Module Summary:** The first step to initiating mechanical ventilation is to secure the airway using an endotracheal tube. This protects the airway and facilitates ventilation. The procedure involves preparing the equipment required for airway management, preoxygenation of the patient, attaching monitoring and obtaining IV access, administering a sedative followed by muscle relaxant to facilitate rapid sequence intubation and checking that the ETT has been correctly placed.

**Interaction/Assessment:**

- Chapter reading: ABCDs of Emergency Medicine – Rapid Sequence Intubation
- Interactive Clinical Casebook: Airway Management in Ventilation
- Topic Quiz – Airway Management

## 2. Mechanical Ventilation - Modes and Settings

**Module summary:** Mechanical ventilation is one of the central skills in critical care medicine. In this module we explore the physiology, indications, contraindications, ventilator mode SIMV+PS, and the lung protective strategy for ventilator settings in the emergency patient. If this is your first time encountering this topic it is advisable that you consider reviewing the module several times before attempting the quiz.

**Interaction/Assessment:**

- Chapter reading: ABCDs of Emergency Medicine – Mechanical Ventilation
- Interactive Clinical Casebook: Ventilator Mode and Setting
- Topic Quiz – Ventilator Modes and Settings

## 3. Ventilation in Obstructive Lung Disease

**Module summary**: In this topic we focus our attention on the obstructive lung ventilator strategy designed for the management of the patient with asthma or COAD requiring ventilation. In the later part of the module we review the assessment and management of complications relating to ventilation and the procedure for managing the patient who develops hypoxia during ventilation. As the material is quite complex it may be worth reviewing this module several times before attempting the quiz.

**Interaction/Assessment:**

- Chapter reading: ABCDs of Emergency Medicine – Acute Asthma
- Interactive Clinical Casebook: Application to Clinical Care
- Topic Quiz: Ventilation – Application to Clinical Care

## 4. Application to Practice: Setting up the Ventilator

**Module summary**: *Please Note: For this course you are only required to complete one of the topics on Setting up the Ventilator - either the Oxylog 3000 or Hamilton T1*

In this topic we consider the practical issues relating to setting up and commencing ventilation in a patient. There are a wide variety of ventilators used in clinical practice making it difficult to cover this aspect of care for each ventilator. We have selected the two most commonly used ventilators in Emergency Medicine and Retrieval in Australia, the Draeger Oxylog 3000 and 3000 plus and the Hamilton T1 ventilator. **You get to choose!**

There is no need for you to become familiar with both the Oxylog and the Hamilton ventilators - choose the Ventilator that you will most likely to be operating in your clinical practice and work through the series of short video eTutorials that help you to get to know the machine, its cables, buttons, operating capabilities and its limitations, how to use the machine for volume controlled lung protective and obstructive ventilation - the two most common modes used for ventilation of the emergency patient.

### 4a. Oxylog 3000 Module

**Interaction/Assessment:**

- Reading: Draeger Oxylog 3000: Settings for Lung Protective and Obstructive Strategies
- Video eTutorial: Getting to know the Oxylog 3000
- Video eTutorial: Lung Protective Strategy with Oxylog 3000
- Video eTutorial: Obstructive Ventilation Strategy with Oxylog 3000
- Video eTutorial: Ventilating the Hypoxic Patient
- Video eTutorial: Ventilating the Acidotic Patient
- Topic Quiz: Oxylog 3000 Ventilator

### 4b. Hamilton T1 Ventilator Module

**Interaction/Assessment:**

- Reading: Hamilton T1: Settings for Lung Protective and Obstructive Strategies
- Video eTutorial: Setting up the Hamilton T1
- Video eTutorial: Getting to Know the Hamilton T1
- Video eTutorial: Ventilating the Hypoxic Patient with Hamilton T1
- Video eTutorial: Ventilating the Acidotic Patient with Hamilton T1
- Video eTutorial: Obstructive Ventilation Strategy with Hamilton T1
- Topic Quiz: Hamilton T1 Ventilator

## 5. Final Post Course Assessment Quiz

Final Course Quiz – Ventilation in Emergency Medicine