Non-invasive Ventilation & HFNP Oxygen in Emergency Care Online Course

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Learning outcomes

At the completion of the workshop the participants should be able to:

1. Discriminate the indications for non-invasive ventilation in the emergency patient
2. Differentiate the pressures in non-invasive ventilation using CPAP and BiPAP
3. Outline the contraindications and potential adverse effects associated with non-invasive ventilation
4. Discriminate the clinical findings and management of life threatening acute pulmonary oedema
5. Prioritise the ventilator settings and procedure for commencing CPAP in acute pulmonary oedema
6. Outline the role of NIV for treating acute exacerbations of chronic obstructive pulmonary disease
7. Differentiate the pressure settings and procedure for titrating BiPAP in the patient with an acuter exacerbation of COPD
8. Identify role of HFNP Oxygen in clinical care of the patient with respiratory distress

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 6.5 hours.

The four topics are:

1. Noninvasive Ventilation: Basic principles
2. CPAP: Acute Pulmonary Oedema
3. BiPAP: Chronic Obstructive Pulmonary Disease
4. Humidified High Flow Nasal Prong Therary (HFNP)

Outline of the Program

1. Non-invasive Ventilation: Basic Principles

Module summary: Noninvasive Ventilation (NIV) is an effective means of delivering positive pressure ventilation in the patient with severe respiratory distress without the use of an endotracheal tube. Often referred to as “CPAP” or “BiPAP,” NIV uses the patient’s upper airway and a mask for the delivery of positive pressure and is most frequently used to treat patients with moderate to severe respiratory distress due to COAD and Acute Pulmonary Oedema. In the first section of this topic we explore the core principles of Noninvasive Ventilation including how NIV works at a physiologic level, clinical applications, contraindications, starting pressures and potential complications.

Interaction/Assessment:

- Chapter reading: ABCDs of Emergency Medicine – Non-invasive Ventilation
- Video eTutorial: Introduction to Non-invasive Ventilation
- Interactive Clinical Casebook: Core Principles of Noninvasive Ventilation
- Topic Quiz – Principles of Noninvasive Ventilation

2. CPAP: Acute Pulmonary Oedema

Module summary: The real "magic" of noninvasive ventilation is best viewed from the perspective of a clinical case. In the following module a clinical scenario is used to illustrate how noninvasive ventilation can be applied in acute care to manage the critically ill patient presenting with shortness of breath. We consider the questions of when CPAP is most likely to be of benefit and how the therapy fits in with current pharmacological strategies.

In the Video eTutorial and Case simulation we examine clinical cases of acute pulmonary oedema and attempt to disentangle the pathophysiological states of systolic and diastolic heart failure. The module examines the significant role of noninvasive ventilation now plays in the management of the patient with severe acute pulmonary oedema and considers the practical setup, pressures and monitoring of the patient receiving noninvasive respiratory support.

Interaction/Assessment:

- Chapter reading: ABCDs of Emergency Medicine – Acute Pulmonary Oedema
- Video eTutorial: Acute Pulmonary Oedema
- Interactive Clinical Casebook: Acute Pulmonary Oedema
- Topic Quiz – CPAP and Acute Pulmonary Oedema

3. BiPAP: Chronic Obstructive Pulmonary Disease

Module summary: In this module we continue to explore the role of NIV in clinical care, this time focusing on the use of BiPAP and considering which patients are most likely to benefit from the use of BiPAP, how the therapy fits in with pharmacological approaches to management, contraindications to the use of BIPAP and the practical selection of pressures and monitoring of response.

Interaction/Assessment:

- Chapter Reading: ABCDs of Emergency Medicine – Chronic Obstructive Pulmonary Disease
- Interactive Clinical Casebook: Chronic Obstructive Pulmonary Disease
- Topic Quiz – BiPAP and Chronic Obstructive Pulmonary Disease

4. Humidified High Flow Nasal Prong Therapy (HFNP)

Module summary: In this module we explore the evolving role of Humidified High Flow Nasal Prong Therapy (HFNP) in the treatment of adults presenting with respiratory distress and hypoxia caused by a range of conditions including pneumonia and cardiac failure. The primary role of HFNP is as a bridge between low flow oxygen therapy (e.g., nasal specs at 2 l/min) and CPAP. It is most often considered in patients with hypoxia receiving high flow oxygen mask therapy and in patients with severe respiratory distress requiring non-invasive ventilation.

The short (quite entertaining) video on setting up the AIRVO2 is included here to illustrate the set up of a Humidified HFNP oxygen device and will prepare you for the Case Simulation. A longer video discussing the set up of the Vapotherm Precision Flow Hi-VNI device is included in the resources.

While HFNP oxygen may be used for the management of both adults and children with Type 1 Respiratory failure, there remain concerns with respect to its role in Type 2 Respiratory Failure (characterised by an elevated PCO2) where BIPAP remains preferred approach for providing noninvasive respiratory support.

Interaction/Assessment:

- Chapter Reading: ABCDs of Emergency Medicine – Humidified High Flow Nasal Cannula Oxygen
- Chapter Reading: ABCDs of Emergency Medicine – Community Acquired Pneumonia
- Video eTutorial: Setting up Humidified HFNP oxygen using AIRVO2
- Interactive Clinical Casebook: Humidified High Flow Nasal Prong Oxygen
- Topic Quiz – HFNP therapy in clinical Care

5. Final Post Course Assessment Quiz

Final Course Quiz – Non-invasive Ventilation and HFNP Oxygen in Clinical Care