

# THE USE OF A NOVEL OXYGEN DELIVERY DEVICE AND WIRELESS CLINICAL OXYGEN DOSE RECORDER FOR MONITORING PATIENTS USING SUPPLEMENTAL OXYGEN

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## BACKGROUND

Supplemental oxygen can be administered to patients with COPD and associated hypoxemia by a variety of delivery devices. Each delivery device has unique characteristics pertaining to the way the oxygen is delivered. These characteristics are responsible for the variability in the delivered oxygen dose under a variety of conditions and may result in inadequate oxygen saturation for the patient.

## PURPOSE

This study was conducted to evaluate oxygen dependent patients with their current oxygen delivery device and a novel Smart Dose device at rest and during exercise using a new wireless Clinical Oxygen Dose Recorder (CODR).

## METHODS

Nine patients with oxygen dependent COPD who were enrolled in a comprehensive pulmonary rehabilitation program were selected for the study. Each patient underwent a six minute walk test using their prescribed oxygen dose using the delivery device they were using at home. After a 10 minute rest period, each patient then underwent a repeat six minute walk test using the SmartDose algorithm device (Inspired Technologies, North Huntingdon, PA). (The SmartDose device automatically establishes the resting breath rate and increases the dose and flow rate setting with rises in respiratory rate during activity.)

A wireless recorder (Clinical Oxygen Dose Recorder, CODR, Inspired Technologies) was used to measure and trend the patient's respiratory rate, I:E ratio, SpO2, heart rate, and oxygen dose delivered. If the resting oxygen saturation was below 88%, the oxygen flow rate was increased as necessary to maintain the resting oxygen saturation above 88%. (Figure 1).

During each walk, respiratory parameters were continually recorded and dyspnea was measured (Borg scale) at the one minute and six minute time periods. The oxygen delivery devices used by the patients included: HomeFill (Invacare, Elyria, OH), Chad Oximatic (Inova, Naples, FL), Airsep (Airsep, Buffalo, NY), Helios (Covidian, Boulder, CO), and continuous flow oxygen. (Figures 2 and 3)

## Study Support

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SmartDose™ and CODR Devices

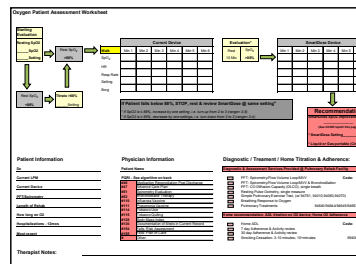


Figure 1. Methods Flowsheet

## RESULTS

Figure 2 SmartDose Waveform

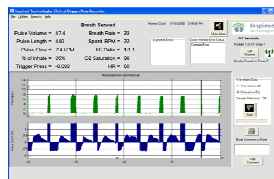


Figure 3 CODR Sample

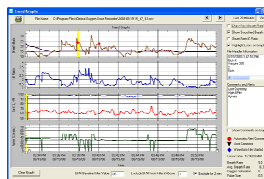


Table 1 Results

Patients	#
Total	9
Desaturation on current home device	3
No desaturation with SmartDose	3
Higher saturation (1-7%) with SmartDose	6
Titrated two settings lower with SmartDose	4
Titrated one setting lower with SmartDose	1
Associated complications	0

## DISCUSSION

Oxygen, for patient requiring supplemental oxygen therapy, is administered through a variety of means. In some instances the dose of oxygen prescribed does not meet the oxygen requirements for an individual patient. The oxygen delivery is dependent upon equipment characteristics and patient characteristics.

The use of a device that allows for an increase in the amount of oxygen delivered based upon an increase in the respiratory rate should help to maintain adequate oxygen saturations. The use of a wireless device capable of measuring respiratory rate, oxygen saturation, I:E ratio, and heart rate can help to determine the characteristics of an individual patient who is undergoing exercise.

## LIMITATIONS

- Nonrandomized selection of patients
- Non-blinding of oxygen delivery devices
- Small number of patients studied

## CONCLUSIONS

- Current oxygen delivery systems fail to provide adequate dose delivery during exercise in 30% of the patients studied. The use of the SmartDose device help to improve oxygen saturation in patients undergoing exercise.
- The CODR device is a helpful tool for understanding the characteristics associated with oxygen delivery with exercise.

## CLINICAL IMPLICATIONS

Attention to the characteristics of the oxygen delivery device must be taken into account in order to allow for optimal prescription of supplemental oxygen therapy.