

# Influence of Pulse Oximeter Technology on Hypopnea Diagnosis Using the Newly Proposed Definition of a Respiratory Hypopnea.

Whitman RA, Garrison ME, Oestreich TJ. *Sleep* 2002; 25:A509.

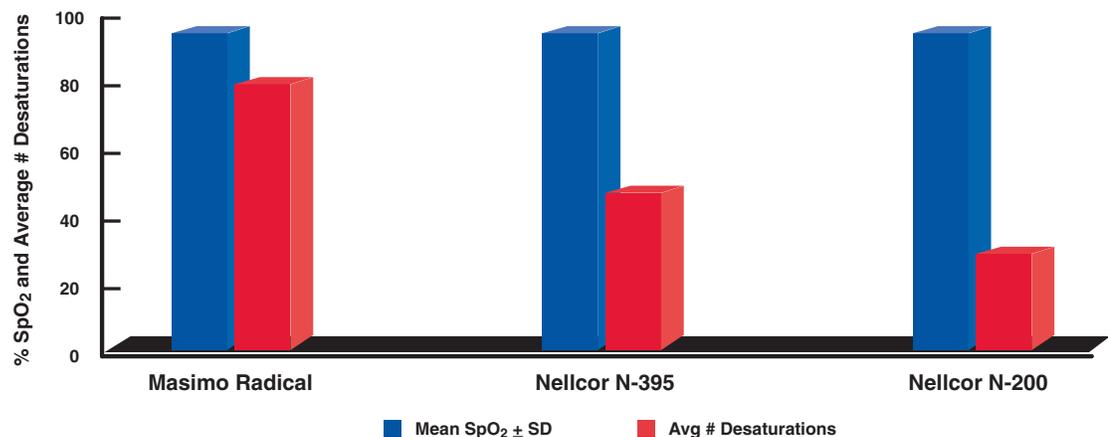
## Introduction

Accurate tracking of transient desaturations is an important part of diagnosing obstructive sleep apnea (OSA) and for establishing Medicare coverage of continuous positive airway pressure (CPAP) therapy. The currently accepted definition for OSA, developed by the American Academy of Sleep Medicine Task Force in 1999<sup>1</sup> is an apnea-hypopnea index of at least 15 events/hour with hypopnea being a 4% or greater drop in oxygen saturation and a 30% reduction in airflow. In this study, Whitman and co-workers compared three pulse oximeters, the Masimo Radical, the Nellcor N-395 and the Nellcor N-200 to determine if the pulse oximeter technology could influence the scoring of desaturations in patients with possible sleep-disordered breathing.

## Methods

Twenty-nine sleep lab patients with suspected sleep-disordered breathing were simultaneously monitored with three pulse oximeters, the Masimo Radical, the Nellcor N-395 and the Nellcor N-200, each set for the shortest averaging time. Trend data collected from the pulse oximeters was then downloaded onto a laptop computer for analysis with ProFox Oximetry Analysis software. Mean saturation and the number of desaturations greater to or equal to 4% SpO<sub>2</sub> were calculated and compared.

## Results



Average SpO<sub>2</sub> and Average Number of Desaturations by Pulse Oximetry Technology in Sleep Lab Patients (n=29)

There was no difference in the mean SpO<sub>2</sub> readings between the three pulse oximeters. There was a large difference however, in the number of desaturations detected by the different technologies. The Masimo Radical detected 69% more desaturations than the Nellcor N-395 and 161% more desaturations than the Nellcor N-200.

## Authors' Conclusions

There are serious health consequences to allowing OSA to go undiagnosed and untreated. Chronic or intermittent hypoxia, as occurs in patients with OSA and sleep disordered breathing, has been associated with numerous negative health consequences such as increased risk of heart failure, atrial fibrillation, stroke, high blood pressure, accidents and an overall decrease in quality of life.<sup>2</sup> The accurate diagnosis of OSA allows for more patients to receive CPAP treatment with coverage by Medicare. This study shows that, even when averaging times are similar, Masimo SET pulse oximetry is significantly better at tracking desaturations and therefore better for the diagnosis of OSA than other commonly used pulse oximetry technologies.

1. Sleep-related breathing disorders in adults; recommendations for syndrome definition and measurement techniques in clinical research. The report of an American Academy of Sleep Medicine Task Force. *Sleep*. 1999 Aug 1; 22(5):667-89.
2. Verneuil A, Marks JW. *Sleep Apnea*. MedicineNet.com 2005; Available at <http://www.medicinenet.com>. Accessed 5/3/07.