

# Using Microstream® Capnography to Detect Alveolar Hypoventilation Syndrome in the Sleep Lab

Submitted by  
 Dave Polaski,  
 Director of Respiratory Care  
 The Sleep Laboratory  
 Greenwich Hospital  
 Greenwich, CT USA

Oridion Capnography USA  
 21 Highland Circle  
 Needham, MA 02494  
 USA  
 Toll Free: (888) ORIDION  
 Tel.: (781) 453-0500  
 Fax: (781) 453-2722

capnographyUSA@oridion.com  
 capnographyEurope@oridion.com  
 capnographyJapan@oridion.com  
 capnographyAsiaPacific@oridion.com  
[www.oridion.com](http://www.oridion.com)



## Profile

An 8 year-old female was referred to the sleep lab to rule out sleep apnea. She had a history of nocturnal polysomnography associated with loud snoring and nocturnal respiratory distress. A long history of worsening loud snoring with some c/o daytime fatigue and morning headaches was reported. The mother reported that the patient “struggles for breath at night” though the length of the apneas were not noted.

**Physical Examination:** Large cryptic tonsils with small pharyngeal inlet and large adenoids. Otherwise unremarkable.

**Sleep History:** Sleep onset within two minutes. Nine hours sleep per night. Parent observes loud snoring, unusual movements, thirst, need to urinate and disturbance by heat and cold during sleep. Wakes with a headache and dry mouth. No history of caffeine use. No medications. Limited physical exercise.

## Clinical situation

**Polysomnography:** The EtCO<sub>2</sub> was monitored using a pediatric nasal FilterLine® attached to an NPB-70 monitor with a Digital to Analog converter. The recording time was 453 minutes, of which 432 minutes was sleep, for a sleep efficiency of 95.5%. There were no observed respiratory events and

### Clinical EtCO<sub>2</sub> data summary

	Pre-op	Post-op
Average EtCO <sub>2</sub> . . . . .	.46 mmHg . . . . .	.43 mmHg
Maximum EtCO <sub>2</sub> . . . . .	57 mmHg . . . . .	.49 mmHg
Sleep time with EtCO <sub>2</sub> > 50 mmHg . . . . .	.12.5%. . . . .	.0%

moderate snoring was observed in all body positions. There was one SpO<sub>2</sub> desaturation to 92% with four awakenings and 47 arousals.

## Discussion

Based on the Standards and Indications for Cardiopulmonary Sleep Studies in Children by the American Thoracic Society, July 1995, there were abnormal findings of EtCO<sub>2</sub> during this study. EtCO<sub>2</sub> exceeding 50 mmHg for greater than 8% of the total sleep time and peak EtCO<sub>2</sub> of 57 mmHg indicates alveolar hypoventilation syndrome. The patient underwent a tonsillectomy. The follow-up polysomnography showed resolution of the alveolar hypoventilation as evidenced by the EtCO<sub>2</sub> data.