

Benefits of XFlow in CPAP Efficacy Studies

A Medcare proprietary software algorithm has been developed to derive airflow from the XactTrace RIP signals.

XFlow

By combining the output of the abdominal and thoracic signals measured by the XactTrace sensors it is possible to derive a measure of the patient's inspiratory and expiratory flow. This signal is called XFlow and is qualitative.

To measure XFlow two XactTrace respiratory movement sensors are required; one on the abdomen and one on the thorax. The output from these sensors represent changes in the cross sectional area in the abdomen and thorax. The sum of the abdominal and thoracic movements provides a method to measure airflow. This is an efficient means to obtain a full representation of the patients' ventilatory patterns.

The XFlow signal is comparable to linearized airflow signals acquired from nasal pressure transducers¹.

The XFlow signal is also comparable to a signal collected by a pneumotachograph.

XSum

Another way to look at ventilation is by using the XSum signal, which represents the sum output of the abdominal and thoracic signals measured by XactTrace sensors. XSum represents qualitative changes in the lung volume.

Challenges of CPAP airflow monitoring in the home setting

One of the challenges of CPAP efficacy studies in the home setting is the ability to easily and reliably measure the patients' airflow while the patient is breathing through a CPAP mask. Traditionally, changes in CPAP mask pressure have been used as a surrogate marker of airflow. However, mask pressure represents pressure oscillations in the CPAP circuit rather than the patients' airflow.

Nasal cannula or thermistors placed under the mask can measure airflow but these are not suitable solutions as they could cause leaks and / or discomfort to the patient.

¹ Medcare Advert Sheet: Benefits of Linearized Flow

Airflow, pressure, tidal volume, respiratory rate and leak are some of the parameters that can be acquired from CPAP, VPAP or AutoSet devices. However, the cumbersome equipment needed to acquire these signals from the CPAP device precludes its use in the home environment.

XFlow provides values of airflow during CPAP use

As described earlier, by combining the output of the abdominal and thoracic signals measured by the XactTrace sensors it is possible to derive a measure of the patient's inspiratory and expiratory flow.

As the XFlow is derived from the two signals, alone it provides an efficient means to get a full representation of the patients' ventilatory patterns and does not interfere with the CPAP mask or the headgear.

When values of XFlow are combined with values of CPAP mask pressure measurements, the clinician has full assessment of flow and therapy pressure acquired in the least intrusive way.

XFlow and Embletta PDS: Tools to assess CPAP efficacy

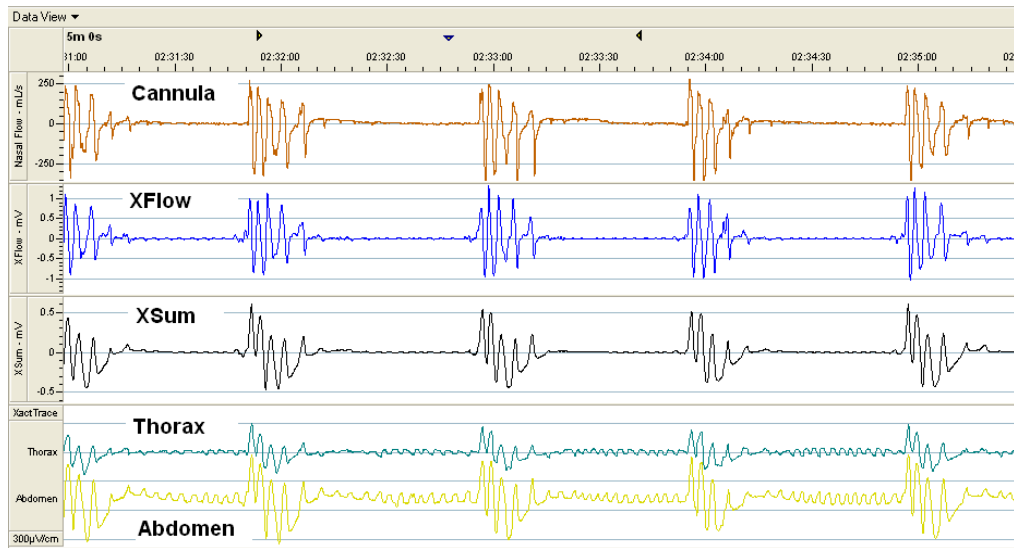
The Embletta PDS is a pocket-sized digital recorder designed to diagnose sleep-disordered breathing.

In CPAP efficacy studies the following signals can be acquired with the Embletta PDS:

- Mask Pressure via a pressure transducer
- Snoring via a microphone
- Thoracic and Abdominal movement with XactTrace Respiratory Inductive Plethysmography sensors
- Body Position and Activity via an accelerometer
- Oximetry and Pulse and Plethysmograph

The patient can use his own CPAP device. No special interface is needed.

XFlow and XSum are derived from the XactTrace RIP belts. These signals can indicate the quality of the CPAP treatment in harmony with data from the oximeter and the body position and actigraph.



Availability

XFlow and XSum are derived from the thoracic and abdominal signals acquired from the XactTrace RIP bands. These signals are available in Medcare software applications compatible with XactTrace RIP such as Somnologia for Embletta, Somnologia Studio and Compass.