

# European Respiratory Society Annual Congress 2012

**Abstract Number:** 1637

**Publication Number:** 2855

**Abstract Group:** 2.2. Noninvasive Ventilatory Support

**Keyword 1:** Ventilation/NIV **Keyword 2:** Experimental approaches **Keyword 3:** Intensive care

**Title:** Is volume assured ventilation always able to compensate volume loss in presence of leaks?

Annia 9736 Schreiber annia.schreiber@fsm.it MD <sup>1</sup>, Annalisa 9735 Carlucci annalisa.carlucci@fsm.it MD <sup>1</sup>, Piero 9737 Ceriana piero.ceriana@fsm.it MD <sup>1</sup>, Alessio 9738 Mattei mattei.alessio@virgilio.it MD <sup>3</sup> and Cesare 9739 Gregoretti c.gregoretti@gmail.com MD <sup>2</sup>. <sup>1</sup> Respiratory Intensive Care Unit, IRCCS-Fondazione S. Maugeri, Pavia, Italy ; <sup>2</sup> Intensive Care and Emergency Department, CTO - M. Adelaide, Torino, Italy and <sup>3</sup> Cardiothoracic Department, San Giovanni Battista Hospital- Molinette, Torino, Italy .

**Body:** Background: Volume assured ( $V_{TG}$ ) ventilation is a pressure targeted mode aimed to guarantee a target tidal volume ( $V_t$ ) by varying the inspiratory pressure between two preset pressure values.  $V_{TG}$  ventilation has been used to correct sleep-related periodic hypoventilations during noninvasive ventilation (NIV). However, in this setting the likelihood of non-intentional leaks (NIL) may be high. Aim and Methods: In a bench study we wanted to assess the  $V_{TG}$  NIL compensation algorithm in three turbine driven ventilators designed to set a  $V_{TG}$  either with an EVC or with an ILC (Vivo50, Breas; PB560, Covidien; Ventimotion, Weimann). All ventilators were tested in random order using a lung simulator (Ingmar, ASL5000) in  $V_{TG}$  Pressure Control mode with both the ILC and the EVC at three level of leaks (15, 27 and 37 l/min) and at three different conditions of respiratory mechanics: normal, obstructive and restrictive. Results: All the ventilators in the ILC configuration were able to maintain the  $V_{TG}$  in all simulated conditions; conversely, during all simulated leak conditions when the EVC was used a significant fall both in  $V_t$  and inspiratory pressure compared to the baseline value was observed.

Conclusions: All single circuit ventilators tested in ILC configuration were able to compensate the volume loss and to ensure the preset  $V_{TG}$  in all leak conditions but failed to ensure the  $V_{TG}$  when the EVC was used.