

# BREAS | NEWSLETTER

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## News from ERS 2015.

This year the European Respiratory Society hosted its 25th annual congress from 26-30 September in Amsterdam and again attracted leaders and experts in the respiratory field, exchanging information and knowledge regarding evidenced based clinical practice and scientific discoveries. The scientific and educational programme delivered a wealth of new material from all sections of respiratory health and disease to more than 23.000 participants that attended the conference in The Netherlands.

On Sunday morning a lot of interesting topics were covered during a session about Noninvasive ventilation in acute respiratory failure. Emeline Fresnel (Rouen, France) presented a new procedure to compare domiciliary ventilators and test their performance depending on the pathology. They show that the ventilatory frequency and the occlusion pressure have a strong impact on the synchronizability of ventilators, factors which depend on the lung model considered. Using this model it was found that triggering and pressurization performances of ten ventilators present heterogeneities due to their different settings and operating strategies.

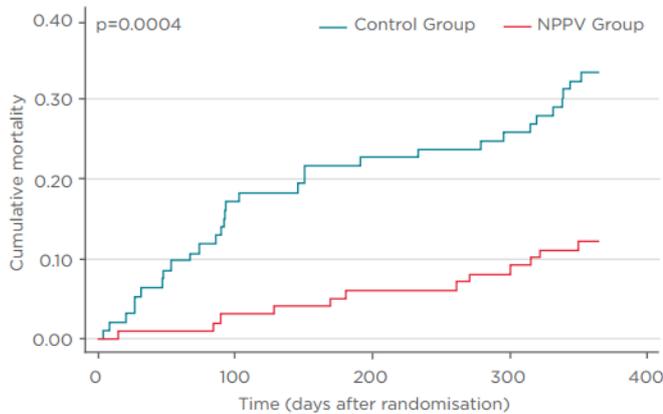
Anne-Kathrin Brill (Bern, Switzerland) presented her study which was selected as the ERS Best Abstract in Noninvasive Ventilatory Support and received a Grant which was sponsored by Breas. Her randomized crossover trial of a pressure sensing visual feedback system to improve mask fitting in non-invasive ventilation (NIV) compared standard mask fitting procedures with one using visual feedback on the pressure exerted on the nasal bridge obtained from a computerized system. It was concluded that

visual feedback from pressure sensing technology may support healthcare professionals during mask fitting training, leading to a lower pressure and a more comfortable fit over the nasal bridge and an increase in staff confidence.



A large Spanish study which included 969 patients suffering from chronic obstructive pulmonary disease (COPD) with acute hypercapnic respiratory failure (AHRF), acute cardiogenic pulmonary edema (ACPE) and obesity hypoventilation syndrome (OHS) concluded that ACPE, COPD and OHS patients with AHRF and severe acidosis ( $\text{pH} \leq 7.25$ ) could be successfully treated with NIV in RICUs and probably in other similar special units. During a session on "NIV for COPD – When and how?" Dr

Thomas Köhnlein (Hannover, Germany) discussed in the results from his latest publication in The Lancet Respiratory Medicine about Non-invasive positive pressure ventilation for the treatment of severe stable COPD. With his results Dr Köhnlein showed that long-term domiciliary use of NIV in patients with advanced stable COPD and chronic hypercapnia may be beneficial with regard to mortality, health related quality of life and exercise capacity.



Overall Mortality for treatment with NIV versus standard care in stable COPD (Köhnlein T et al., Lancet Respir Med.2014;2:698-705)

Dr Mattei (Turin, Italy) showed the preliminary results of a program where telemonitoring was combined with the availability of pneumological domiciliary assistance in a group of ALS patients. They found that it was feasible with a good adherence to the protocol and that it could reduce days of hospitalization without a difference in mortality between the two groups.

In a 5 years follow-up study, Dr Ogna (Garches, France) compared the prognostic value of SpO2 and TcCO2 in ventilated adult NMD patients. It was found that residual hypoventilation, assessed by capno-oxymetry, has a negative prognostic impact in adult ventilated NMD patients. Accordingly, the authors suggest that capno-oxymetry should be included in the assessment of HMV efficacy in NMD patients, since TcCO2 identifies more patients at risk than oximetry alone.

During one of the sessions on Wednesday, Dr Dreher (Aachen, Germany) showed some of the conclusions of the ERS “Telemonitoring of ventilator-dependent patients” Task Force, stating that telemonitoring in these patients may facilitate initiation of NIV outside the hospital, might be used to control NIV, might be used to early detect exacerbations of COPD, might increase compliance towards NIV and might detect/solve ventilator associated problems. But, however studies in this field are urgently needed.

**All APAP’s are not equivalent.**

Very recently Prof Escourrou and co-workers published a very interesting bench test in the Journal of Clinical Sleep Medicine (J Clin Sleep Med 2015;11(7):725–734) entitled “All APAPs Are Not Equivalent for the Treatment of Sleep Disordered Breathing: A Bench Evaluation of Eleven Commercially Available Devices”. This study challenges on a bench-test the efficacy of auto-titrat-

ing positive airway pressure (APAP) devices for obstructive sleep disordered breathing treatment and evaluates the accuracy of the device reports. The latter being of high clinical importance as these reports are often used by physicians as measures of efficacy and even for titration of fixed CPAP pressure.

The test bench consisted of an active lung simulator and a Starling resistor on which eleven commercially available APAP devices were evaluated on their reactions to single-type SDB sequences (obstructive apnea and hypopnea, central apnea, and snoring), and to a long general breathing scenario (5.75 h) simulating various SDB during four sleep cycles and to a short scenario (95 min) simulating one sleep cycle. This study is the most extensive evaluation of APAP devices to date using a new closed-loop respiratory bench model, taking into account not only the mechanical properties of human upper airway, but also the lung characteristics, such as compliance and resistance.

**The authors report that their main findings are as follows:**

- Most devices responded to simulated obstructive apneas and obstructive hypopneas, but their reaction time and their treatment efficacy considerably differed.
- 5 devices raised the pressure when subjected to the snoring sound.
- When central apneas were simulated, only 4 devices did not increase the pressure.
- For the long scenario, efficacy varied between devices: only 5 devices obtained a residual obstructive AHI < 5/h.
- For the short scenario, significant differences were found in therapy pressure and in efficacy between devices and between bench-assessed and device-reported data: only 2 devices obtained a residual obstructive AHI < 5/h whereas 3 devices underestimated the AHI by > 10%.

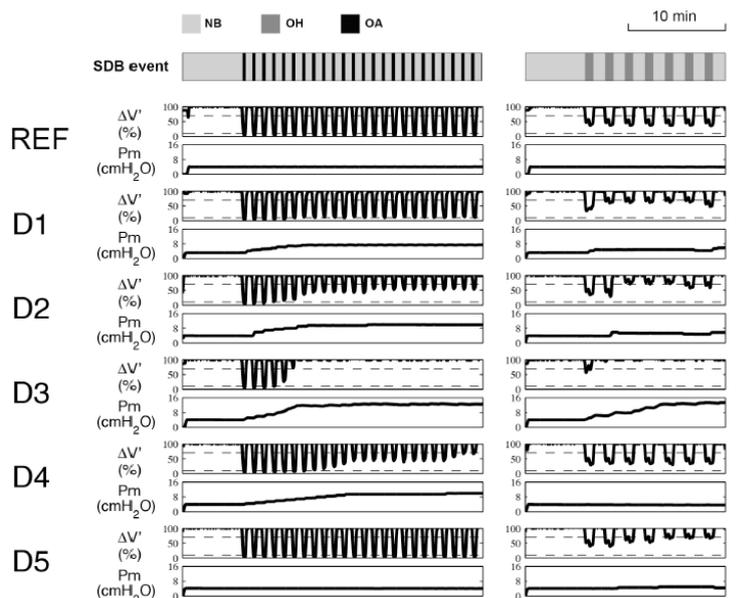


Illustration of single-type SDB event sequences and results of some of the tested devices: obstructive apnea (left column) and hypopnea (right column).

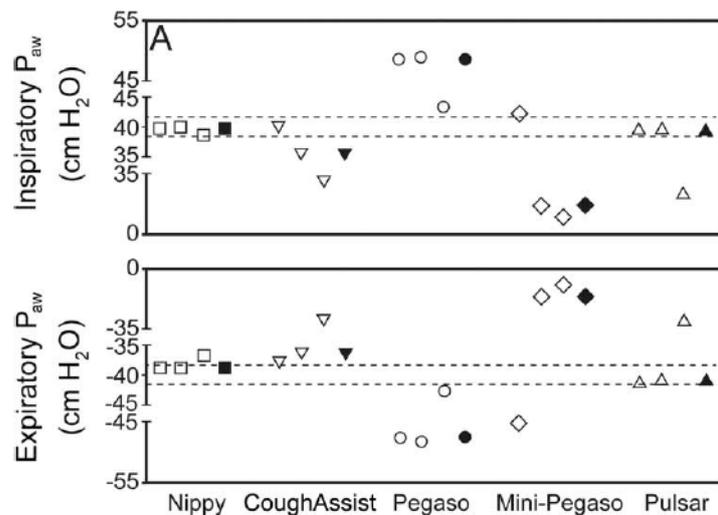
It is to be noted that iSleep20i is the only device that scored a 100% treatment efficacy for Obstructive apneas and hypopneas!

## All Mechanically Assisted Cough Devices are not equivalent.

Mechanically assisted cough devices are used in patients with impaired cough to avoid secretion accumulation. Pamela Frigério compared 5 mechanically assisted cough devices by bench testing using a breathing simulator and published the results in *Respiratory Care* (Respir Care 2015;60(7):975–982). The authors measured inspiratory and expiratory airway pressures and peak expiratory flow, the strongest indicator of cough efficacy. They performed 2 bench tests: 1) to ascertain the differences between preset and actual settings in 3 different machines of each mechanically assisted cough device and 2) to assess the effects of varying respiratory impedance and air leaks on performance of the devices. They also evaluated the user-friendliness of the devices by measuring the time required and errors in accomplishing 4 tasks by 10 physicians unfamiliar with mechanically assisted cough devices compared with product specialists from the distributing companies. Furthermore the physicians also scored the ease of use.

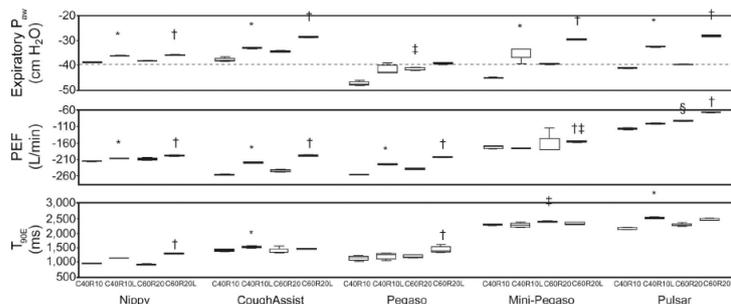
Some of the most striking results of the test are:

- All devices but one (Nippy) showed uneven inspiratory and expiratory Paw with the 3 machines tested.



Discrepancy between preset and actual airway pressures.

- The performance of the 5 devices was affected differently by the simulated mechanical properties, the air leaks, or both.



Expiratory Paw, peak expiratory flow (PEF), and time to reach 90% of preset expiratory Paw (T90E) in different simulated conditions.

- The performance of different mechanically assisted cough devices was extremely variable, even between machines of the same model, and is affected by respiratory system impedance and air leaks.

As a summary we can look at what is important for a Mechanical In-Exsufflator and how the Nippy Clearway scores in this bench test.

### 1. Stability and accuracy of pressures:

- ✓ The Clearway shows excellent inter-device stability
- ✓ The Inspiratory and Expiratory Pressures generated are the most accurate with the Clearway

### 2. Effective flow performance

- ✓ Overall the Clearway's PEF is the most stable
- ✓ The Clearway's PEF is not affected by lung mechanics
- ✓ The Clearway's PEF is as good as not affected by the presence of leaks

### 3. Ease of use

- ✓ The Clearway scored 'excellent' on ALL tasks
- ✓ The Clearway is the only device with all VAS scores >8,8

### Some dates for your calendar:

- 7 – 10 November 2015 : AARC congress, Tampa, USA
- 12 November 2015 : B&D Advanced Acute Respiratory Study Day, London, UK (\*)
- 29 – 31 January 2016 : CPLF congress, Lille, France
- 2 – 4 June 2016 : DIGAB congress, Bamberg, Germany
- 3 – 7 September : ERS congress, London, UK

(\*) This event is free of charge and is aimed at respiratory nurses, physiotherapists and medics. If you wish to attend, please contact [training@nippyventilator.com](mailto:training@nippyventilator.com)

PS. WELCOME TO VISIT US AT MEDICA IN DÜSSELDORF  
16-19 NOVEMBER 2015. **BOOTH 11/B26**

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