

# Non-invasive mechanical ventilation: a practice not for all seasons

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After a period of understandable skepticism, non-invasive mechanical ventilation has continuously acquired evidence of efficacy, has come out the boundaries of the scientific arena and has actually entered the routine treatment of ARF [1].

Non-invasive ventilation (NIV), in fact, has been shown to be an effective treatment for ventilatory failure resulting from acute exacerbations of COPD of differing degrees of severity [2]. Also, NIV has been successfully employed in ARF resulting from causes other than exacerbation of COPD [3].

The reasons of this success must be firstly sought in the brilliant results obtained in the Intensive Care Unit (ICU) studies showing both a reduction in the need of endotracheal intubation (ETI) and mechanical ventilation (MV), which in the largest study translated into improved survival, and reduced complication rates and length of both ICU and hospital stay [4]. Secondly, and perhaps most importantly, NIV has gained favour due to the possibility to perform MV outside the intensive care setting, as it doesn't need sedation and paralysis; given the considerable pressure on ICU beds in most countries, the high costs and the fact that for some patients admission to ICU is a distressing experience, this is an attractive option.

Warnings have been raised, however, in the recent past, concerning the potential risks of performing NIV outside the ICU setting, particularly in the medical ward. It has been suggested, for instance, that patients with severe acidosis (<7.30) should be better ventilated in an intensive setting rather than in the ward and even that delay in institution of ETI and MV would worsen prognosis [5, 6]. This latter hypothesis, in particular, has been argued by another study [7] reinforcing the view that NIV is at least no worse than ETI and MV in these sicker patients.

Another brick in the wall of the matter of where NIV should be better performed has been added by the study by *Campos et al.*, appearing in the present issue of the *Monaldi Archives*, indirectly comparing NIV performed either in a general or a respiratory ward [8]. This prospective and observational study rises many of the cited issues, some of which deserve comments.

The first comment is that great attention is to be paid once that any practice comes out of the sci-

entific arena and enters the routine practice (the real world). And NIV makes no exception. NIV can be considered with good reason a life-saving respiratory treatment which can be effectively and safely performed also in the ward provided that a close monitoring of clinical results and effectiveness is done.

The second and most important issue is that it is not so much where NIV is performed, but by whom. What really makes the difference in the efficacy of NIV is skill and expertise of the staff involved. We should remind, then, that skills and expertise of both medical and non-medical personnel, required to perform non-invasive ventilation is no lesser than that required to perform invasive ventilation.

Expertise can be acquired only "on the field" and if NIV is performed with an adequate frequency to assure skill retention. It is crucial to stress that the level of expertise (capability to select patients, to use ventilators and devices, to monitor adequately patients during all the phases of exacerbation, and last but not least the ability to stop NIV to declare it as "failure") may dramatically improve during years of continuous use of NIV also in a well trained respiratory department [9]. On the other hand a recent European survey [10] has underlined the necessity to develop different levels of respiratory units to care critical patients with NIV. We should then conclude that training in NIV is related to the personal effort and skills of the involved physicians and other health care workers. For these reasons and for the control needed of the quality of the service provided, NIV should be performed preferably in a single location and under the direct responsibility and supervision of a physician expert in the field.

## References

1. Keenan SP, Sinuff T, Cook DJ, Hill NS. Which patients with acute exacerbation of Chronic Obstructive Pulmonary Disease benefit from noninvasive positive-pressure ventilation? A Systematic Review of the Literature. *Ann Intern Med* 2003; 138: 861-870.
2. Lightowler JV, Wedzicha JA, Elliott MW, Ram FS. Non-invasive positive pressure ventilation to treat respiratory failure resulting from exacerbations of chronic obstructive pulmonary disease: Cochrane systematic review and meta-analysis. *BMJ* 2003; 326 (7382): 185-189.

3. Mehta S, Hill NS. Noninvasive ventilation. *Am J Respir Crit Care* 2001; 163: 540-577.
4. Brochard L, Mancebo J, Wysocki M, Lofaso F, Conti G, Rauss A, *et al.* Noninvasive ventilation for acute exacerbations of chronic obstructive pulmonary disease. *N Engl J Med* 1995; 333: 817-822.
5. Plant PK, Owen JL, Elliott MW. Non-invasive ventilation in acute exacerbations of chronic obstructive pulmonary disease: long term survival and predictors of in-hospital outcome. *Thorax* 2001; 56: 708-712.
6. Wood KA, Lewis L, Von Harz B, Kollef MH. The use of noninvasive positive pressure ventilation in the Emergency Department. *Chest* 1998; 113: 1339-1346.
7. Conti G, Antonelli M, Navalesi P, Rocco M, Bui M, Spadetta G, *et al.* Noninvasive vs. conventional mechanical ventilation in patients with chronic obstructive pulmonary disease after failure of medical treatment in the ward: a randomized trial. *Intensive Care Med* 2002; 28 (12): 1701-1707.
8. Campos JL, Garcia Pulo C, Leon Jimenez A, Arnedillo A, Gonzales-Moya E, Fernandez Berni JJ. Staff training influence of non-invasive ventilation outcome for acute hypercapnic respiratory failure. *Monaldi Arch Chest Dis* 2006; 65: 145-151.
9. Carlucci A, Delmastro M, Rubini F, *et al.* Changes in the practice of non invasive ventilation in treating COPD patients over 8 years. *Intensive Care Med* 2003; 29: 419-425.
10. Corrado A, Roussos C, Ambrosino N, *et al.* Respiratory Intermediate care units: A European survey. *Eur Respir J* 2002; 20:1343-1350.



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