



# Go with the flow

New evidence continues to emerge showing how Optiflow™ Nasal High Flow contributes to **improved patient care and outcomes**. To learn more about one of the world's fastest-growing respiratory therapies, be sure to visit [www.myoptiflow.com](http://www.myoptiflow.com) today.

## Focus: Optiflow™ Nasal High Flow post extubation

### USING NASAL HIGH FLOW TO REDUCE THE RISK OF REINTUBATION

**It is well known that escalation resulting in intubation is generally associated with poor clinical and economic outcomes. Reintubation following extubation failure is particularly detrimental.**<sup>1,2</sup>

In 1997, Epstein<sup>1</sup> and colleagues examined patient outcomes associated with reintubation for extubation failure. They determined that patients who failed extubation had:

- **increased hospital mortality** (43% vs. 12%,  $p < 0.0001$ )
- **increased ICU length of stay** (21.2 vs 4.5 days,  $p < 0.001$ )
- **increased hospital length of stay** (30.5 vs 16.3 days,  $p < 0.001$ )

Increased length of stay associated with extubation failure directly translates into increased daily and total hospital costs. In a study by Seymour<sup>2</sup> in 2004, the costs of reintubated patients were double that of successfully extubated patients. Avoiding reintubation means avoiding these significant costs.

#### Where does Nasal High Flow fit in?

In previous editions we have shared the results of key studies by Frat<sup>3</sup> and Maggiore<sup>4</sup> demonstrating the efficacy of Optiflow™ in avoiding primary intubation as well as reintubation.

Although the primary outcome of the Frat study was not

met, it was shown that for the more acute patients (with a  $\text{PaO}_2:\text{FiO}_2 \leq 200$  mmHg):

- **NHF significantly decreased the need for intubation** (35% of NHF patients compared to 53% standard  $\text{O}_2$  and 58% NIV)

Maggiore's 2014 study investigated reintubation rates in a general population of critical care patients and found that:

- **NHF significantly decreased the need for reintubation** (4% of NHF patients compared to 21% in the venturi mask group)

Overleaf, we are pleased to present a summary of the results of the Hernández<sup>5</sup> study recently published in the Journal of the American Medical Association (JAMA). This study focused on patients deemed at low risk for reintubation and found a reduced risk of reintubation within 72 hours of extubation.

**Collectively, these study findings provide a strong justification for the use of Optiflow™ Nasal High Flow both pre-intubation and post-extubation.**

Reducing the rates of primary intubation and reintubation could have profound impacts on clinical and economic outcomes in your hospital.

▶ *See overleaf for a summary of the Hernández JAMA publication.*

1. Epstein S, Ciubotaru R, Wong J. Effect of failed extubation on the outcome of mechanical ventilation. *Chest*. 1997; 112: 186-192

2. Seymour CW, Martinez A, Christie JD, et al. The outcome of extubation failure in a community hospital intensive care unit: a cohort study. *Crit Care*. 2004; 8(5):322-327.

3. Frat JP, Thille AW, Mercat, et al. High-Flow Nasal Cannula Oxygen in Respiratory Failure. *N Engl J Med*. 2015; 372(23):2185-96.

4. Maggiore SM, Idrone FA, Vaschetto R, et al. Nasal high-flow versus Venturi mask oxygen therapy after extubation: effects on oxygenation, comfort, and clinical outcome. *Am J Respir Crit Care Med*. 2014; 190:282-288

5. Hernández G, Vaquero C, González P, et al. Effect of Postextubation High-Flow Nasal Cannula vs Conventional Oxygen Therapy on Reintubation in Low-Risk Patients: A Randomized Clinical Trial. *JAMA*. 2016; 315(13):1354-61.

6. Stéphane F, Barrucand B, Petit P, et al. High-flow nasal oxygen vs noninvasive positive airway pressure in hypoxemic patients after cardiothoracic surgery: a randomized clinical trial. *JAMA*. 2015; 313(23):2331-9.

7. Kritek, P. Two Approaches to Lessen Need for Reintubation. Retrieved 10 May, 2016, from <http://www.jwatch.org/na40798/2016/03/24/two-approaches-lessen-need-reintubation>

# Optiflow™ reduces the risk of reintubation in low-risk patients, compared with conventional O<sub>2</sub>

HERNÁNDEZ ET AL. 2016

**The Hernández<sup>5</sup> study recently published in the Journal of the American Medical Association (JAMA) has significant implications for critical care practice.**

Hernández and colleagues randomized 527 extubated patients at *low risk of reintubation* to receive nasal high flow (NHF) or conventional oxygen therapy for the first 24 hours after extubation. The study was carried out in seven ICU's throughout Spain.

Use of Optiflow™ nasal high flow:

- reduced reintubation within 72 hours of extubation
- reduced post-extubation respiratory failure
- did not delay reintubation compared to conventional oxygen therapy
- avoided one reintubation per 14 patients treated

## Background

Nasal high flow after extubation has demonstrated clinical benefits in general critical care populations<sup>4</sup> as well as specific populations such as patients post cardiothoracic surgery<sup>6</sup>.

## Why this trial?

Maggiore et al showed in 2014 that nasal high flow therapy after planned extubation decreased the reintubation rate in a general population of critical care patients.

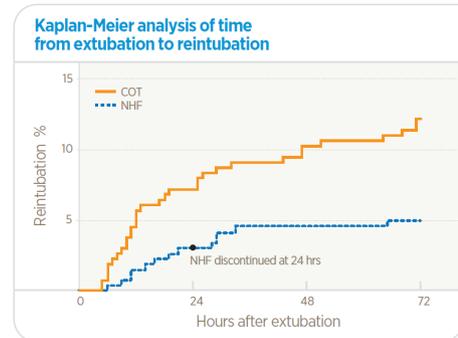
However, it had been suggested that the results seen were attributable to improvements in the high-risk patients in this group. In their trial, Hernández et al focused specifically on low-risk patients, defined as:

- < 65 years of age
- Simple weaning from MV
- APACHE II < 12
- Absence of heart failure
- BMI < 30
- Comorbidities < 2
- Adequate secretion clearance

## Results

The primary outcome of the study was met. 527 patients were included and randomized to NHF (n=264) or standard oxygen therapy (n=263) (mean age 51.4 years, 62% male) with the following results:

- Reduced risk of reintubation within 72 hours of extubation (NHF 4.9% vs. standard O<sub>2</sub> 12.2%, p=0.004)



- Reduced rate of post-extubation respiratory failure (NHF 8.3% vs. conventional O<sub>2</sub> 14.4%, p=0.03)
- No significant difference in median time to reintubation (NHF 19 h, conventional O<sub>2</sub> 15 h, p=0.66)
- For every 14 patients treated with NHF, one reintubation was avoided (NNT = 14)

## How does this study help clinicians and their patients?

This well-designed study provides compelling evidence that use of NHF immediately after planned extubation can reduce 72-hour reintubation rates in low-risk patients compared to conventional oxygen therapy.

These findings have significant implications not only on patient care, but also on costs of treatment. A secondary analysis of the patients who underwent reintubation showed increased ICU and hospital stays compared to those successfully extubated.

Extubating each and every patient to Optiflow™ *could* provide a simple method to avoiding costly re-escalation of therapy. Patricia Kritek, MD, of NEJM Journal Watch commented recently that “*extubation to [NHF] in low-risk patients makes sense and is relatively low-cost to implement*”<sup>7</sup>.

▶ To view the abstract for the study, please visit: <http://www.ncbi.nlm.nih.gov/pubmed/26975498>

▶ To discover how to integrate Optiflow™ NHF into your clinical practice, **contact your local Fisher & Paykel Healthcare representative.**

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