



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 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.^{1,2}

In 1997, Epstein¹ 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 Seymour² 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 Frat³ and Maggiore⁴ 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 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 Hernández⁵ 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 O₂

HERNÁNDEZ ET AL. 2016

The Hernández⁵ 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 populations⁴ as well as specific populations such as patients post cardiothoracic surgery⁶.

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.

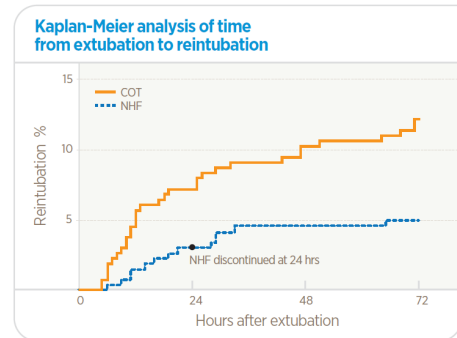
However, it had been suggested that the results seen were attributable to improvements in the high-risk patients in this group. In their trial, Hernández et al focused specifically on low-risk patients, defined as:

- < 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 O₂ 12.2%, p=0.004)



- Reduced rate of post-extubation respiratory failure (NHF 8.3% vs. conventional O₂ 14.4%, p=0.03)
- No significant difference in median time to reintubation (NHF 19 h, conventional O₂ 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*”.

▶ 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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