Lunettes à Hauts débits chez l'adulte

Arnaud Bruyneel, RN, CCRN, MSc, PhDc (ULB)
Assistant ULB
Vice president SIZ Nursing
Member of council EfCCNa
Nurse ICU, CHU Tivoli

Virignie Coolens, RN, CCRN
Nurse ICU, CHU Tivoli

Introduction

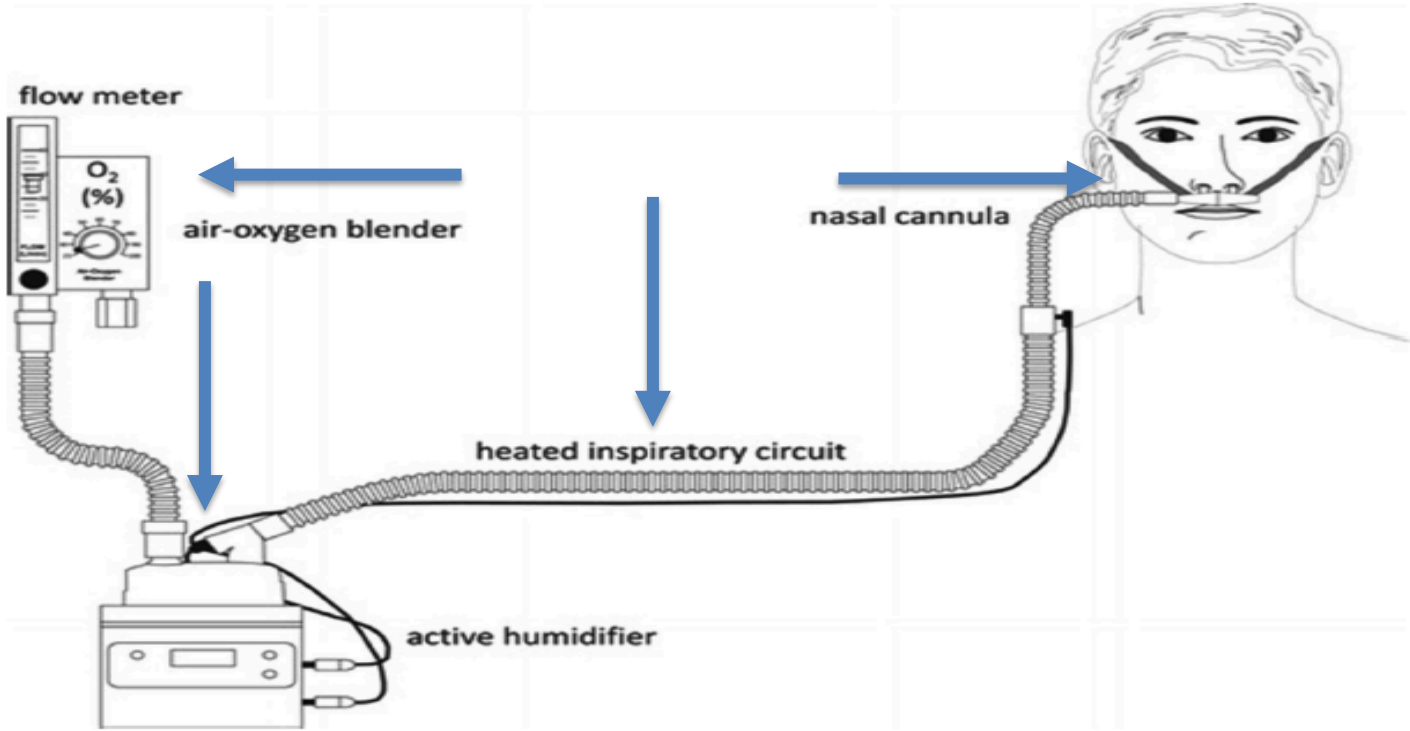


Fig. 1 High-flow nasal cannula oxygenation (HFNCO) device. An air/oxygen blender, allowing FiO_2 ranging from 0.21 to 1.0, generates flows of up to 60 L/min. The gas is heated and humidified by an active heated humidifier and delivered via a single limb

Intensive Care Med DOI 10.1007/s00134-016-4277-8

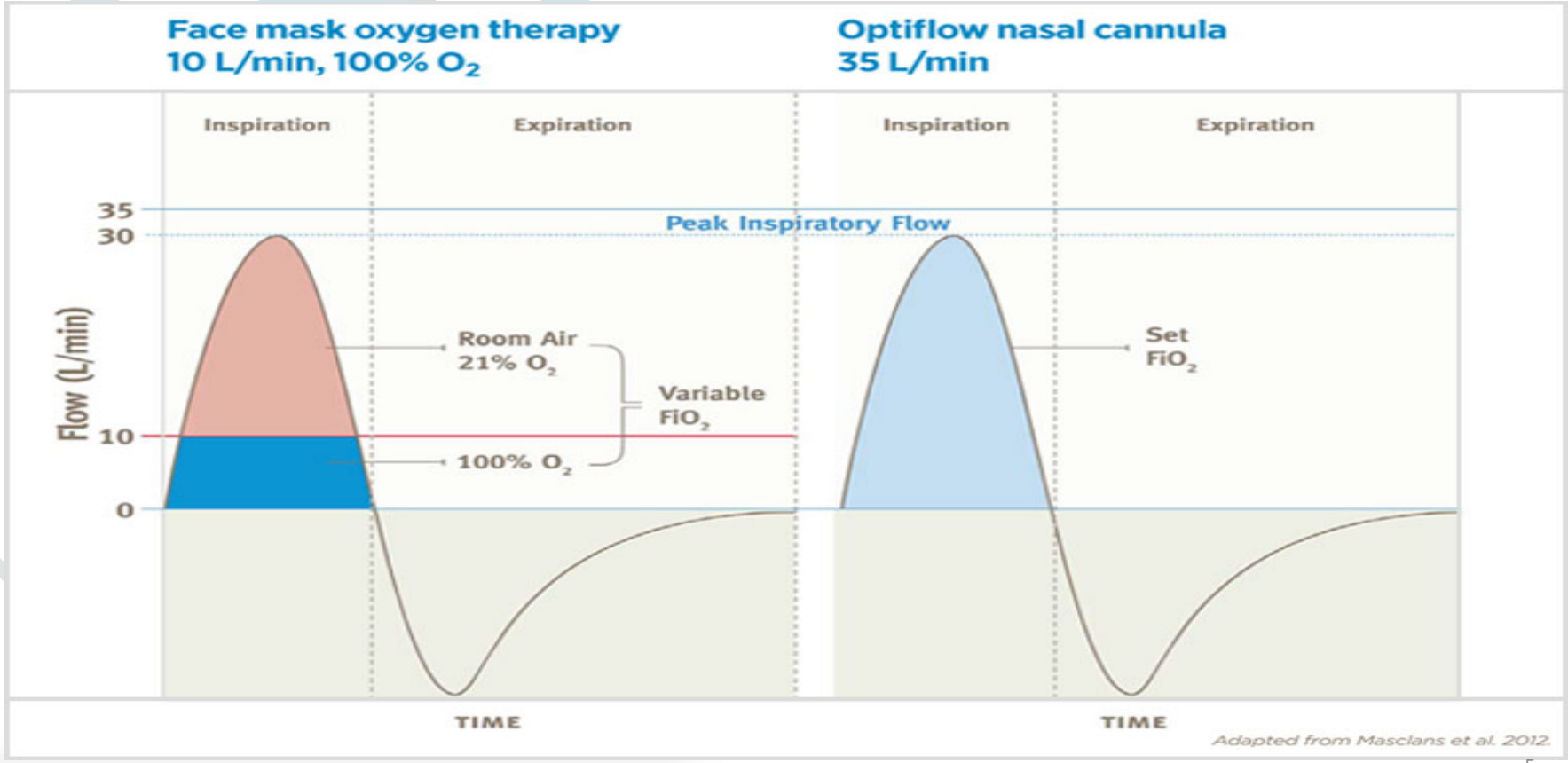
Oxygénothérapie

J. Messika, SRLF 2019

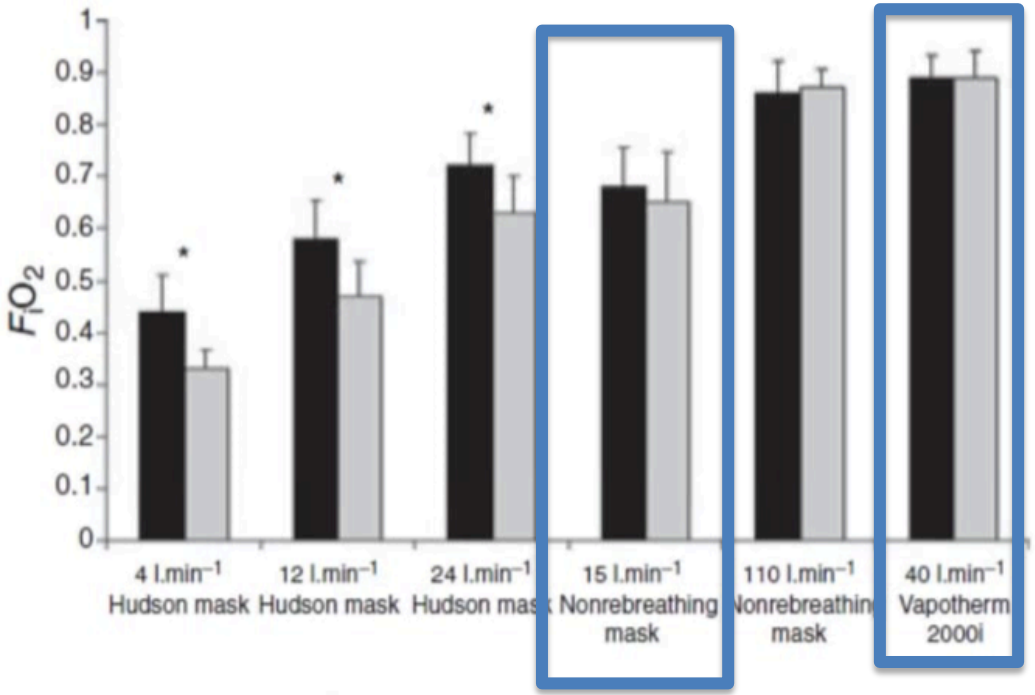
F&P Optiflow™

- OPTIMAL HUMIDITY
  - Clairance mucociliaire — 1
  - Confort — 2
- DÉBIT
  - Apport d'oxygène précis — 3
  - Rinçage de l'espace mort anatomique — 4
  - Faible niveau de pression — 5

Dilution de la FiO2



Précision de la FiO2



Sim et al. Anesthesia 2008

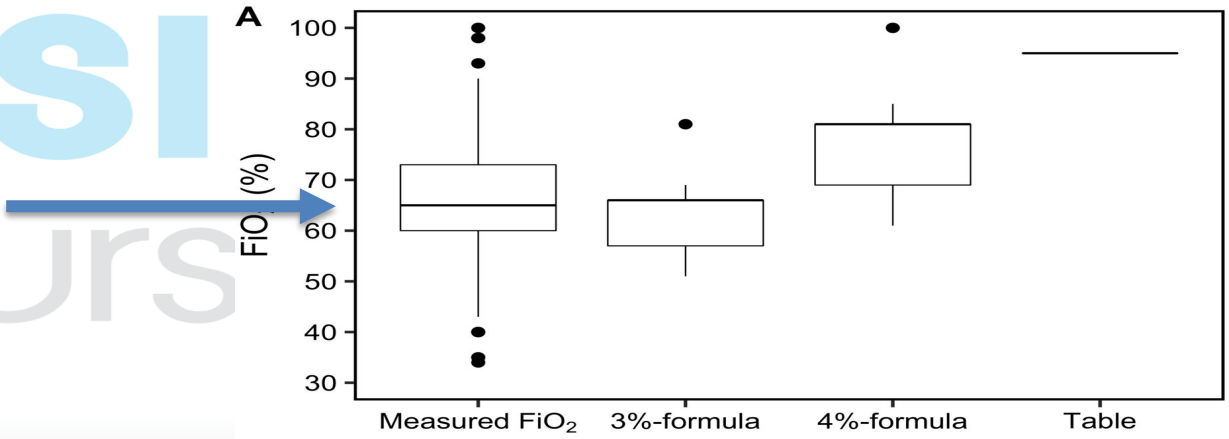
- *Vmin = 20 l/min*
  - O_2 = 15 l/min
  - $FiO_2 \approx 60$ %
- *Vmin = 30 l/min*
  - O_2 = 15 l/min
  - $FiO_2 \approx 46$ %
- O_2 = 50 l/min
  - $FiO_2 \approx 100$ %

Mauri et al. Am J Resp Crit Care Med 2017

Dilution de la FiO2

Reliability of methods to estimate the fraction of inspired oxygen in patients with acute respiratory failure breathing through non-rebreather reservoir bag oxygen mask

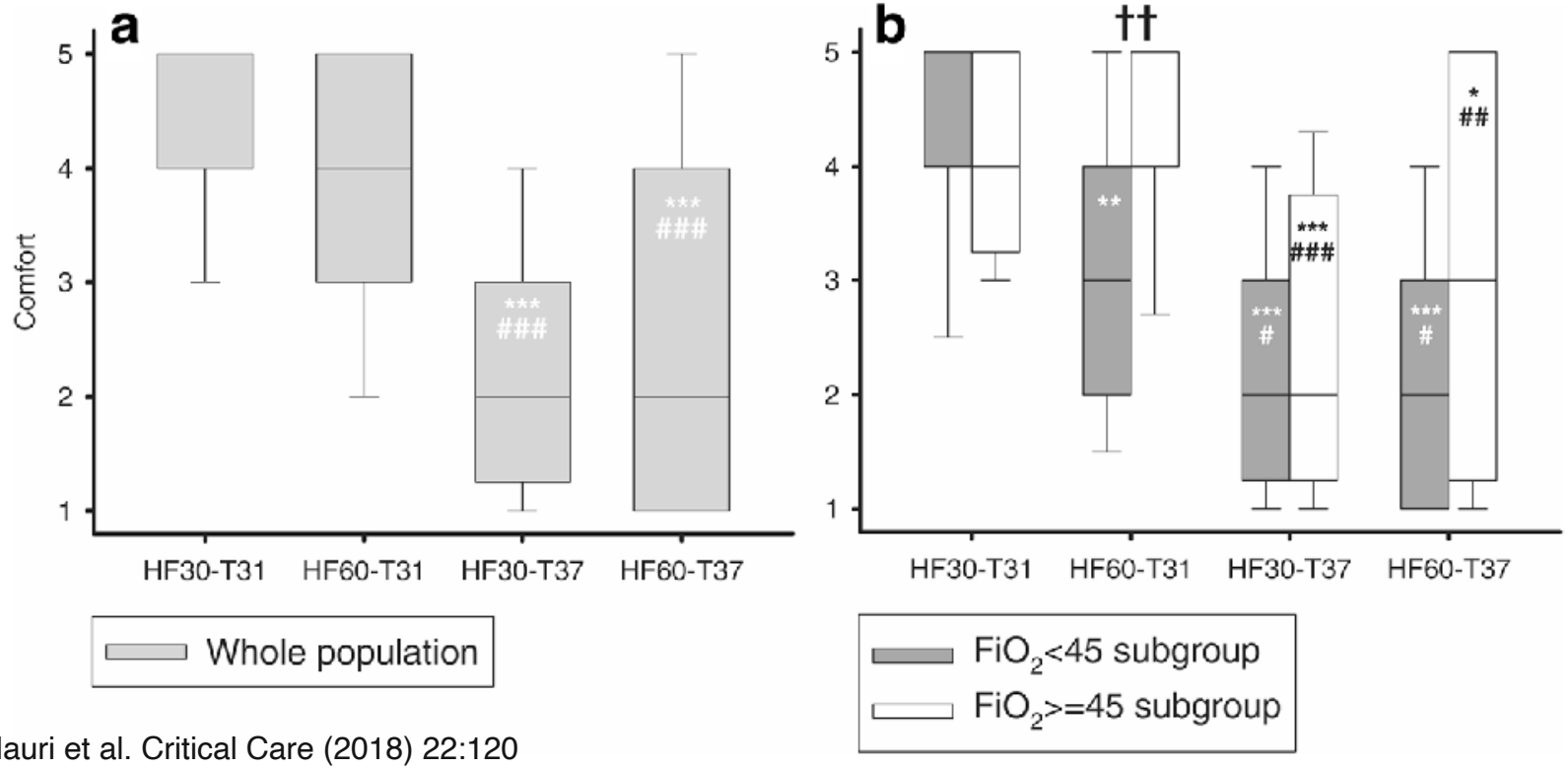
Rémi Coudroy,[1,2] Jean-Pierre Frat,[1,2] Christophe Girault,[3,4] Arnaud W Thille[1,2]



http://dx.doi.org/10.1136/thoraxjnl-2020-214863

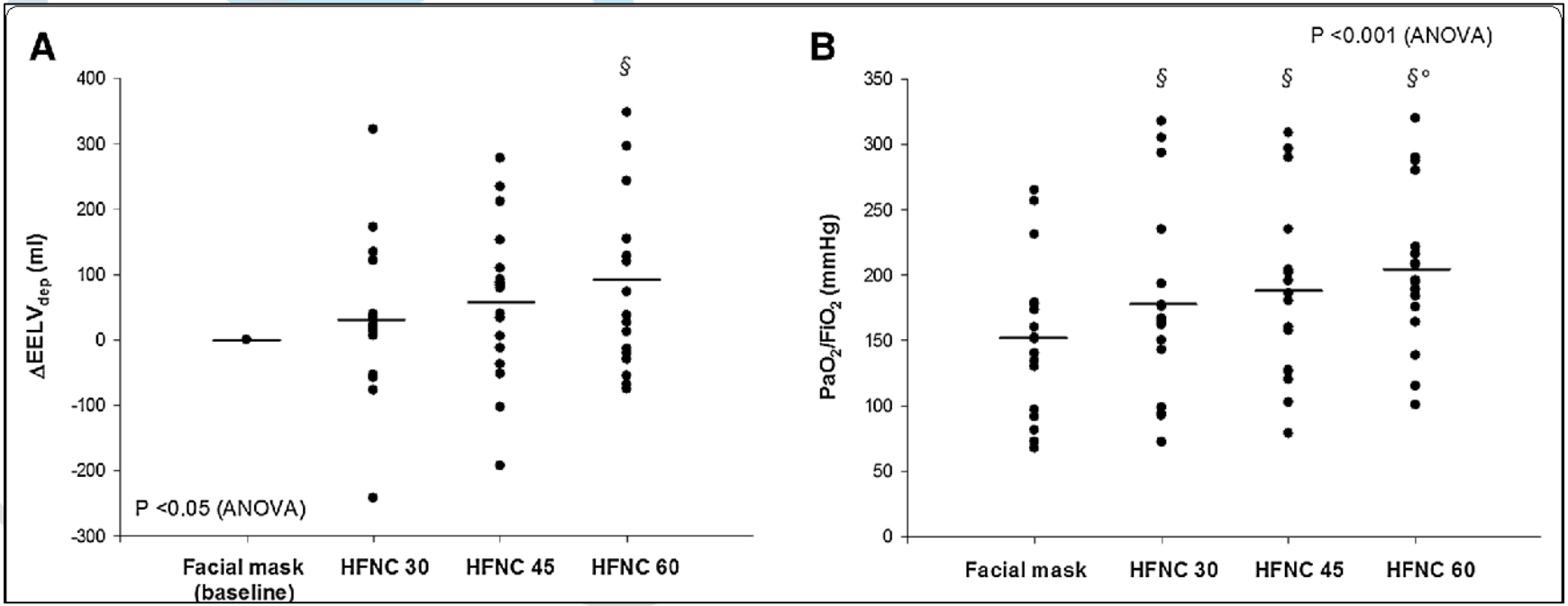
Réglages - taille canules

Réglages – température



Mauri et al. Critical Care (2018) 22:120
https://doi.org/10.1186/s13054-018-2039-4

Réglages - débit



DOI:10.1007/s00134-017-4890-1

Réglages - débit

FiO2	21-30%	30-40%	40-60%	60-100%
Débit	30 l/min	30-40 l/min	40-50 l/min	50-70 l/min

Oxygen therapy for acutely ill medical patients: a clinical practice guideline

BMJ 2018 ; 363 doi: https://doi.org/10.1136/bmj.k4169 (Published 24 October 2018)
Cite this as: *BMJ* 2018;363:k4169

Overview of recommendations

Recommendation 1 STRONG
Stop oxygen therapy no higher than 96% saturation

Recommendation 2 WEAK
We suggest not starting oxygen therapy between 90-92% saturation

Peripheral capillary oxygen saturation (SpO2)

100 99 98 97 96 95 94 93 92 91 90 89 88 87

Applies to:
Patients with acute stroke or myocardial infarction

Applies to:
Acutely ill adult medical patients (with exceptions)

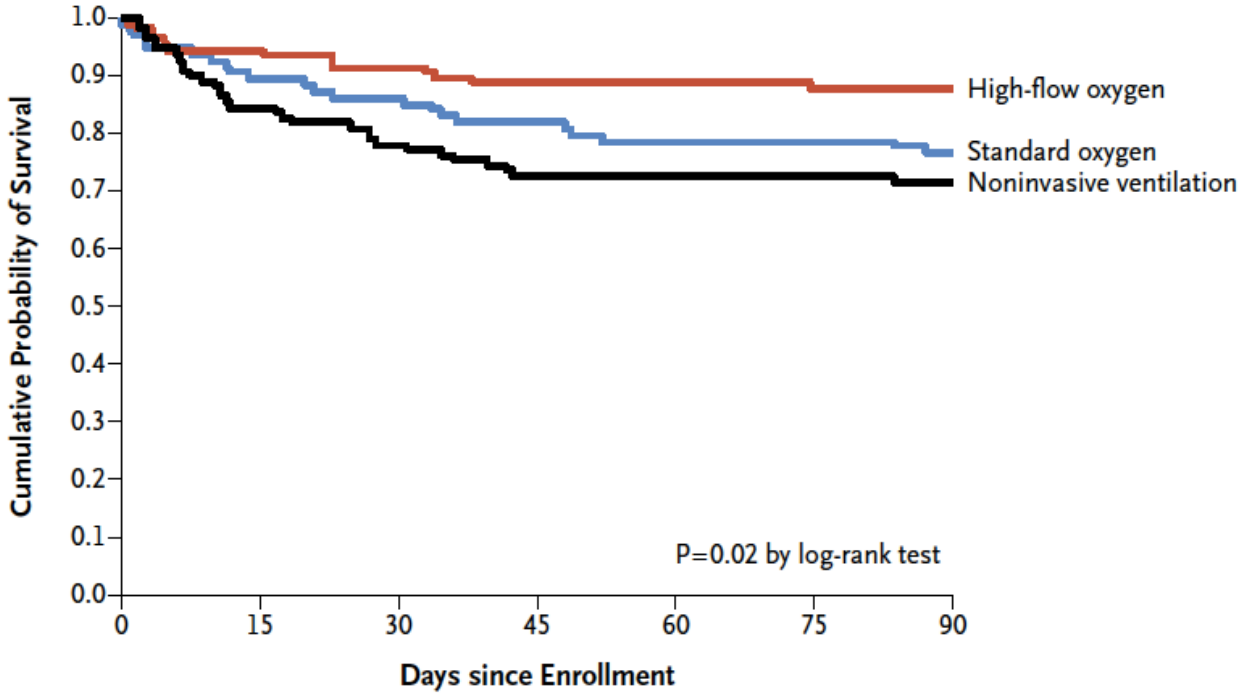
Recommendation 3 STRONG
Do not start oxygen therapy at or above 93% saturation

	Overall, % (*n*)	Seniors, % (*n*)	Juniors, % (*n*)	*p**
Hypoxemic ARF	100 (111/111)	100 (68/68)	100 (43/43)	1
Pneumonia	98 (109/111)	97 (66/68)	100 (43/43)	0.52
Thoracic trauma	91 (100/110)	90 (60/67)	93 (40/43)	0.74
Pulmonary embolism	85 (94/110)	87 (58/67)	84 (36/43)	0.78
ARDS	71 (78/110)	67 (45/67)	77 (33/43)	0.39
Acute pulmonary edema	57 (63/111)	74 (50/68)	30 (13/43)	< 0.000
Acute severe asthma	40 (44/109)	45 (30/67)	33 (14/42)	0.32
"Do not intubate" patients	92 (100/109)	90 (60/67)	95 (40/42)	0.48
Per bronchoscopy	92 (97/106)	91 (58/64)	93 (39/42)	1
Preoxygenation before ETI	84 (86/102)	81 (51/63)	90 (35/39)	0.28
Post-operative ARF	76 (80/105)	77 (50/65)	75 (30/40)	0.82
Post-extubation ARF treatment	70 (74/105)	70 (45/64)	71 (29/41)	1
Post-extubation ARF prevention	44 (39/89)	45 (25/56)	42 (14/33)	1
Hypercapnic ARF	33 (27/83)	29 (15/52)	39 (12/31)	0.47
Bronchial dilatation	32 (35/108)	27 (18/67)	41 (17/41)	0.14
Thoracic wall deformity	32 (35/111)	30 (19/68)	37 (16/43)	0.40
COPD exacerbation	28 (31/110)	22 (15/67)	37 (16/43)	0.13
Acute pulmonary edema	25 (28/111)	31 (21/68)	16 (7/43)	0.12
Neuromuscular disease	20 (22/111)	19 (13/68)	21 (9/43)	0.81
Obesity hypoventilation syndrome	19 (21/111)	16 (11/68)	23 (10/43)	0.46
Acute severe asthma	14 (15/111)	15 (10/68)	12 (5/43)	0.78
Obstructive sleep apnea syndrome	7 (8/110)	6 (4/67)	9 (4/43)	0.71

ARF: Acute respiratory failure; ARDS: Acute respiratory distress syndrome; COPD: chronic obstructive pulmonary disease; ETI: endotracheal intubation. HFNC: high-flow nasal cannula; ICU: intensive care unit

*Comparisons were performed between junior and senior ICU physicians

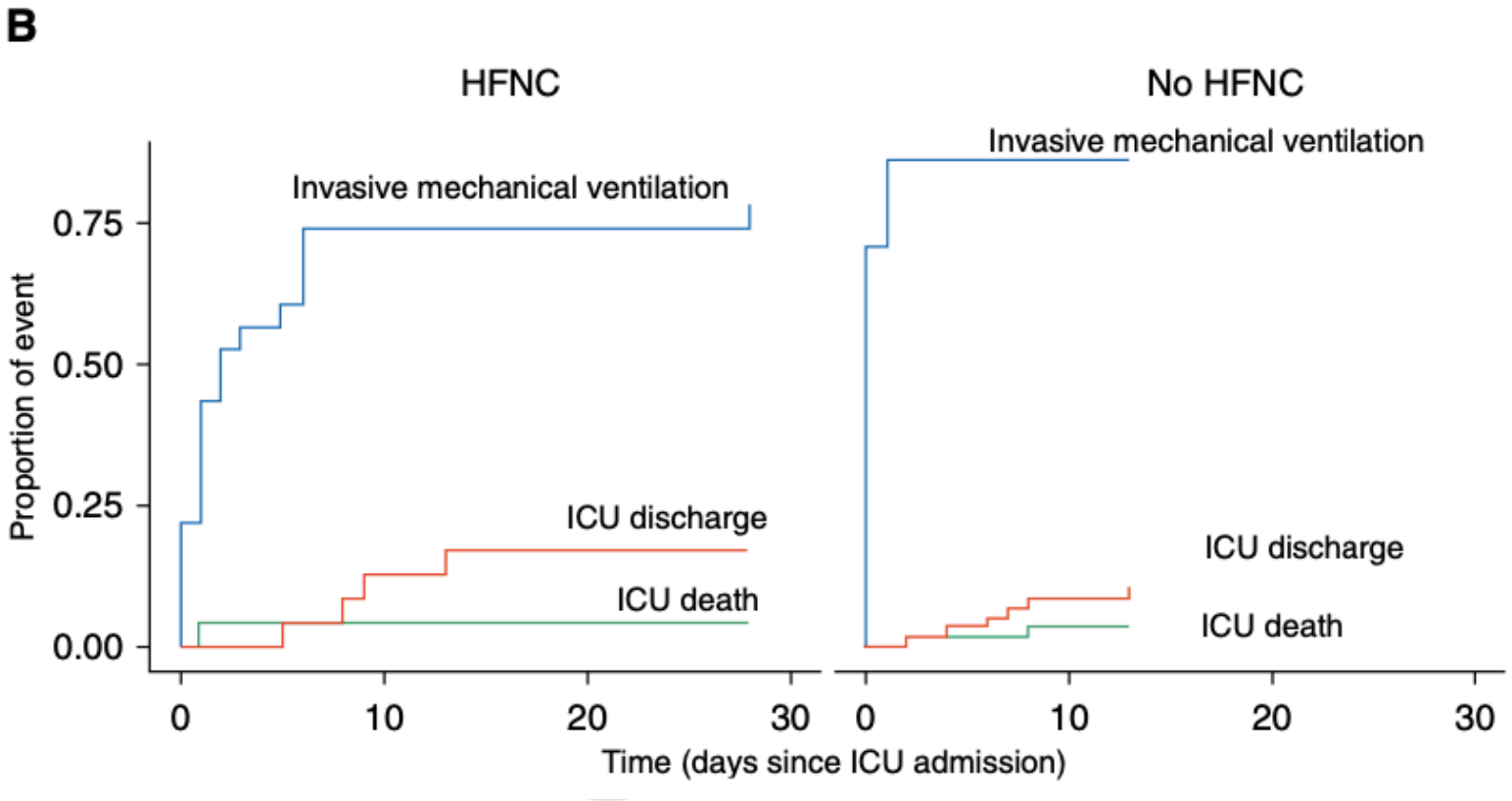
Besnier et al. Ann. Intensive Care (2019)
https://doi.org/10.1186/s13613-019-0569-9



No. at Risk							
High-flow oxygen	106	100	97	94	94	93	93
Standard oxygen	94	84	81	77	74	73	72
Noninvasive ventilation	110	93	86	80	79	78	77

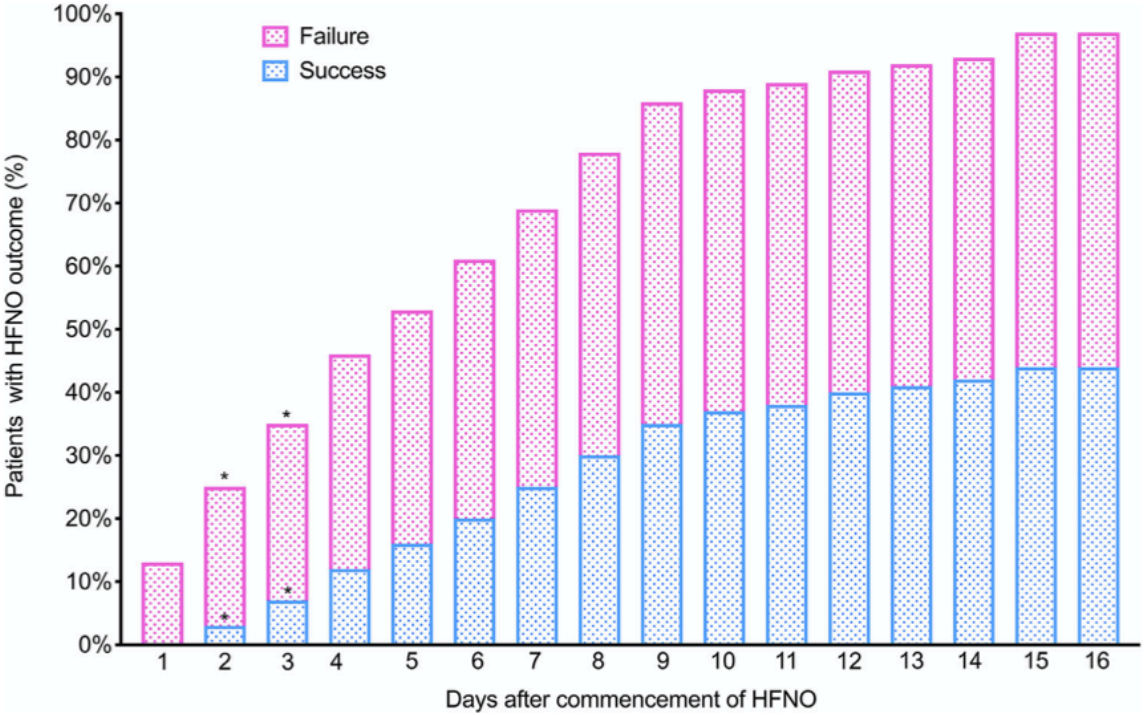
Figure 3. Kaplan–Meier Plot of the Probability of Survival from Randomization to Day 90.

Study florali, NEJM 2016



American Journal of Respiratory and Critical Care Medicine Volume 202 Number 7 | October 1 2020

LHD hors USI …



Published: October 05, 2020 DOI:https://doi.org/10.1016/j.eclinm.2020.100570

$$\frac{SpO_2 / FiO_2}{\text{Respiratory Rate}} = \textbf{ROX index}$$

Example at 6 hours

SpO_2 = **88%**

FiO_2 = **.70**

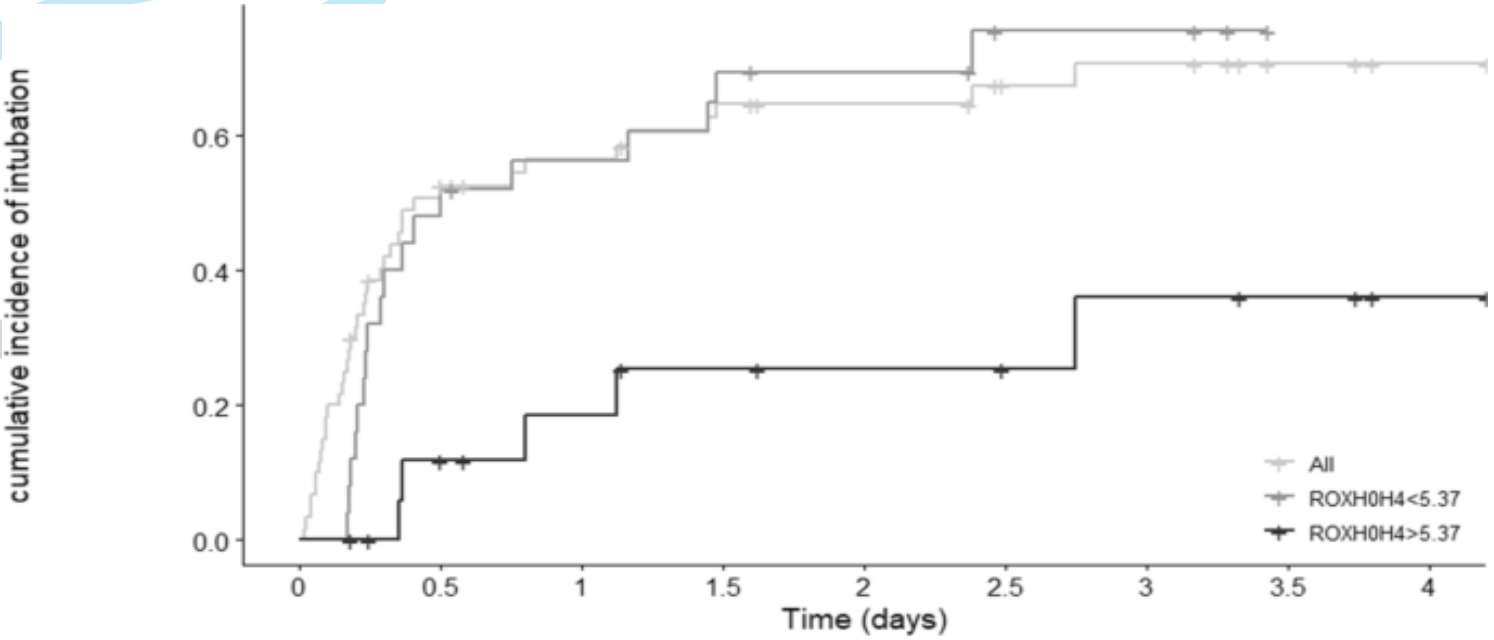
RR = **28** breaths/minute

$$\frac{88 / .70}{28} = 4.48$$

In the example above, the resulting score of 4.48 is greater than the score for predicted failure at 6 hours (3.47 as shown in the ROX Score table right). Therefore, continued NHF treatment should be considered.

ROX score margin for failure over time

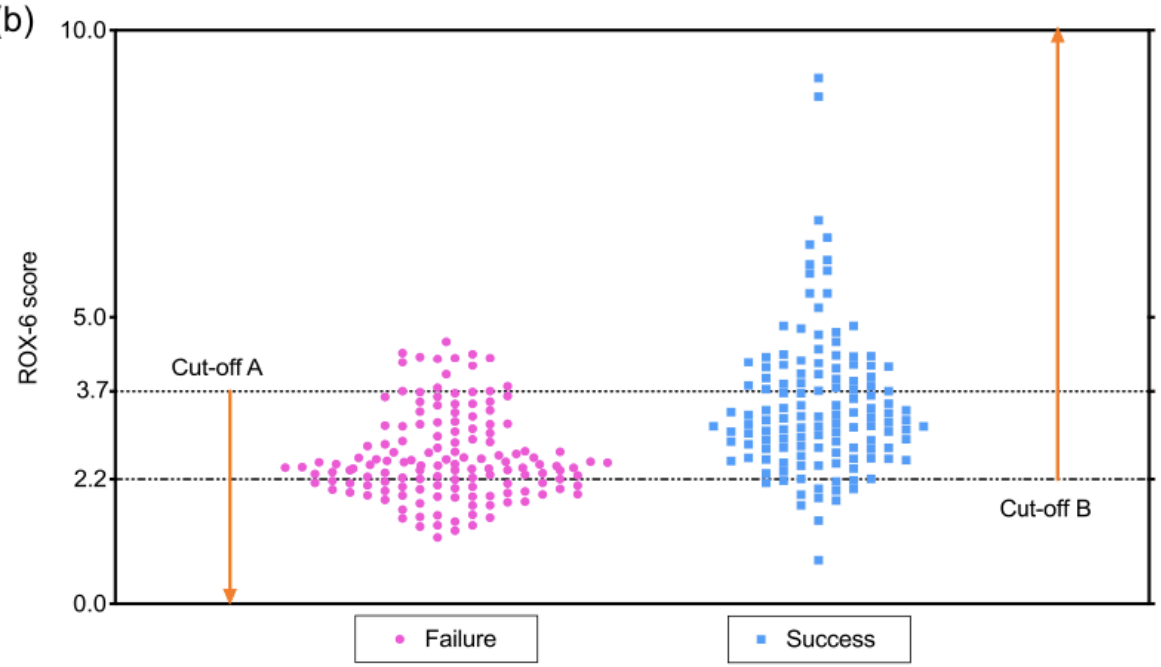
Time Point (Hours of NHF use)	**ROX Score**	**Positive Predictive Value %**
2 hours	< 2.85	98
6 hours	**< 3.47**	98–99
12 hours	< 3.85	99
> 12 hours	< 4.88	80



Cumulative number of events

All	0	31	33	37	37	38	39	39	39
ROXH0H4<5.37	0	13	14	17	17	18	18	18	18
ROXH0H4>5.37	0	2	3	4	4	4	5	5	5

Intensive Care Med (2020) 46:1924–1926
https://doi.org/10.1007/s00134-020-06177-1



Cut-point	Sensitivity	Specificity	PPV	NPV
3.7	90%	37%	56%	81%
2.7	68%	77%	72%	73%
2.2	33%	90%	74%	60%

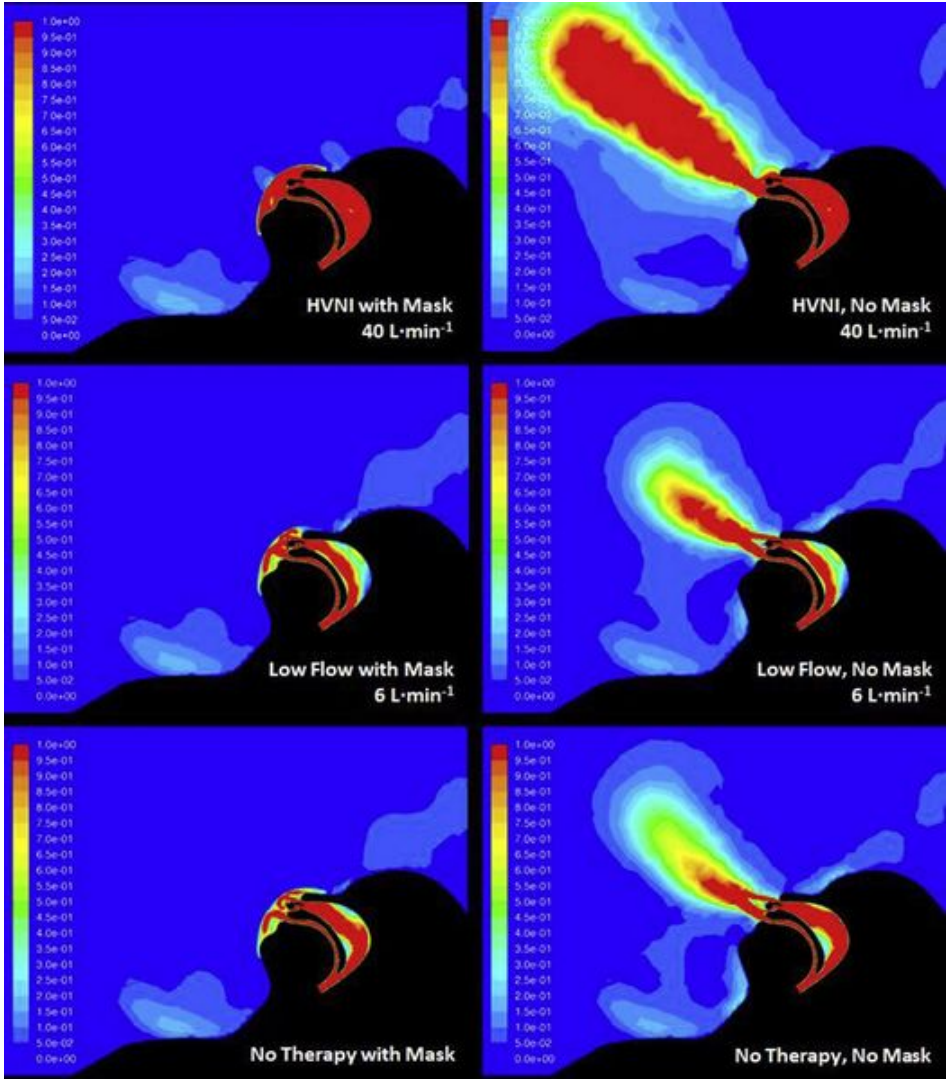
TABLE 1

Summary of exhaled smoke dispersion distances with different oxygen devices

Oxygen device	Flow rate L·min^{-1}	Dispersion distance cm	Ref.
HFNC	60	17.2±3.3	[6]
	30	13.0±1.1	[6]
	10	6.5±1.5	[6]
Simple mask	15	11.2±0.7	[7]
	10	9.5±0.6	[7]
Non-rebreathing mask	10	24.6±2.2	[7]
Venturi mask at F_{IO_2} 0.4	6	39.7±1.6	[7]
Venturi mask at F_{IO_2} 0.35	6	27.2±1.1	[7]

Summary of studies evaluating oxygen delivery devices using a high-fidelity human simulator with smoke particles of <1 µm (an aerosol of solid particles). The smoke was illuminated by a laser light-sheet and high-definition video was used to measure dispersion distance away from the manikin. Indicated dispersion distances give an idea of proximity of contaminated bio-aerosols, to which healthcare workers may be directly exposed. HFNC: high-flow nasal cannula; F_{IO_2}: inspiratory oxygen fraction.

European Respiratory
Journal 2020 55: 2000892; **DOI:** 10.1183/13993003.00892-2020



[Critical Care Research Letter]

CHEST

Preliminary Findings on Control of Dispersion of Aerosols and Droplets During High-Velocity Nasal Insufflation Therapy Using a Simple Surgical Mask

Implications for the High-Flow Nasal Cannula

Figure 1 – Velocity map of gas flow for all tested settings. HVNI 1⁄4 high-velocity nasal insufflation.

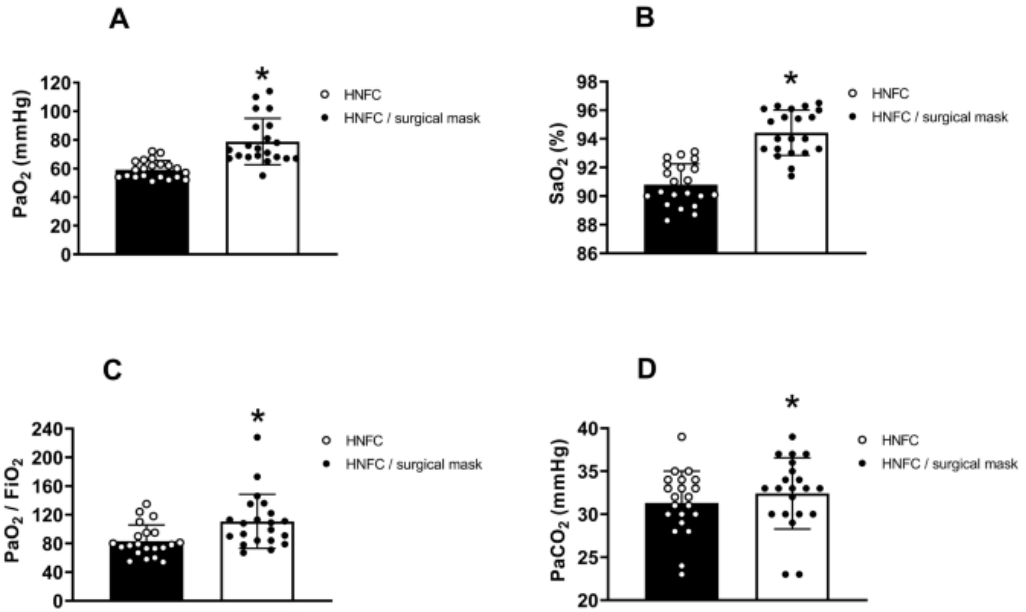
Montiel et al. Ann. Intensive Care (2020) 10:125
https://doi.org/10.1186/s13613-020-00744-x

Annals of Intensive Care

RESEARCH Open Access

Surgical mask on top of high-flow nasal cannula improves oxygenation in critically ill COVID-19 patients with hypoxemic respiratory failure

Virginie Montiel[1*], Arnaud Robert[1], Annie Robert[2], Anas Nabaoui[1], Tourneux Marie[1], Natalia Morales Mestre[1,3], Maerckx Guillaume[1,3], Pierre-François Laterre[1] and Xavier Wittebole[1]



The Double-Trunk Mask Improves Oxygenation During High-Flow Nasal Cannula Therapy for Acute Hypoxemic Respiratory Failure

Respiratory Care April 2019

Frédéric Duprez, Arnaud Bruyneel, Shahram Machayekhi, Marie Droguet, Yves Bouckaert, Serge Brimioulle, Gregory Cuvelier, and Gregory Reychler

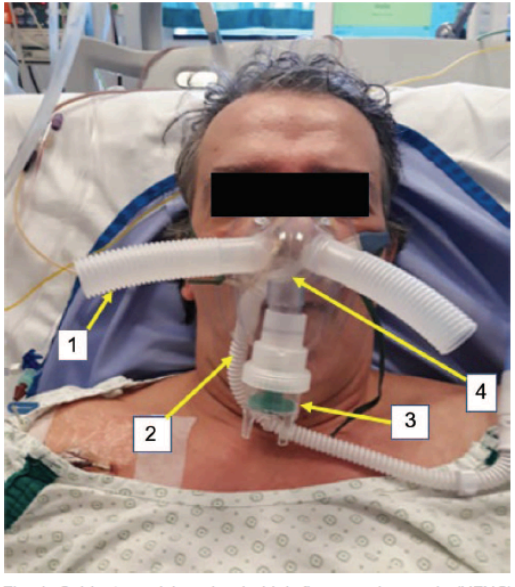
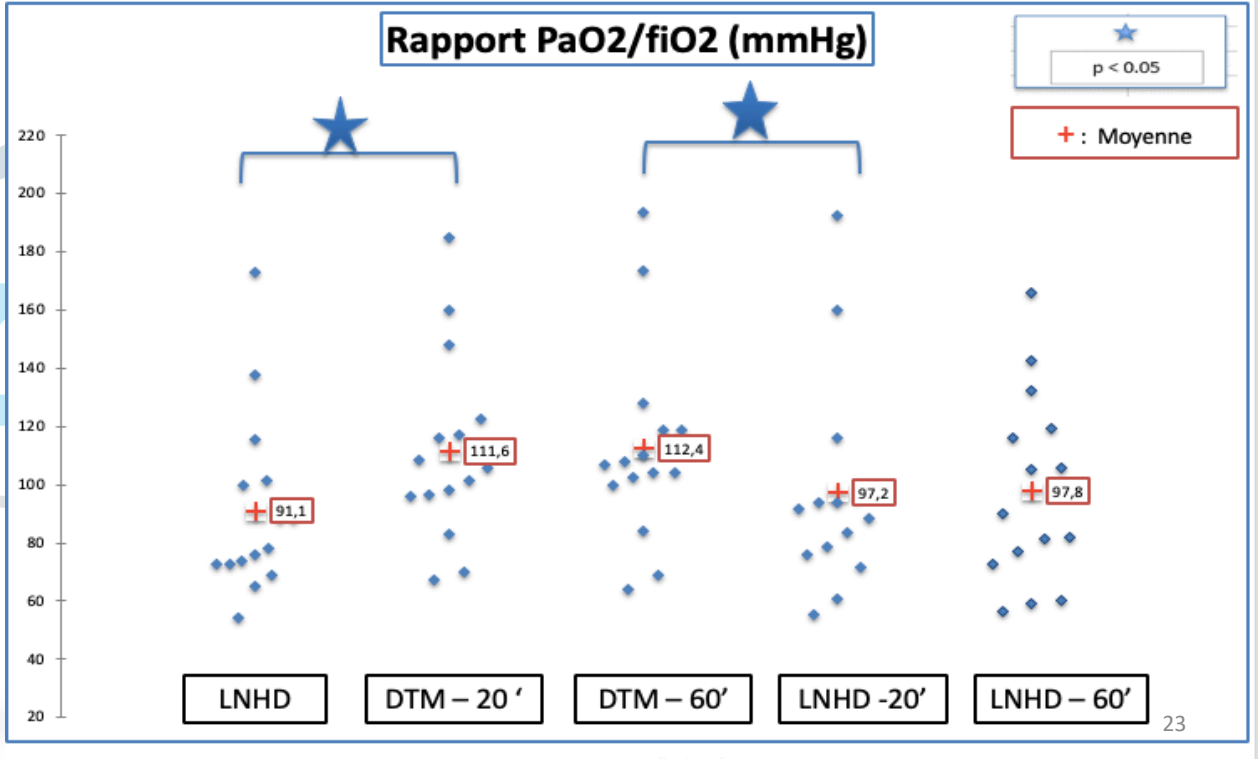


Fig. 1. Subject receiving classic high-flow nasal cannula (HFNC) therapy with a double-trunk mask (DTM). The DTM is composed of a normal aerosol mask (nebulizer and mouth piece) with 2 lateral holes (22 mm in diameter) and 15 cm of corrugated tubing inserted in the holes. The DTM was only applied to the face of subjects breathing spontaneously without obstructed airways. Subjects were already receiving O_2 via a nasal cannula. 1: trunk; 2: HFNC; 3: nebulizer; 4: aerosol mask. The nasal cannula is positioned according to the manufacturer's recommendation.



En pratique …

https://vimeo.com/476170424/9c4e36b65f?fbclid=IwAR3u2P5tsNVbuyMk2i3TOXsfDYH-HY3-2_Gi58m4cWUSpldViynQ8iZ72Zw

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