

Comment gérer une hypoxémie sévère aux urgences

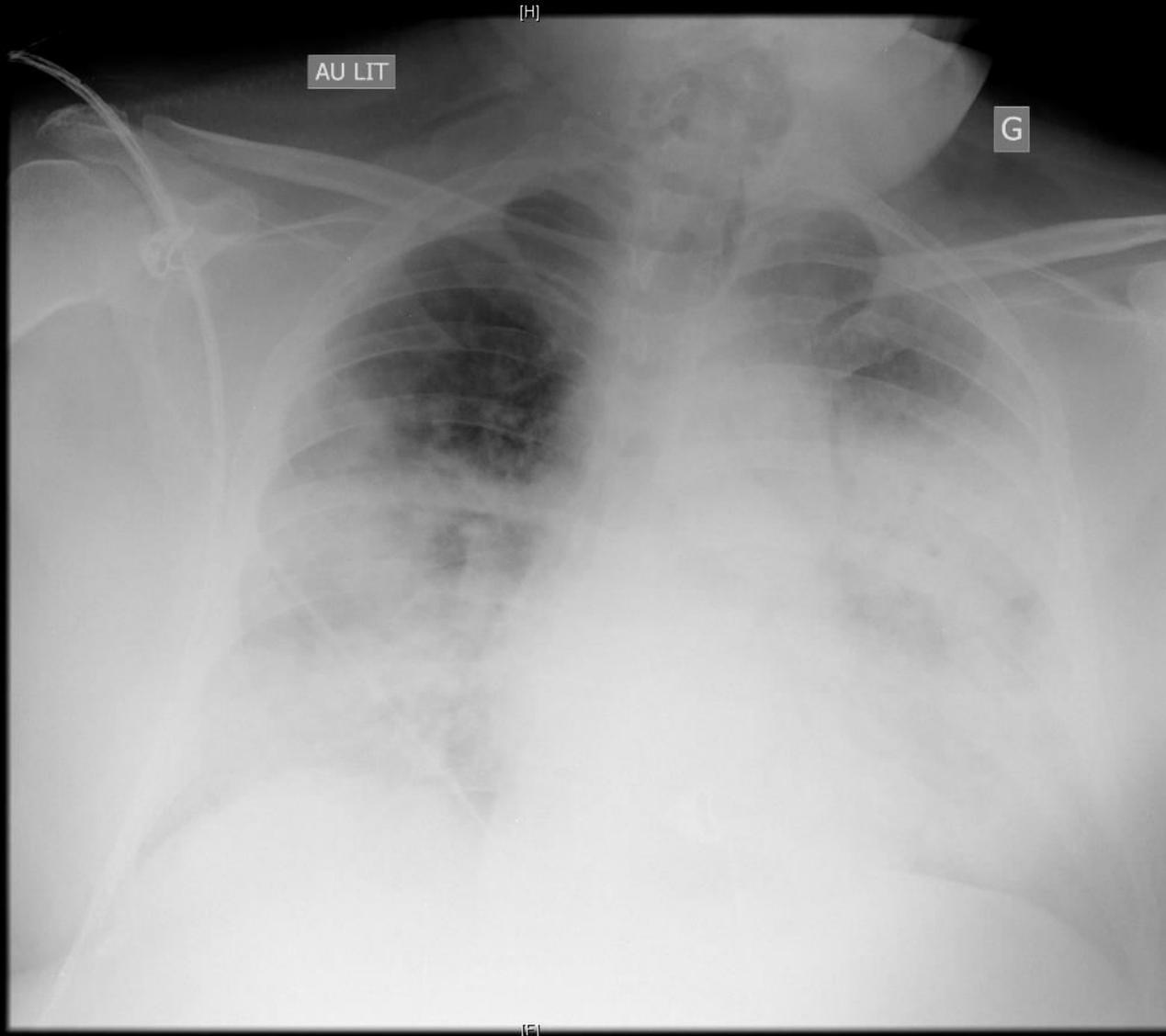
Pr Antoine Roch
Service d'Accueil des urgences
CHU Nord
Marseille



Mr X, 50 ans

- Arrive par ses propres moyens au SAU pour dyspnée, AEG, fièvre
- SaO₂ AA: 60%, FR 48/min, TA 14/8
- MHC 15 L à l'accueil: SPO₂ 79%; FR 45/min
- transfert SAUV

Radio thorax entrée SAU

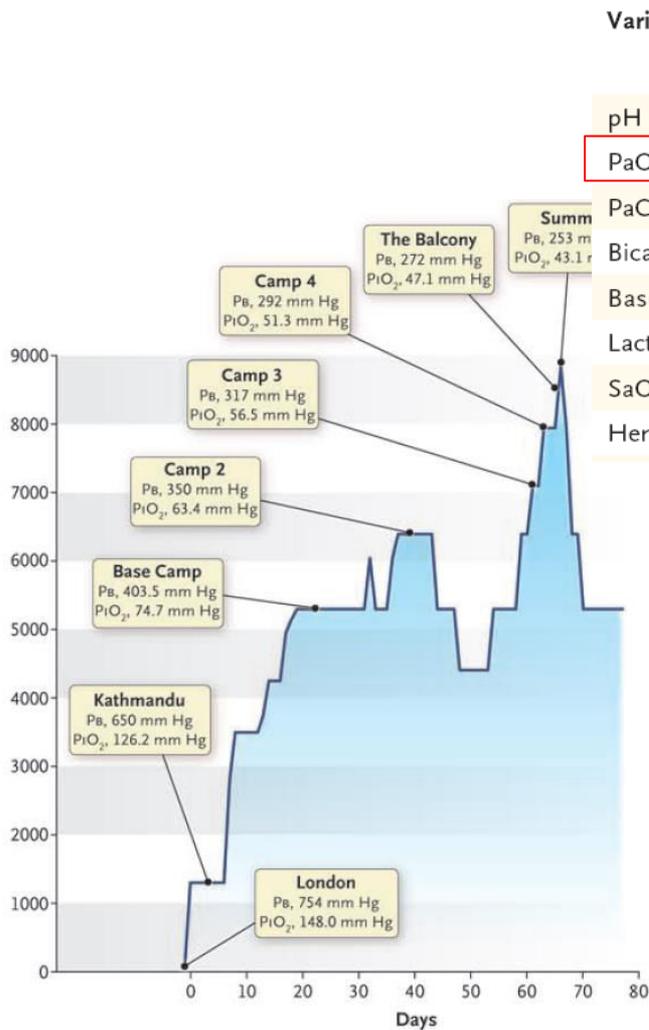


Quelles options ?

- IOT immédiate
 - Appel réa
 - Trouver un autre moyen de faire remonter sa SPO2
-
- Ce qui va probablement arriver = les trois
 - Dans quel ordre ?
 - Comment sécuriser la prise en charge ?

Arterial Blood Gases and Oxygen Content in Climbers on Mount Everest

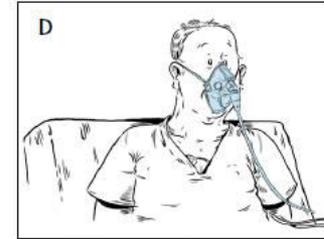
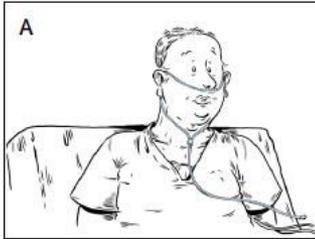
Michael P.W. Grocott, M.B., B.S., Daniel S. Martin, M.B., Ch.B.,
 Denny Z.H. Levett, B.M., B.Ch., Roger McMorrow, M.B., B.Ch.,
 Jeremy Windsor, M.B., Ch.B., and Hugh E. Montgomery, M.B., B.S., M.D.,
 for the Caudwell Xtreme Everest Research Group*



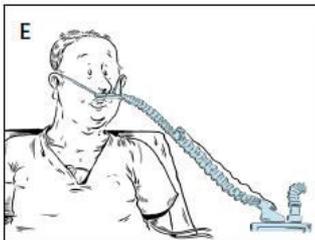
Variable	Subject No.				Group Mean
	1	2	3	4	
pH	7.55	7.45	7.52	7.60	7.53
PaO ₂ (mm Hg) †	29.5	19.1	21.0	28.7	24.6
PaCO ₂ (mm Hg) †	12.3	15.7	15.0	10.3	13.3
Bicarbonate (mmol/liter) ‡	10.5	10.67	11.97	9.87	10.8
Base excess of blood ‡	-6.3	-9.16	-6.39	-5.71	-6.9
Lactate concentration (mmol/liter)	2.0	2.0	2.9	1.8	2.2
SaO ₂ (%) ‡	68.1	34.4	43.7	69.7	54.0
Hemoglobin (g/dl) §	20.2	18.7	18.8	19.4	19.3

Quelle méthode d'oxygénation ?

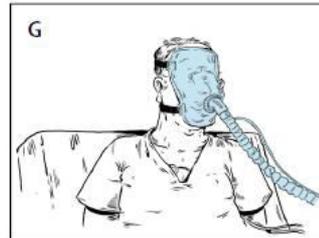
Standard oxygen



High-flow oxygen therapy



Non-invasive ventilation

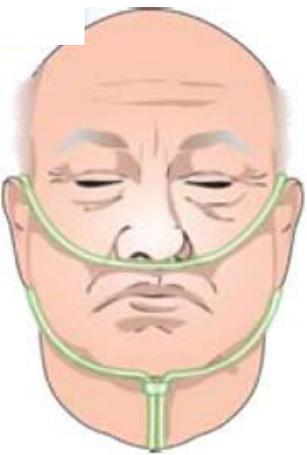


Intubation and invasive mechanical ventilation

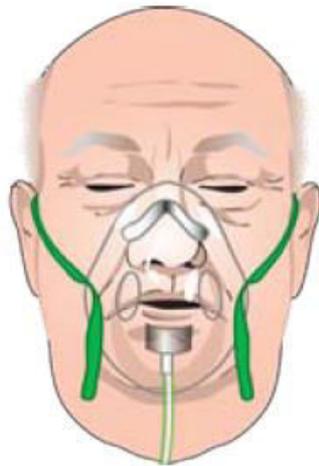


Azoulay E Lancet Respir Med 2018

Oxygénothérapie conventionnelle



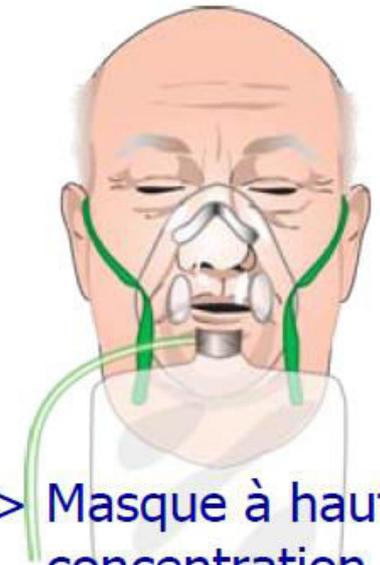
Lunettes nasales



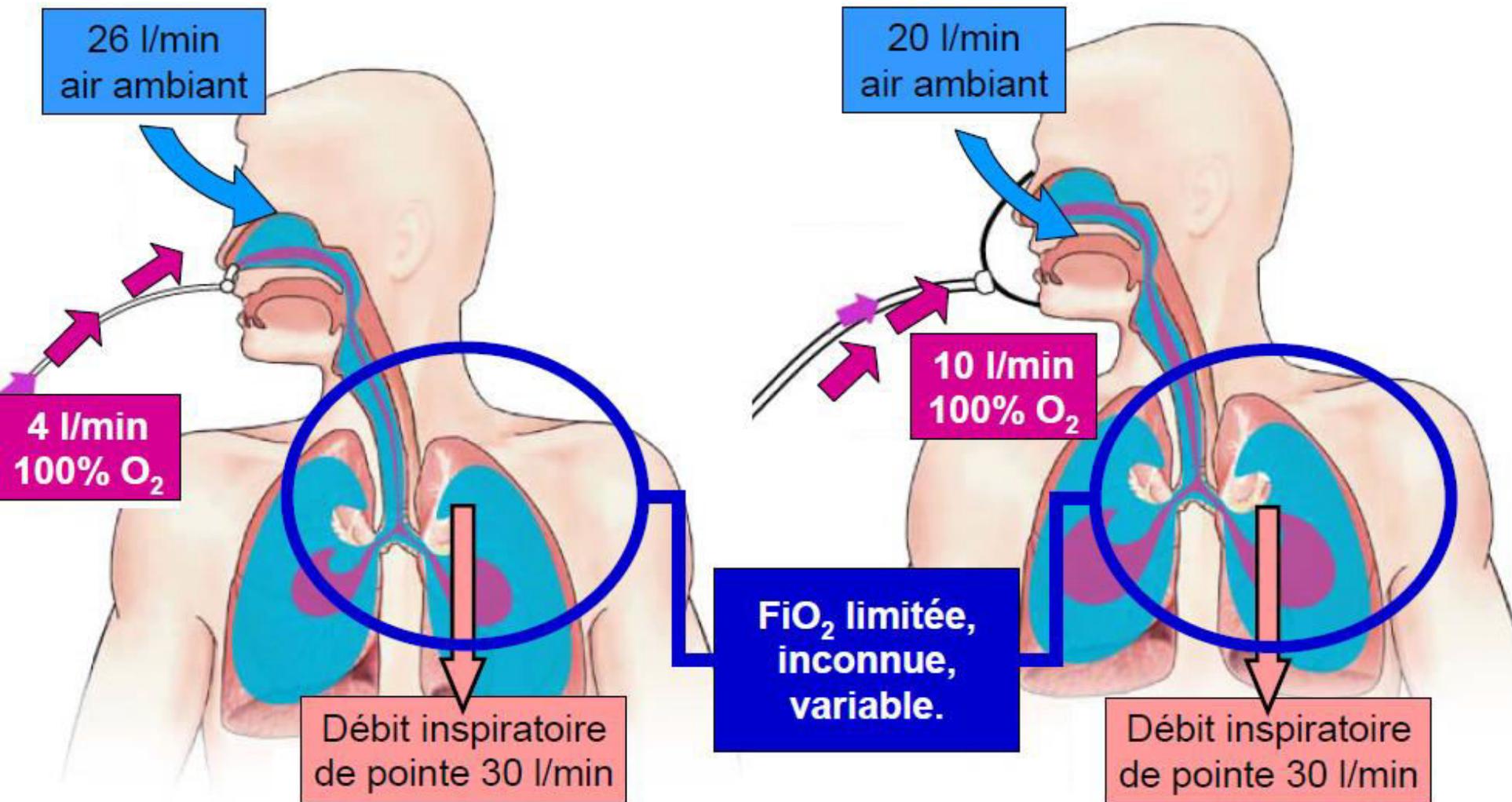
> Masque O₂

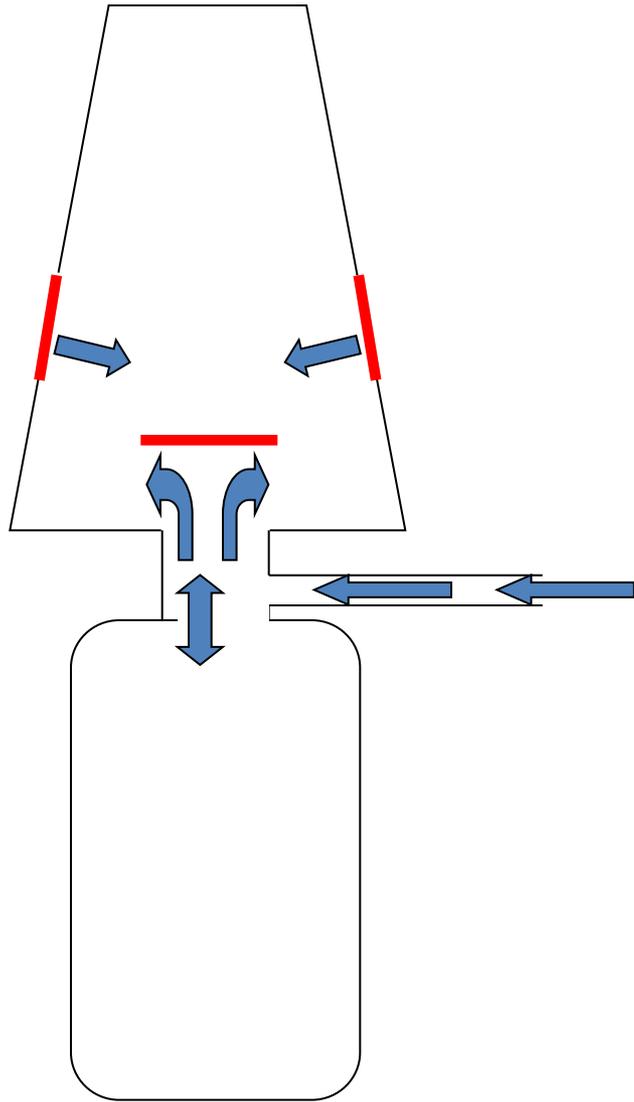


> Masque à venturi

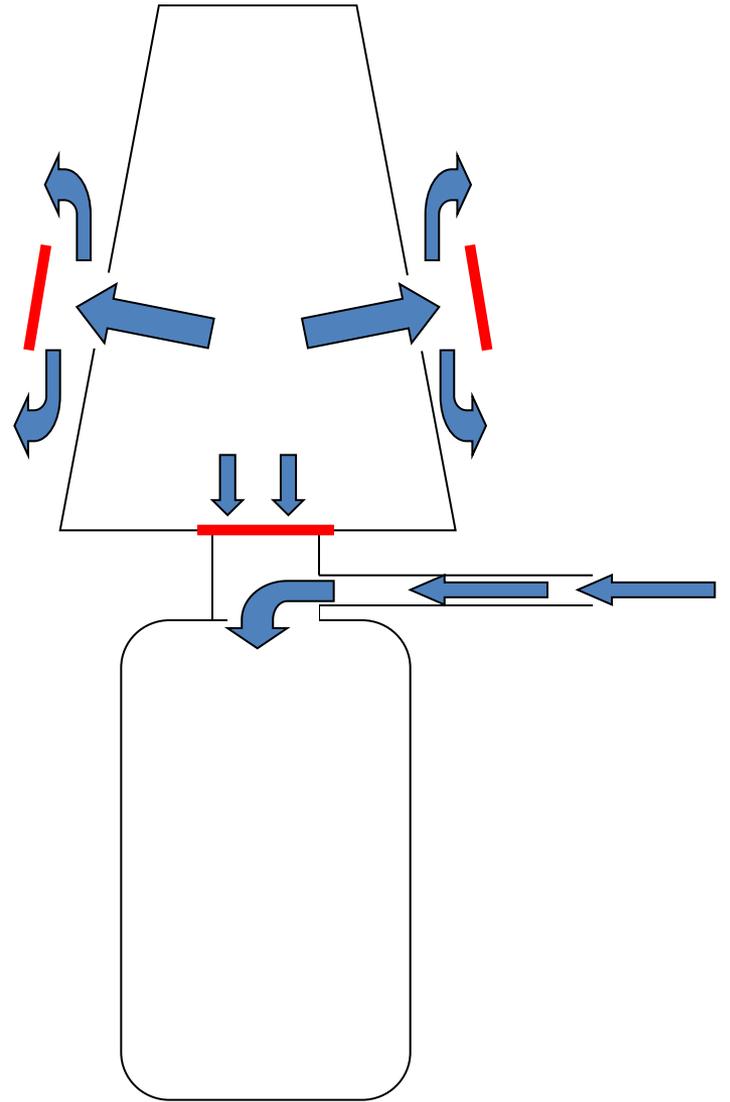


> Masque à haute concentration





Inspiration



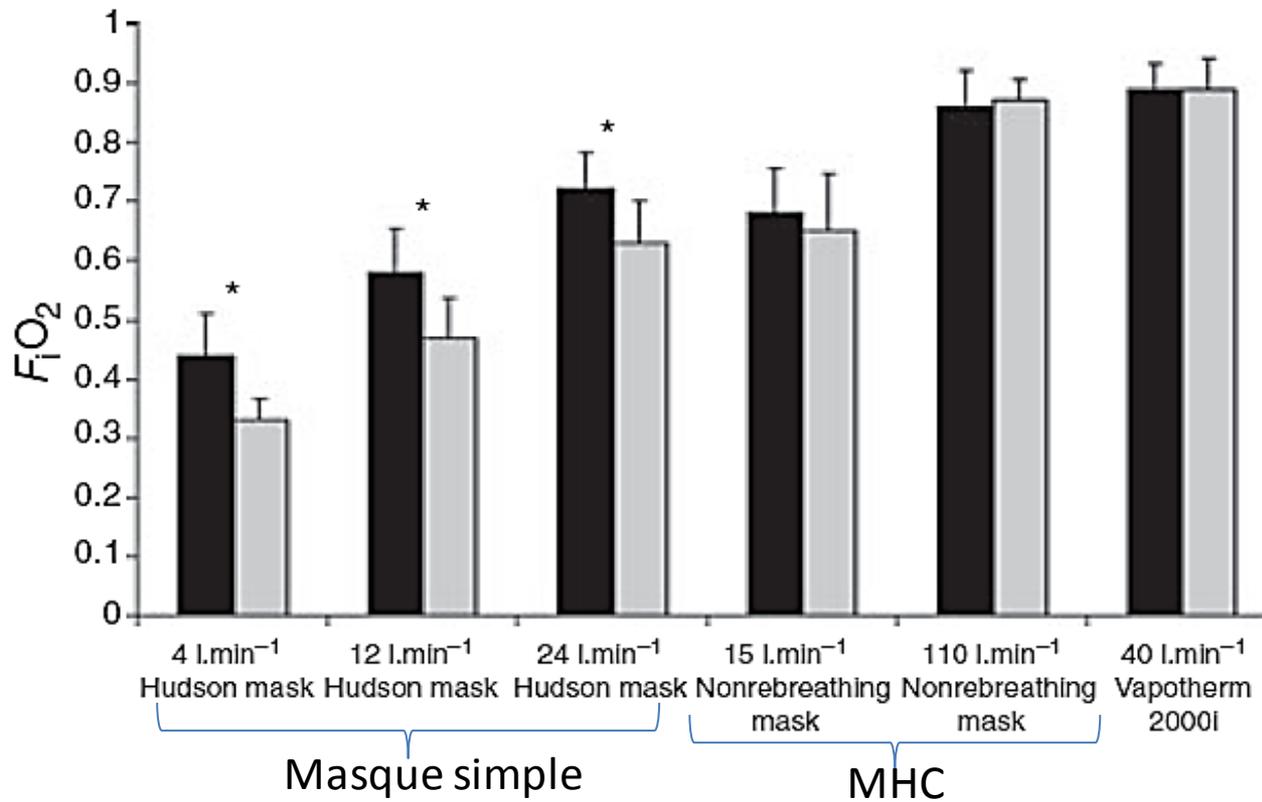
Expiration

FiO₂



Performance of oxygen delivery devices when the breathing pattern of respiratory failure is simulated*

M. A. B. Sim,¹ P. Dean,² J. Kinsella,³ R. Black,⁴ R. Carter⁵ and M. Hughes⁶



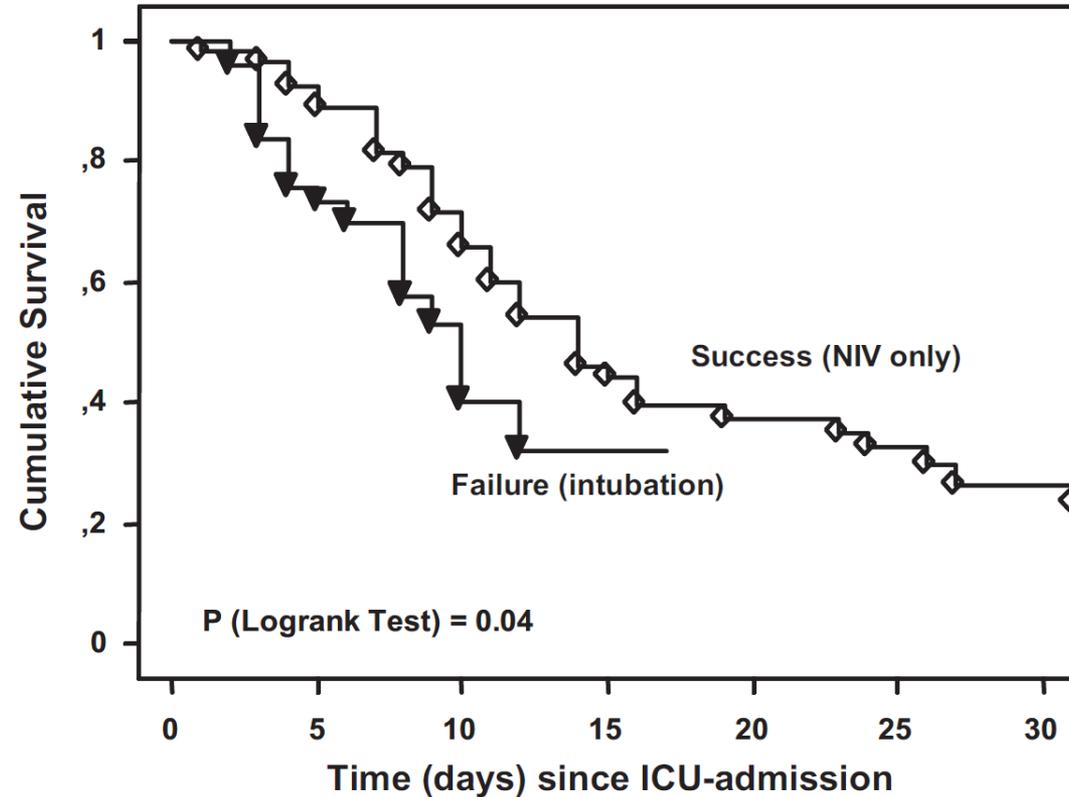


VNI dans l'insuffisance respiratoire aiguë *de novo* ?

	Patients	n	Objective	Intubation rate VNI / O ₂ (%)	Study interests	Drawbacks
Wysocki Chest 1995 107:761-8	ARF non COPD	41	Intubation rate	62 / 70	COPD exclusion	Multiple causes, sub-groups
Confalonieri AJRCCM 1999 160:1585-91	ARF with community-acquired pneumonia	56	Intubation rate	21 / 61	Pneumonie communautaire sévère	Many COPD
Martin AJRCCM 2000 161:807-13	ARF All causes	61	Hospital stay Intubation rate	28 / 59		COPD hypercapnia
Ferrer Chest 2005 128:3916-24	Hypoxemic ARF non COPD non hyperCO ₂	105	Intubation rate	25 / 52	Exclusion BPCO et hypercapnie	1/3 CPE

Echec de VNI et pronostic

- Cohorte
- 100 patients sous VNI
- 50% echec

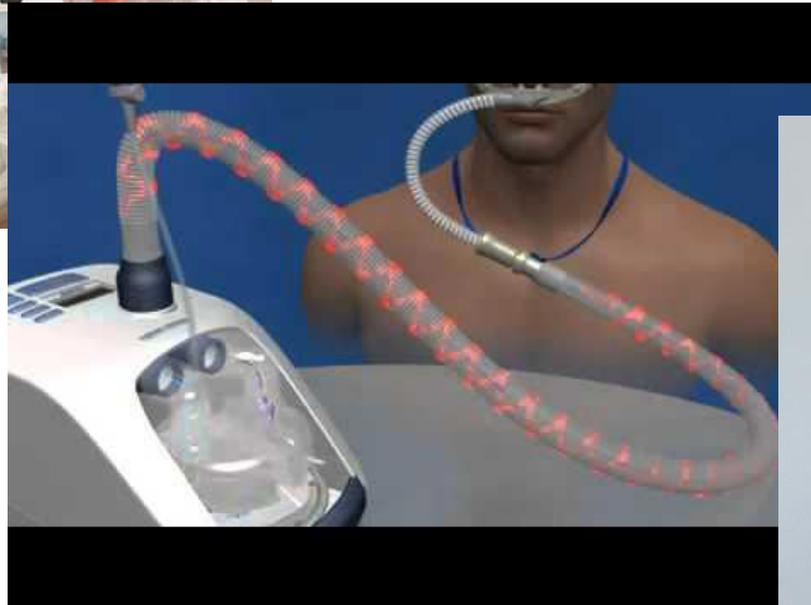


Facteurs de risque d'échec de VNI

Table 4. Results of the multivariate logistic regression model: independent predictors of NIV failure

	Odds Ratio	95% Confidence Interval	<i>p</i>
Respiratory rate under NIV (breaths/min)	1.18/point	1.05–1.33	0.005
Delay from ICU admission to NIV	2.00/day	1.02–3.94	0.04
Need for vasopressors	6.50	1.59–26.53	0.009
Need for renal replacement therapy	18.31	1.99–168.65	0.01
Criteria for ARDS at the time of NIV	77.71	6.88–878.38	0.0004

L'oxygénothérapie nasale humidifiée et réchauffée à haut débit (O_2 -HDN)



FiO₂ 21-100%
Débit 10-80 l/min

FiO₂ élevée



Anaesthesia

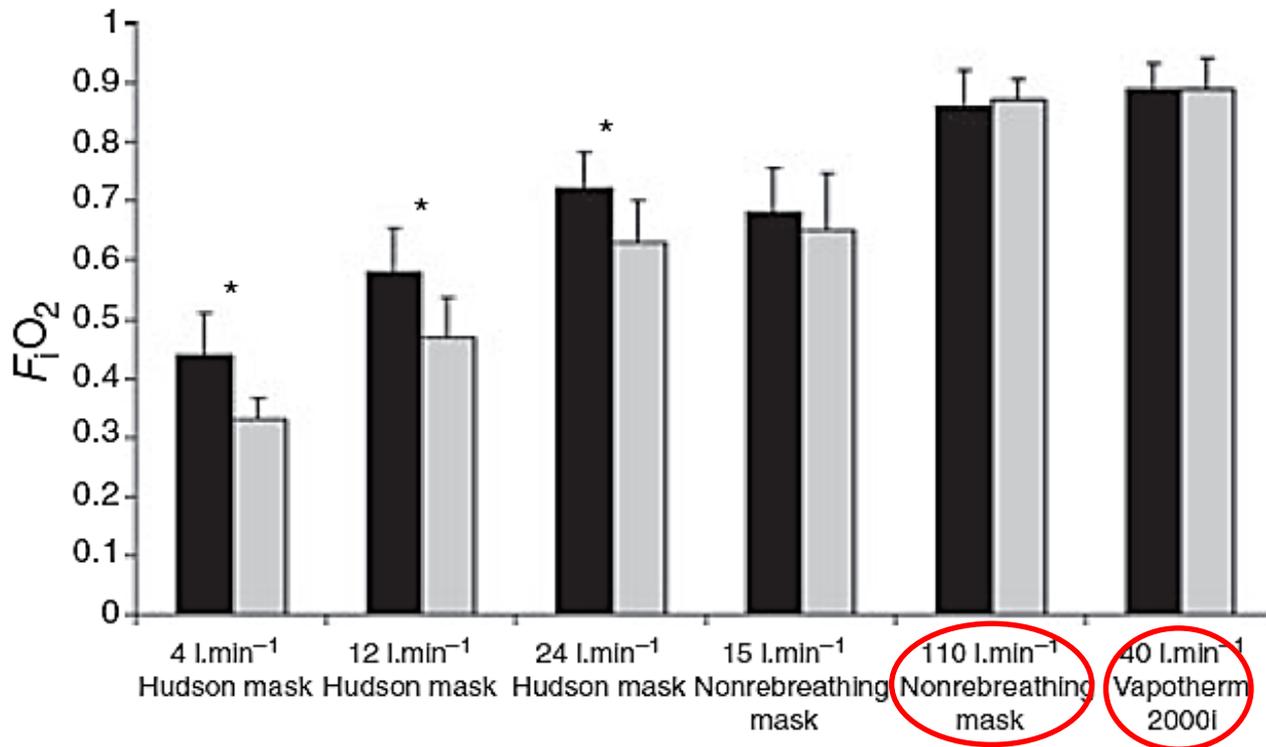
Journal of the Association of Anaesthetists of Great Britain and Ireland

Anaesthesia, 2008, 63, pages 938-940

doi:10.1111/j.1365-2044.2008.05536.x

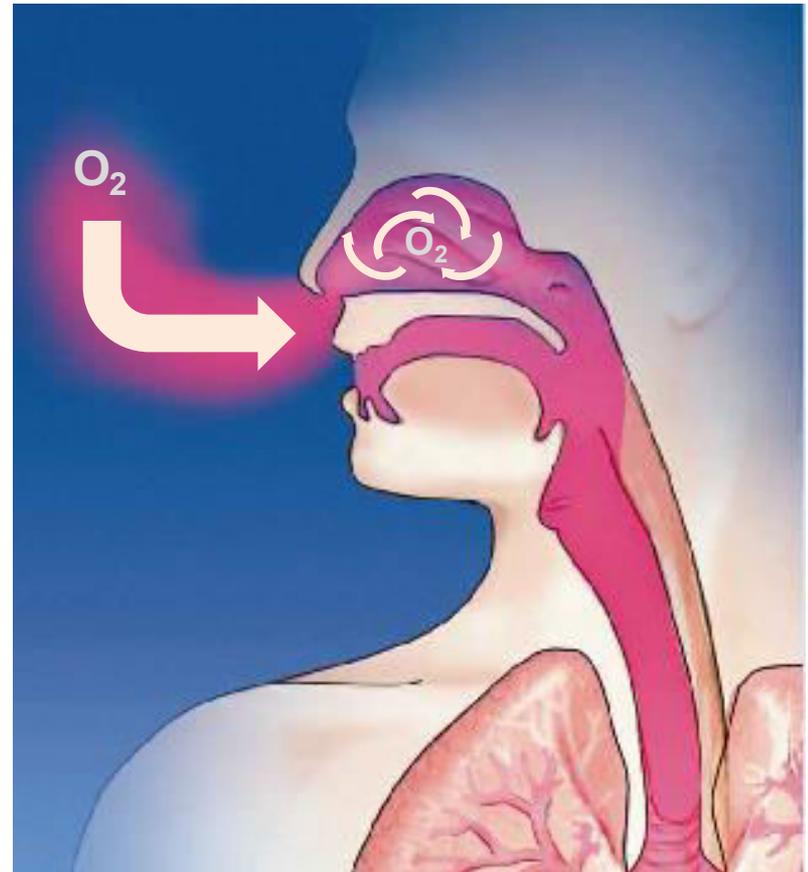
Performance of oxygen delivery devices when the breathing pattern of respiratory failure is simulated*

M. A. B. Sim,¹ P. Dean,² J. Kinsella,³ R. Black,⁴ R. Carter⁵ and M. Hughes⁶



Lavage espace mort

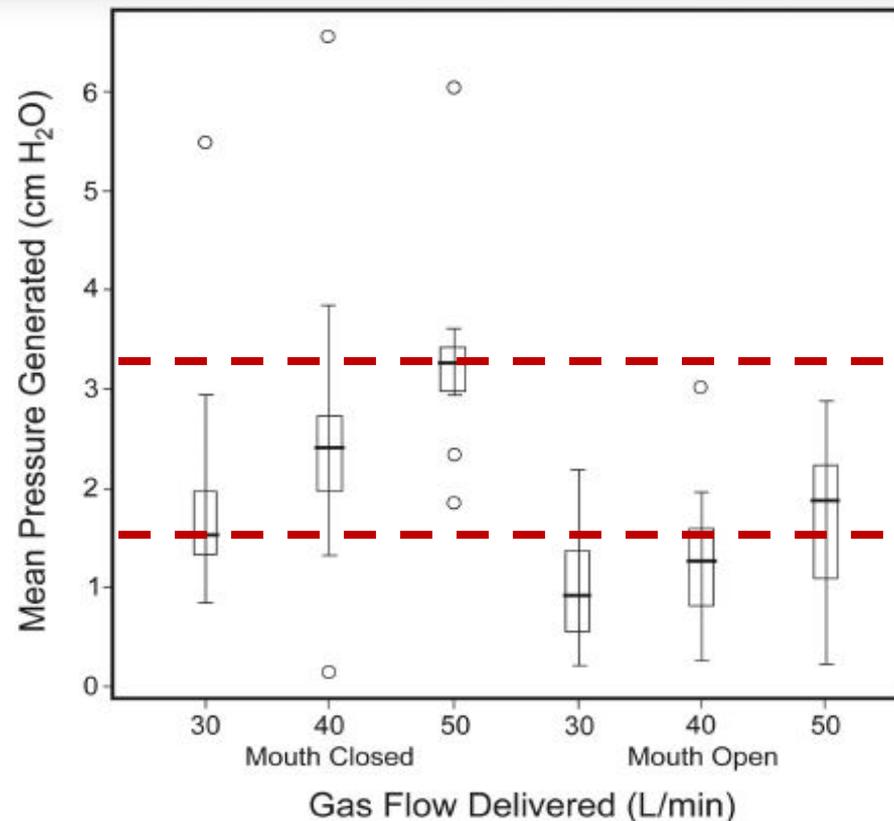
- Débit gaz administré > débit inspiratoire de pointe
- Rinçage-balayage cavité rhino-pharyngée
- Réservoir de gaz frais (FIO₂)
- Minimise ré-inhalation de CO₂



effet PEP

The Effects of Flow on Airway Pressure During Nasal High-Flow Oxygen Therapy

Rachael L Parke RN MHSc, Michelle L Eccleston RN, and Shay P McGuinness MB ChB

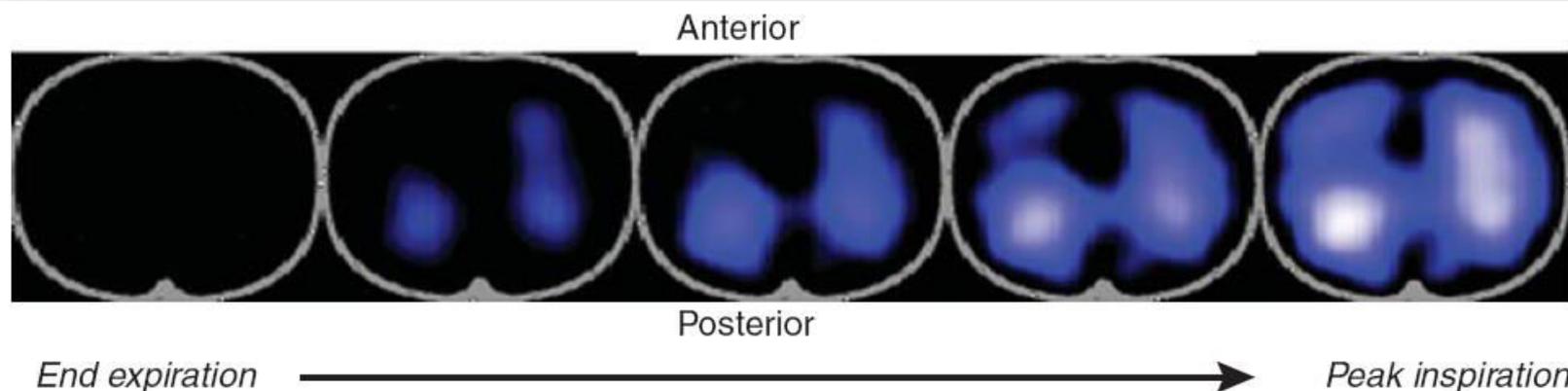


n=26 sous O₂-HDN
n=27 avec O₂ standard, 12/27(44%) échec

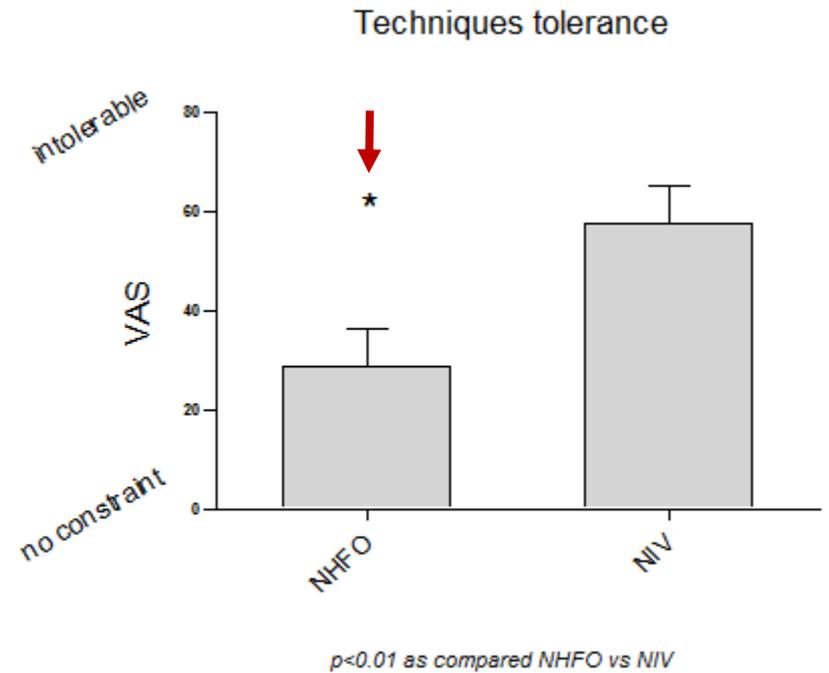
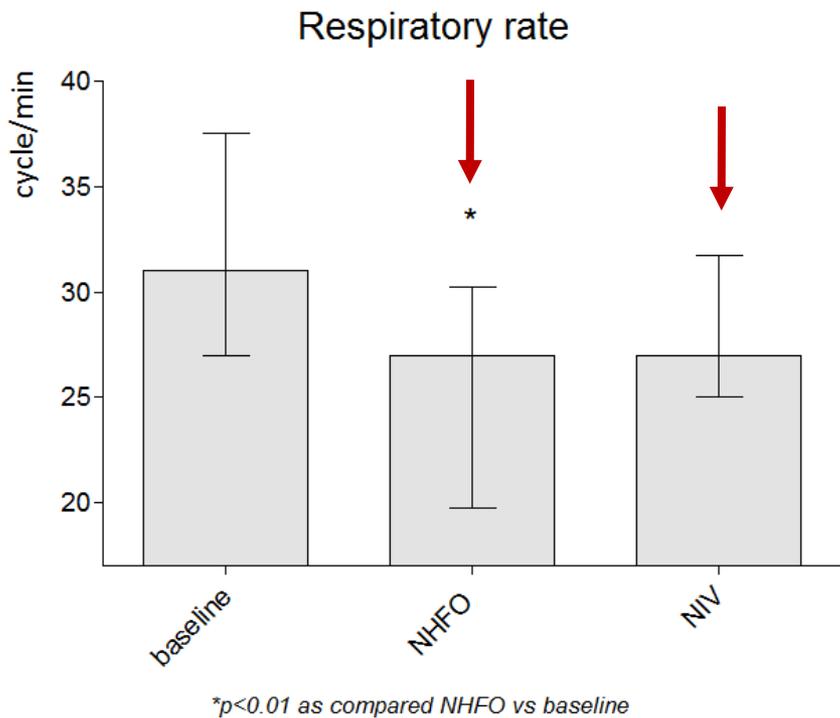
Respir Care 2011;56(8):1151–1155.

Table 2 Outcome variables. Low-flow oxygen compared with HFNCs

Variable	Low-flow oxygen [mean (sd)]	HFNC [mean (sd)]	Mean difference [mean (sd)]	95% confidence interval	P-value
End-expiratory lung impedance (units)	419 (212.5)	1936 (212.9)	1517 (46.6)	1425, 1608	<0.001
Mean airway pressure (cm H ₂ O)	-0.3 (0.9)	2.7 (1.2)	3.0 (1.3)	2.4, 3.7	<0.001
Respiratory rate (bpm)	20.9 (4.4)	17.5 (4.6)	-3.4 (2.8)	-2.0, -4.7	<0.001
Borg score					
0-10	2.7 (2.6)	1.9 (2.3)	-0.8 (1.2)	-0.1, -1.4	0.023
Tidal variation (units)	1512 (195.0)	1671 (195.1)	159 (21.6)	117, 201	<0.001
Pa _{O₂} /Fi _{O₂} ratio (mm Hg)	160 (53.7)	190.6 (57.9)	30.6 (25.9)	17.9, 43.3	<0.001

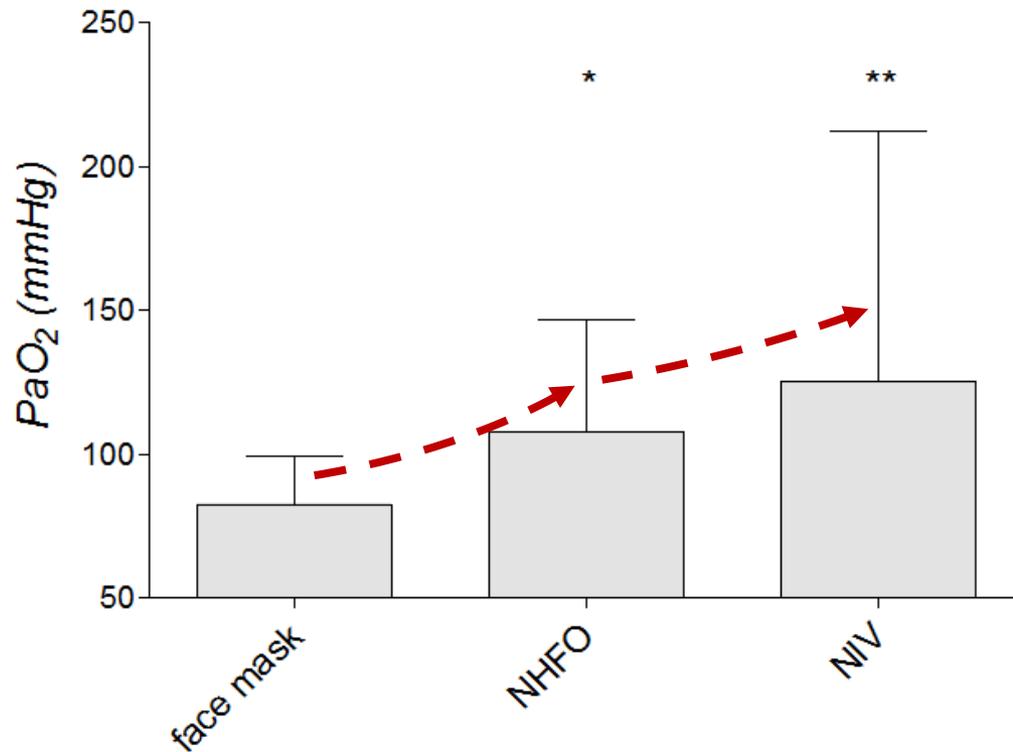


O2-HDN et IRA hypoxémique



n=28
IRA hypoxémique
avec P/F < 200

O2-HDN et IRA hypoxémique



* $p < 0.05$ as compared NHFO versus baseline
** $p < 0.0001$ as compared NIV versus baseline

n=28
IRA hypoxémique
avec P/F < 200

High-Flow Oxygen through Nasal Cannula in Acute Hypoxemic Respiratory Failure

Jean-Pierre Frat, M.D., Arnaud W. Thille, M.D., Ph.D., Alain Mercat, M.D., Ph.D.,

New Engl J Med mai 2015

Insuffisance respiratoire aiguë hypoxémique

FR >25 c/min ; $\text{PaO}_2/\text{FiO}_2 \leq 300$,
 $\text{PaCO}_2 \leq 45$ mm Hg



FiO_2 déterminée par un
analyseur d'oxygène
portable

Insuffisance respiratoire aiguë hypoxémique

FR >25 c/min ; PaO₂/FiO₂ ≤300,
PaCO₂ ≤45 mmHg

Information et recueil consentement
Randomisation et Stratification
antécédent Insuffisance cardiaque

Oxygène
Standard

Oxygène
Haut-Débit

VNI/
O₂-HDN

Standard
oxygen
SpO₂ ≥92%

High-Flow
oxygen
SpO₂ ≥92%

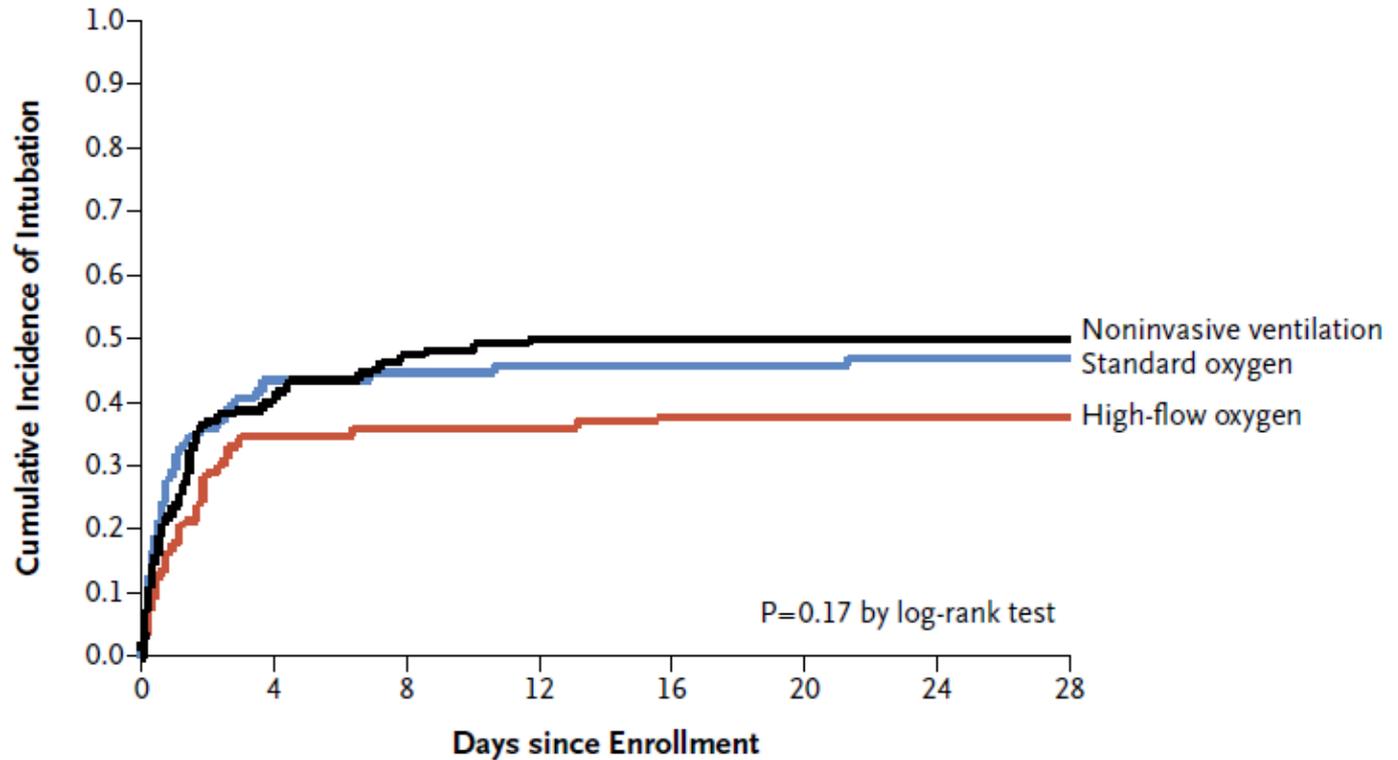
NIV
SpO₂ ≥92%
avec VNI ≥8 h/j

Table 1. Characteristics of the Patients at Baseline, According to Study Group.*

Characteristic	High-Flow Oxygen (N=106)	Standard Oxygen (N=94)	Noninvasive Ventilation (N=110)
Age — yr	61±16	59±17	61±17
Male sex — no. (%)	75 (71)	63 (67)	74 (67)
Body-mass index†	25±5	26±5	26±6
SAPS II‡	25±9	24±9	27±9
Current or past smoking — no. (%)	34 (32)	36 (38)	40 (36)
Reason for acute respiratory failure — no. (%)			
Community-acquired pneumonia	71 (67)	57 (61)	69 (63)
Hospital-acquired pneumonia	12 (11)	13 (14)	12 (11)
Extrapulmonary sepsis	4 (4)	5 (5)	7 (6)
Aspiration or drowning	3 (3)	1 (1)	2 (2)
Pneumonia related to immunosuppression	6 (6)	4 (4)	10 (9)
Other	10 (9)	14 (15)	10 (9)
Bilateral pulmonary infiltrates — no. (%)	79 (75)	80 (85)	85 (77)
Respiratory rate — breaths/min	33±6	32±6	33±7
Heart rate — beats/min	106±21	104±16	106±21
Arterial pressure — mm Hg			
Systolic	127±24	130±22	128±21
Mean	87±17	89±15	86±16
Arterial blood gas			
pH	7.43±0.05	7.44±0.06	7.43±0.06
Pao ₂ — mm Hg	85±31	92±32	90±36
Fio ₂ §	0.62±0.19	0.63±0.17	0.65±0.15
Pao ₂ :Fio ₂ — mm Hg	157±89	161±73	149±72
Paco ₂ — mm Hg	36±6	35±5	34±6

Taux d'intubation à J28

A Overall Population

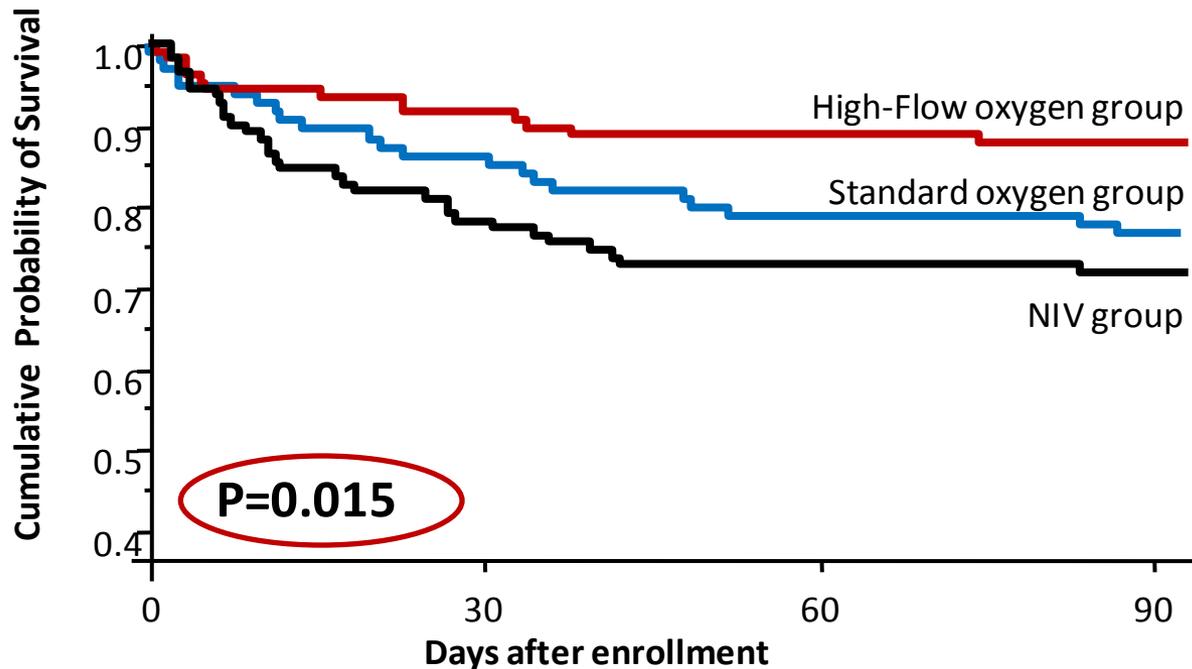


No. at Risk

High-flow oxygen	106	68	67	67	65	65	65	65
Standard oxygen	94	52	50	49	49	49	48	48
Noninvasive ventilation	110	64	57	53	53	53	53	52

Objectifs secondaires : mortalité J90 et en réanimation

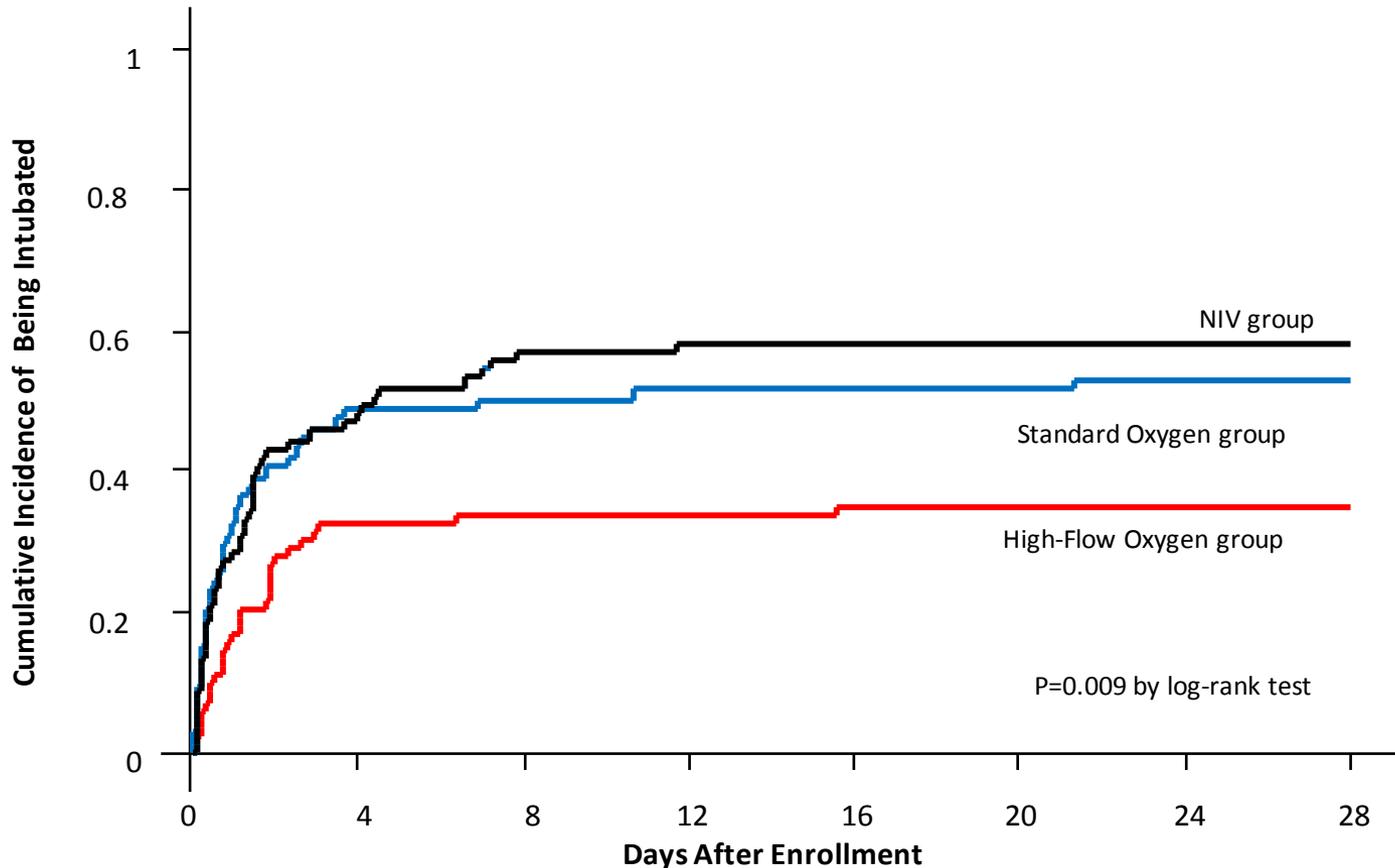
	Standard oxygen group (n=94)	High-Flow oxygen group (n=106)	NIV group (n=110)	P Value
ICU mortality – no. (%)	18 (19.1)	12 (11.3)	27 (24.5)	0.04
Mortality at day 90– no. (%)	22 (23.4)	13 (12.3)	31 (28.2)	0.01



Post-hoc analysis:

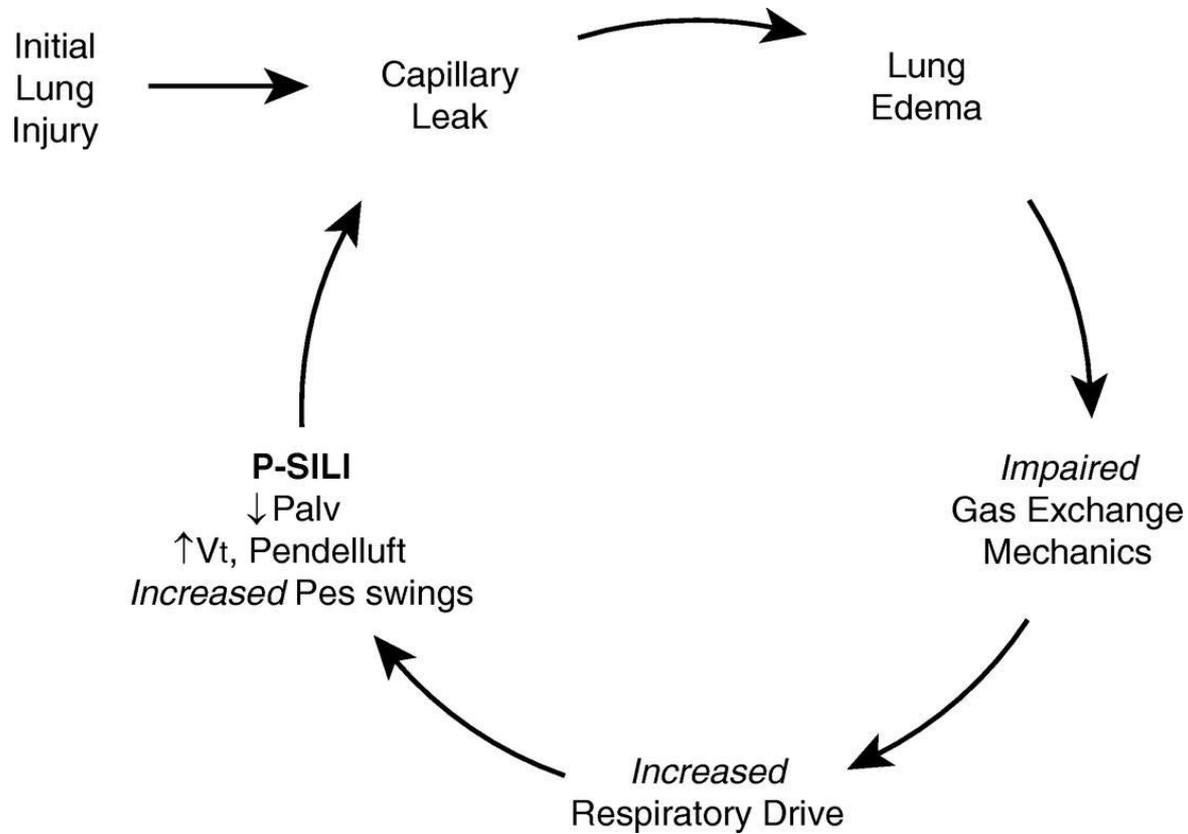
taux d'intubation chez patients P/F ≤ 200 (n=238)

	Standard oxygen group (n=74)	High-Flow group (n=83)	NIV group (n=81)	P Value
Intubation – no. (%)	39 (52.7)	29 (34.9)	47 (58.0)	0.008



Objectifs secondaires : tolérance et gazométrie

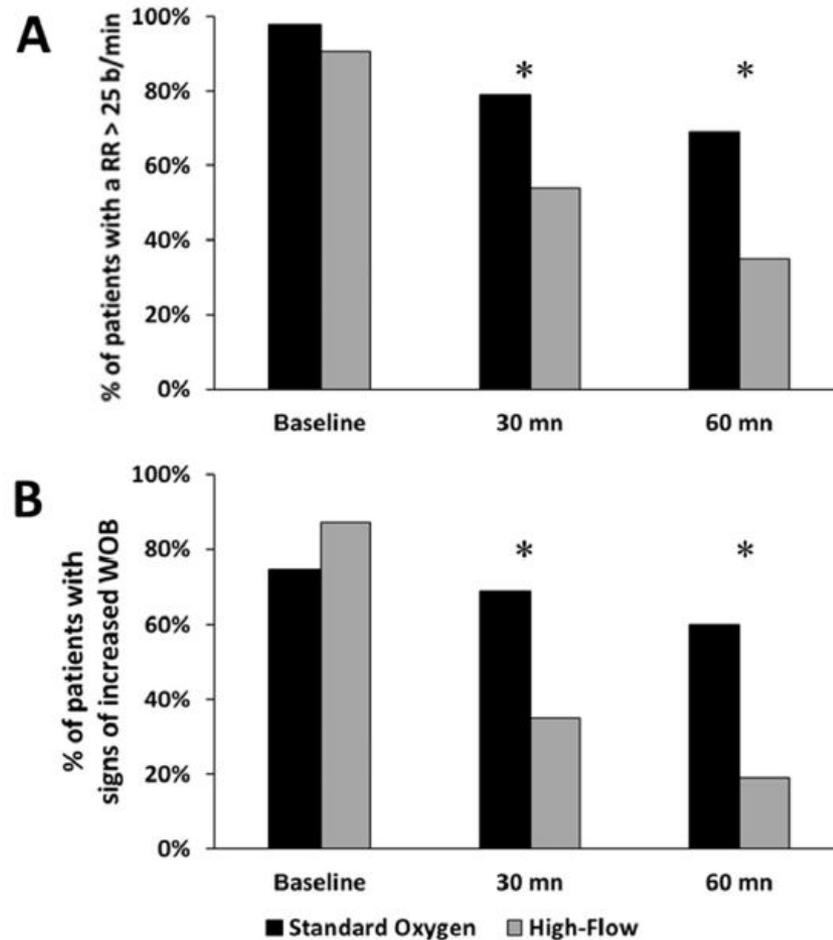
	Standard oxygen group (n=74)	High-Flow group (n=86)	NIV group (n=91)	P Value
Respiratory patient-discomfort at inclusion – mm	44±29	38±31	46±30	0.20
Respiratory patient-discomfort at H1– mm	40±29	29±26	43±29	<0.01
Grade of dyspnea at H1				<0.001
Marked improvement – no. (%)	5 (6.8)	19 (22.1)	13 (14.3)	
Slight improvement– no. (%)	26 (35.1)	46 (53.5)	40 (44.0)	
No change– no. (%)	33 (44.6)	18 (20.9)	23 (25.3)	
Slight deterioration – no. (%)	9 (12.2)	3 (3.5)	8 (8.8)	
Marked deterioration – no. (%)	1 (1.3))	0 (0.0)	7 (7.7)	
Respiratory rate at H1 – cycles/min	31±7	28±7	31±8	<0.01
PaO ₂ at H1– mm Hg	91±32	106±66	118±72	<0.05
PaO ₂ :FiO ₂ ratio at H1 – mm Hg	146±69	133±73	183±83	<0.001



Early high-flow nasal cannula oxygen therapy in adults with acute hypoxemic respiratory failure in the ED: A before-after study

Jean Macé, MD^{a,1}, Nicolas Marjanovic, MD^{b,c,*,1}, Farnam Faranpour, MD^a, Olivier Mimoz, MD, PhD^b, Marc Frerebeau, MD^a, Mathieu Violeau, MD^a, Pierre-Alexis Bourry, MD^a, Jérémy Guénézan, MD^b, Arnaud W. Thille, MD, PhD^{c,d}, Jean-Pierre Frat, MD^{c,d}

American Journal of Emergency Medicine 2019



En pratique dans l'IRA hypoxémique pure, comme technique initiale

- V
- O



**Vous décidez d'intuber le patient
quelle modalité de préoxygénation
utilisez vous ?**

- **MHC 15 litres**
- **VNI PEP 5-8 AI 5-10 FIO2 100 %**
- **Optiflow 60 l FIO2 100%**
- **MHC 40 L**
- **BAVU 15 L**
- **BAVU 40 L**

IOT en réanimation: geste délicat

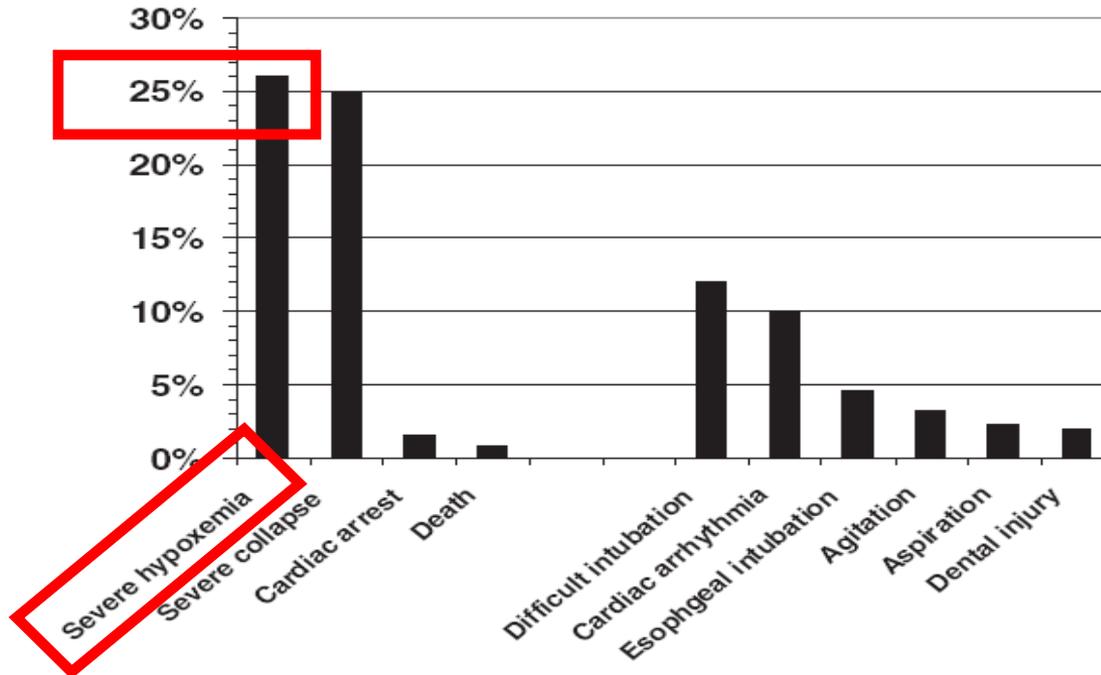


Figure 1. Incidence of the two categories of endotracheal intubation complications in the whole group: severe complications (serious hypoxemia, severe collapses, cardiac arrest and death) and mild to moderate complications (difficult intubation, cardiac arrhythmia, esophageal intubation, agitation, aspiration and dental injury). Mortality rate is calculated based on the 247 intubations carried out for patients with an obtainable blood pressure at the time of procedure.

Clinical practice and risk factors for immediate complications of endotracheal intubation in the intensive care unit: A prospective, multiple-center study*

Samir Jaber, MD, PhD; Jibba Amraoui, MD; Jean-Yves Lefrant, MD, PhD; Charles Arich, MD; Robert Cohendy, MD, PhD; Liliane Landreau, MD; Yves Calvet, MD; Xavier Capdevila, MD, PhD; Aba Mahamat, MD; Jean-Jacques Eledjam, MD, PhD

Critical Care Med 2006

Rendement de la préoxygénation en réanimation

	Stable (n = 34)	All Unstable (n = 42)	Unstable AP (n = 8)	Unstable NAP (n = 34)
T-0	79 ± 12.3 ^a	67 ± 19.6	80.8 ± 7.7 ^b	64.2 ± 3.5
T-4	403.6 ± 71.8 ^c	103.8 ± 63.2	185.8 ± 21 ^b	86.8 ± 9.5
Mean Δ	325 ^c	37	105 ^b	22

Stable, stable preoperative patients; All, NAP + AP patients; AP, airway protection patients; NAP, nonairway protection patients; T-0, time zero or baseline; T-4, following 4 mins of preoxygenation.

^a*p* < .02 for all unstable compared with stable patients; ^b*p* < .01 for unstable-NAP compared with unstable-AP patients; ^c*p* < .001 for all unstable compared with stable patients. All values are mm Hg.

Mort T., Proxymgénation in critically ill patients requiring emergency tracheal intubation. Crit Care Med, 2005

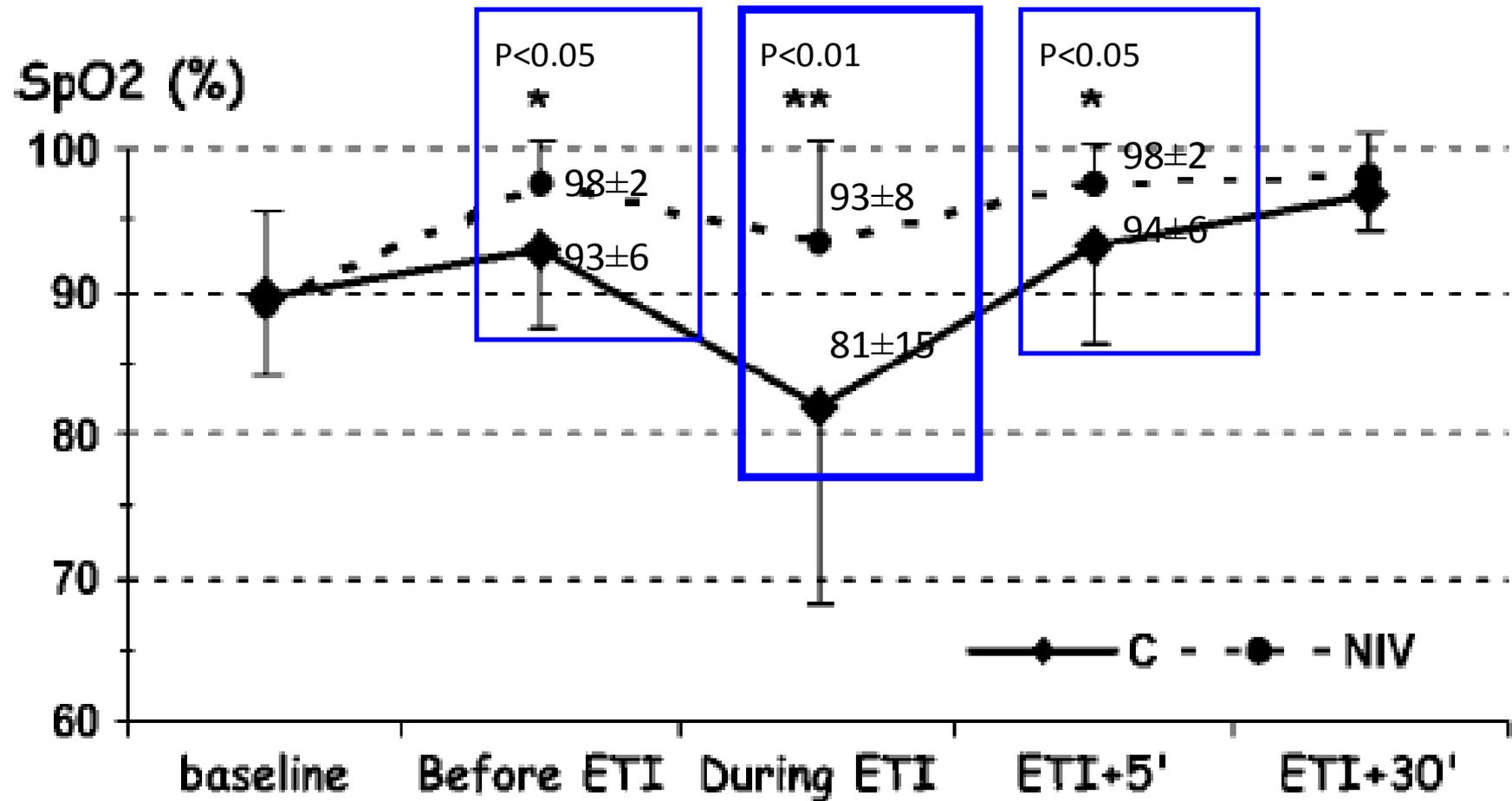
Noninvasive Ventilation Improves Preoxygenation before Intubation of Hypoxic Patients

Am J Respir Crit Care Med Vol 174. pp 171-177, 2006

Christophe Baillard, Jean-Philippe Fosse, Mustapha Sebbane, Gérald Chanques, François Vincent, Patricia Courouble, Yves Cohen, Jean-Jacques Eledjam, Frédéric Adnet, and Samir Jaber

Department of Anesthesiology and Intensive Care, and SAMU 93, Avicenne Hospital, Paris 13 University-AP-HP, Bobigny; Intensive Care Unit, Department of Anesthesiology, DAR B University Hospital of Montpellier, and Saint Eloi Hospital, Montpellier University, Montpellier, France

PaO₂ < 100 mmHg sous masque HC 10 l/min.



Use of High-Flow Nasal Cannula Oxygen Therapy to Prevent Desaturation During Tracheal Intubation of Intensive Care Patients With Mild-to-Moderate Hypoxemia*

Crit Care Med 2015

Romain Miguel-Montanes, MD¹; David Hajage, MD²; Jonathan Messika, MD^{1,3,4}; Fabrice Bertrand, MD¹; Stéphane Gaudry, MD^{1,3,4}; Cédric Rafat, MD¹; Vincent Labbé, MD¹; Nicolas Dufour, MD^{1,3,4}; Sylvain Jean-Baptiste, MD¹; Alexandre Bedet, MD¹; Didier Dreyfuss, MD^{1,3,4}; Jean-Damien Ricard, MD, PhD^{1,3,4}

- Étude avant-après
- Tous patients intubés
- Exclusion si Spo2 < 95% au MHC 15 L/min
- Pas de gazo systématique avant
- Période 1: MHC 15 l 3 minutes
- Période 2: optiflow 60 l/min FiO2 1 pendant 3 minutes
- 50 patients par période

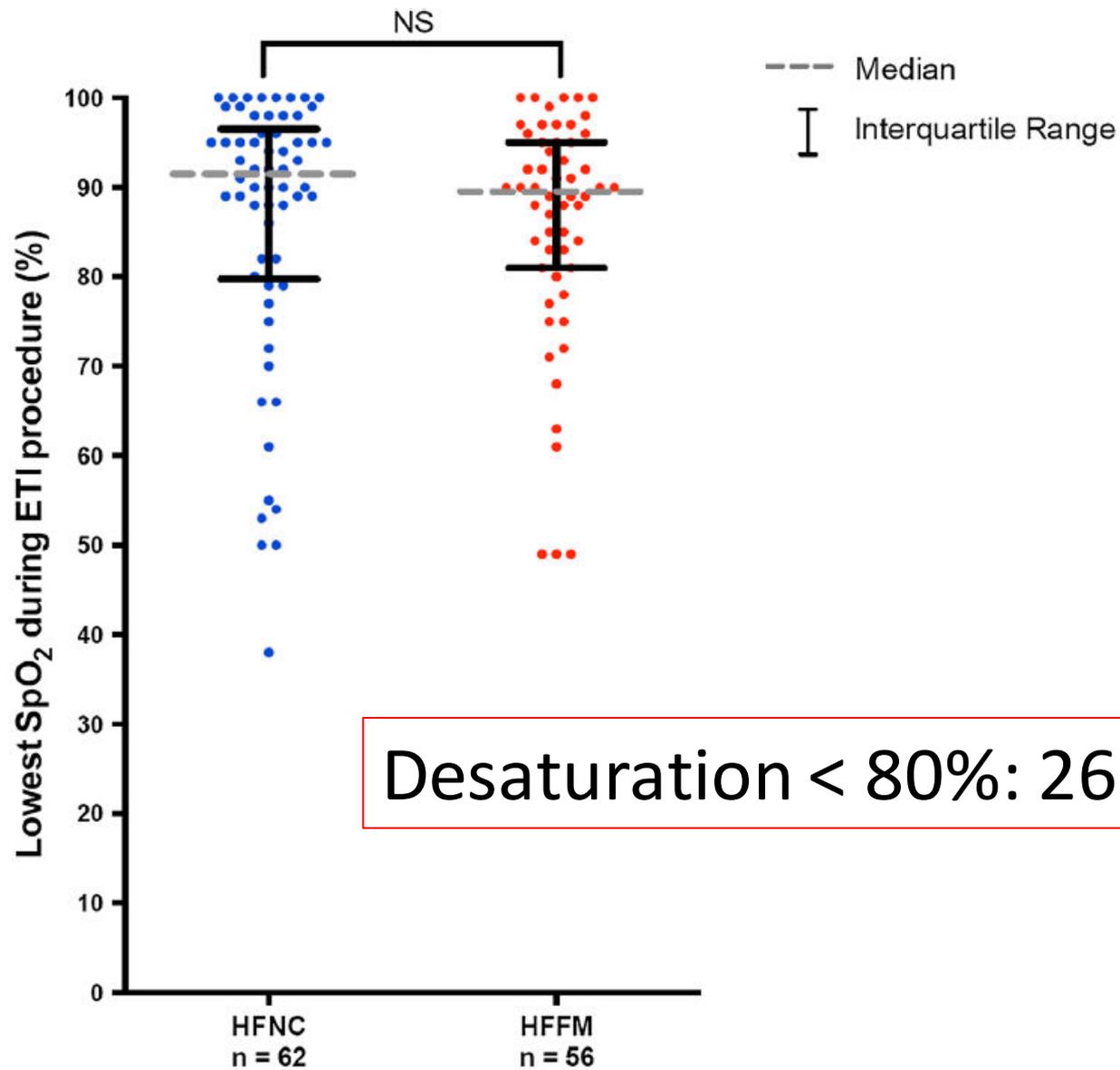
Variable	Nonbreathing Bag Reservoir Facemask	High-Flow Nasal Cannula Oxygen	<i>p</i>
	<i>n</i> = 50	<i>n</i> = 51	
Spo ₂ after preoxygenation, %, median (IQR)	100 (98–100)	100 (100–100)	0.01 ^a
Lowest Spo ₂ , median (IQR)	94 (83–98)	100 (95–100)	< 0.0001 ^b
Adjusted lowest Spo ₂ , %, median ^c	94	99.2	0.007
Spo ₂ upon respirator connection, %, median (IQR)	98 (92.5–100)	100 (99–100)	0.0004 ^b
Spo ₂ 5 min after intubation, %, median (IQR)	100 (98.8–100)	100 (100–100)	0.002 ^b
Spo ₂ 30 min after intubation, %, median (IQR)	100 (99–100)	100 (100–100)	0.024 ^b
Spo ₂ < 80%, <i>n</i> (%)	7 (14)	1 (2)	0.03 ^a
Pao ₂ after intubation, mm Hg, median (IQR)	280 (143–359)	239 (128–440)	0.59 ^b

Episodes de désaturation < 80 %: 2 % optiflow vs 14% MHC

High-flow nasal cannula oxygen during endotracheal intubation in hypoxemic patients: a randomized controlled clinical trial

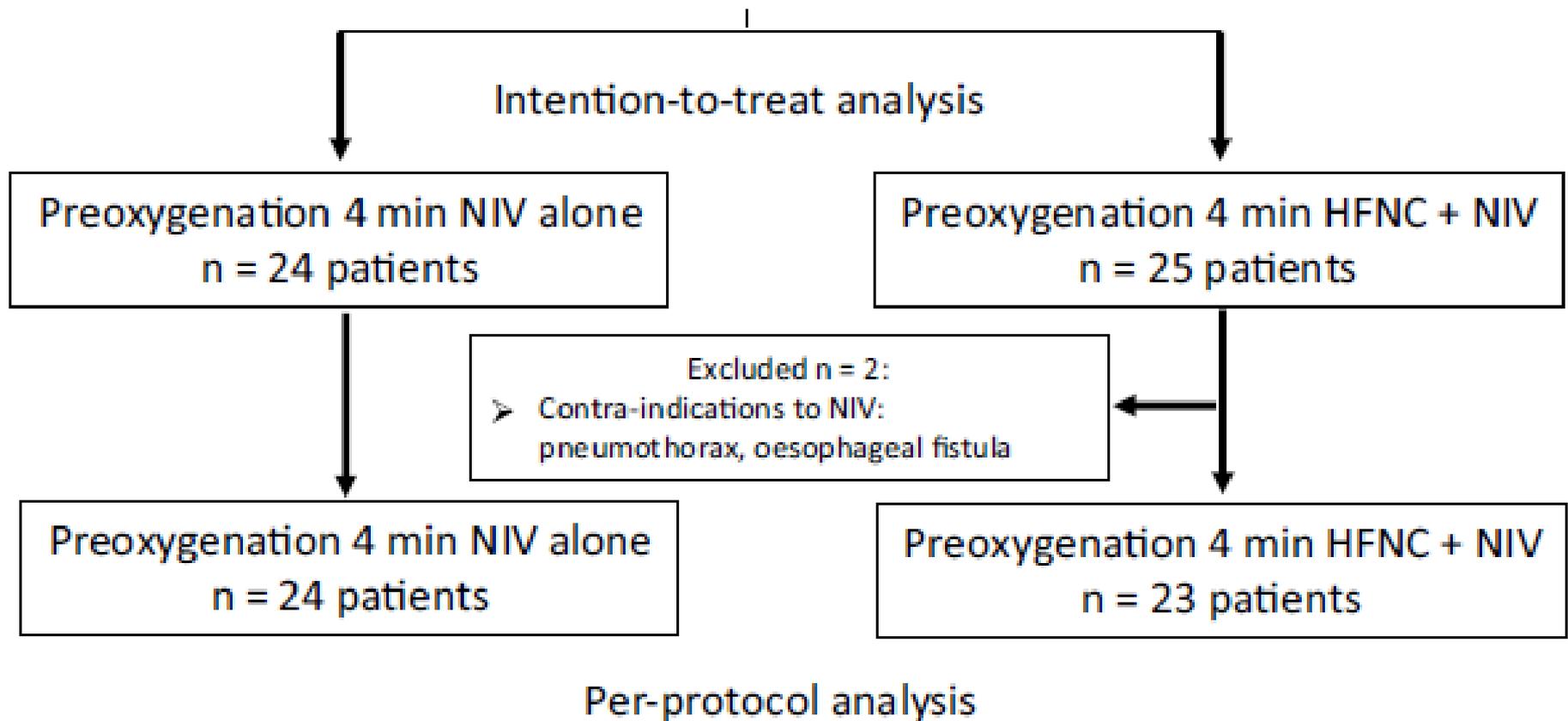
ICM 2015

- Essai randomisé
- Patients avec PAFI < 300 et FR > 30 et FiO₂ > 50% pour obtenir une SPO₂ > 90%
- Groupe 1: MHC 15 litres pendant 4 minutes
- Groupe 2: optiflow 60 l/min FiO₂ 1 pendant 4 minutes

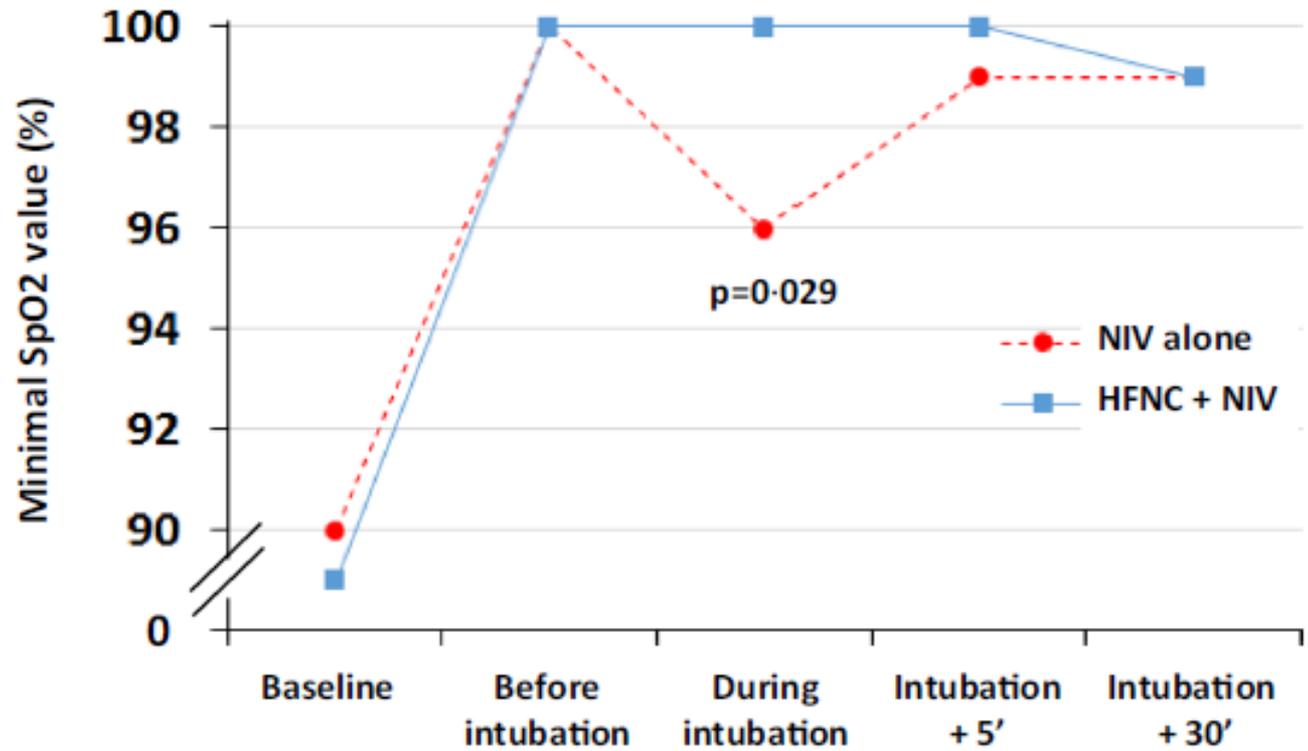


Desaturation < 80%: 26 vs 23 % NS

Median (IQR)	91.5 (80-96)	89.5 (81-95)	p = 0.44
Mean (SD)	86.2 (15.2)	85.9 (12.9)	



PAFI inclusion 80-250



	Total (n = 49)	Interventional group (n = 25)	Reference group (n = 24)	p value
Preoxygenation				
Failure to increase saturation to 90 % during preoxygenation	3 (6 %)	1 (4 %)	2 (8 %)	1.000
Ability to improve SpO ₂	46 (94 %)	24 (96 %)	22 (92 %)	0.609
Lowest SpO ₂ during intubation procedure	99 (93–100)	100 (95–100)	96 (92–99)	0.029
Severe procedural complications during intubation procedure				
Severe hypoxaemia	6 (12 %)	1 (4 %)	5 (21 %)	0.098
Severe collapse	11 (22 %)	6 (24 %)	5 (21 %)	0.791
Cardiac arrest	0 (0 %)	0 (0 %)	0 (0 %)	1.000
Death	0 (0 %)	0 (0 %)	0 (0 %)	1.000

En pratique pour préoxygénation

- O₂ MHC 4 min = référence
- But= approcher SPO₂ 100%
- VNI semble le moyen le plus efficace si hypoxémie sévère
- VNI: disponibilité, expérience, estomac plein
- Poursuivre VNI pour préox si déjà en place
- Optiflow si dispo - patient avec fort drive ?
- Voir les deux

Intubation

- Opérateur le plus expérimenté (x)
- Optimisation hdm
- Matériel IOT difficile prêt: mandrin, ML, video
- Séquence rapide
- Savoir ventiler efficacement au masque

Objectifs de la VMI dans la détresse hypoxémique

- Maitriser l'hypoxémie ++++
- Éviter l'acidose « dangereuse » +
- Limiter les effets hémodynamiques ++
- Prévention VILI+++

Concept 1

Réduction du volume courant

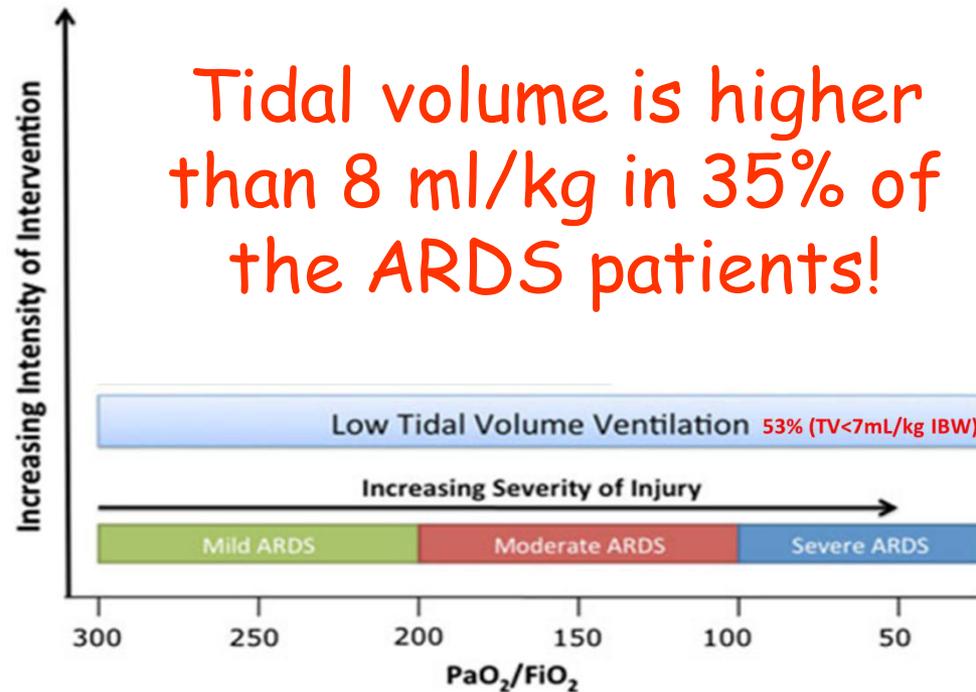
6 vs 12 ml/kg



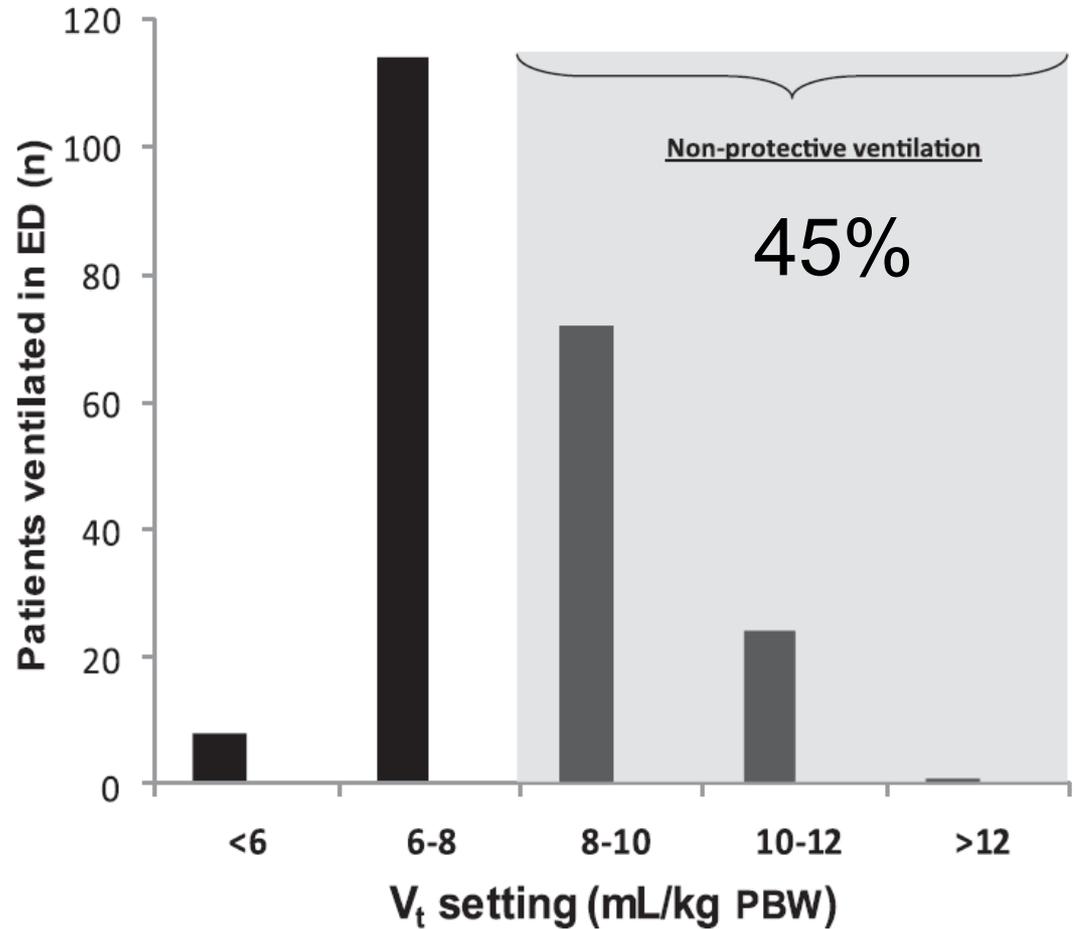


Lungsafe study

Bellani et al, JAMA
2016



219 patients
ventilés aux urgences
4 centres



Concept 2

Monitorage de la pression de plateau (P_{plat})

Paw

25

10

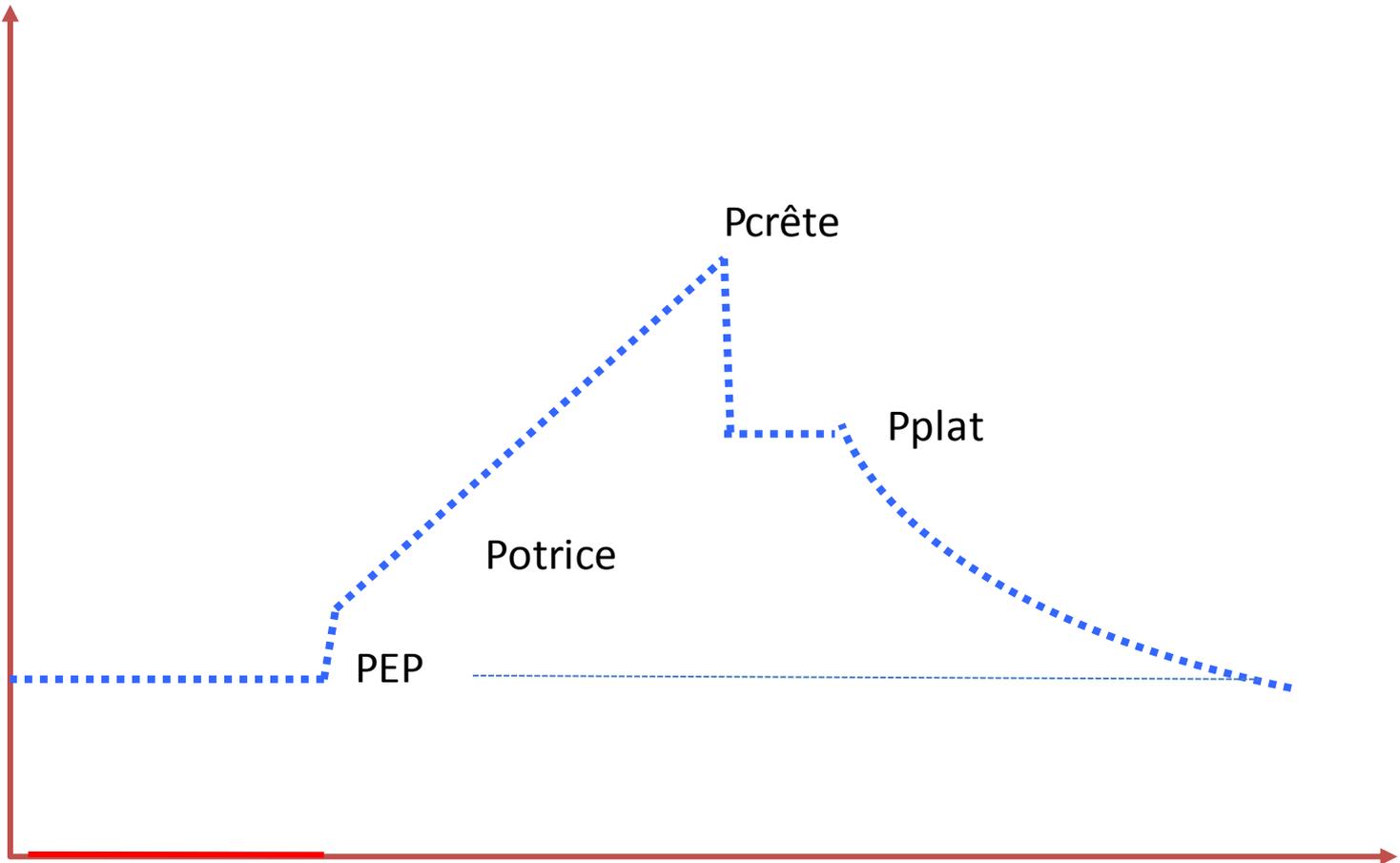
Pcrête

Pplat

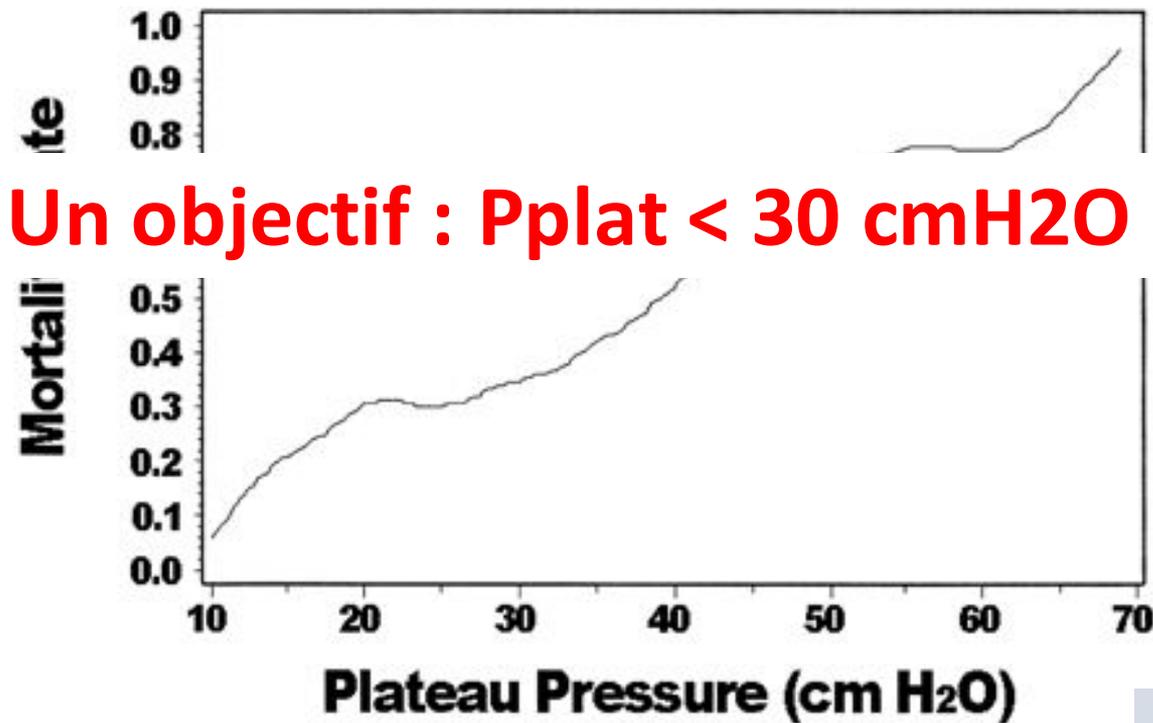
Potrice

PEP

Temps



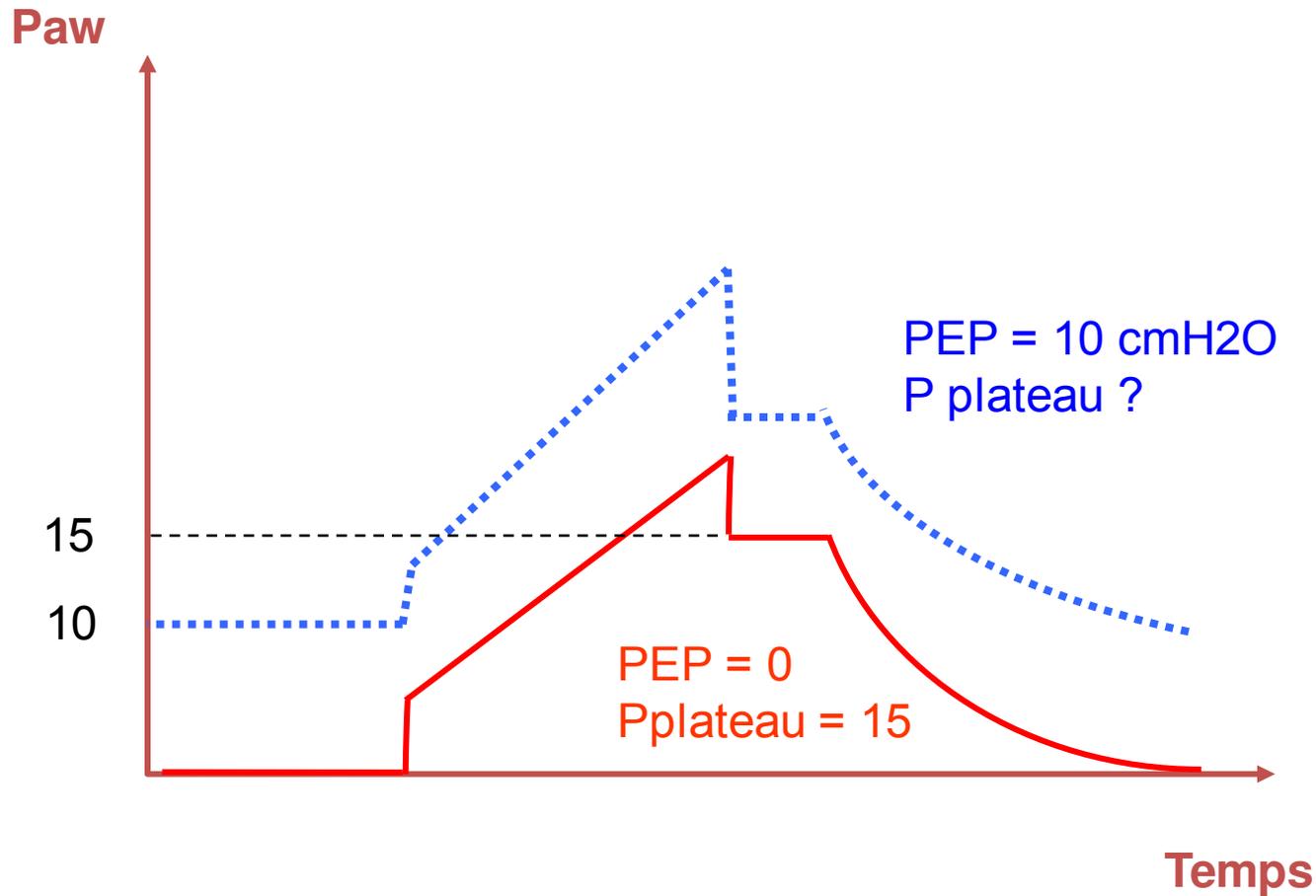
Relation Pplat à J1 – mortalité dans l'étude du NIH



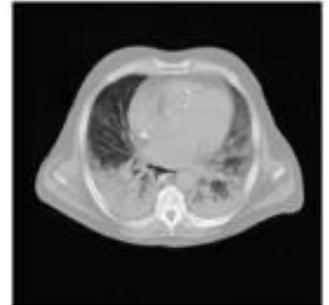
Concept 3

Réglage de la PEP et recrutement alvéolaire

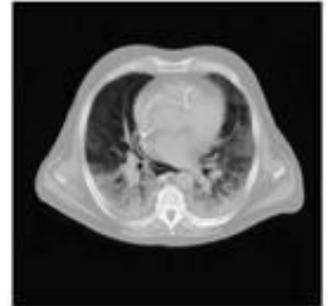
Pression Expiratoire Positive



PEEP = 5 cmH₂O



30 cmH₂O

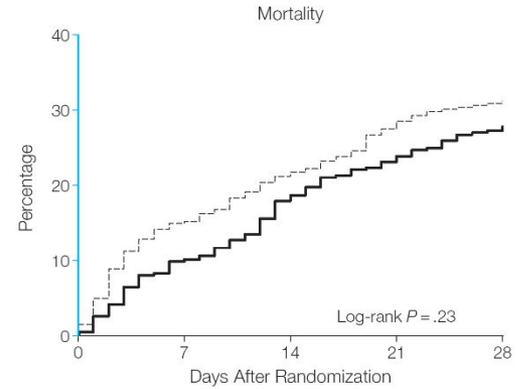


High/Low PEEP

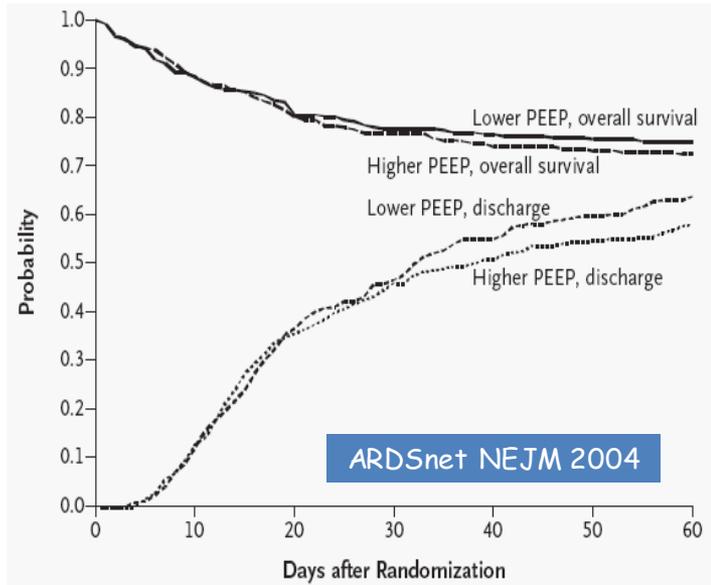
Mercat *et al.* JAMA 2008

All Patients

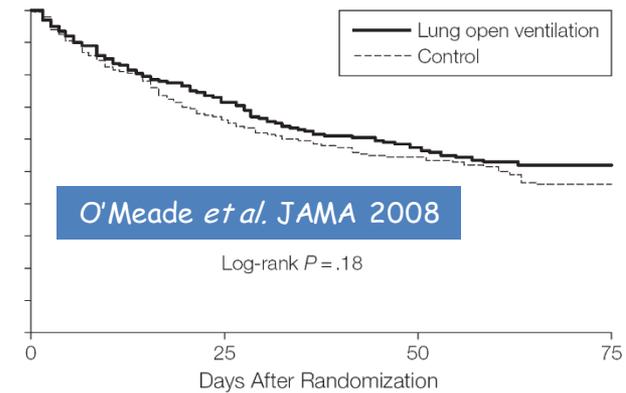
----- Minimal distension
 ——— Increased recruitment



No. at risk	0	7	14	21	28
Minimal distension	382	325	301	277	264
Increased recruitment	385	347	316	296	280



All-cause mortality



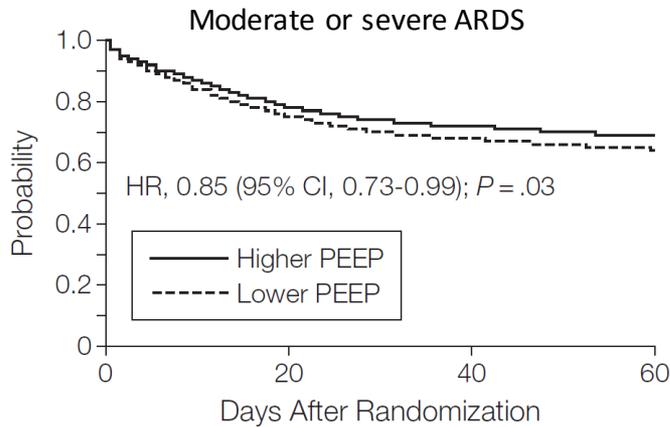
0	25	50	75
475	223	91	43
508	220	97	47

Higher vs Lower Positive End-Expiratory Pressure in Patients With Acute Lung Injury and Acute Respiratory Distress Syndrome

Systematic Review and Meta-analysis

Briel *et al.* JAMA 2010

In-hospital time to death

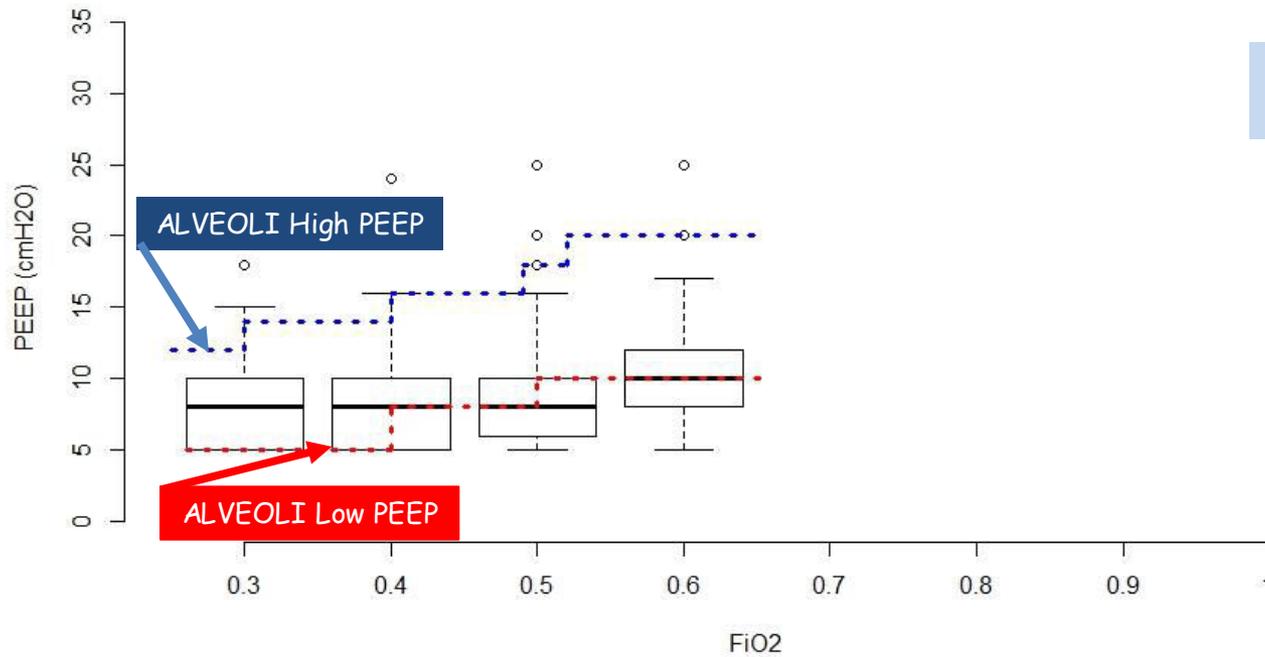


No. at risk	0	20	40	60				
Higher PEEP	949	760	693	666	183	158	148	144
Lower PEEP	939	723	649	619	219	196	186	183



PEEP versus FiO₂

Highest Peep in the 1st 72h according to the corresponding FiO₂ Level in patients with ARDS



Bellani et al, JAMA
2016



Concept 4

Monitorer la pression motrice (Δp)

Paw

objectif pression motrice = 10-15 cmH2O

25

0

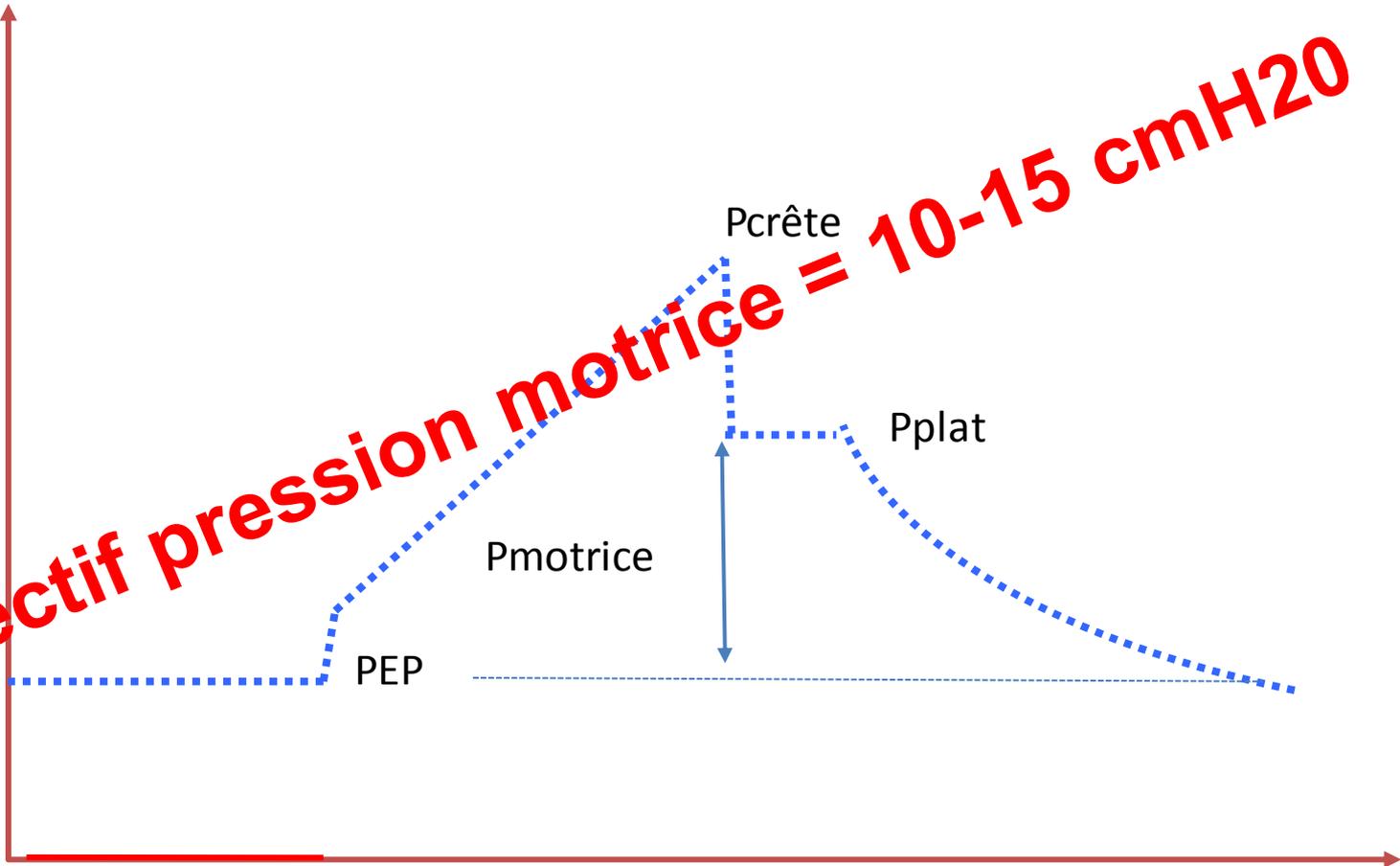
Pcrête

Pplat

Pmotrice

PEP

Temps



Première réglage du respirateur

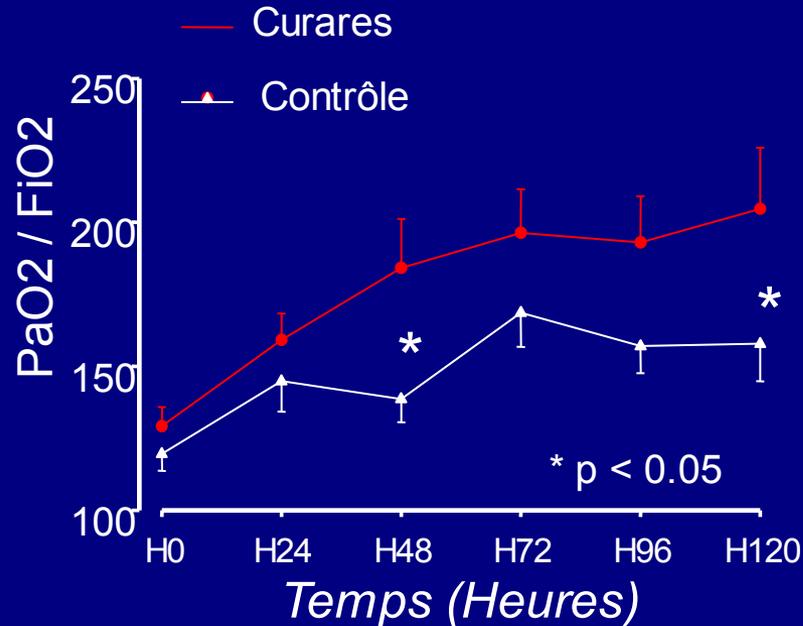
- $V_t = 5-7 \text{ ml/kg IBW}$
- PEP :
 - 5 cm H₂O si hypoxémie modérée
 - 10 cmH₂O si hypoxémie sévère
- FR 20-30/min
- Pause 0,2 sec
- $P_{\text{plat}} < 30 \text{ cmH}_2\text{O}$
- Débit 50 l/min
- FiO_2 50-90%

Première gazométrie: j'optimise

- FR pour pH > 7.25
- PEP :
 - PAFI > 200 : 5 cm H₂O
 - PAFI 150-200: 8 cmH₂O
 - PAFI 100-150: 10-12 cmH₂O
 - PAFI < 100 : > 12 cmH₂O
- Et viser P motrice < 15 cmH₂O et Pplat < 28-30 cmH₂O
- Manoeuvre de recrutement: 30 sec à 30-40 cmH₂O et éviter débranchement
- Curarisation continue si PAFI < 150 > 2h
- Rescue si PAFI < 60 à H3: NO, ECMO

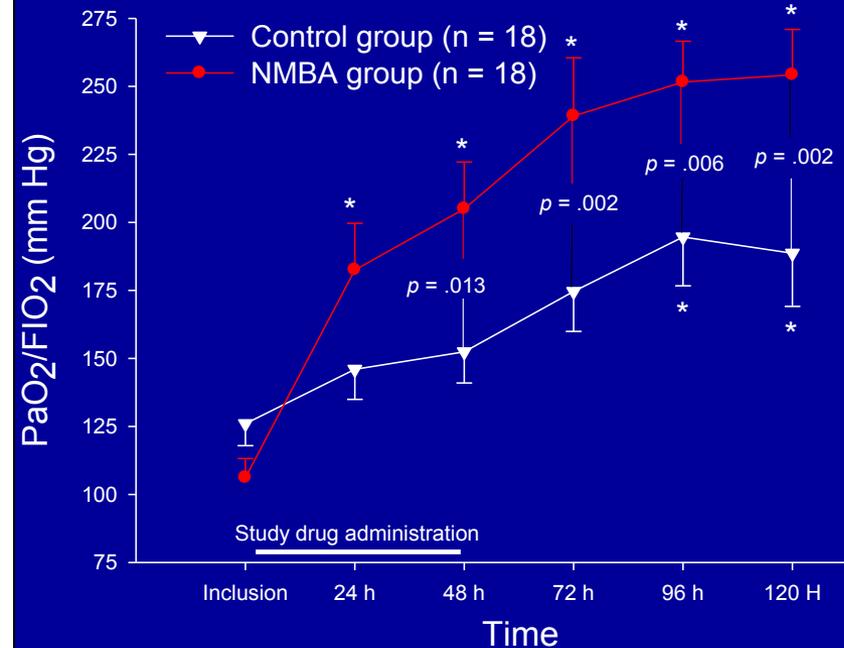
Curarisation précoce de 48 h au cours du SDRA sévère

N = 56



Gainnier, Roch, Crit Care Med 2004

N = 36

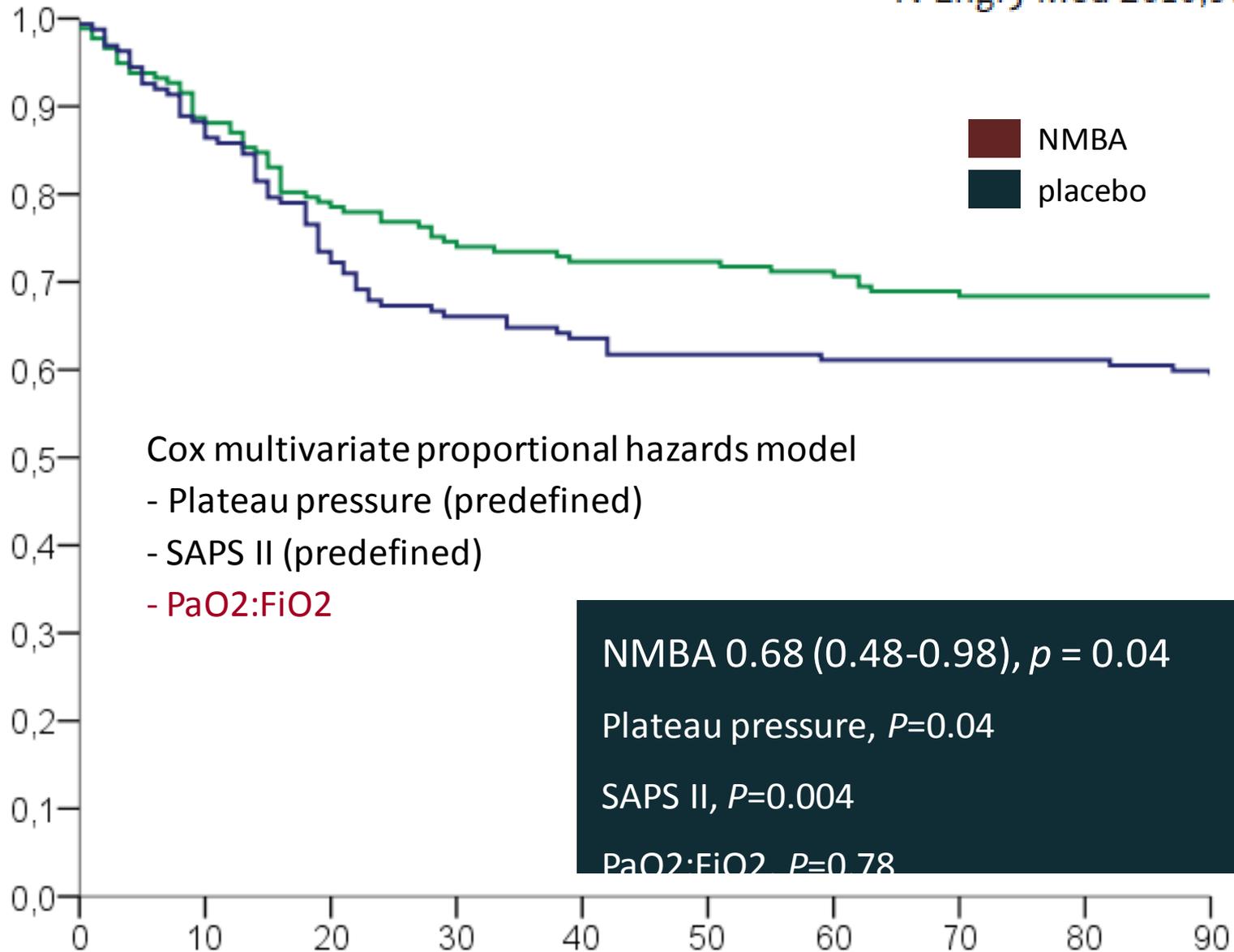


Forel, Roch, Crit Care Med 2006

PaO₂/FiO₂ identiques entre les groupes à H24 dans accuras

Curarisation

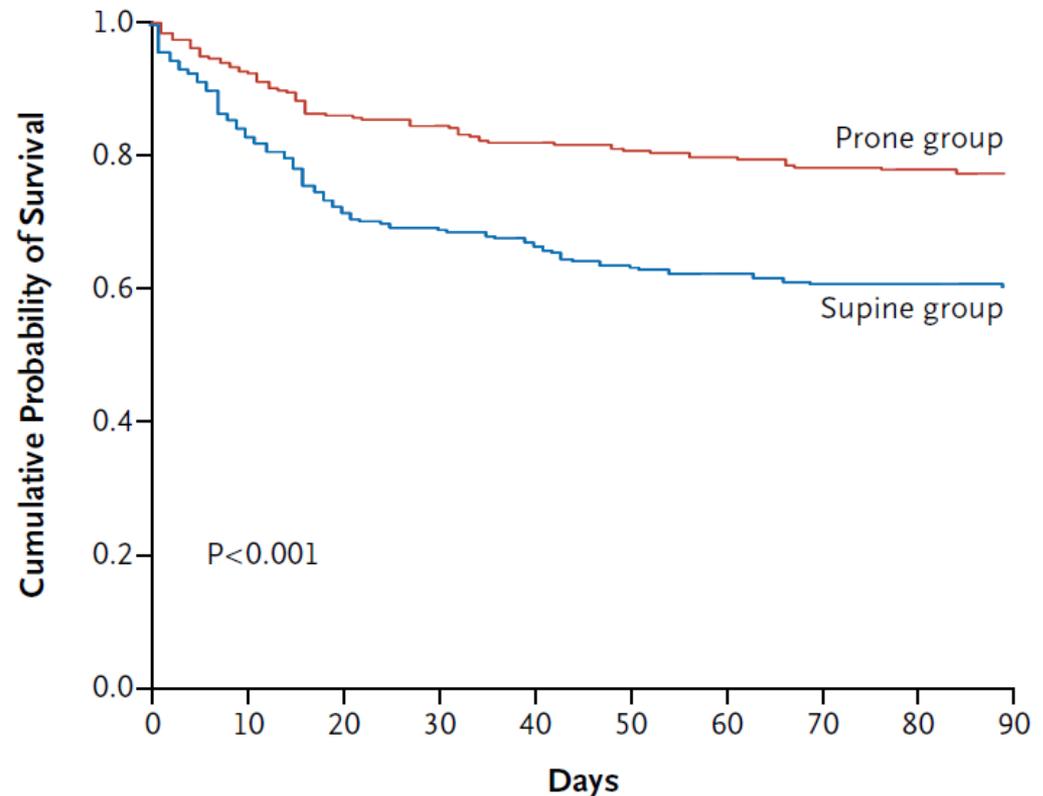
N Engl J Med 2010;363:1107-16.



Prone Positioning in Severe Acute Respiratory Distress Syndrome

N Engl J Med 2013.

- PAFI < 150 persistent, en moyenne 100
- 4±4 séances de DV de 17±3 h

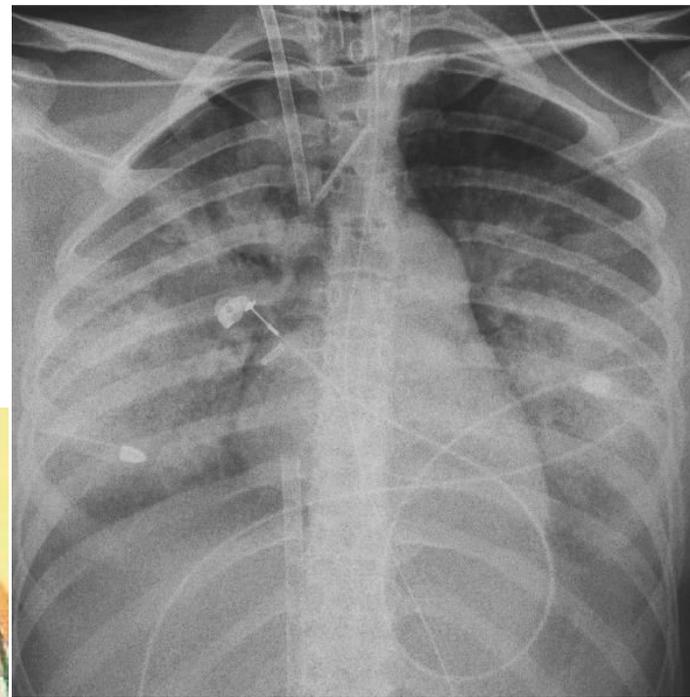
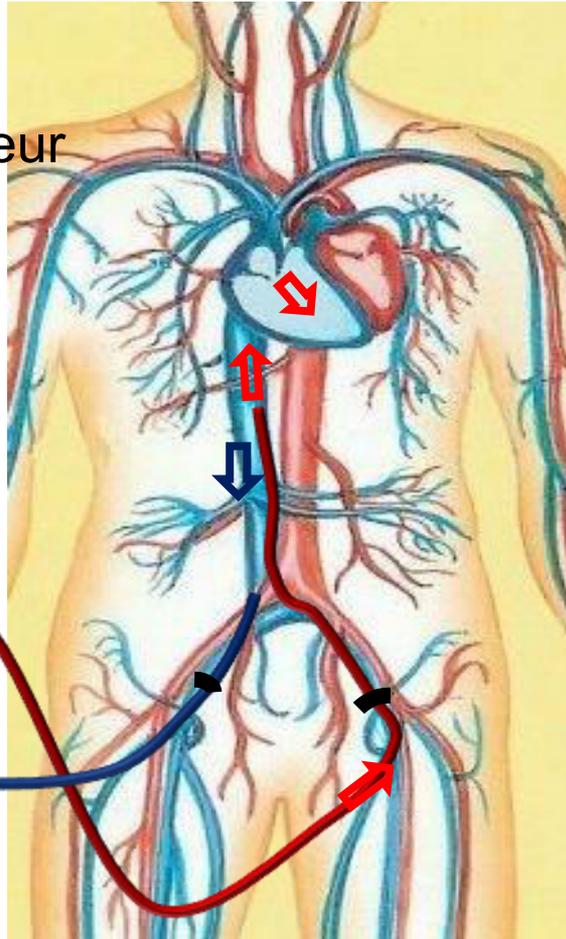
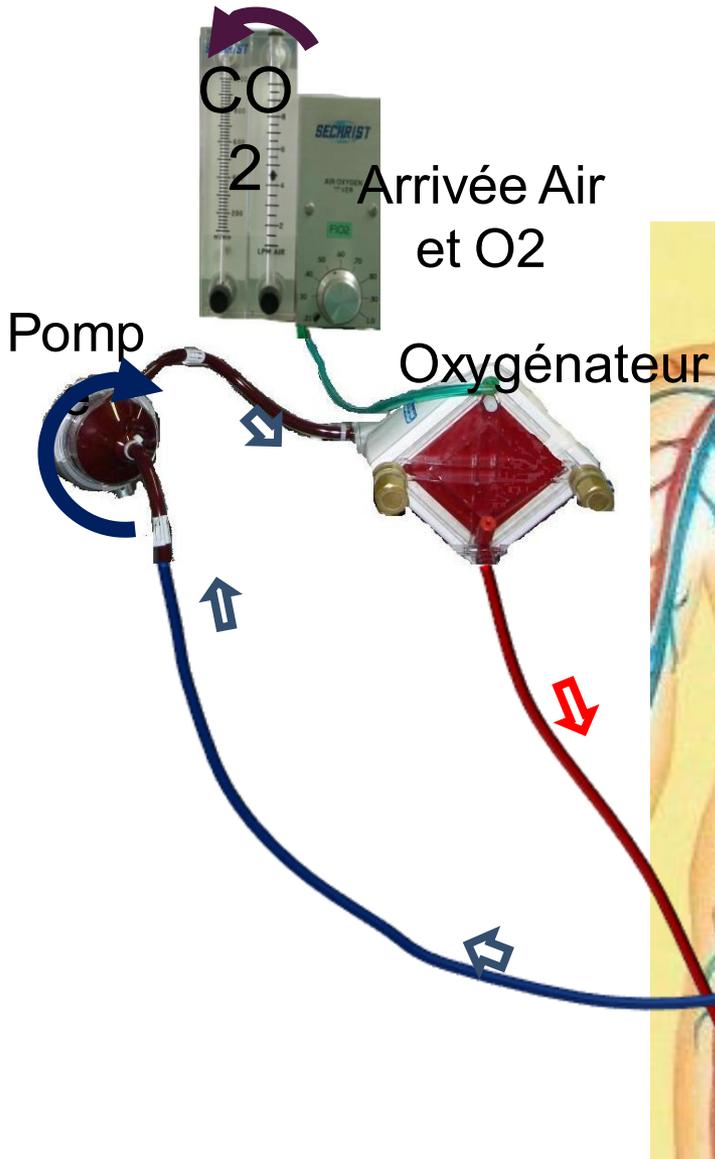


Prone Positioning in Severe Acute Respiratory Distress Syndrome

N Engl J Med 2013.

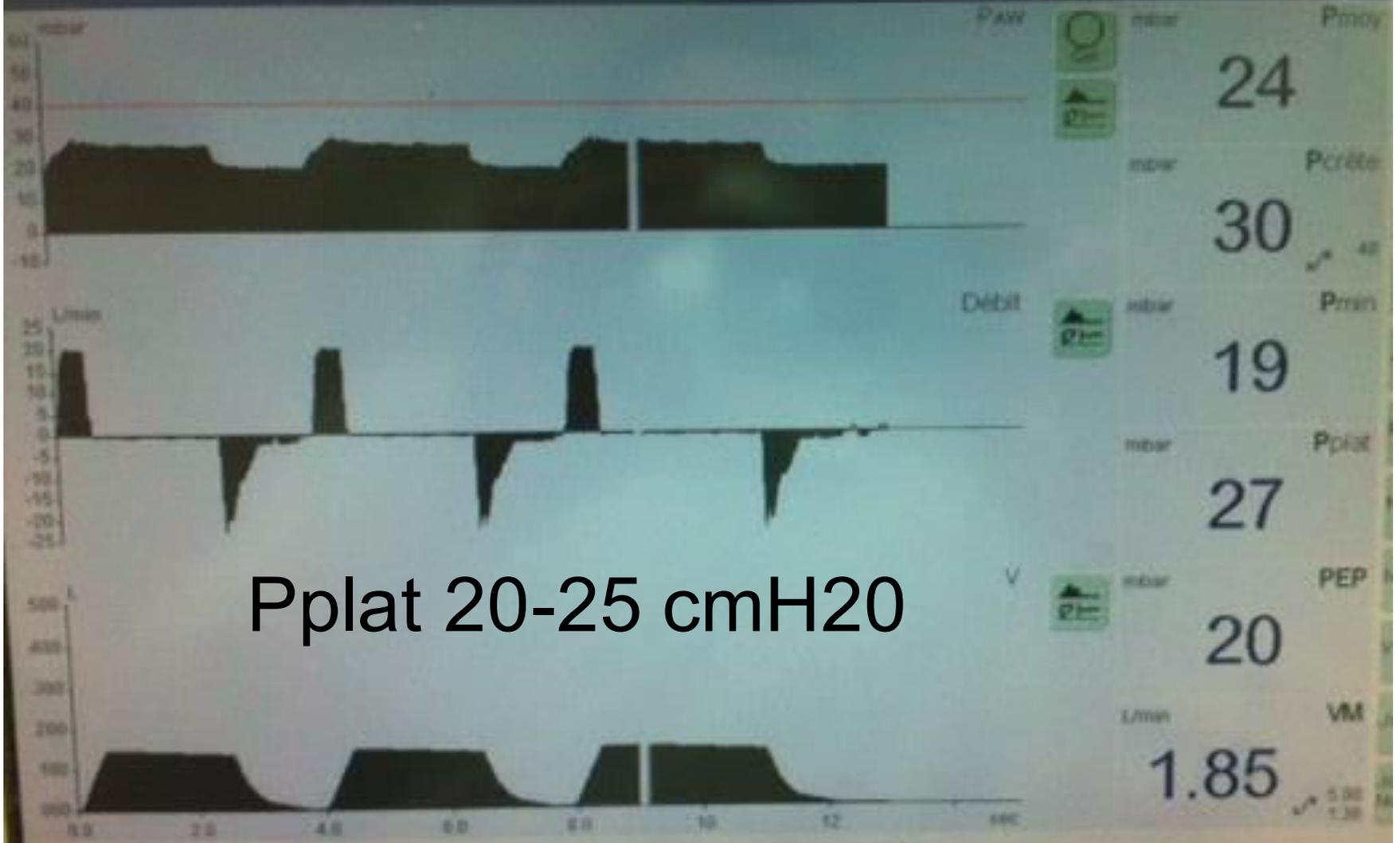
	supine	prone	p
ECMO	2.6%	0.8%	0.14
INO	15.7	9.7	0.05
almitrine	6.6	2.5	0.04

ECMO



Pression voies aér. basse !!!

VAC



Pplat 20-25 cmH2O

1.0:1.0

60

O₂

150

VT

2.5

Temp

12

f

20

PEP

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VOL. 378 NO. 21

Extracorporeal Membrane Oxygenation for Severe Acute
Respiratory Distress Syndrome

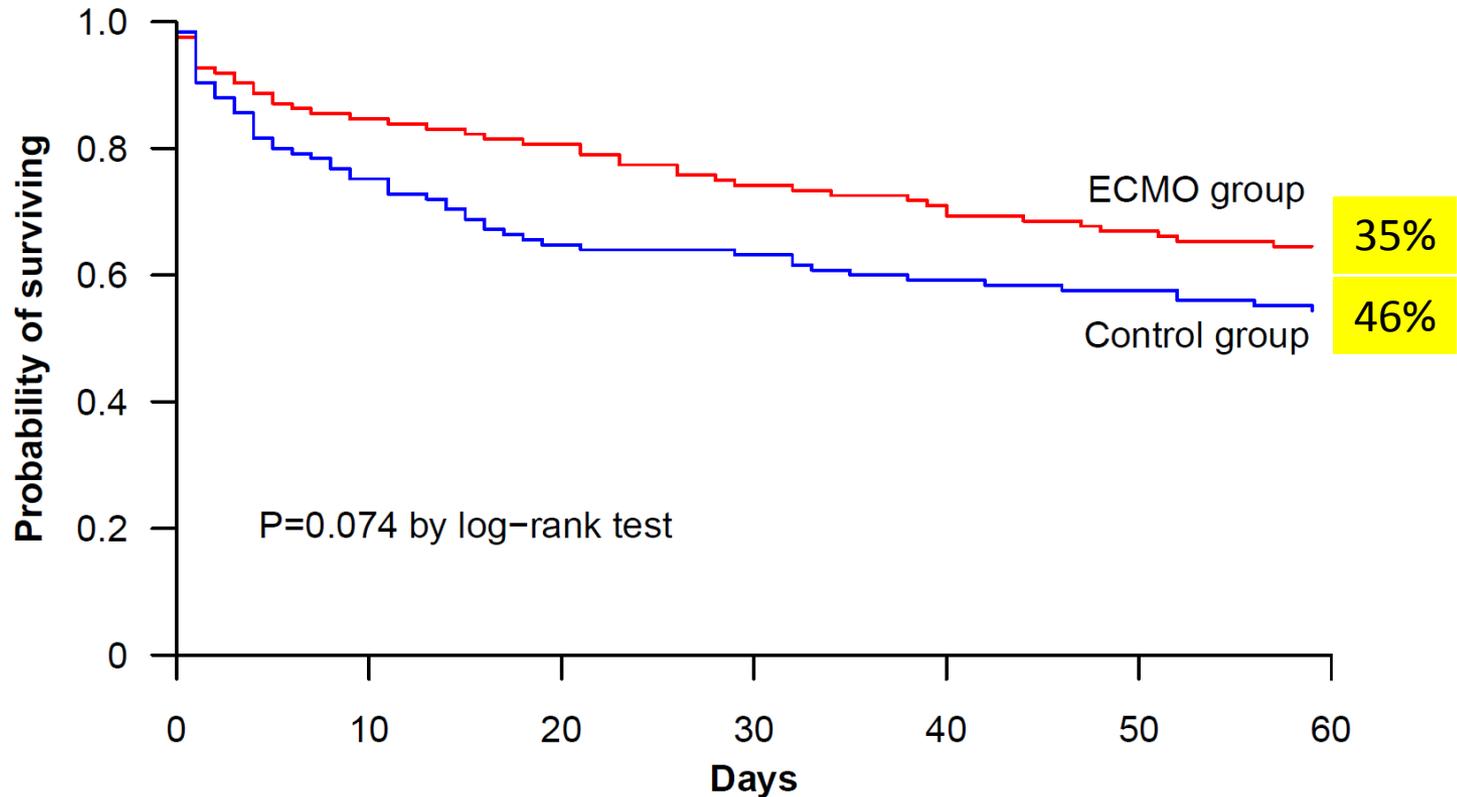
A. Combes, D. Hajage, G. Capellier, A. Demoule, S. Lavoué, C. Guervilly, D. Da Silva, L. Zafrani, P. Tirot, B. Veber, E. Maury, B. Levy, Y. Cohen, C. Richard, P. Kalfon, L. Bouadma, H. Mehdaoui, G. Beduneau, G. Lebreton, L. Brochard, N.D. Ferguson, E. Fan, A.S. Slutsky, D. Brodie, and A. Mercat, for the EOLIA Trial Group, REVA, and ECMONet*

Critères d'inclusion

- 1) PaO₂:FIO₂ Ratio <50 mmHg for >3 hours
- 2) PaO₂:FIO₂ <80 mmHg for >6 hours
- 3) Arterial blood pH <7.25 with a partial pressure of arterial carbon dioxide (PaCO₂) >60 mmHg for >6 hours (with respiratory rate increased to 35/minute) resulting from MV settings adjusted to keep Pplat ≤32 cm H₂O

Mortalité J60

End Point	ECMO Group (N=124)	Control Group (N=125)	Relative Risk or Difference (95% CI)†	P Value
Primary end point: mortality at 60 days — no. (%)	44 (35)	57 (46)	0.76 (0.55 to 1.04)	0.09



No. at risk

ECMO	124	105	100	92	88	83	80
Control	125	94	81	79	74	72	69

Et différence maintenue à 90 j

Indications

- Il faut envisager le recours à l'ECMO VV si le rapport $\text{PaO}_2/\text{FiO}_2$ est inférieur à 50 mmHg sous une $\text{FiO}_2=1$, pendant au moins 3 heures en dépit d'une stratégie de ventilation protectrice (comportant le recours au décubitus ventral)
- Il faut engager une réflexion sur le recours à l'ECMO VV
 - si le rapport $\text{PaO}_2/\text{FiO}_2$ est inférieur à 80 mmHg sous une $\text{FiO}_2=1$, pendant plus de 6 heures en dépit d'une stratégie de ventilation protectrice (comportant le recours au décubitus ventral)
 - si, associée à une stratégie de ventilation protectrice (comportant le recours au décubitus ventral), existe une acidose respiratoire avec un $\text{pH} < 7,20$ pendant plus de 6 h

MAIS MODULABLE AU CAS PAR CAS

Unités Mobiles d'Assistance circulatoire (UMAC)

- Structure capable de dépêcher une équipe transportée en urgence, 7/24, hors de son hôpital d'origine, pour implanter une ECMO et de rapatrier le patient après stabilisation dans une unité de réanimation habituée à prendre en charge les patients sous ECMO

Antoine Roch
 Sami Hraiech
 Elodie Masson
 Dominique Grisoli
 Jean-Marie Forel
 Mohamed Boucekinge
 Pierre Morera
 Christophe Guervilly

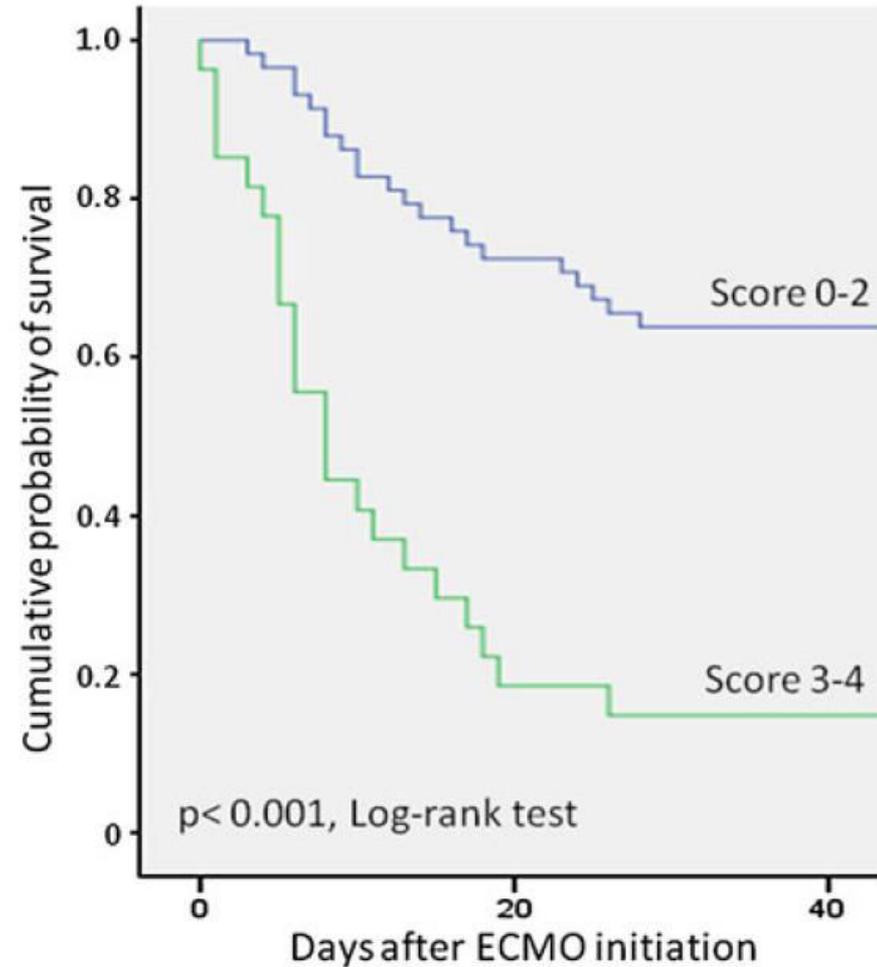
Outcome of acute respiratory distress syndrome patients treated with extracorporeal membrane oxygenation and brought to a referral center

ICM 2014

Table 3 Hospital mortality score calculated with parameters available just before ECMO initiation

Parameter	Partial score ps_i
SOFA	
<9	0
9-11	1
≥12	2
Age	
<45 years	0
≥45 years	1
Influenza pneumonia	
Yes	0
No	1
Total score	0-4

A higher score was associated with higher hospital mortality
SOFA sequential organ failure assessment



Rappelez moi vos indications d'ECMO

06 32 36 48 22..... j'écoute



Antoine Roch
 Renaud Lepaul-Ercole
 Dominique Grisoli
 Jacques Bessereau
 Olivier Brissy
 Matthias Castanier
 Stephanie Dizier
 Jean-Marie Forel
 Christophe Guervilly
 Vlad Gariboldi

Extracorporeal membrane oxygenation for severe influenza A (H1N1) acute respiratory distress syndrome: a prospective observational comparative study

Intensive Care Med



(mmHg)			
Lung Injury Score, median (IQR)	3.6 (3.3–3.7)	3 (2.5–3.5)	<0.01
SOFA, median (IQR)	9 (8–10)	7 (6–8)	<0.01

CARTE PROVENCE

Bouches du Rhône - Var - Vaucluse - Haute Provence
www.web-provence.com



Marseille n= 18
Conception : 11
Laveran : 1
St Joseph : 3
Vert cotreau : 1
IPC : 1
Desbief : 1

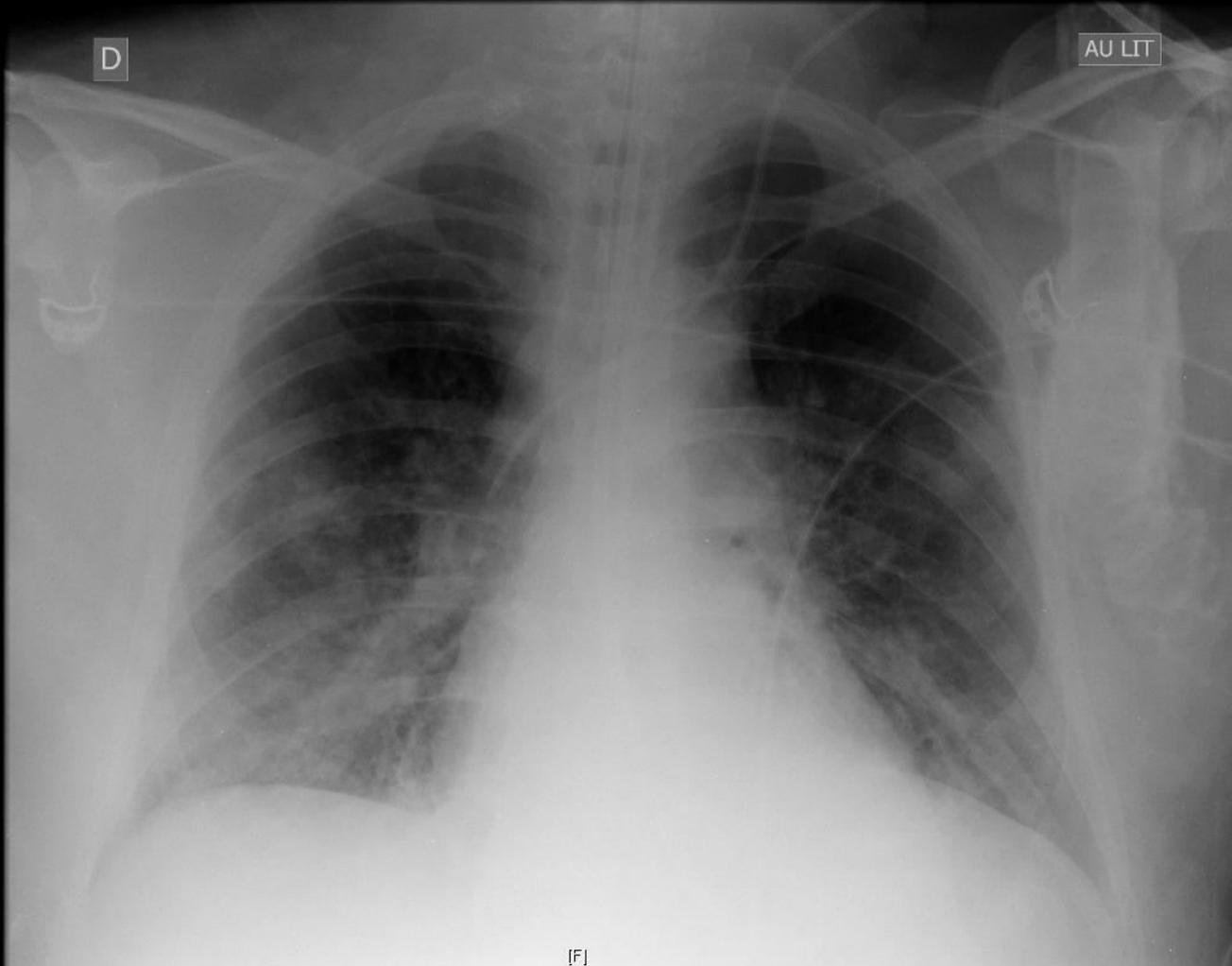
Evolution J4

[H]

D

AU LIT

PEP 16
Pplat 26



[F]

Messages

- Hypoxémie sévère : donner beaucoup d'oxygène pour sécuriser
- Préoxygénation: SpO2 la plus haute possible
 - MHC avec manomètre haut débit
 - Optiflow (bien si phase d'attente initiale)
 - VNI (le plus efficace)

Messages

- Pour éviter/retarder l'intubation:
 - Pas de technique supérieure à ce jour
 - VNI: possiblement délétère
 - Optiflow:
 - Efficacité, Tolérance, réduction dyspnee
 - risque de sous-estimation severité ?
 - Patient dépendant de l'optiflow= réanimation ou LAT
 - Succès du sevrage optiflow assez difficile à predire
 - Risque = retard à l'intubation

PROGRAMME

JRUR 2019

JEUDI 4 AVRIL 2019

Marseille

16^{ème} JOURNÉE DE RÉANIMATION ET URGENCES RESPIRATOIRES

INTERVENANTS :

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- Xavier ATTRAIT, Marseille
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- Fabrice BARLESJ, Marseille
- Jean-Michel CONSTANTIN, Clermont-Ferrand
- Didier DOREZ, Annecy
- Jean-Christophe M RICHARD, Annecy
- Philippe NOUGUIER, Marseille
- Laurent PAPAIZIAN, Marseille
- Jean-Pierre QUENOT, Dijon
- Antoine ROCH, Marseille
- Fabienne TAMION, Rouen
- Sabine VALERA, Marseille
- Anne-Pascale WASIER, Marseille

Avec le soutien de



3^{ÈME} ÉDITION DE LA
**JOURNÉE MARSEILLAISE
D'URGENCES
CARDIOVASCULAIRES**
JEUDI 25 AVRIL 2019
FACULTÉ DE MÉDECINE LA TIMONE

EN COLLABORATION AVEC LE GROUPE USIC DE LA SFC



COMITÉ SCIENTIFIQUE :

Pr Laurent Bonello, Dr Jennifer Cautela, Pr François Kerbaul
Dr Marc Laine, Dr Thibaut Markarian, Pr Pierre Michelet
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Yannis Donati • Nathalie Embriaco, Toulon

www.jrur.org

Merci