JAVA
CRETEIL

Samedi 26 Novembre 2016
8 h 30 - 17 h 30
Faculté de Médecine de Créteil
8 rue du Général Sarrail, 94000 Créteil
Métro Ligne 8, Station Créteil L'Échat

Eviter l'intubation:
Quelle solution pour quel patient?

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CHU de Poitiers

srlf
SOCIÉTÉ DE RÉANIMATION DE LANGUE FRANÇAISE

Je n’ai pas de conflits d’intérêts

VNI: Effets bénéfiques

1. Humidification
2. FiO_2 max. 100%
3. PEP
4. Assistance Respiratoire = AI
5. Effets cardiaques

VNI: Effets délétères

1. Asynchronies
2. Intolérance
3. Intubation retardée
4. Barotrauma: V_T

Oxygène à haut débit: Quels bénéfices?

1. **Confort:** via lunettes et humidification
2. **Oxygénation:** Haut Débit = Haute FiO_2
3. **Effet PEP:** Oxygénation - Prévention des atélectasies?
4. **Lavage espace mort:** $PaCO_2$

▶ **Augmentation de la PaO_2**
Diminution de l'effort et de la fréquence respiratoire

Table S5. Assessment of tolerance to the oxygenation strategy at inclusion and 1 hour after inclusion *

	High-Flow Oxygen group (n=106)	Standard Oxygen group (n=94)	NIV group (n=110)	P Value
Respiratory patient-discomfort at inclusion – mm †	38±31	44±29	46±30	0.20
Respiratory patient-discomfort at H1– mm †	29	40	43	<0.01
Grade of dyspnea at H1‡	76%	42%	58%	<0.001
Marked improvement – no. (%)	19 (22.1)	5 (6.8)	13 (14.3)	
Slight improvement– no. (%)	46 (53.5)	26 (35.1)	40 (44.0)	
No change– no. (%)	18 (20.9)	33 (44.6)	23 (25.3)	
Slight deterioration – no. (%)	3 (3.5)	9 (12.2)	8 (8.8)	
Marked deterioration – no. (%)	0 (0.0)	1 (1.3)	7 (7.7)	
Respiratory rate– breaths/min				
H1	28±7	31±7	31±8	<0.01
H6	27±7	29±8	29±7	0.13

Frat JP, Thille AW et al., New England Journal of Medicine 2015; 372:2185-2196.

Table S5. Assessment of tolerance to the oxygenation strategy at inclusion and 1 hour after inclusion *

	High-Flow Oxygen group (n=106)	Standard Oxygen group (n=94)	NIV group (n=110)	P Value
PaO_2 – mm Hg				<0.05
H1	106	91	118±72	<0.05
H6	90±35	93±36	111±59	<0.01
FIO_2 §				
H1	82 %	66 %	0.67±0.24	<0.001
H6	0.75±0.22	0.64±0.18	0.63±0.21	<0.001
PaO_2:FIO_2 ratio– mm Hg				
H1	133	146	183	<0.001
H6	130±60	161±77	186±85	<0.001
$PaCO_2$ – mmHg				
H1	35±7	35±6	35±7	0.84

Frat JP, Thille AW et al., New England Journal of Medicine 2015; 372:2185-2196.

OAP: quels objectifs?

1. Des hautes pressions

2. Des hautes FiO_2

VNI

The NEW ENGLAND JOURNAL of MEDICINE

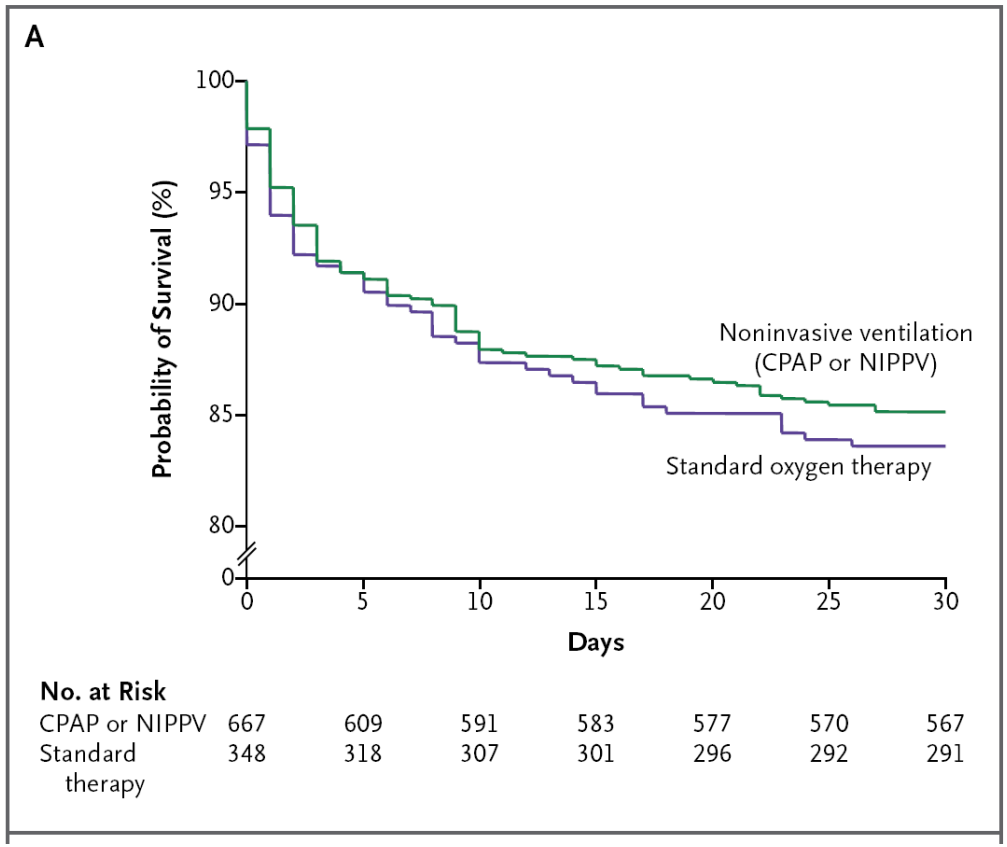
ORIGINAL ARTICLE

Noninvasive Ventilation in Acute Cardiogenic Pulmonary Edema

Alasdair Gray, M.D., Steve Goodacre, Ph.D., David E. Newby, M.D., Moyra Masson, M.Sc., Fiona Sampson, M.Sc., and Jon Nicholl, M.Sc., for the 3CPO Trialists*

Taux d'intubation < 3%

Amélioration plus rapide avec la VNI mais intolérance chez certains patients



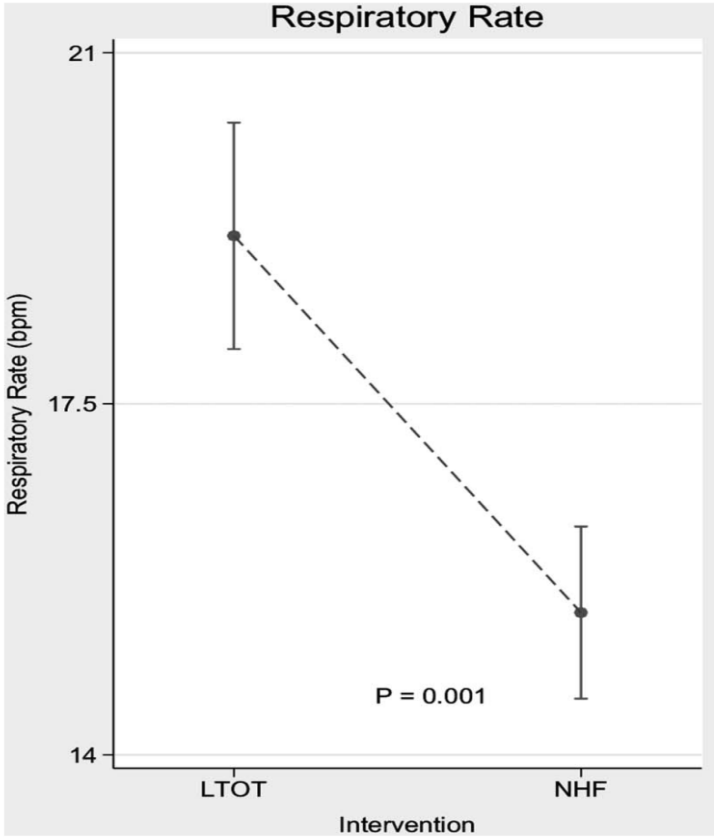
BPCO et autres IRC: quels objectifs?

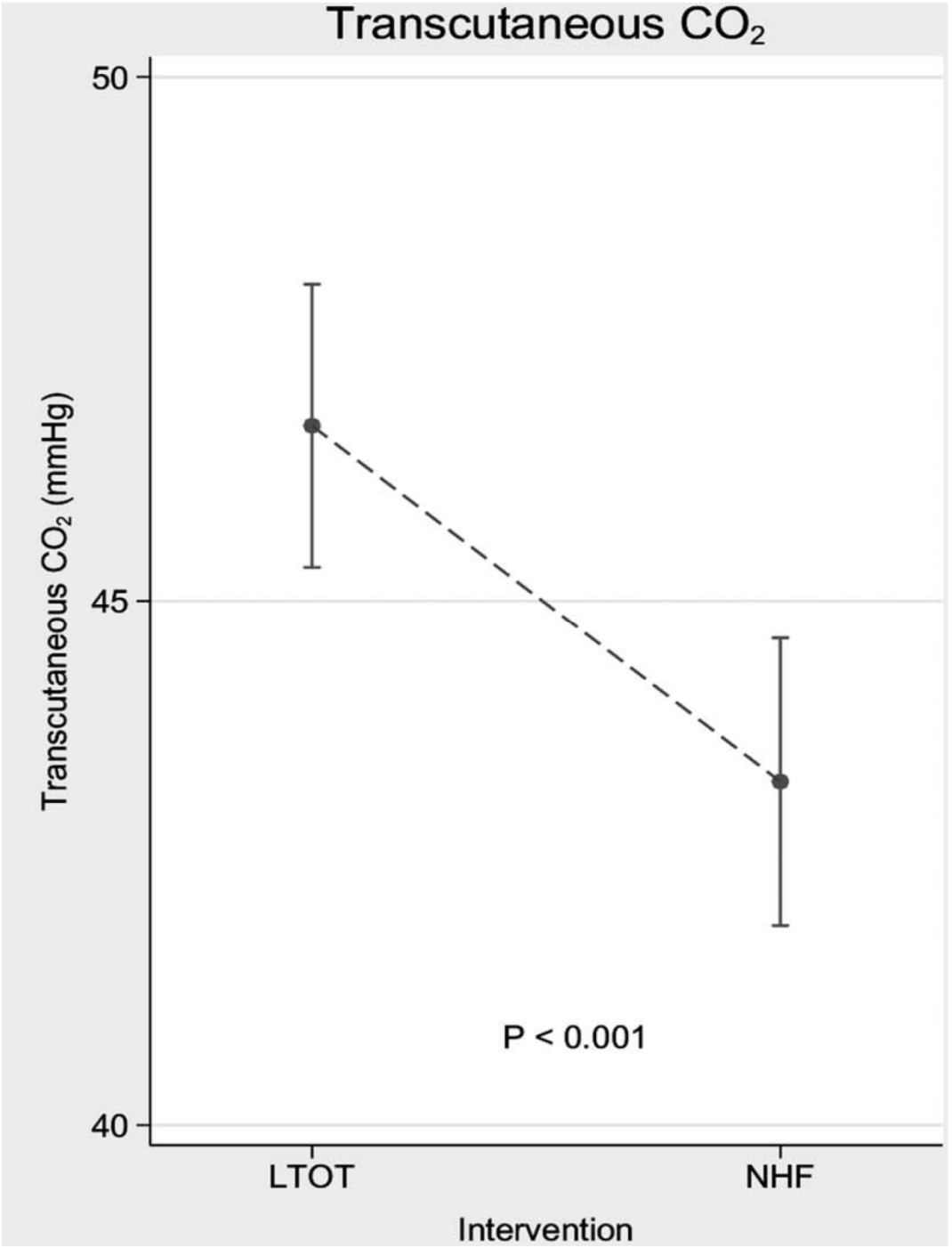
1. Diminuer le WOB: AI + PEP
2. Augmenter la ventilation alvéolai
(PCO_2) : AI
3. Limiter les apnées: PEP

VNI

Nasal high flow oxygen therapy in patients with COPD reduces respiratory rate and tissue carbon dioxide while increasing tidal and end-expiratory lung volumes: a randomised crossover trial

Fraser et al., Thorax 2016





Dans l’IRA hypoxémique - ARDS

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JUNE 4, 2015 VOL. 372 NO. 23

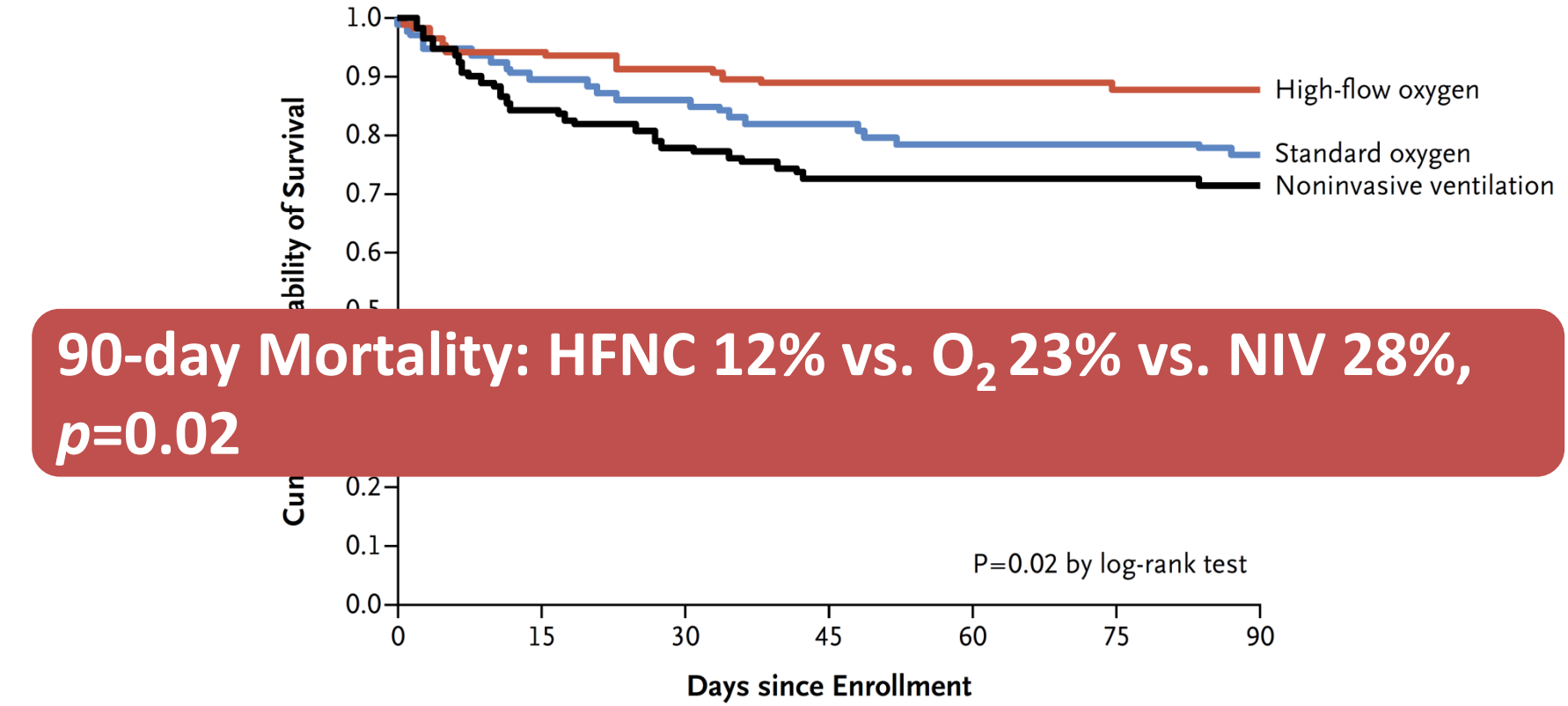
High-Flow Oxygen through Nasal Cannula in Acute Hypoxemic Respiratory Failure

Jean-Pierre Frat, M.D., Arnaud W. Thille, M.D., Ph.D., Alain Mercat, M.D., Ph.D., Christophe Girault, M.D., Ph.D., Stéphanie Ragot, Pharm.D., Ph.D., Sébastien Perbet, M.D., Gwénael Prat, M.D., Thierry Boulain, M.D., Elise Morawiec, M.D., Alice Cottereau, M.D., Jérôme Devaquet, M.D., Saad Nseir, M.D., Ph.D., Keyvan Razazi, M.D., Jean-Paul Mira, M.D., Ph.D., Laurent Argaud, M.D., Ph.D., Jean-Charles Chakarian, M.D., Jean-Damien Ricard, M.D., Ph.D., Xavier Wittebole, M.D., Stéphanie Chevalier, M.D., Alexandre Herbland, M.D., Muriel Fartoukh, M.D., Ph.D., Jean-Michel Constantin, M.D., Ph.D., Jean-Marie Tonnelier, M.D., Marc Pierrot, M.D., Armelle Mathonnet, M.D., Gaëtan Béduneau, M.D., Céline Delétage-Métreau, Ph.D., Jean-Christophe M. Richard, M.D., Ph.D., Laurent Brochard, M.D., and René Robert, M.D., Ph.D., for the FLORALI Study Group and the REVA Network*

310 patients with acute respiratory failure:

RR >25 /min, $PaO_2/FiO_2 \leq 300$ mm Hg, $PaCO_2 \leq 45$ mm Hg

79% with bilateral infiltrates and 77% with $PaO_2/FiO_2 \leq 200$ mm Hg



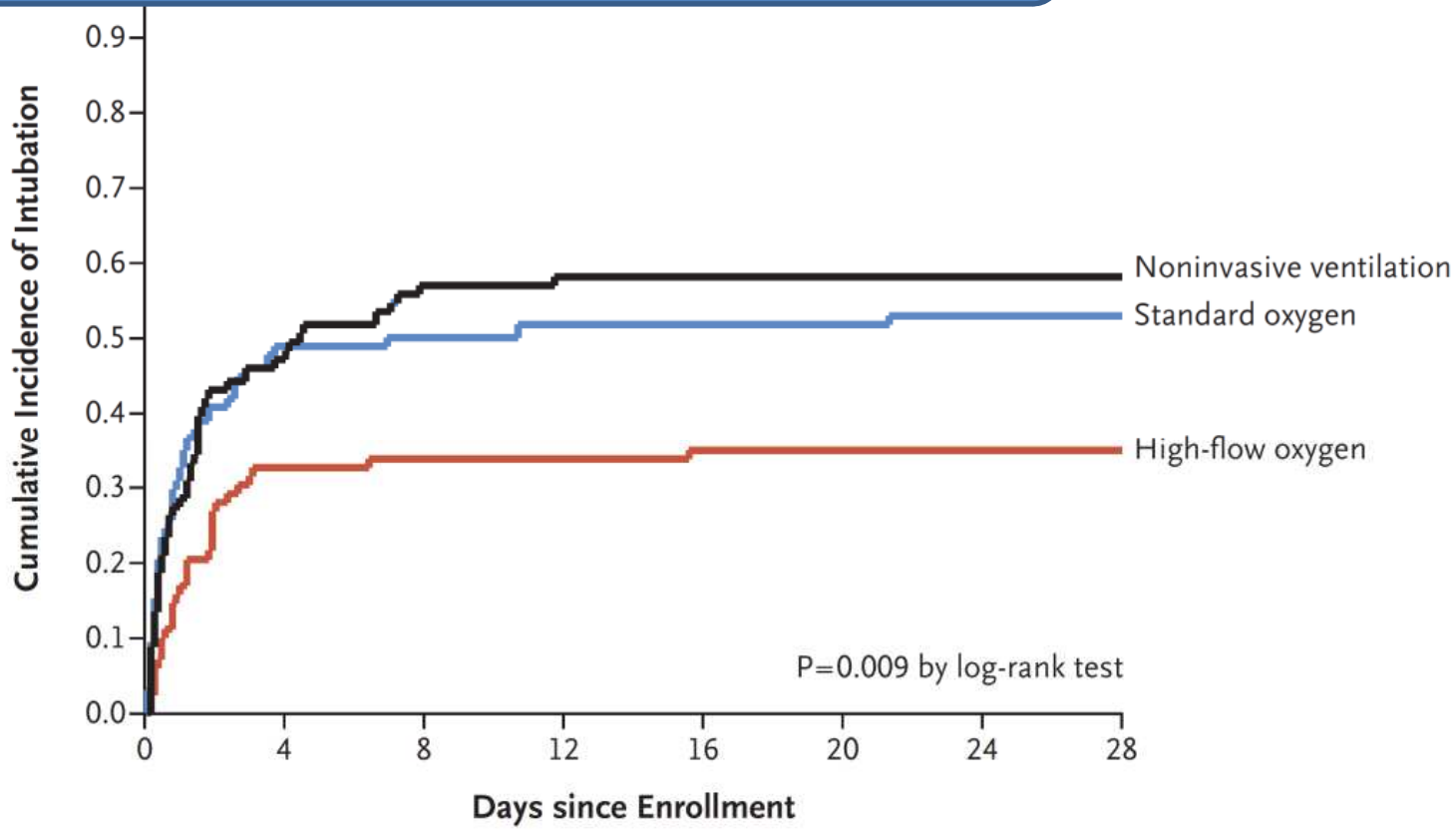
90-day Mortality: HFNC 12% vs. O_2 23% vs. NIV 28%, *p*=0.02

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.

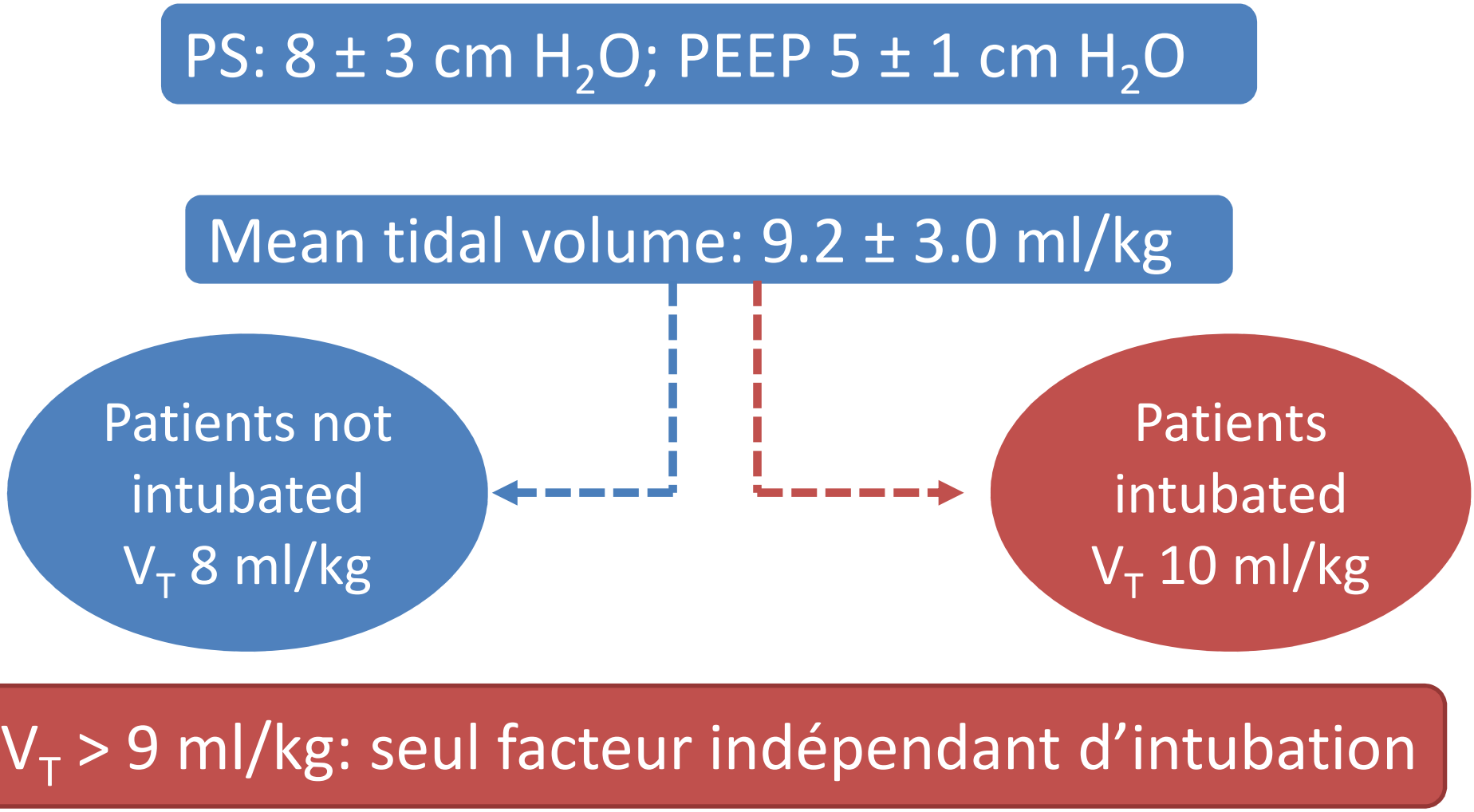
238 patients avec un $PaO_2/FiO_2 \leq 200$ mm Hg (77%)



Intubation: HFNC 35% vs. O_2 53 % vs. VNI 58% , $p<0.01$

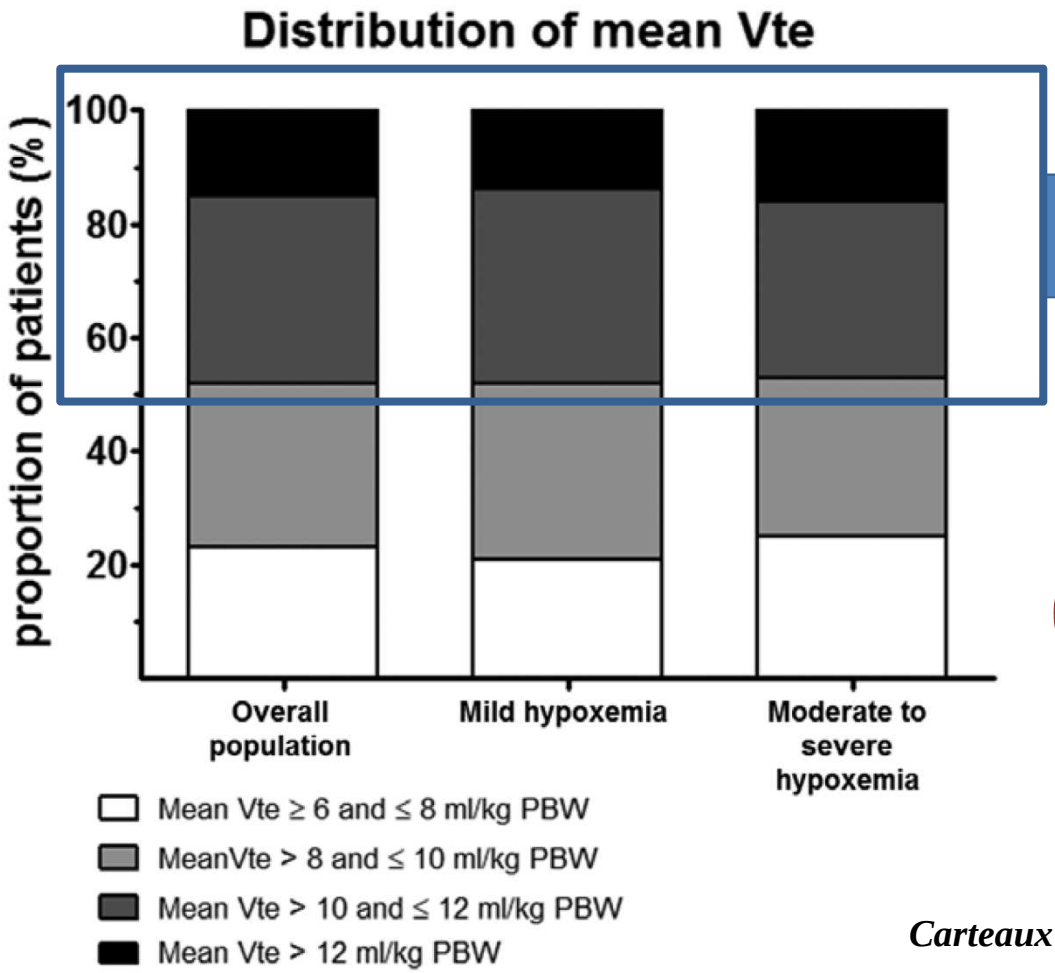
Figure 2. Kaplan–Meier Plots of the Cumulative Incidence of Intubation from Randomization to Day 28.

What is the matter with NIV?



Failure of Noninvasive Ventilation for De Novo Acute Hypoxemic Respiratory Failure: Role of Tidal Volume

Guillaume Carteaux, MD[1,2,3]; Teresa Millán-Guilarte, MD[4]; Nicolas De Prost, MD, PhD[1,2,3]; Keyvan Razazi, MD[1,2,3]; Shariq Abid, MD, PhD[3]; Arnaud W. Thille, MD, PhD[5]; Frédérique Schortgen, MD, PhD[1,3]; Laurent Brochard, MD[3,6,7]; Christian Brun-Buisson, MD[1,2,8]; Armand Mekontso Dessap, MD, PhD[1,2,3]



> 10 ml/kg

Increased risk of intubation!

Carteaux et al., Crit Care Med 2016; 44:282-290.

Effect of non-invasive oxygenation strategies in immunocompromised patients with severe acute respiratory failure: a post-hoc analysis of a randomised trial

Jean-Pierre Frat, Stéphanie Ragot, Christophe Girault, Sébastien Perbet, Gwénael Prat, Thierry Boulain, Alexandre Demoule, Jean-Damien Ricard, Rémi Coudroy, René Robert, Alain Mercat, Laurent Brochard, Arnaud W Thille, for the REVA network

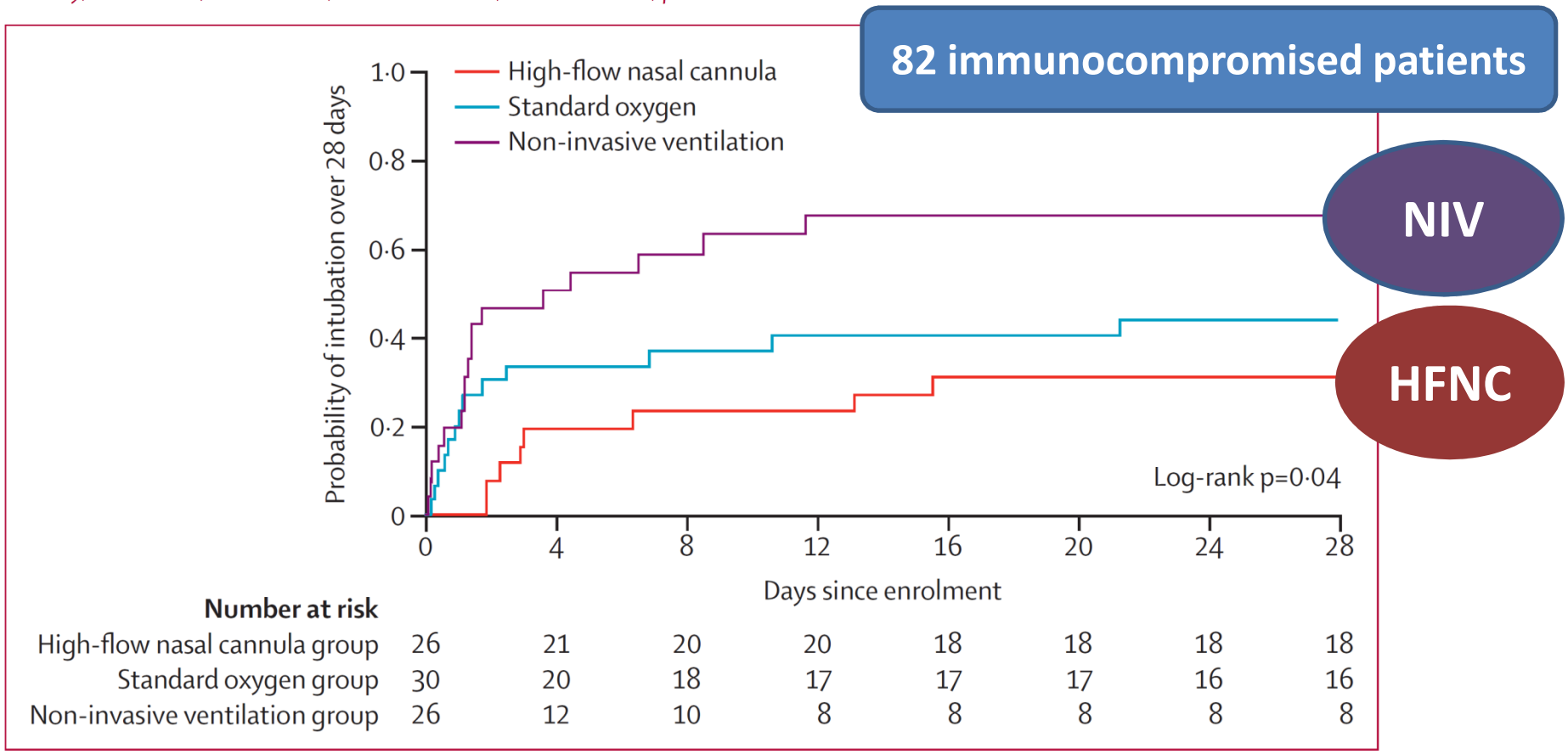


Figure 1: **Probability of intubation at day 28 in patients in the non-invasive ventilation group versus standard oxygen and high-flow nasal cannula groups**

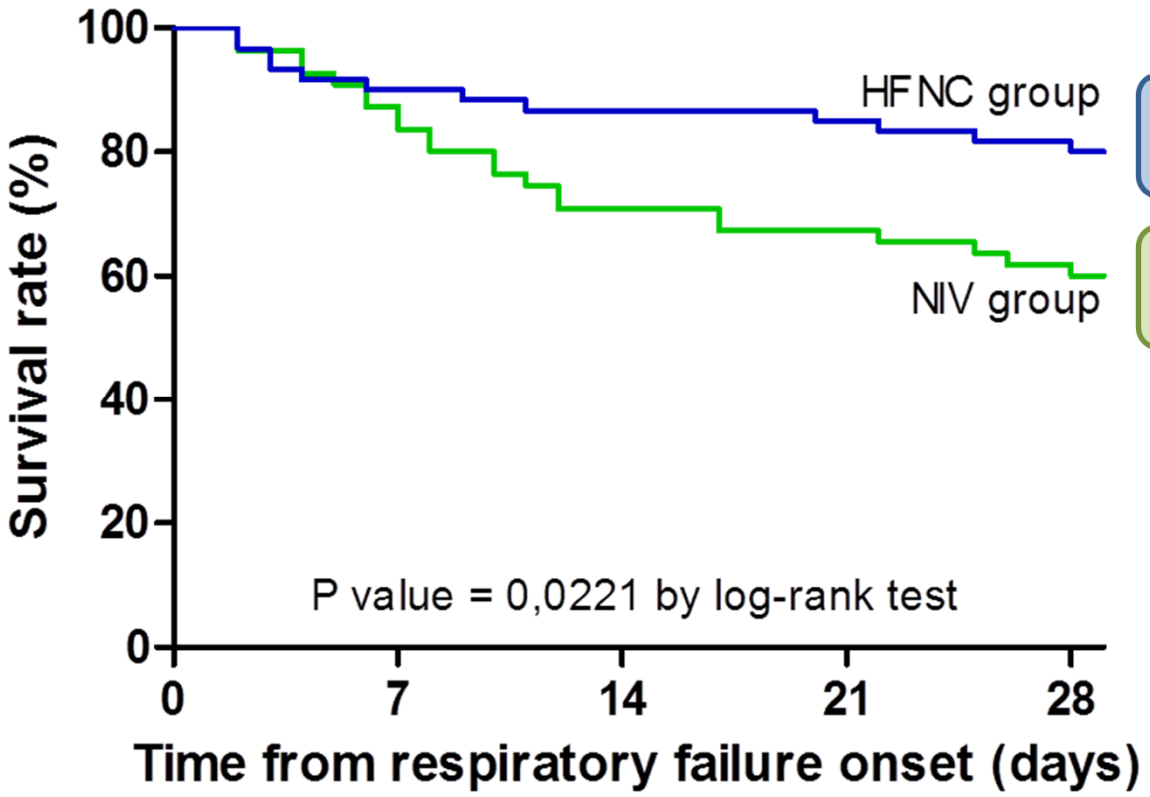
Coudroy *et al. Ann. Intensive Care (2016) 6:45*
DOI 10.1186/s13613-016-0151-7

Annals of Intensive Care

RESEARCH Open Access

High-flow nasal cannula oxygen therapy versus noninvasive ventilation in immunocompromised patients with acute respiratory failure: an observational cohort study

Rémi Coudroy[1,2*], Angéline Jamet[1], Philippe Petua[1], René Robert[1,2], Jean-Pierre Frat[1,2] and Arnaud W. Thille[1,2]



60 patients treated with HFNC

55 patients treated with NIV

Research

JAMA. 2015;314(16):1711-1719. doi:10.1001/jama.2015.12402
Published online October 7, 2015.

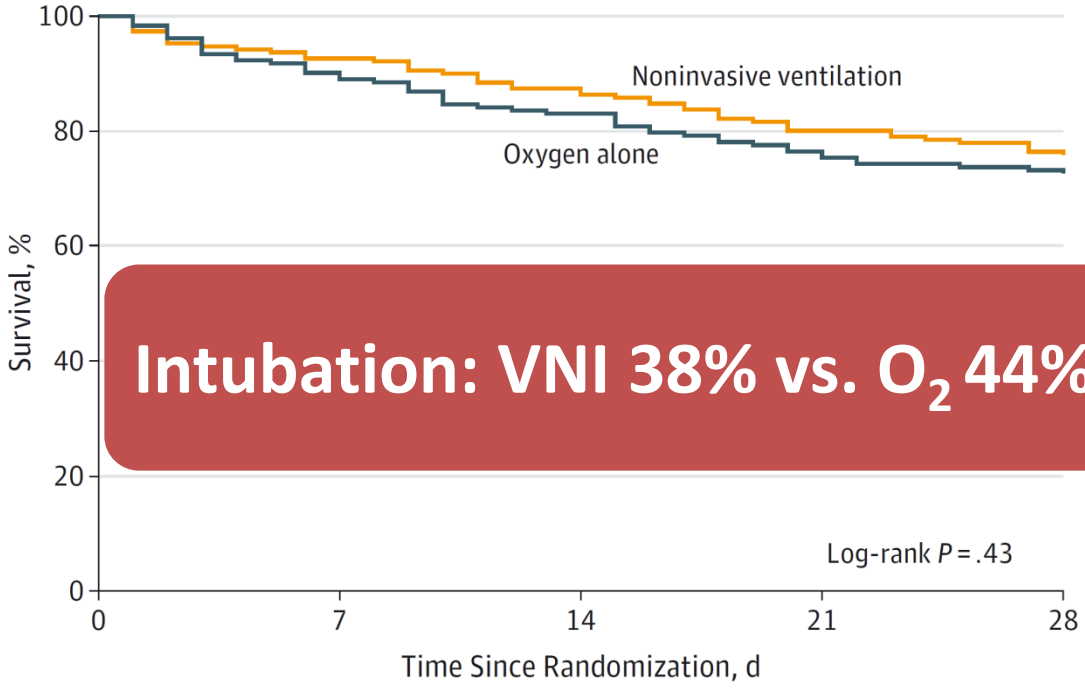
Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Effect of Noninvasive Ventilation vs Oxygen Therapy on Mortality Among Immunocompromised Patients With Acute Respiratory Failure

A Randomized Clinical Trial

374 patients

Figure 2. Probability of Survival at Day 28



Intubation: VNI 38% vs. O_2 44%, p=0.20

No. at risk					
Noninvasive ventilation	191	177	167	153	146
Oxygen alone	183	165	152	140	134

IRA de l'Immunodéprimé

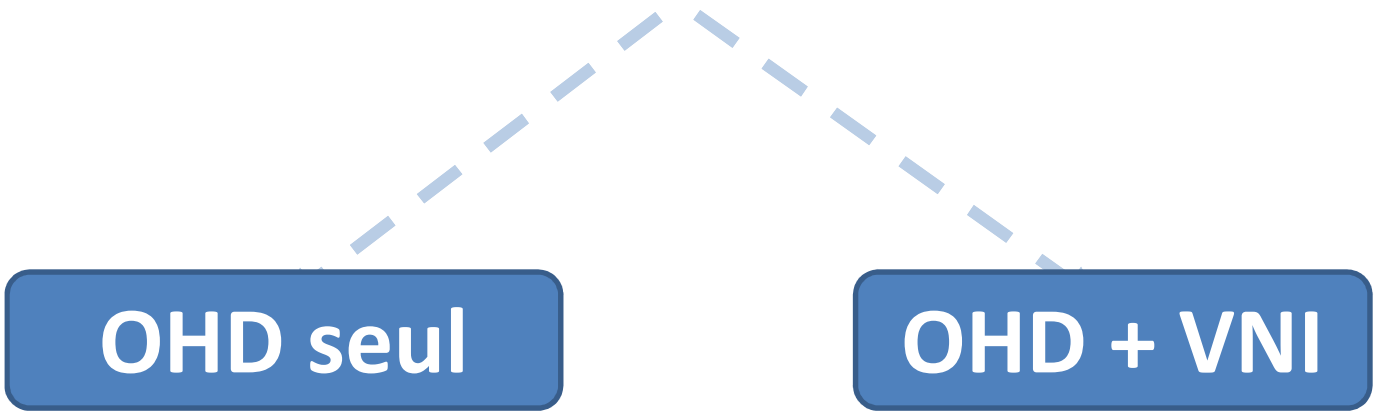
Insuffisance respiratoire aiguë

FR >25/min, PaO_2/FiO_2 <300, PCO_2 < 50 mm Hg

FLORALI-IM

CHU de Poitiers

Dr Rémi Coudroy



Which strategy after extubation in ICU?

JAMA. 2016;315(13):1354-1361.

Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

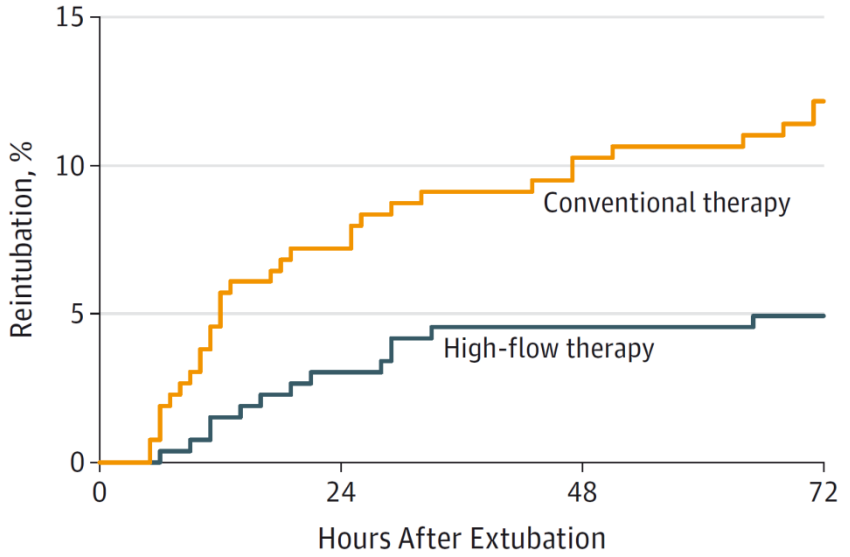
Effect of Postextubation High-Flow Nasal Cannula vs Conventional Oxygen Therapy on Reintubation in Low-Risk Patients

A Randomized Clinical Trial

Gonzalo Hernández, MD, PhD; Concepción Vaquero, MD; Paloma González, MD; Carles Subira, MD; Fernando Frutos-Vivar, MD; Gemma Rialp, MD; Cesar Laborda, MD; Laura Colinas, MD; Rafael Cuena, MD; Rafael Fernández, MD, PhD

527 patients à faible risque de réintubation

Figure 2. Kaplan-Meier Analysis of Time From Extubation to Reintubation



No. at risk				
Conventional therapy	263	244	236	231
High-flow therapy	264	256	252	251

Reintubation:
O_2 12% vs. HFNC 5%,
p=0.004

JAMA. 2016;316(15):1565-1574.

Research

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

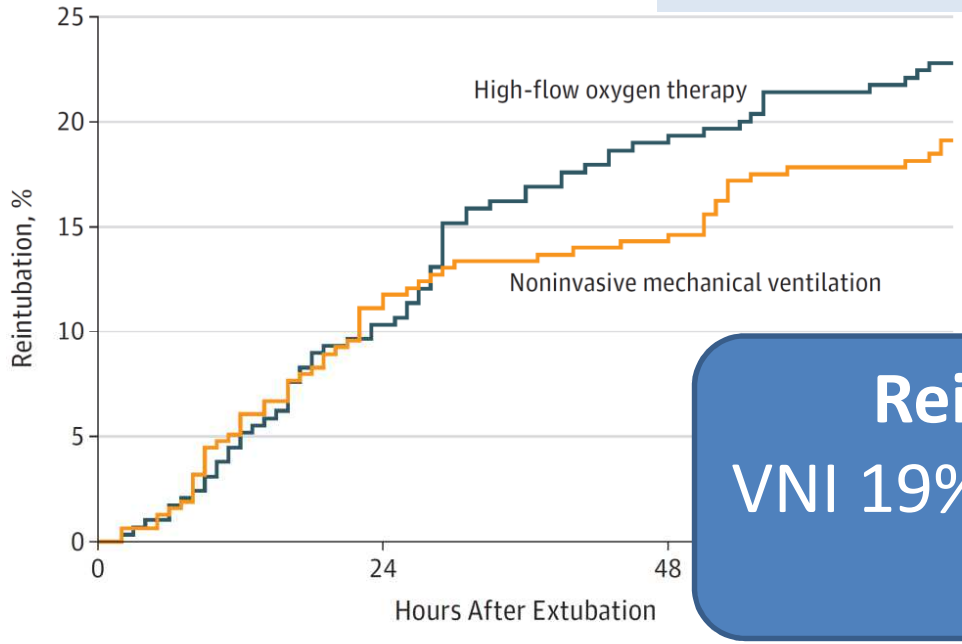
Effect of Postextubation High-Flow Nasal Cannula vs Noninvasive Ventilation on Reintubation and Postextubation Respiratory Failure in High-Risk Patients

A Randomized Clinical Trial

Gonzalo Hernández, MD, PhD; Concepción Vaquero, MD; Laura Colinas, MD; Rafael Cuena, MD; Paloma González, MD; Alfonso Canabal, MD, PhD; Susana Sanchez, MD; Maria Luisa Rodriguez, MD; Ana Villasclaras, MD; Rafael Fernández, MD, PhD

604 patients à haute risque de réintubation

Figure 2. Kaplan-Meier Analysis of Time From Extubation to Reintubation



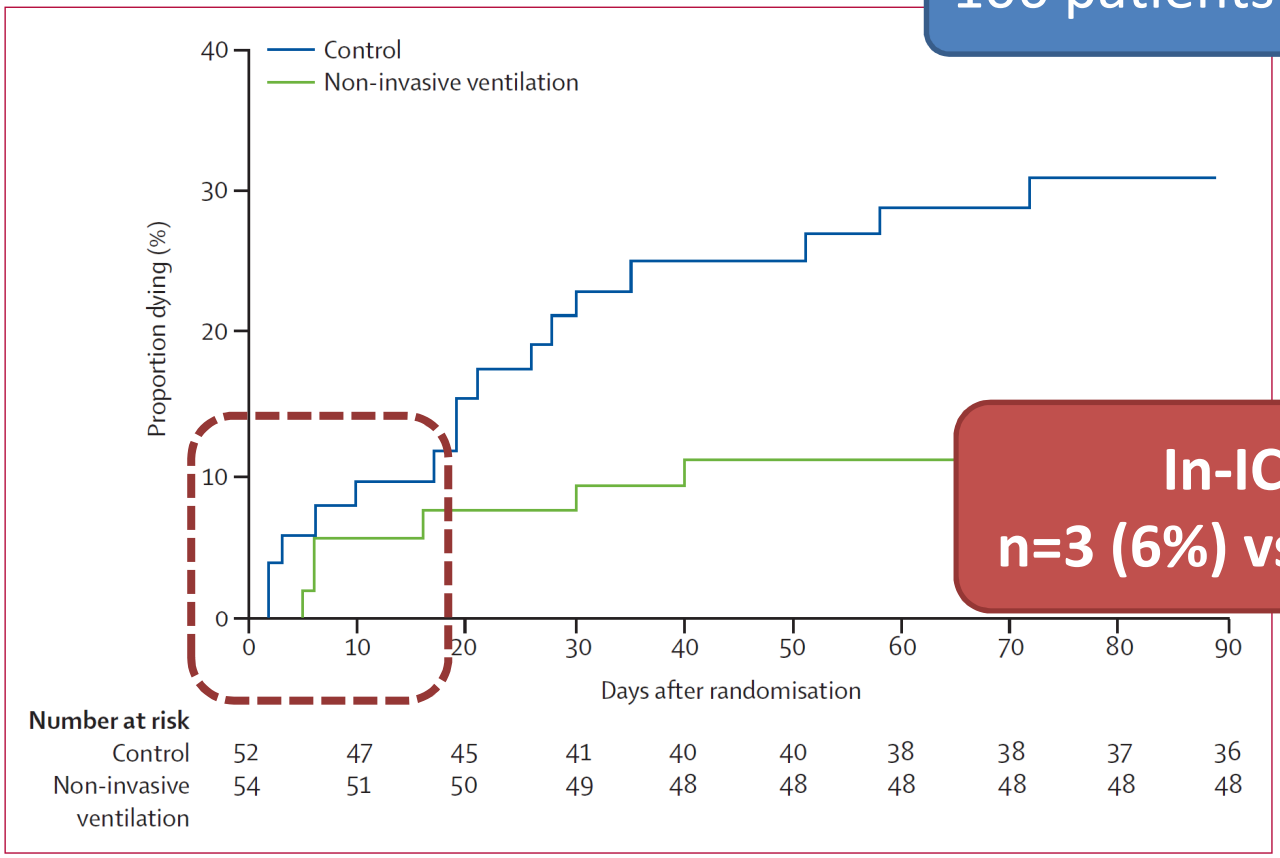
No. at risk				
High-flow oxygen therapy	290	260	234	223
Noninvasive mechanical ventilation	314	279	269	253

Reintubation:
VNI 19% vs. HFNC 23%,
p=NS

Non-invasive ventilation after extubation in hypercapnic patients with chronic respiratory disorders: randomised controlled trial

Miquel Ferrer, Jacobo Sellarés, Mauricio Valencia, Andres Carrillo, Gumersindo Gonzalez, Joan Ramon Badia, Josep Maria Nicolas, Antoni Torres

106 patients: $PaCO_2$ > 45 mm Hg



In-ICU Mortality:
n=3 (6%) vs. n=4 (8%), p=0.71

Figure 3: Kaplan-Meier 90-day mortality curve

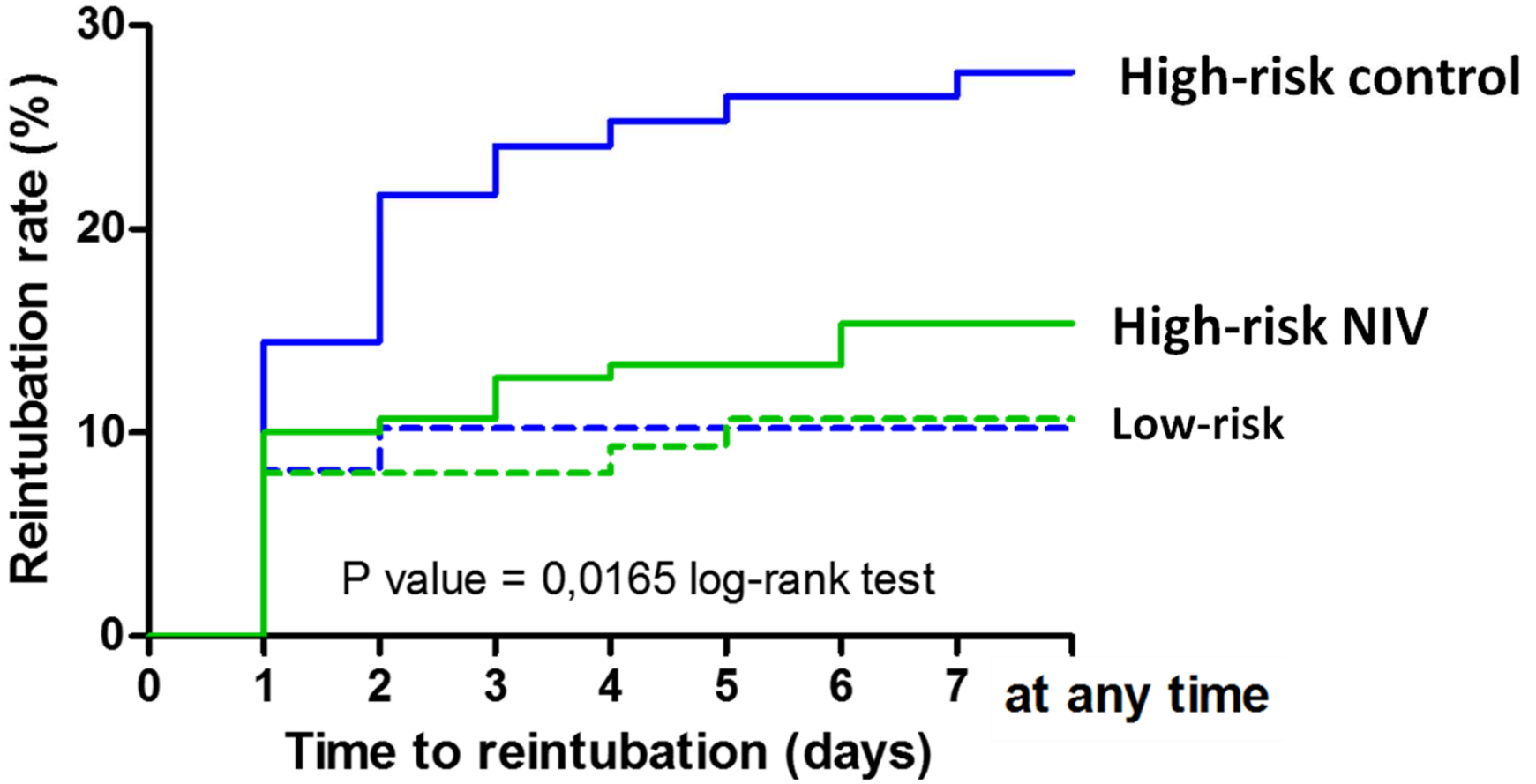
Lancet 2009; 374: 1082–88

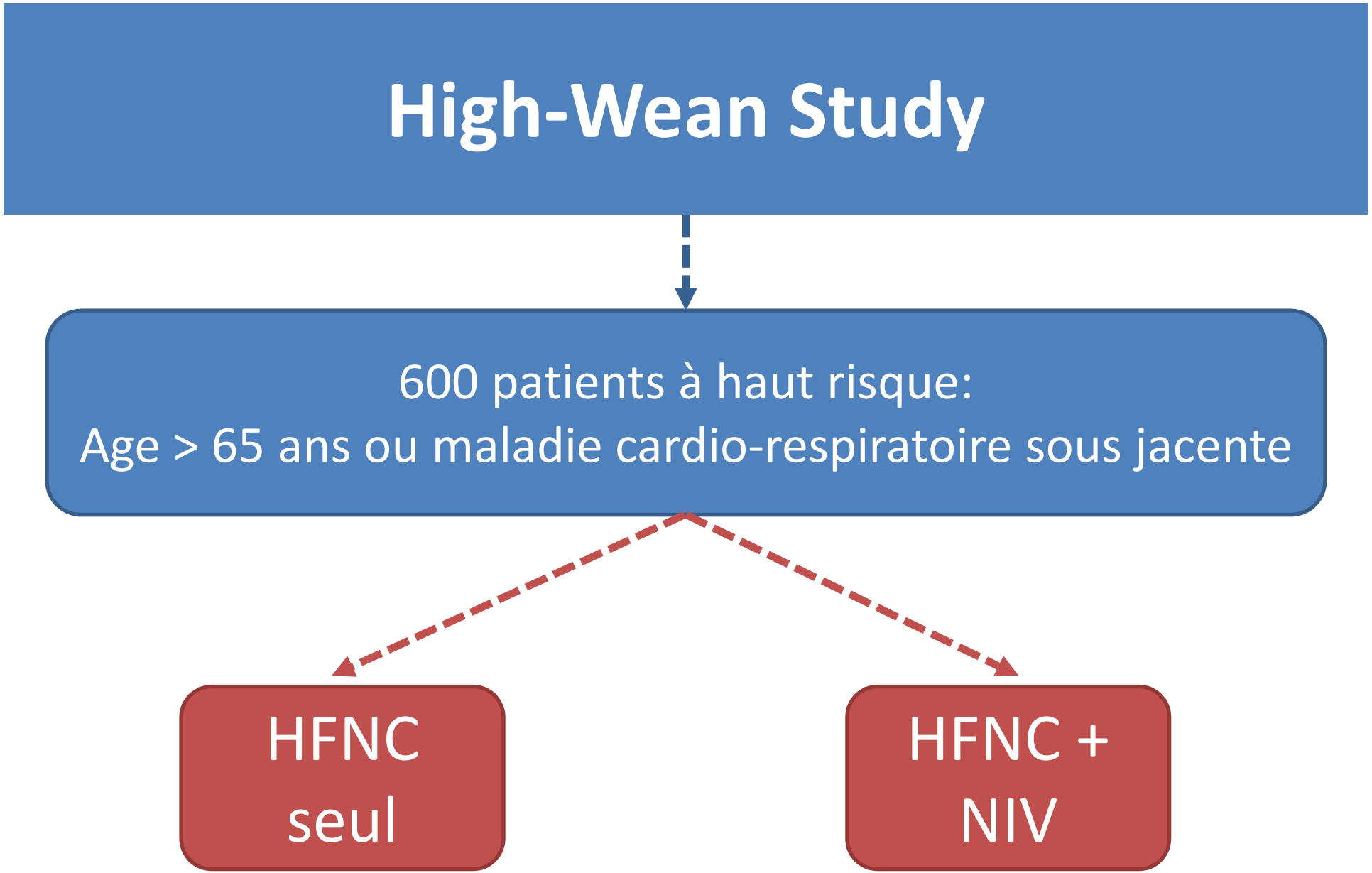
RESEARCH Open Access

Easily identified at-risk patients for extubation failure may benefit from noninvasive ventilation: a prospective before-after study

Arnaud W. Thille[1,2,3,4*], Florence Boissier[1,2,3,4†], Hassen Ben-Ghezala[4†], Keyvan Razazi[4], Armand Mekontso-Dessap[4], Christian Brun-Buisson[4] and Laurent Brochard[5,6]

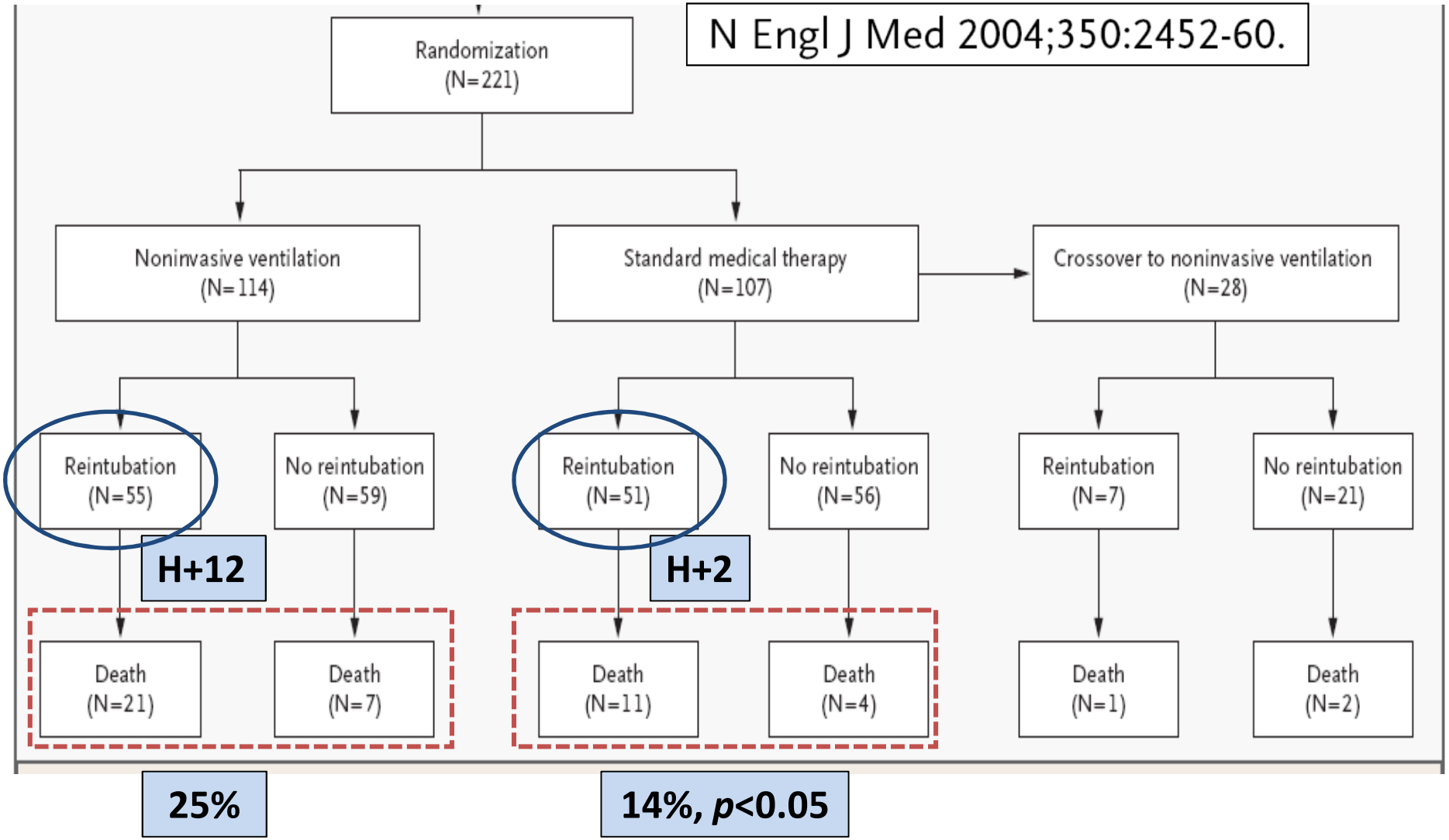
Patients with age ≥ 65y or underlying cardiac/respiratory disease




High-Wean Study
600 patients à haut risque:
Age > 65 ans ou maladie cardio-respiratoire sous jacente
HFNC seul
HFNC + NIV

Noninvasive Positive-Pressure Ventilation for Respiratory Failure after Extubation

Andrés Esteban, M.D., Ph.D., Fernando Frutos-Vivar, M.D.,

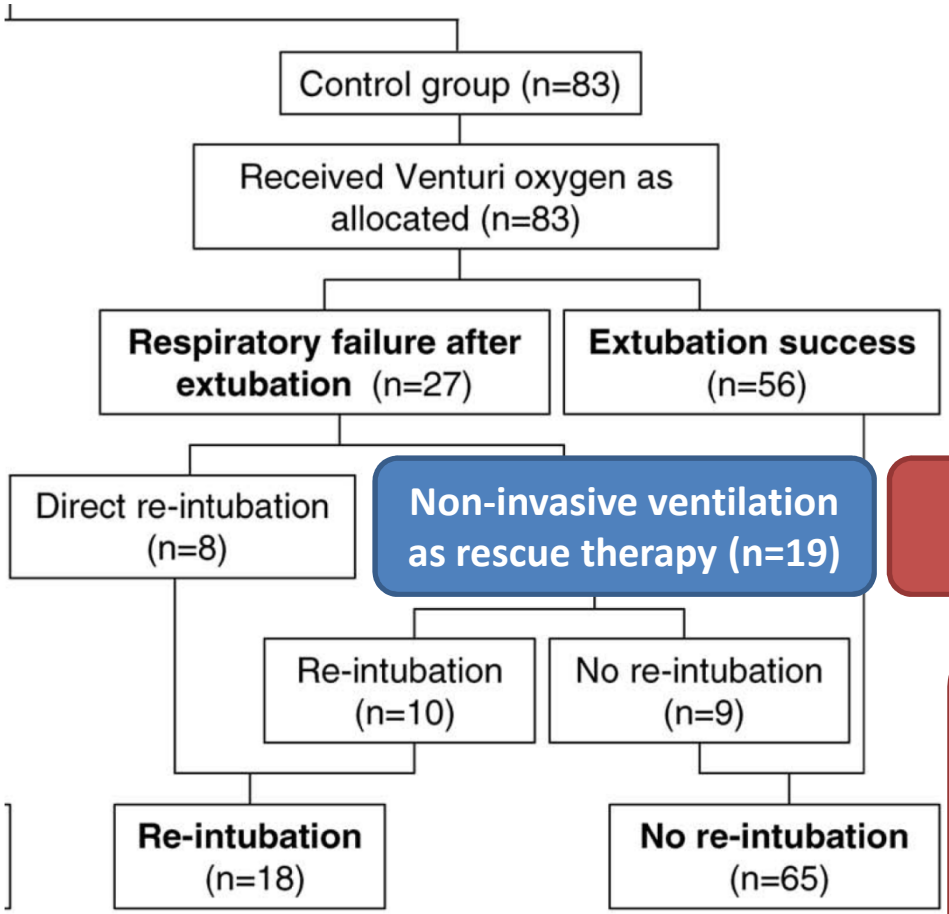


Quelles recommandations peut-on proposer en post-extubation?

En réanimation, **il faut probablement utiliser la VNI prophylactique** après l'extubation des patients à haut risque de réintubation, notamment les hypercapniques.
(Grade 2+, Accord Fort)

En réanimation, **il ne faut probablement pas utiliser la VNI curative** pour traiter une insuffisance respiratoire aigüe en post-extubation, *excepté chez les patients BPCO ou en cas d'OAP évident.*
(Grade 2+, Accord Fort)

Should we use NIV to treat ARF after extubation in COPD patients?



Which Reintubation rate?

Girault et al. AJRCCM 1999: ***48% (10/23)***

Ferrer et al. AJRCCM 2003: ***43% (10/23)***

Ferrer et al. Lancet 2009: ***38% (10/27)***

Girault et al. AJRCCM 2011: ***48% (34/71)***

In postoperative patients?

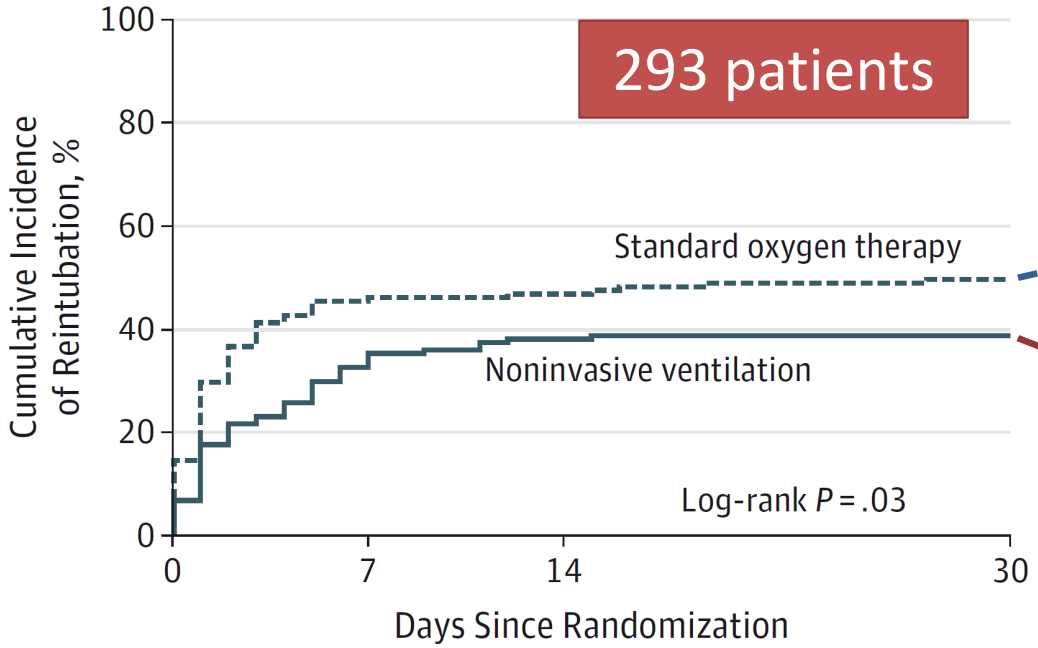
Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Effect of Noninvasive Ventilation on Tracheal Reintubation Among Patients With Hypoxemic Respiratory Failure Following Abdominal Surgery

A Randomized Clinical Trial

Jaber et al., JAMA 2016; 315:1345-1353.

Figure 2. Cumulative Incidence of Reintubation Between Randomization and Day 30 According to Study Group



No. at risk				
Standard oxygen therapy	145	79	76	71
Noninvasive ventilation	148	99	90	87

O_2: 50%

VNI: 39%

Table 2. Surgery and Acute Respiratory Failure Characteristics at Randomization

Characteristics	Standard Oxygen Therapy (n = 145)	Noninvasive Ventilation (n = 148)
Causes of acute respiratory failure, No. (%)[b]		
Atelectasis[c]	94/143 (65.7)	93/148 (62.8)
Tracheal secretions	54/143 (37.8)	58/148 (39.1)
Pneumonia	36/143 (25.2)	27/148 (18.2)
Pulmonary edema	23/143 (16.1)	21/148 (14.2)
Pleural effusion	19/143 (13.3)	18/148 (12.2)
Pulmonary embolism	11/143 (7.7)	6/148 (4.1)

Postoperative ǂ ARDS

Extubated <6 h after end of surgery, No. (%)	90/145 (62.1)	94/148 (63.5)
Time from end of surgery to acute respiratory failure, mean (SD), d	2.6 (1.7)	2.4 (1.6)

Postoperative ǂ Postextubation

Conclusions

1	BPCO - OAP	**VNI**
2	IRA de Novo – SDRA ???	**OHD** nasal
3	Post-extubation (préventif)	**OHD** nasal **+ VNI**

! *VNI curative*