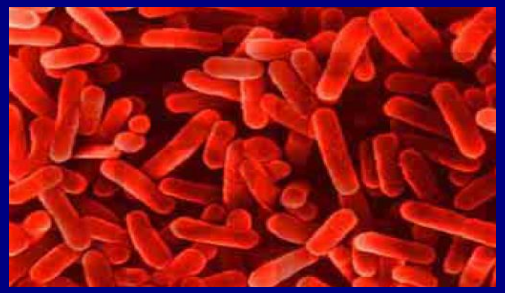
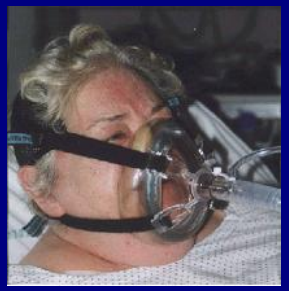
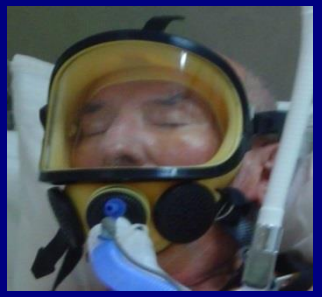
VNI : Etat des lieux, Controverses, Perspectives


G. HILBERT

Service de Réanimation médicale, CHU Bordeaux
INSERM U885, Université Bordeaux

JARCA 15 novembre 2019

RATIONNEL

BASES PHYSIO-PATHOLOGIQUES

(~~BPCO - OAP~~)

INSUFFISANCE RESPIRATOIRE HYPOXÉMIANTE :

- **IMMUNOCOMPÉTENTS**
- **IMMUNODÉPRIMÉS**

POST-OPÉRATOIRE

POST-EXTUBATION

D'OÙ VENONS-NOUS ?

OÙ EN SOMMES-NOUS ?

OÙ ALLONS-NOUS ?

IRA Hypoxémique sévère/ Pneumopathie/ SDRA

Comblement

- Oedème

Alvéolaire

Oedème interstitiel :

- **compromet la stabilité alvéolaire**
- **compression des petites voies aériennes**

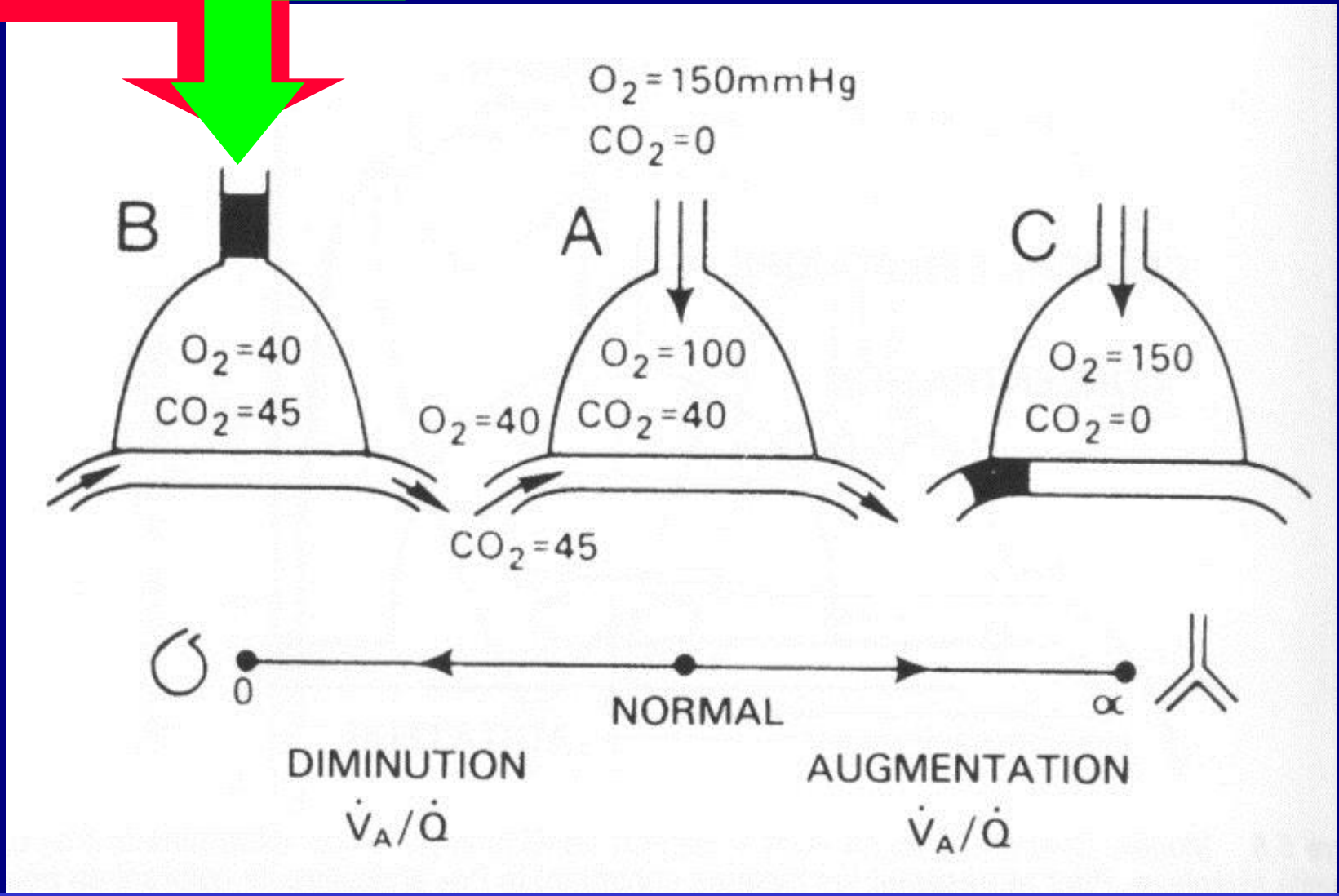
Micro et Macro Atélectasies

↑ SHUNT INTRAPULMONAIRE

↓ CRF

SHUNT

PEP

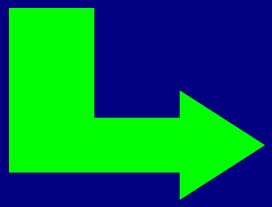


Modifications du rapport VA / Q dans une unité pulmonaire

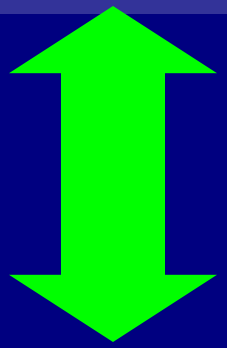
HYPOXÉMIE ↔ ↑SHUNT INTRAPULMONAIRE

↓CRF

↑ Pression Positive Moyenne des Voies aériennes



↑CRF



VS-PPC **: (PEP x Ti/Ttot) + (PEP x Te/Ttot)**

VS-AI-PEP **: (AI x Ti/Ttot) + (PEP x Te/Ttot)**

VNI - *INSUFFISANCE RESPIRATOIRE HYPOXÉMIQUE*

- **IMMUNO COMPETENTS**

D'OÙ VENONS-NOUS ?

OÙ EN SOMMES-NOUS ?

OÙ ALLONS-NOUS ?

VNI / IRA Hypoxémique - PNEUMOPATHIES - Patients IMMUNOCOMPÉTENTS

ETUDES [* = R. C.]	n	Particularités	Masque	Mode	SUCCÈS
Benhamou Chest 1992	10		F	AI/PEP	60 %
Wysocki Chest 1995 *	7/21	± Hypercapnie	F	AI/PEP	?/38 % (vs 30 %)
Meduri Chest 1996	14		F	AI/PEP	71 %
Pollack Ann Em M 1996	10		N/F	AI/PEP	80 %
Alsous ICM 1999	14	PaO2/FiO2 = 89	F	AI/PEP	50 %
Antonelli NEJM 1998 *	5/32	critères intubation	F	AI/PEP	80/69 %
Confalonieri AJRCCM 1999 *	28	Pneumop. Com. ± BPCO	F	AI/PEP	79 % (vs 50 %)
Delclaux JAMA 2000 *	26/40	ALI	F	VS-PPC	?/63 % (vs 56 %)
Jolliet ICM 2001	24	Pneumop. Com.	F	AI/PEP	34 %
Antonelli ICM 2001	64	Pp. Com + noso + inh	F	AI/PEP	58 %
Domenighetti ICM 2002	18	Pneumop. Com.	F	AI/PEP	62 %
Smailes Burns 2002	29	Brûlés	F	AI/PEP	74 %
Ferrer AJRCCM 2003 *	19		F	AI/PEP	74 % (vs 27 %)
Cheung Chest 2004	20	SARS (Coronarovirus)	F	AI/PEP	70 %

Noninvasive Ventilation in Severe Hypoxemic Respiratory Failure

A Randomized Clinical Trial

Miquel Ferrer,

2003

	NIV N = 51	Control N = 54	p
SUCCESS :all	**38 (75 %)**	**26 (48 %)**	0.010
Pneumonia	**14/19**	**4/15**	0.017
ARDS	**1/7**	**0/8**	**0.333**
ICU-Death :all	**9 (18 %)**	**21 (39 %)**	0.028
Pneumonia	**3/19**	**8/15**	0.030
ARDS	**5/7**	**7/8**	**0.569**

Consensus commune

organisée conjointement par
la SFAR, la SPLF et la SRLF

Ventilation Non Invasive

au cours de l'insuffisance respiratoire aiguë (nouveau-né exclu)

Avec la participation de la SFMU,
du SAMU de France,
du GFRUP
et de l'ADARPEF

RÉSUMÉ

Tableau 2 – Niveaux de reccommandation pour les indications de la VNI

Aucun avantage démontré Il ne faut probablement pas faire (G2-)	Pneumopathie hypoxémiante SDRA
	Traitement de l' IRA post-extubation Maladies neuromusculaires aiguës réversibles

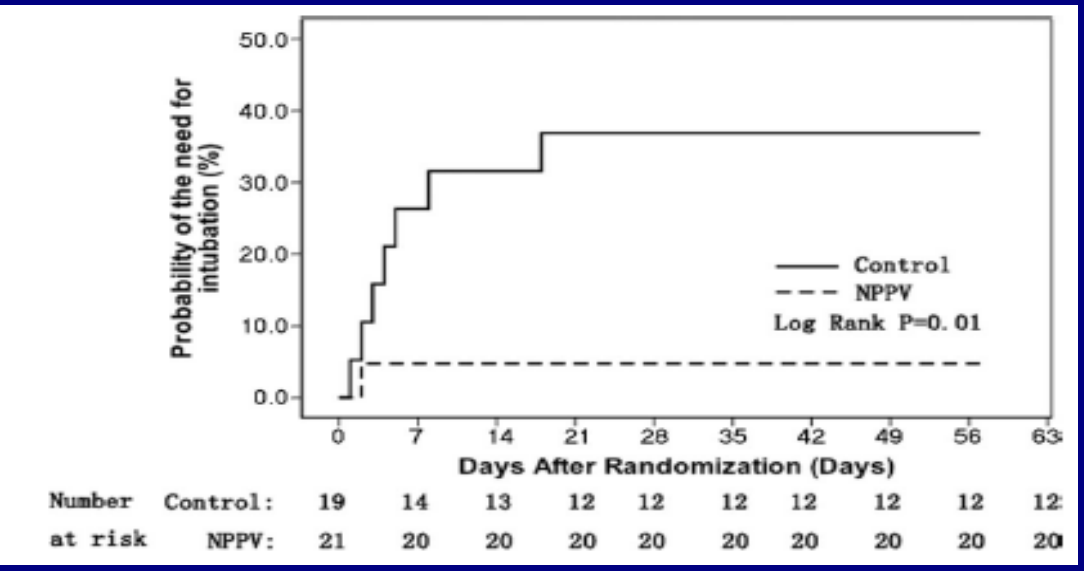
Early use of noninvasive positive pressure ventilation for acute lung injury: A multicenter randomized controlled trial*

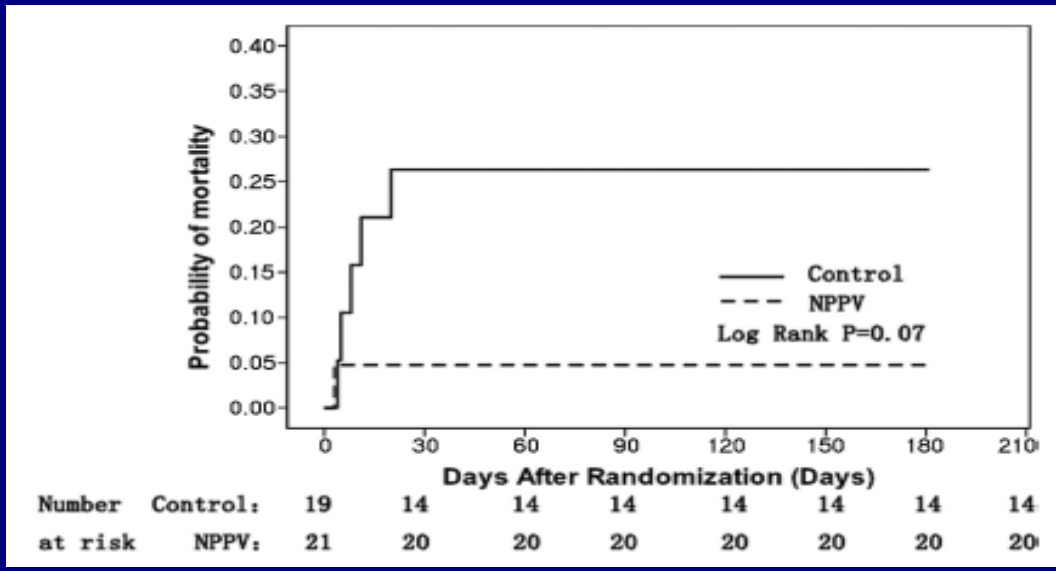
Qingyuan Zhan

2012

	Noninvasive Positive Pressure Ventilation, Group (n = 21)	Control Group (n = 19)	*p*
Underlying comorbidities, no. (%)			.71
Hypertension	4 (19.0)	7 (36.8)	.21
Immunosuppression[a]	5 (23.8)	6 (31.6)	.58
Diabetes mellitus	2 (9.5)	2 (10.5)	.92
Chronic renal insufficiency	1 (4.8)	4 (21.1)	.28
Cancer	0 (0.0)	1 (5.3)	.96
Causes of acute lung injury, no. (%)			
Pulmonary infection	10 (47.6)	10 (52.6)	
Acute pancreatitis	2 (9.5)	5 (26.3)	
Multiple trauma	3 (14.3)	0 (0)	
Sepsis[b]	3 (14.3)	3 (15.8)	
Others[c]	3 (14.3)	1 (5.3)	

Early use of noninvasive positive pressure ventilation for acute lung injury: A multicenter randomized controlled trial*





Starting point to embark on a widespread use of noninvasive positive pressure ventilation in acute lung injury or early acute respiratory distress syndrome?*

some caution is warranted before using these study results as a starting point to widespread use of NPPV in patients with ALI.

Taken together these data suggest that starting NPPV in ALI, or in the early stage of ARDS in selected patients, is the best alternative to providing supplemental oxygen only. More powerful randomized trials are warranted to confirm previous encouraging results.

Gilles Hilbert, MD, PhD

A multicenter RCT of noninvasive ventilation in pneumonia-induced early mild acute respiratory distress syndrome

Hangyong He

2019

CRITICAL CARE

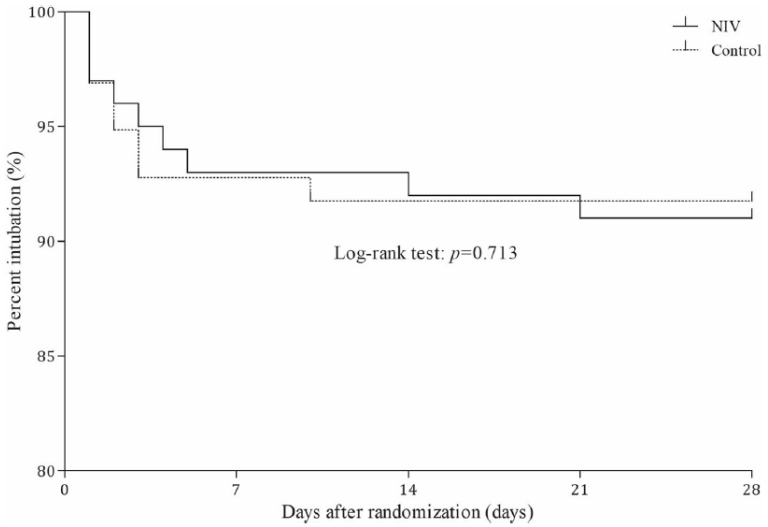


Fig. 2 Kaplan-Meier estimates of the probability of the need for endotracheal intubation based on the criteria for endotracheal intubation. No difference was found for the cumulative probability for endotracheal intubation of the two groups (log-rank test: $p = 0.71$)

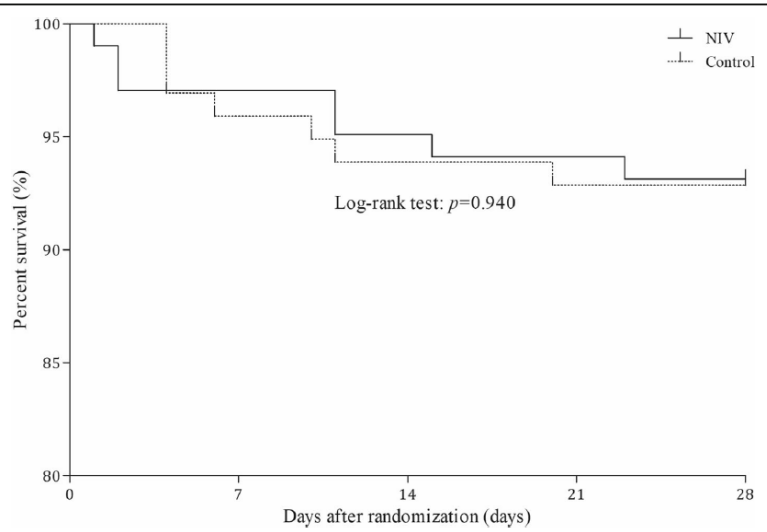


Fig. 3 Kaplan-Meier estimates of the probability of mortality. No difference was found for the cumulative probability for endotracheal intubation of the two groups (log-rank test: $p = 0.94$)

% INTUBATION

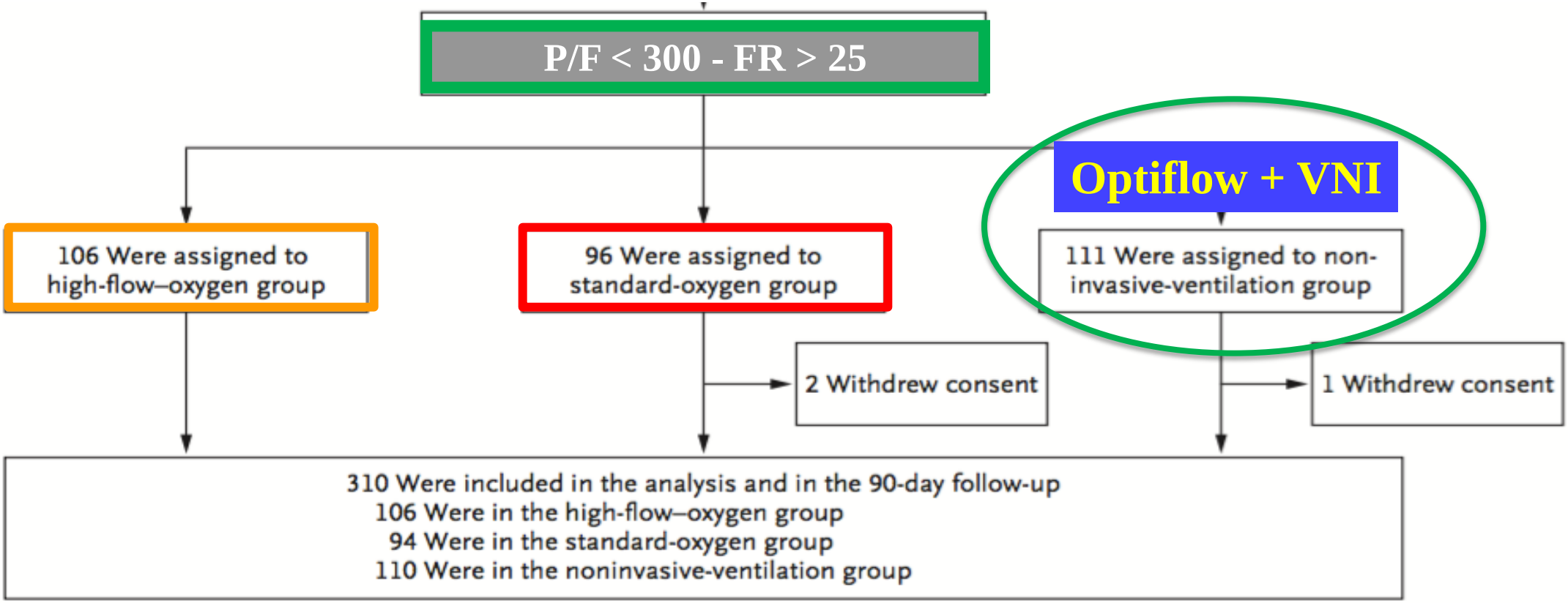
% SURVIE

The NEW ENGLAND JOURNAL of MEDICINE

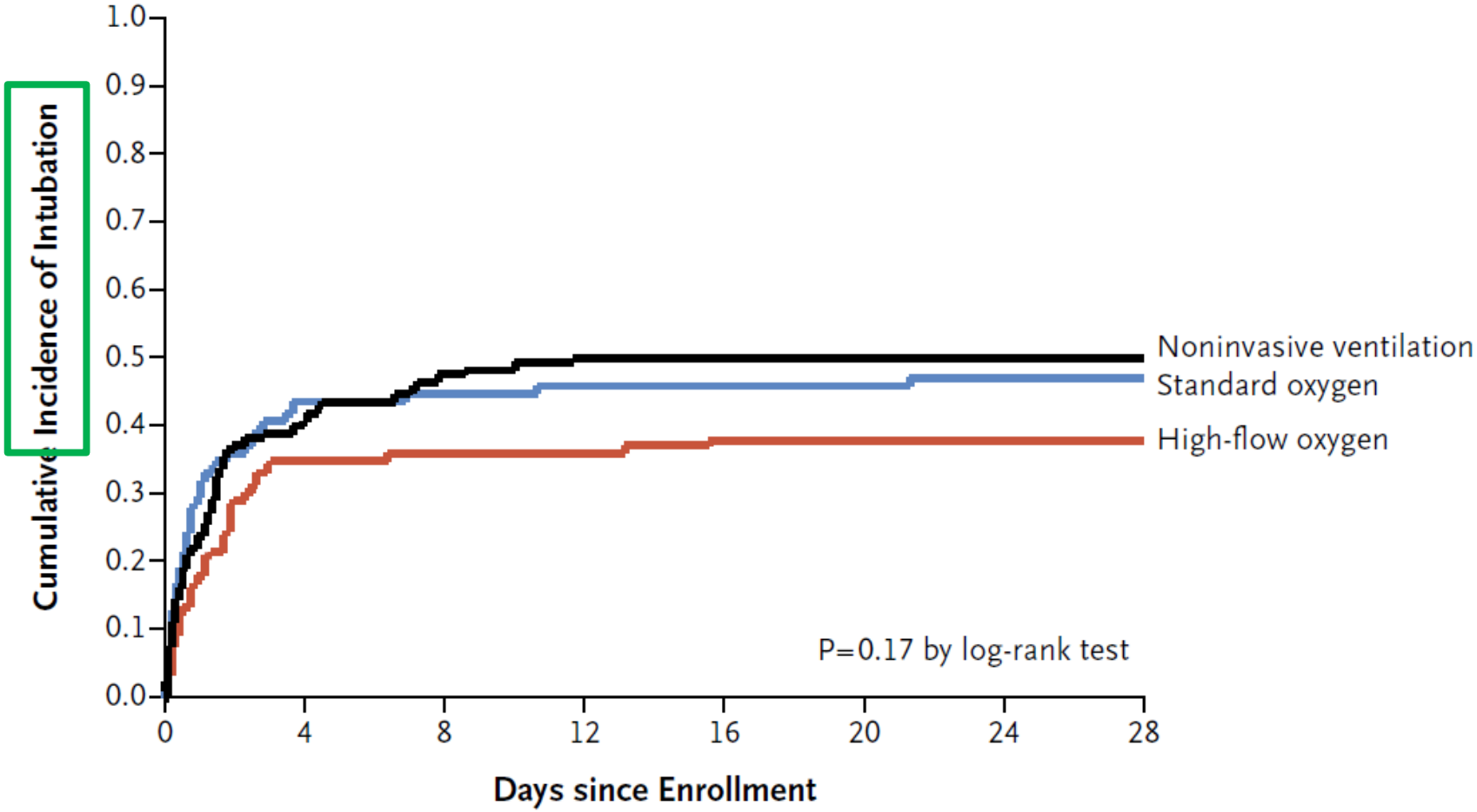
JUNE 4, 2015 VOL. 372 NO. 23

Jean-Pierre Frat

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

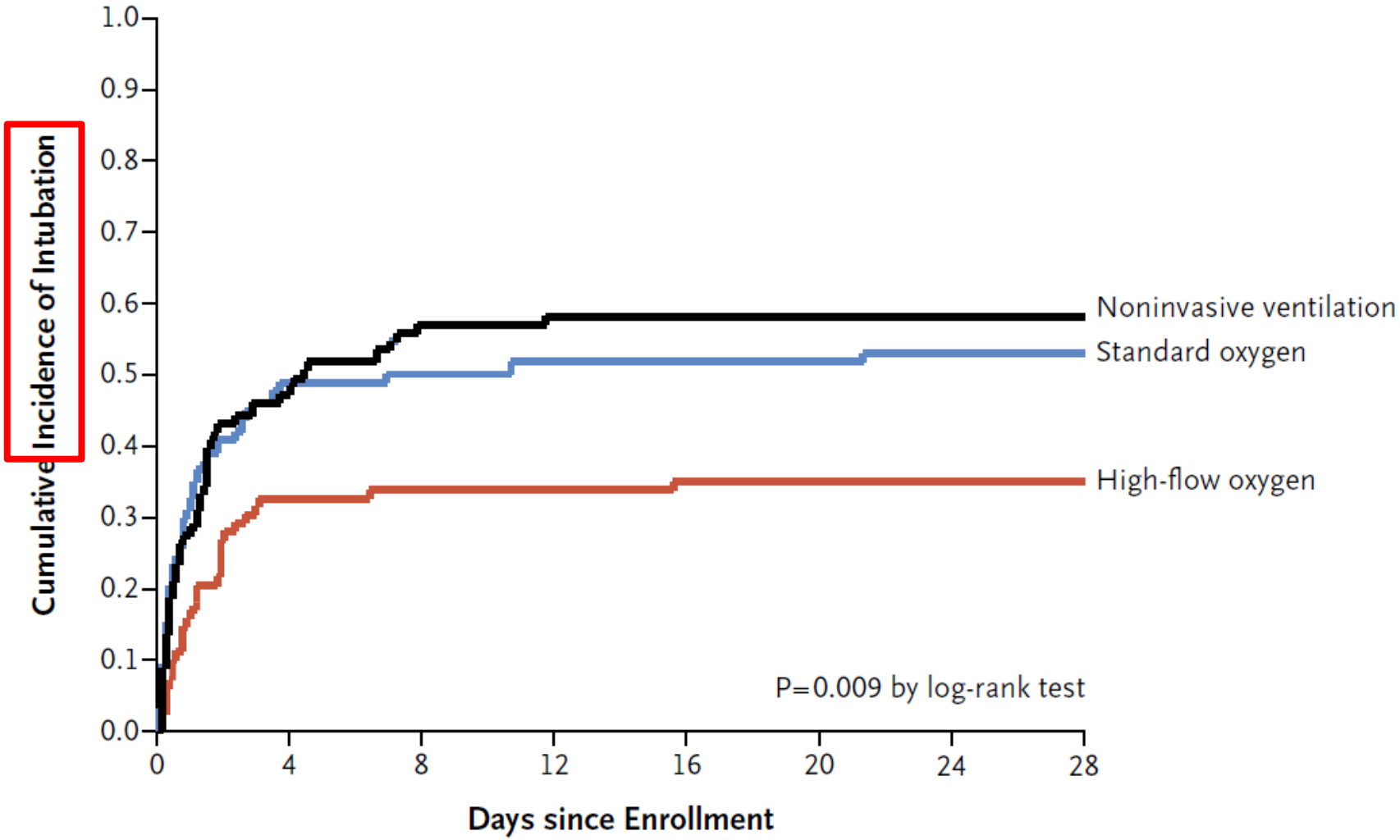


A **Overall Population**

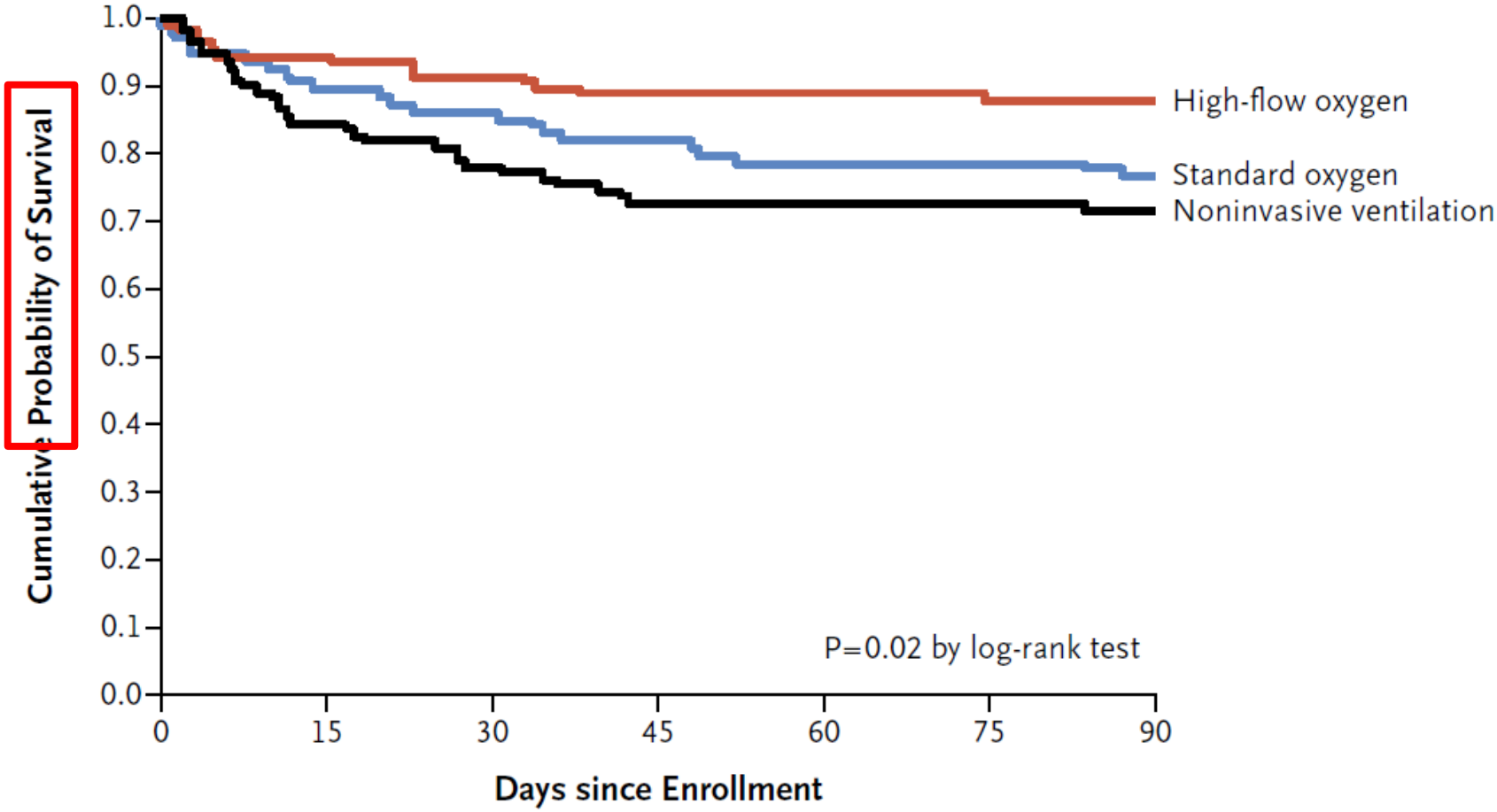


No. at Risk								
High-flow oxygen	106	68	67	67	65	65	65	65
Standard oxygen	94	52	50	49	49	49	48	48
Noninvasive ventilation	110	64	57	53	53	53	53	52

B Patients with a Pao_2:FIO_2 ≤200 mm Hg



No. at Risk								
High-flow oxygen	83	55	54	54	53	53	53	53
Standard oxygen	74	37	35	34	34	34	33	33
Noninvasive ventilation	81	41	34	32	32	32	32	32



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.

srlf
SOCIÉTÉ
DE RÉANIMATION
DE LANGUE FRANÇAISE

réanimation 2017
PARIS 11-13 JANVIER

Jeu 12 Janvier

17:55 - 18:35 | Il faut utiliser la VNI dans l'insuffisance respiratoire aiguë hypoxémique de novo

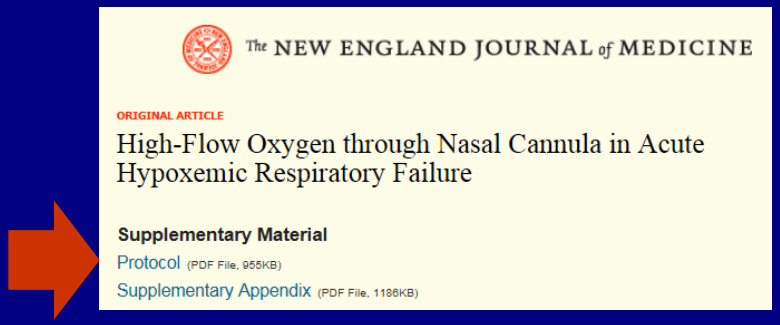
Controverse

Modérateur(s) : Alain Cariou *(Paris)*, Salvatore Maggiore *(Chieti)*

17:55 **Pour**
Gilles Hilbert *(Bordeaux)*

18:10 **Contre**
Jean-Pierre Frat *(Poitiers)*

CRITÈRES D'INTUBATION


The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

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

Supplementary Material

Protocol (PDF File, 955KB)

Supplementary Appendix (PDF File, 1186KB)

Critères d'intubation trachéale et ventilation invasive
(un seul critère est suffisant)

- défaillance respiratoire* : signes de détresse respiratoire persistant ou se majorant après traitement, FR >40/min, pH <7,35, encombrement bronchique, SpO_2 <90% plus de 5 minutes non expliquée par des problèmes techniques, dépendance de la VNI >12heures,
- défaillance hémodynamique : PAS <90 mmHg, PAM <65 mmHg *ou* amines vasopressives,
- défaillance neurologique : troubles de la conscience (score de Glasgow<12) ou agitation,
- intolérance VNI,

* en cas de défaillance respiratoire isolée, la stratégie VNI/OHD peut être appliquée dans les groupe OHD et O_2, selon le libre choix du médecin en charge du patient.

- **UN SEUL CRITÈRE EST SUFFISANT**
  - Défaillance respiratoire
    - * Détresse respiratoire persistant ou se majorant après traitement
    - * FR > 40/min * pH< 7,35 * **Encombrement bronchique**
    - *** SpO2 < 90% plus de 5 minutes * VNI > 12 heures**
  - Défaillance hémodynamique
    - PAS < 90 mmHg, PAM < 65 mmHg ou amines vasopressives
  - Défaillance neurologique * Troubles de la conscience ou agitation
  - **INTOLÉRANCE À LA VNI**

PROTOCOL

TRAINING

Pressure Support

PEEP

eTV

Interface

Monitoring

LEAKS

Reassurance

Expiratory Trigger

Ventilator

NIV Mode

Alarm limits

Pt/Ventil. Synchrony

Humidification

Pressurisation rate

New Mode ?

I. Trigger

Modest sedation ?

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ORIGINAL ARTICLE

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

Supplementary Material

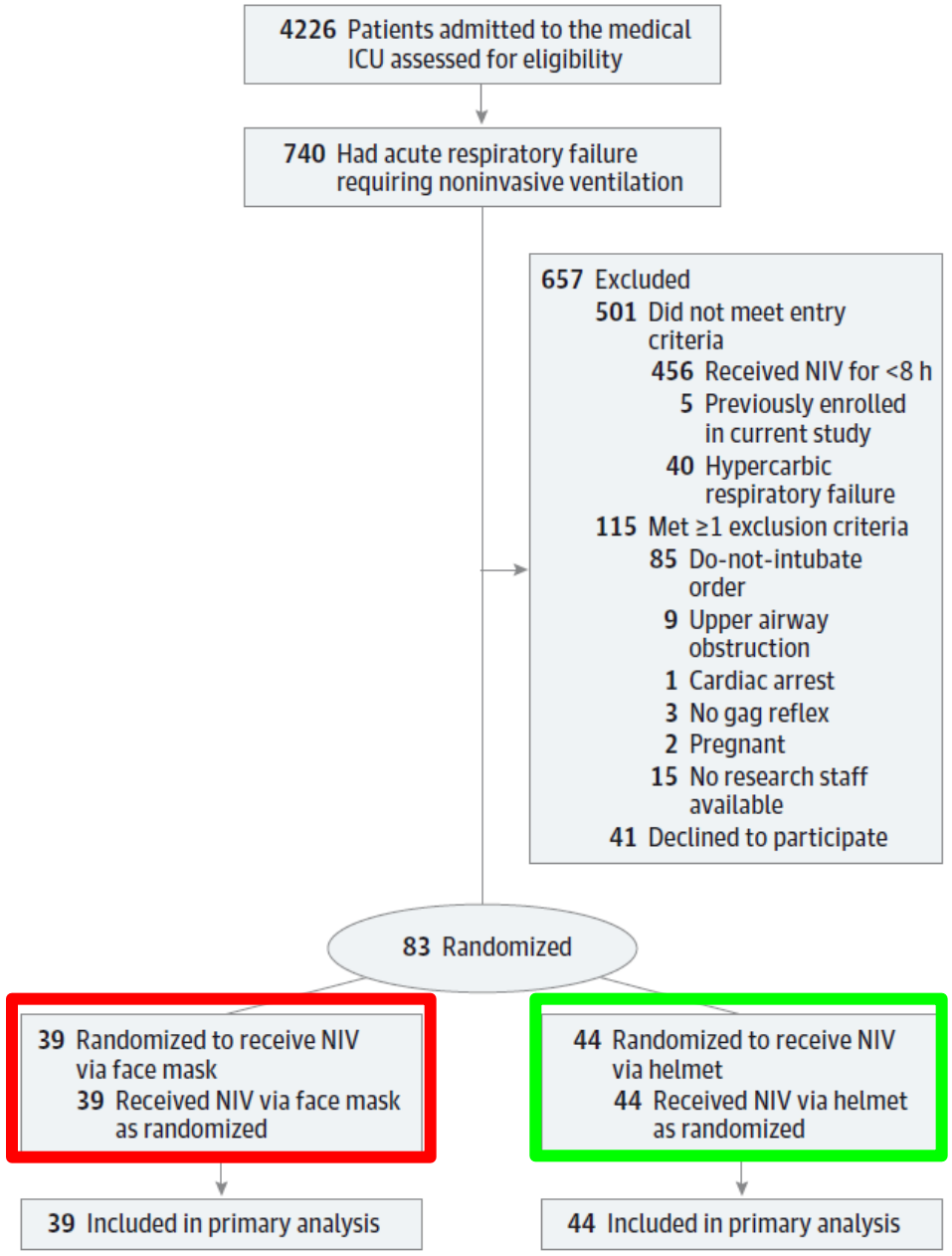
Protocol (PDF File, 955KB)

Supplementary Appendix (PDF File, 1186KB)

Table S2. Secondary Outcomes According to Study Group.

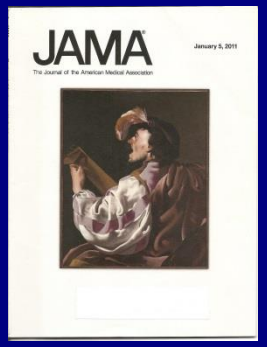
Outcomes	High-Flow Oxygen Group (N =106)	Standard Oxygen Group (N = 94)	NIV Group (N = 110)	P Value†
Septic shock – no. (%)	19 (17.9)	26 (27.7)	34 (30.9)	0.08
Nosocomial pneumonia – no. (%)	4 (3.8)	8 (8.5)	9 (8.2)	0.32
Hospital mortality in overall population – no. (%)	12 (11.3)	20 (21.3)	31 (28.2)	<0.01

Figure 1. Flow of Participants Through Study



Effect of Noninvasive Ventilation Delivered by Helmet vs Face Mask on the Rate of Endotracheal Intubation in Patients With Acute Respiratory Distress Syndrome
A Randomized Clinical Trial

Bhakti K. Patel



2016

	Face Mask (n = 39)	Helmet (n = 44)	Absolute Difference (95% CI)	*P* Value
Primary outcome, No. (%)				
Endotracheal intubation	24 (61.5)	8 (18.2)	−43.3 (−62.4 to −24.3)	<.001
Reason for intubation				
Respiratory failure	20 (83.3)	3 (37.5)	−45.3 (−82.5 to −9.1)	.01
Circulatory failure	3 (12.5)	0 (0)	−12.5 (−25.7 to 0.7)	.55
Neurologic failure	1 (4.2)	5 (62.5)	58.3 (24.8 to 92.8)	.001

Effect of Noninvasive Ventilation Delivered by Helmet vs Face Mask on the Rate of Endotracheal Intubation in Patients With Acute Respiratory Distress Syndrome
A Randomized Clinical Trial

Bhakti K. Patel

2016

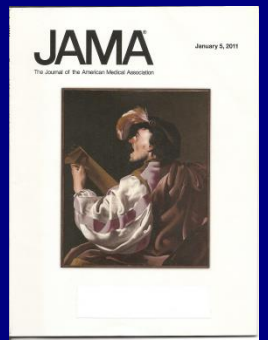
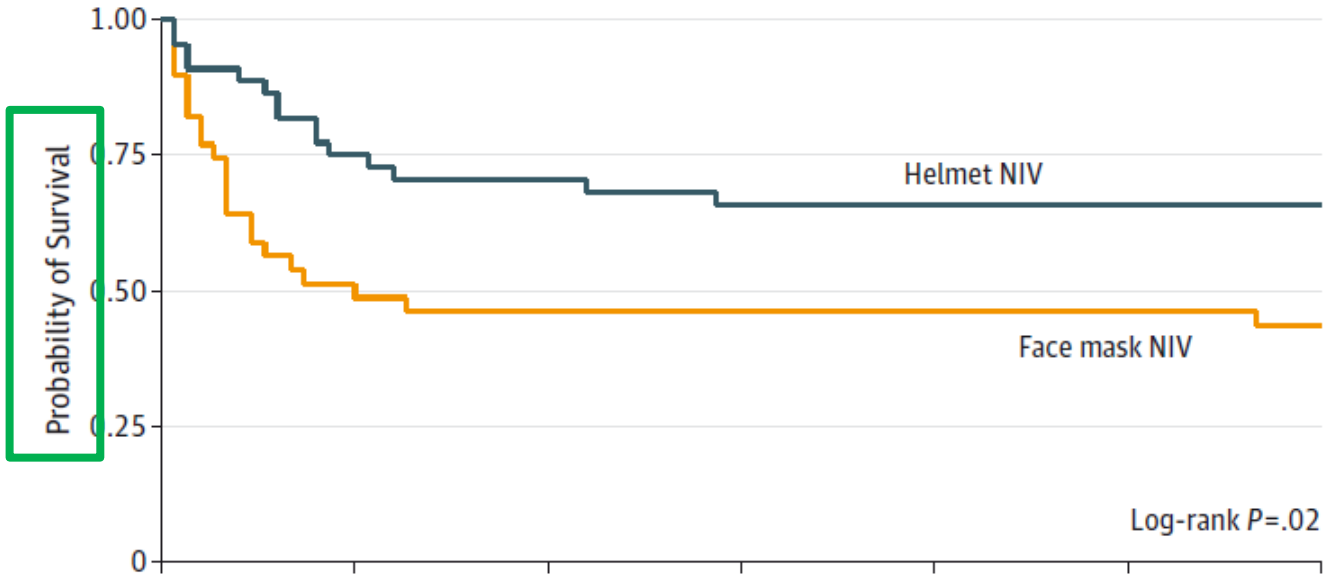


Figure 2. Probability of Survival From Randomization to Day 90

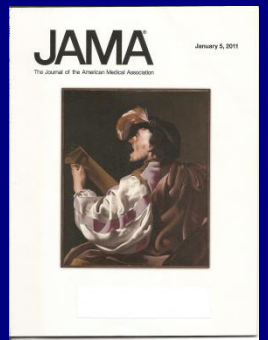


No. at risk							
Face mask	39	20	18	18	18	18	17
Helmet	44	33	31	29	29	29	29

Effect of Noninvasive Ventilation Delivered by Helmet vs Face Mask on the Rate of Endotracheal Intubation in Patients With Acute Respiratory Distress Syndrome
A Randomized Clinical Trial

Bhakti K. Patel

2016



VNI - *INSUFFISANCE RESPIRATOIRE HYPOXÉMIQUE*

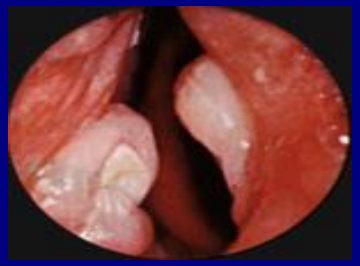
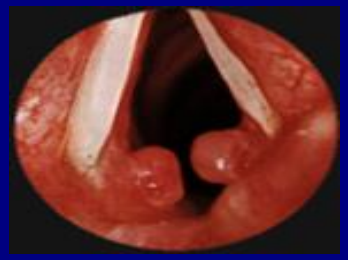
- **IMMUNODÉPRIMÉS**

D'OÙ VENONS-NOUS ?

OÙ EN SOMMES-NOUS ?

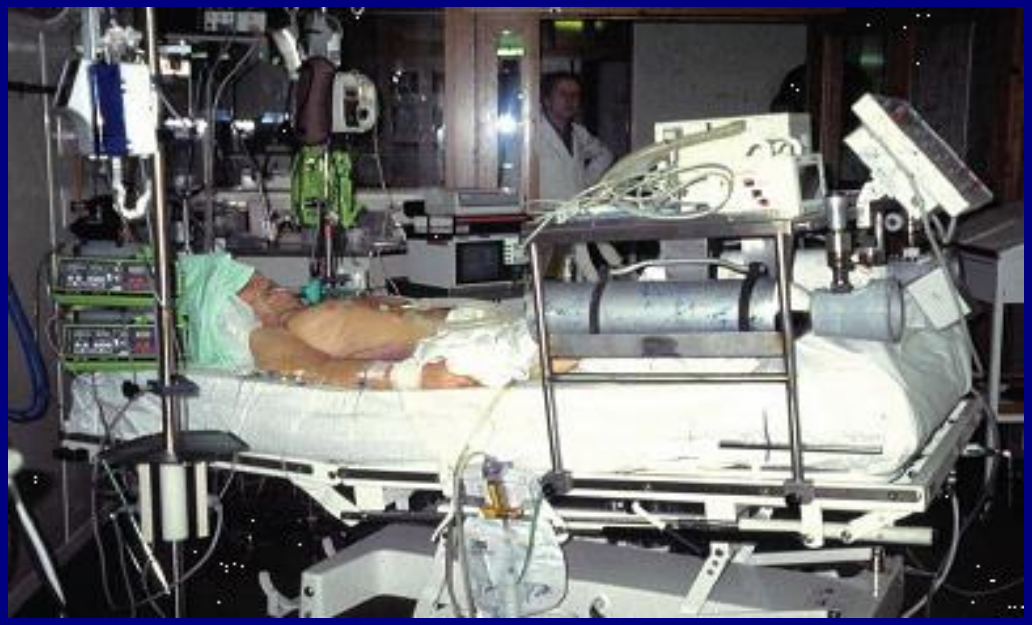
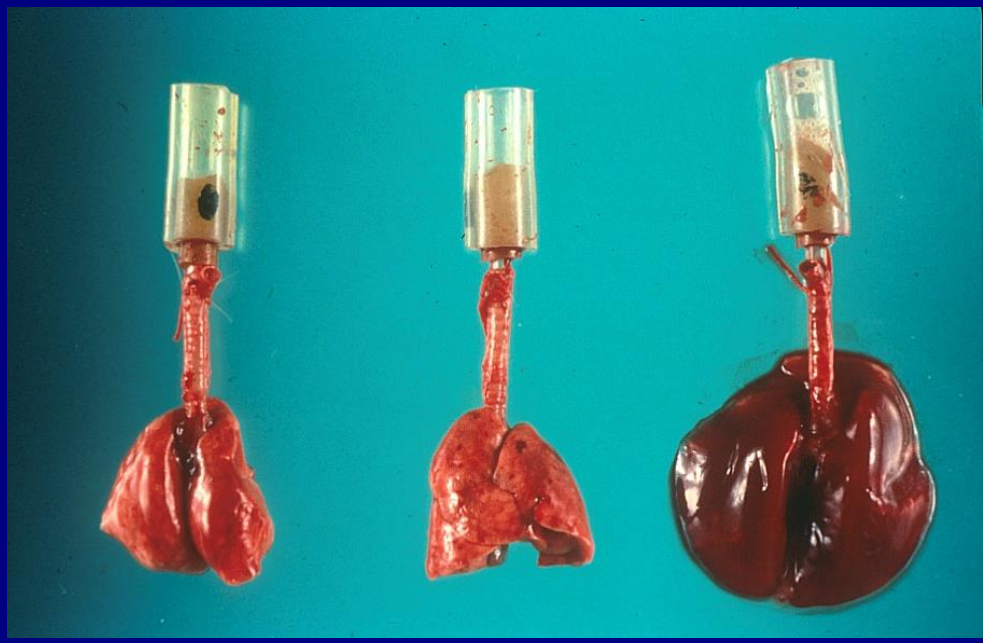
OÙ ALLONS-NOUS ?

IRA, surtout chez l'Immunodéprimé


EVITER L'INTUBATION

OBJECTIF MAJEUR !

NIV / IMMUNOSUPPRESSED PATIENTS

STUDIES * = R.C.T	n	Particularities	Mask	Mode	SUCCESS
		AIDS (Pneumocystis)			
Bedos *CCM 1999*	66		F	CPAP	66 %
Confalonieri *ICM 2002*	48	intubation criteria	F	PS/PEEP	67 %
		HEMATOLOGICAL			
Tognet *Clin I C 1994*	18		N F	PS/PEEP	33 %
Conti *ICM 1998*	16	intubation criteria	N	PS/PEEP	69 %
Depuydt *Chest 2001*	26	intubation criteria	F	CPAP PS/PEEP	31 %
Hilbert *CCM 2000*	64	Neutropenia	F	CPAP	25 %
Azoulay *CCM 2001*	48	CANCER	F	PS/PEEP	44 %
Azoulay *Medicine 2004*	79	CANCER (++ Hemato)	F	PS/PEEP	43 %
Hilbert * *NEJM 2001*	52	HEMATO-Neutropenia Drug→Isup. AIDS	F	PS/PEEP	54 % (vs 23%)
Rocco *Chest 2004*	38	Hem. SolidOT. AIDS	F/Helmet	PS/PEEP	58 %

NONINVASIVE VENTILATION in IMMUNOSUPPRESSED PATIENTS with PULMONARY INFILTRATES, FEVER, and ACUTE RESPIRATORY FAILURE.

HILBERT G, GRUSON D, VARGAS F, et al. 2001

The NEW ENGLAND JOURNAL of MEDICINE

* **NEUTROPÉNIE ↔ HÉMOPATHIE MALIGNE**
* **IMMUNOSUPPRESEURS**
* **SIDA**

	VNI (n = 26)	**Traitement Standard** (n = 26)
PaO_2 / FiO_2	**141** ± 24	**136** ± 23
FR	**35** ± 3	**36** ± 3

	NIV	Standard treatment	p
Intubation - no./total no.(%)	12/26 (**46**)	20/26 (**77**)	**0.03**
Hematological malignancy	8/15 (**53**)	14/15 (**93**)	**0.02**
Drug-Immunosuppression	3/9 (**33**)	5/9 (**56**)	0.32
AIDS	1/2 (50)	1/2 (50)	0.83
Complications- no. (%)	13 (**50**)	21 (**81**)	**0.02**
Complications → ICU death	10 (**38**)	18 (**69**)	**0.03**
V.A.P. / Sinusitis -no. (%)	3 (**12**)	9 (**35**)	**0.05**
ICU Deaths - no./total no.(%)	10/26 (**38**)	18/26 (**69**)	**0.03**
Hematological malignancy	7/15 (**47**)	13/15 (**87**)	**0.02**
Hospital Deaths -no./tot.no. (%)	13/26 (**50**)	21/26 (**81**)	**0.02**
Hematological malignancy	8/15 (**53**)	14/15 (**93**)	**0.02**

American Thoracic Society Documents

Guidelines for the Management of Adults with Hospital-acquired, Ventilator-associated, and Healthcare-associated Pneumonia

2005

Noninvasive ventilation should be used whenever possible in selected patients with respiratory failure (**Level I**)

NONINVASIVE VENTILATION FOR ACUTE EXACERBATIONS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

LAURENT BROCHARD, M.D., JORDI MANCEBO, M.D., MARC WYSOCKI, M.D., FRÉDÉRIC LOFASO, M.D., GIORGIO CONTI, M.D., ALAIN RAUSS, M.D., GÉRALD SIMONNEAU, M.D., SALVADOR BENITO, M.D., ALESSANDRO GASPARETTO, M.D., FRANÇOIS LEMAIRE, M.D., DANIEL ISABEY, PH.D., AND ALAIN HARF, M.D.

1995

The NEW ENGLAND JOURNAL of MEDICINE

A COMPARISON OF NONINVASIVE POSITIVE-PRESSURE VENTILATION AND CONVENTIONAL MECHANICAL VENTILATION IN PATIENTS WITH ACUTE RESPIRATORY FAILURE

MASSIMO ANTONELLI, M.D., GIORGIO CONTI, M.D., MONICA ROCCO, M.D., MAURIZIO BUFI, M.D., ROBERTO ALBERTO DE BLASI, M.D., GABRIELLA VIVINO, M.D., ALESSANDRO GASPARETTO, M.D., AND GIANFRANCO UMBERTO MEDURI, M.D.

1998

The NEW ENGLAND JOURNAL of MEDICINE

NONINVASIVE VENTILATION IN IMMUNOSUPPRESSED PATIENTS WITH PULMONARY INFILTRATES, FEVER, AND ACUTE RESPIRATORY FAILURE

GILLES HILBERT, M.D., DIDIER GRUSON, M.D., FRÉDERIC VARGAS, M.D., RUDDY VALENTINO, M.D., GEORGES GBIKPI-BENISSAN, M.D., MICHEL DUPON, M.D., JOSY REIFFERS, M.D., AND JEAN P. CARDINAUD, M.D.

2001

The NEW ENGLAND JOURNAL of MEDICINE

Early CPAP prevents evolution of acute lung injury in patients with hematologic malignancy

Vincenzo Squadrone

2010

INTENSIVE CARE MEDICINE

	Control ($n = 20$)	CPAP ($n = 20$)	Relative risk (95% CI)	P value
Intubation and invasive ventilation at ICU entry (no.)	8	2	0.5 (0.29–0.85)	0.03
Noninvasive ventilation at ICU entry (no.)	8	2	0.5 (0.29–0.85)	0.03
Failure on noninvasive ventilation requiring intubation (no.)	5	0	0.42 (0.29–0.63)	0.017

CPAP : Helmet

cPAP pour prévenir l'évolution vers l'IRA !!

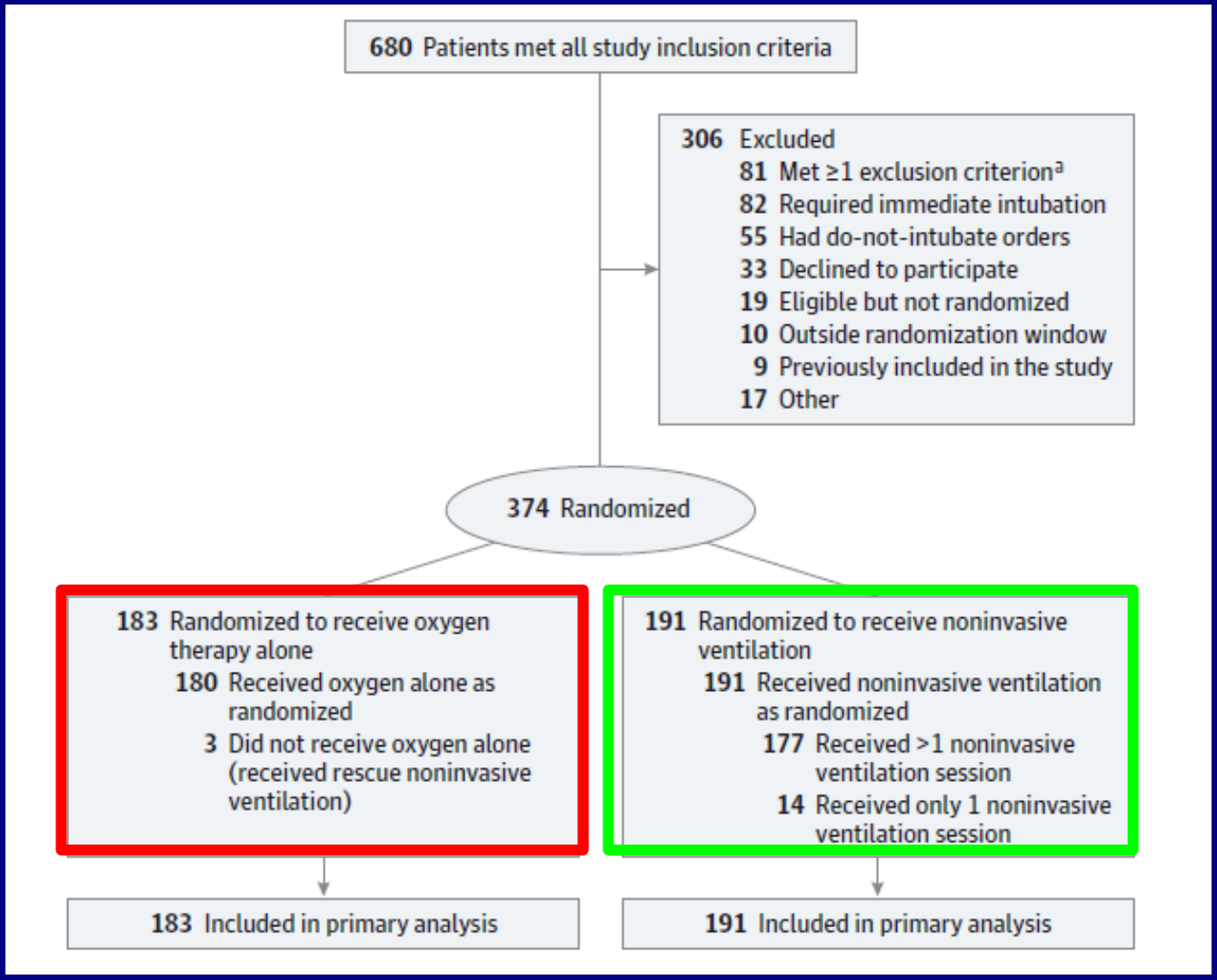
Effect of Noninvasive Ventilation vs Oxygen Therapy on Mortality Among Immunocompromised Patients With Acute Respiratory Failure

A Randomized Clinical Trial

Virginie Lemiale,

JAMA®
The Journal of the American Medical Association

2015



Acute hypoxemic respiratory failure :

PaO2 <60 mm Hg

on room air.

+

or tachypnea > 30/min

or labored breathing

or respiratory distress

or dyspnea at rest

Table 3. Primary and Secondary End Points

	Oxygen Alone (n = 183)	Noninvasive Ventilation (n = 191)	Absolute Difference (95% CI)	*P* Value
Primary End Point				
All cause 28-d mortality, No. (%)	50 (27.3)	46 (24.1)	−3.2 (−12.1 to 5.6)	.47
Secondary End Points				
Need for invasive mechanical ventilation, No. (%)	82 (44.8)	73 (38.2)	−6.6 (−16.6 to 3.4)	.20
SOFA on day 3, median (IQR)	4 (2-6)	4 (2-5)	−0.5 (−1.2 to 0.3)	.17
ICU-acquired infection, No. (%)	46 (25.1)	48 (25.1)	0 (−8.8 to 8.8)	.99
Length of ICU stay, median (IQR), d	7 (3-16)	6 (3-16)	−0.3 (−3.2 to 2.6)	.55
Duration of mechanical ventilation, median (IQR), d	14 (6-33)	17 (6-38)	0.3 (−5.7 to 6.3)	.70
Length of hospital stay, median (IQR), d	22 (14-42)	24 (12-43)	0.3 (−5 to 5.5)	.99
Mortality at 6 mo, No. (%)[a]	82/181 (45.3)	72/182 (39.6)	−5.7 (−16.4 to 3.9)	.23
Good performance status in 6-mo survivors, No. (%)[b]	70/75 (93.3)	85/91 (93.4)	−0.1 (−7.7 to 7.5)	.98

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

Virginie Lemiale,

2015

JAMA®
The Journal of the American Medical Association

WHAT'S NEW IN INTENSIVE CARE

My paper 20 years later: NIV in immunocompromized patients

Gilles Hilbert[1,2*] and Frédéric Vargas[1,2]

INTENSIVE CARE MEDICINE

2018

NONINVASIVE VENTILATION IN IMMUNOSUPPRESSED PATIENTS WITH PULMONARY INFILTRATES, FEVER, AND ACUTE RESPIRATORY FAILURE

GILLES HILBERT, M.D., DIDIER GRUSON, M.D., FRÉDERIC VARGAS, M.D., RUDDY VALENTINO, M.D., GEORGES GBIKPI-BENISSAN, M.D., MICHEL DUPON, M.D., JOSY REIFFERS, M.D., AND JEAN P. CARDINAUD, M.D.

The NEW ENGLAND JOURNAL of MEDICINE

2001

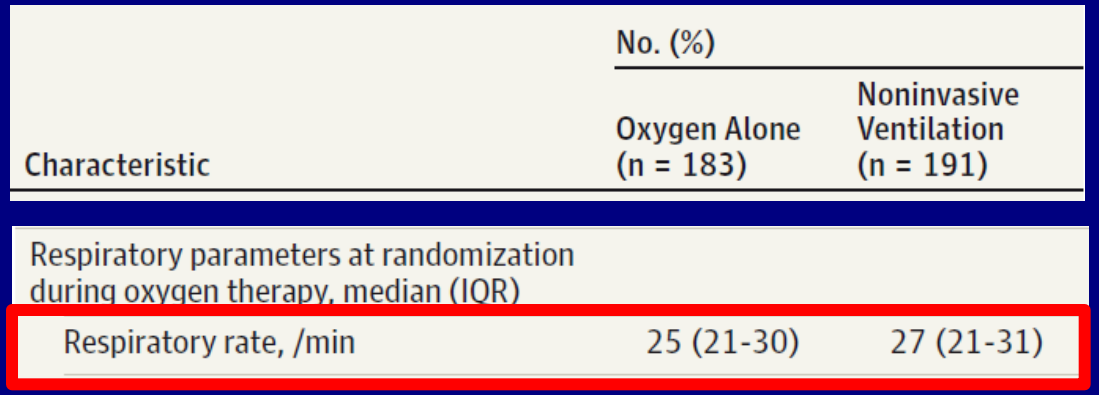
Effect of Noninvasive Ventilation vs Oxygen Therapy on Mortality Among Immunocompromised Patients With Acute Respiratory Failure
A Randomized Clinical Trial

Virginie Lemiale,

2015

JAMA The Journal of the American Medical Association

Characteristic	No. (%) Oxygen Alone (n = 183)	Noninvasive Ventilation (n = 191)
Age, median (IQR), y	64 (53-72)	61 (52-70)
Men	105 (57.4)	117 (61.3)
Underlying conditions	155 (84.7)	162 (84.8)
Cancer		
Hematologic malignancies	113 (61.7)	125 (65.4)
Solid tumors	42 (23.0)	37 (19.4)
Immunosuppressive drugs	28 (15.3)	29 (15.2)
For non-transplant-related reasons	17 (9.3)	16 (8.4)
After solid organ transplantation	11 (6.0)	13 (6.8)
Chemotherapy at admission	84/155 (54.2)	86/162 (53.1)
Chronic hematologic malignancy	35/155 (22.6)	39/162 (24.1)
Allogeneic stem cell transplantation	29/155 (18.7)	26/162 (16.1)
Remission of the malignancy	19/155 (12.3)	18/162 (11.1)
Comorbidities[a]		
Chronic respiratory insufficiency[b]	12 (6.6)	18 (9.4)
Chronic kidney insufficiency	20 (10.9)	19 (9.9)
Chronic heart insufficiency	10 (5.5)	16 (8.4)
Oxygen flow at ICU admission, median (IQR), L/min	9 (6-15)	8 (6-15)
Time since respiratory symptom onset, median (IQR), d	1 (0-2)	1 (0-2)
Treatment before ICU admission		
Noninvasive ventilation	16 (8.7)	10 (5.2)
Diuretics	47 (25.8)	31 (16.2)
Aerosolized agents	26 (14.3)	19 (9.9)
Anti-infectious agents	138 (75.4)	123 (64.4)
Respiratory parameters at randomization during oxygen therapy, median (IQR)		
Respiratory rate, /min	25 (21-30)	27 (21-31)
Oxygen saturation (Spo_2), %	96 (4-98)	96 (94-98)
Oxygen flow, L/min	9 (6-15)	9 (5-15)
Pao_2:Fio_2 ratio, mm Hg[c]	130 (86-205)	156 (95-248)
SOFA score at randomization, median (IQR)[d]	5 (3-7)	5 (3-7)



Characteristic	No. (%) Oxygen Alone (n = 183)	Noninvasive Ventilation (n = 191)
Respiratory parameters at randomization during oxygen therapy, median (IQR)		
Respiratory rate, /min	25 (21-30)	27 (21-31)

the patients enrolled in the earlier trials by Hilbert et al[8] and Antonelli et al[5] had greater degrees of tachypnea compared with patients in the current study (upper respiratory rate, 35-38/min vs 25/min), suggesting a greater severity of respiratory failure in the previous trials.

unlike the earlier studies of noninvasive ventilation in acute hypoxemic respiratory failure,[5,8] Lemiale et al did not report a severity of illness score (eg, Simplified Acute Physiology Score)

Given the much higher respiratory rates and higher mortality in the earlier trials, it may be that the patients in this current trial had lower acuity of illness.

EDITORIAL

Bhakti K. Patel

John P. Kress

JAMA®
The Journal of the American Medical Association

Official ERS/ATS clinical practice guidelines: noninvasive ventilation for acute respiratory failure

Eur Respir J 2017

Pooled analysis of relevant studies demonstrated that **NIV use** led to a **decrease** in:

Mortality (RR 0.68, 95% CI 0.53–0.88; moderate certainty)

Need for intubation (RR 0.71, 95% CI 0.58–0.87; moderate certainty) and

Rates of nosocomial pneumonia (RR 0.39, 95% CI 0.20–0.76; low certainty)

in **immunocompromised patients**

The guideline committee suggested early NIV for immunocompromised patients with ARF

VNI : Etat des lieux,
Controverses, Perspectives

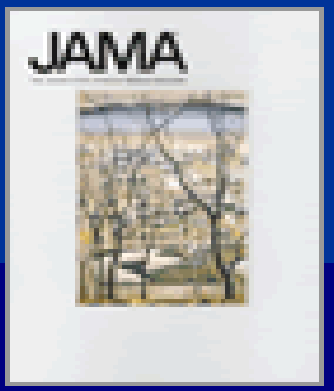
POST-OPÉRATOIRE

D'OÙ
VENONS-NOUS ?

OÙ EN
SOMMES-NOUS ?

OÙ
ALLONS-NOUS ?

Noninvasive Ventilation for treatment of acute respiratory failure in patients undergoing solid organ transplantation. Antonelli M. 2000



VNI : Masque FACIAL – AI-PEP

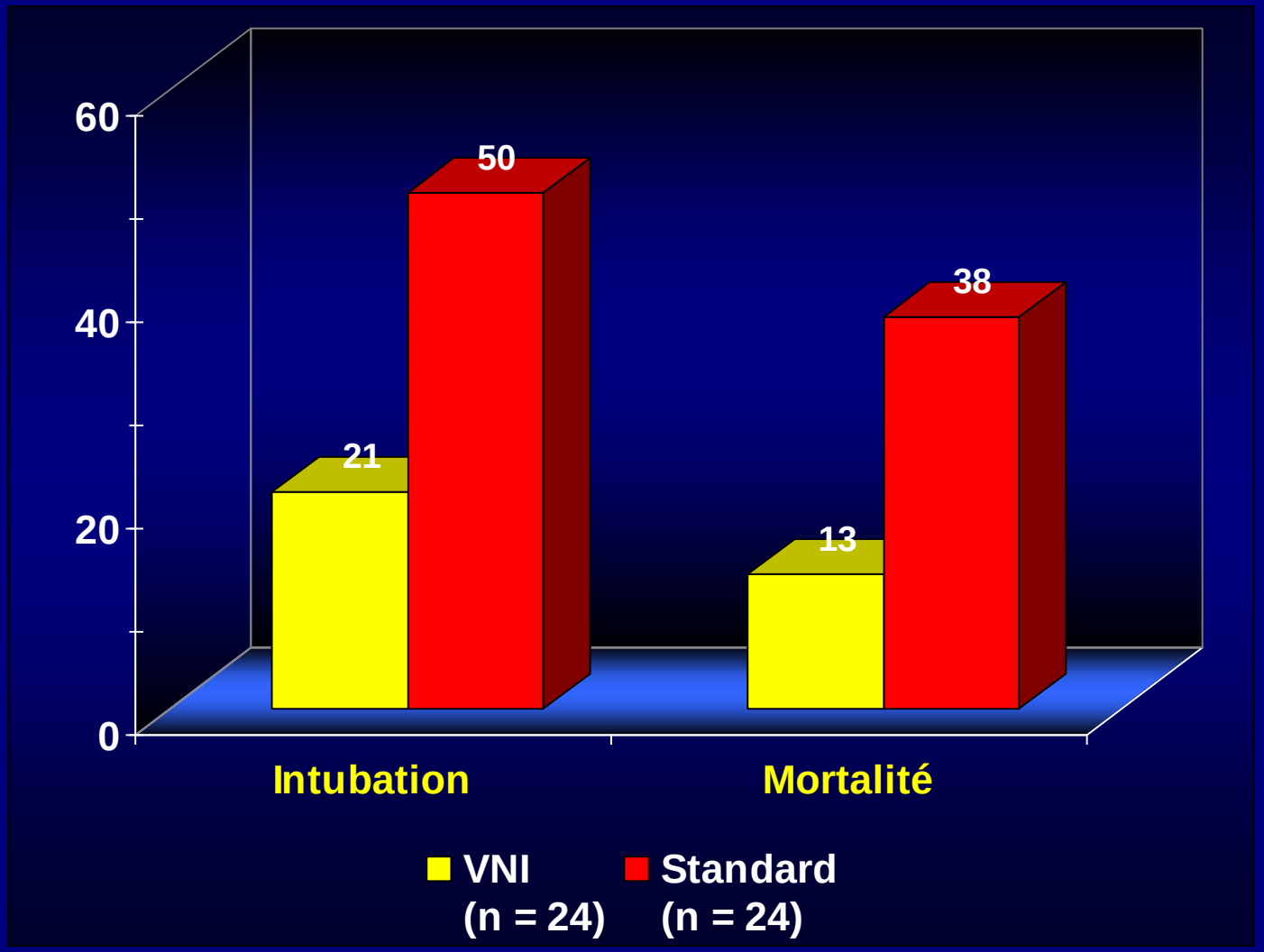
≥ 24 H. : MODE CONTINUU

	VNI (n = 20)	Traitement Standard (n = 20)	p
Intubation	4 : **20** %	14 : **70** %	0.002
Ventilation (Jours)	**4** ± 5	**5** ± 6	0.58
Après Intubation : **Complications → Décès Réa**	4 : **20** %	10 : **50** %	0.05
Séjour Réa. (Jours)	**7** ± 5	**10** ± 6	0.18
Séjour Réa. – Survivants (J.)	**5** ± 3	**9** ± 4	**0.03**
Décès Réa.	4 : **20** %	10 : **50** %	0.05

Noninvasive Ventilation Reduces Mortality in Acute Respiratory Failure following Lung Resection

IGOR AURIANT, ANNE JALLOT, PHILIPPE HERVÉ, JACQUES CERRINA, FRANCOIS LE ROY LADURIE, JEAN LAMET FOURNIER, BERNARD LESCOT, and FRANCOIS PARQUIN

Am J Respir Crit Care Med Vol 164. pp 1231–1235, 2001



Masque nasal

Ventilateur BiPAP S/T-D

Consensus commune

organisée conjointement par
la SFAR, la SPLF et la SRLF

Ventilation Non Invasive
au cours de l'insuffisance respiratoire aiguë (nouveau-né exclu)

Avec la participation de la SFMU,
du SAMU de France,
du GFRUP
et de l'ADARPEF

RÉSUMÉ

Tableau 2 – Niveaux de reccommandation pour les indications de la VNI

Intérêt non établi de façon certaine Il faut probablement faire (G2+)	Post-opératoire de chirurgie thoracique et abdominale

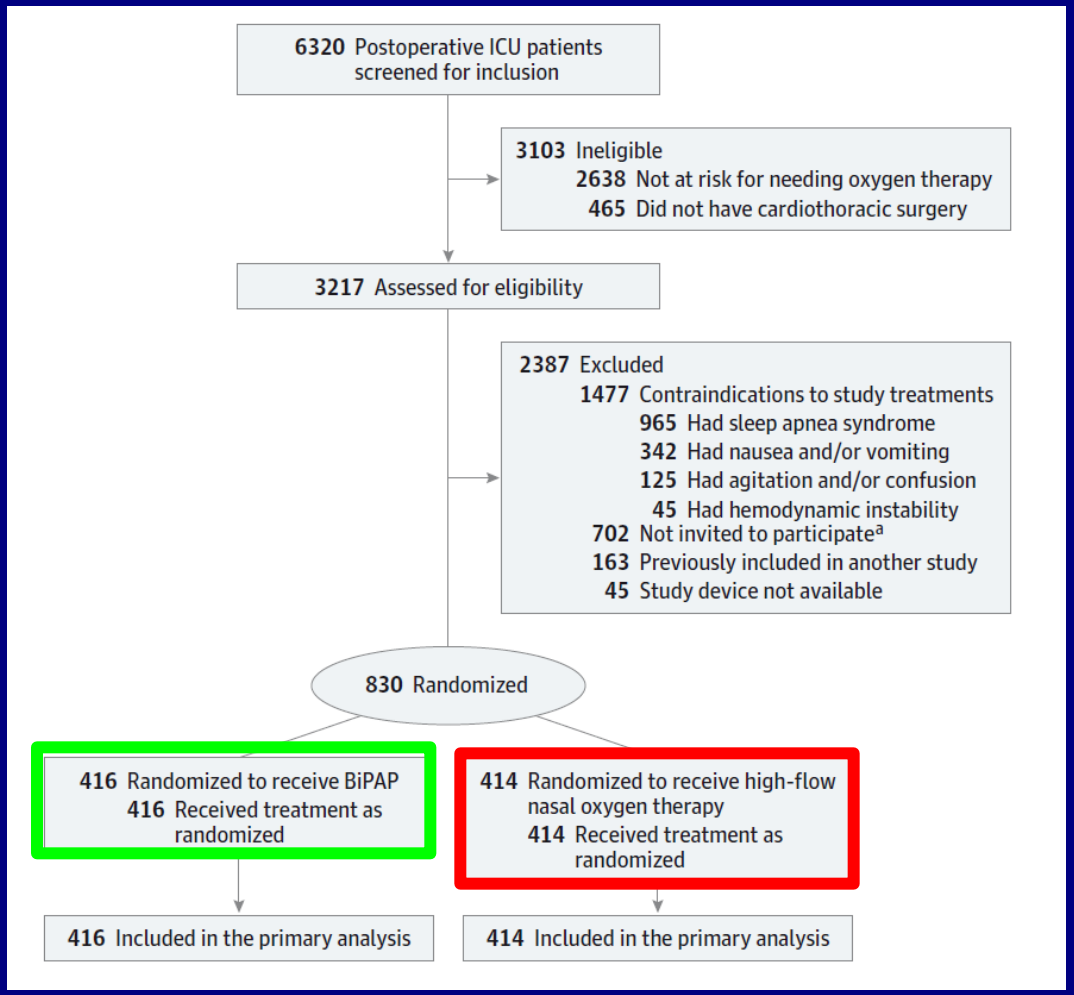
High-Flow Nasal Oxygen vs Noninvasive Positive Airway Pressure in Hypoxemic Patients After Cardiothoracic Surgery

A Randomized Clinical Trial

François Stéphan

2015

OBJECTIVE To determine whether high-flow nasal oxygen therapy was not inferior to BiPAP for preventing or resolving acute respiratory failure after cardiothoracic surgery.



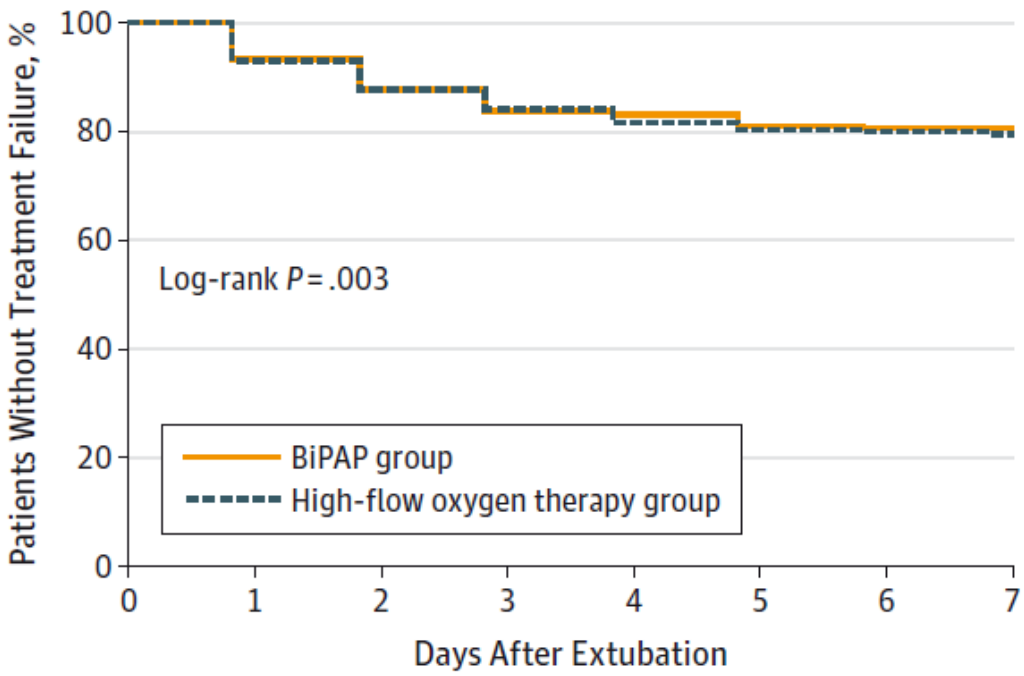
High-Flow Nasal Oxygen vs Noninvasive Positive Airway Pressure in Hypoxemic Patients After Cardiothoracic Surgery

A Randomized Clinical Trial

François Stéphan

2015

Figure 2. Postoperative Patients Without Treatment Failure After Extubation



No. at risk								
BiPAP	416	385	363	348	339	333	331	329
High-flow oxygen therapy	414	385	361	346	342	334	333	331

High-Flow Nasal Oxygen vs Noninvasive Positive Airway Pressure in Hypoxemic Patients After Cardiothoracic Surgery

A Randomized Clinical Trial

François Stéphan

2015

Table 2. Physiologic Variables and Subjective Effect on Dyspnea at Baseline (Before Any Study Intervention), After 1 Hour, and After 6-12 Hours

	Mean (95% CI)							
	Baseline		1 Hour			6-12 Hours		
Parameters	BiPAP Group	HFNO Group	BiPAP Group	HFNO Group	*P* Value	BiPAP Group	HFNO Group	*P* Value
Pao_2:FIo_2	203 (195-212)	196 (187-204)	221 (213-230)[a]	184 (177-192)[b]	<.001	261 (248-274)[c]	198 (187-208)[c]	<.001
Respiratory rate, breaths/min	23.3 (22.6-24.0)	22.8 (22.1-23.5)	23.0 (22.3-23.7)	21.0 (20.4-21.7)[a]	<.001	22.5 (21.9-23.1)	21.6 (20.9-22.2)	.16

High-flow nasal oxygen therapy was not inferior to BiPAP

Dyspnea and comfort scores during the first 3 days were similar in both groups.

Pour PREVENIR L'EVOLUTION VERS L'IRA :

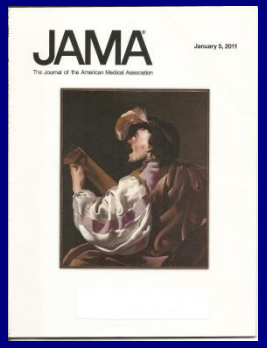
O2 HAUT DEBIT <==> VNI

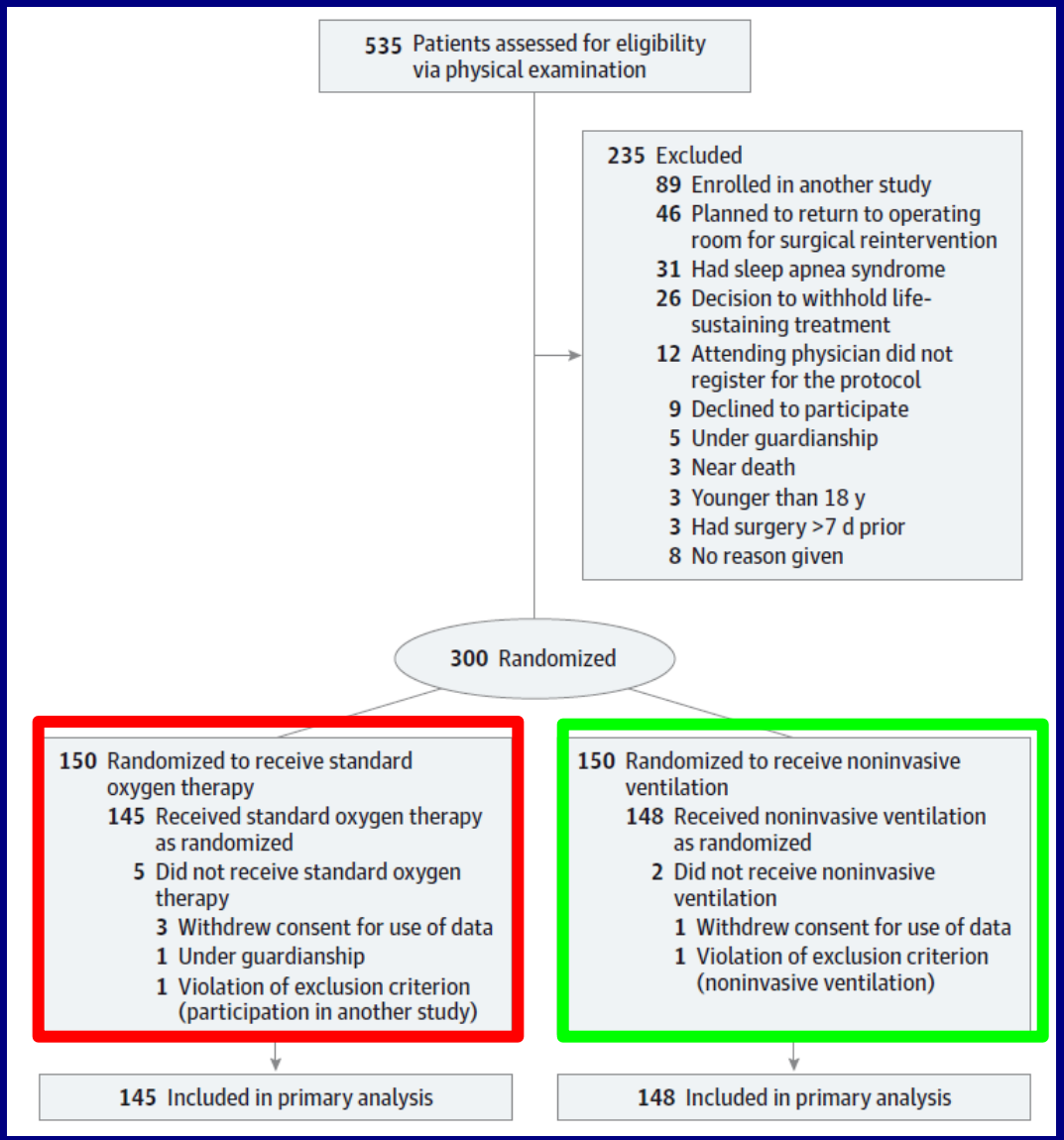
Effect of Noninvasive Ventilation on Tracheal Reintubation Among Patients With Hypoxemic Respiratory Failure Following Abdominal Surgery

A Randomized Clinical Trial

Samir Jaber

2016



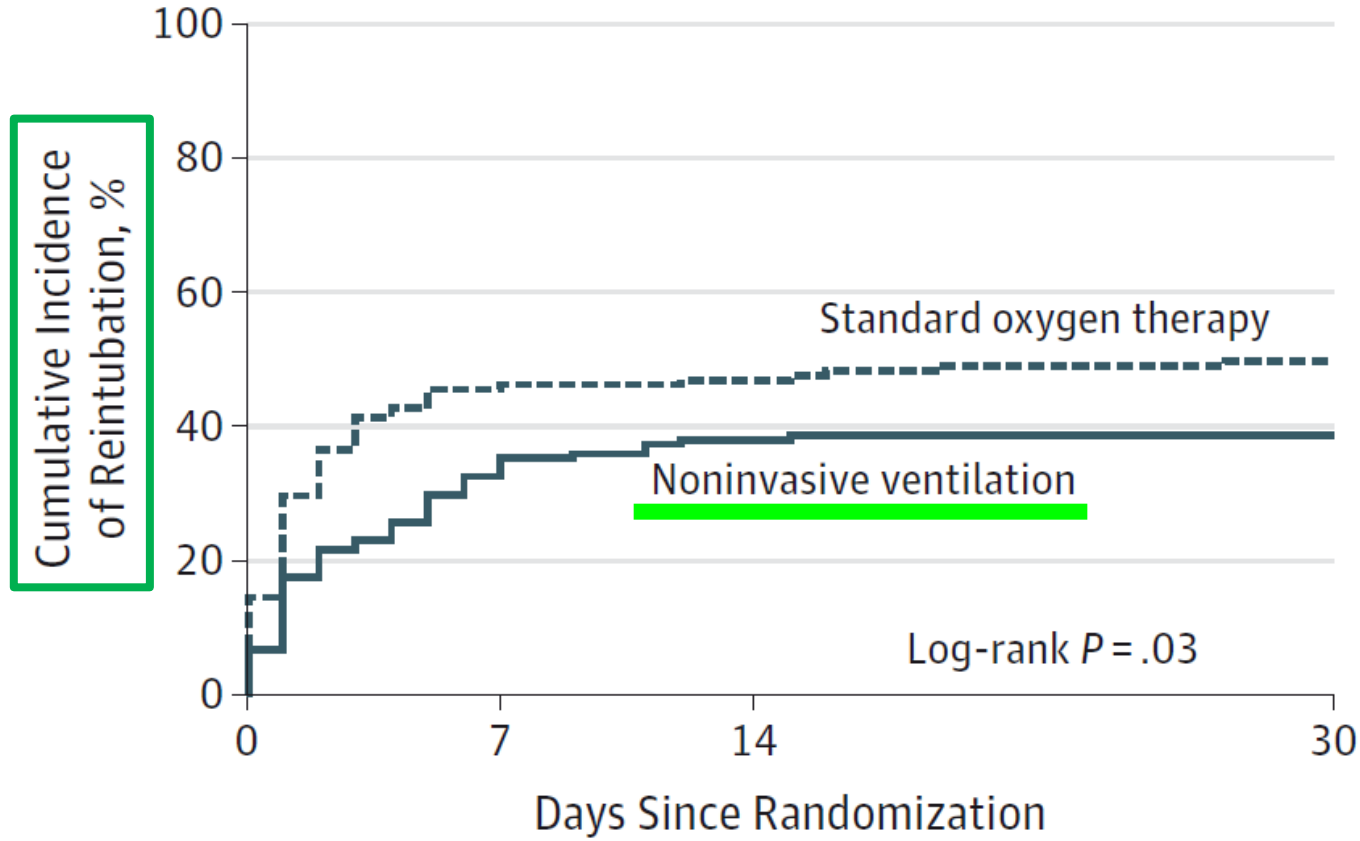


Effect of Noninvasive Ventilation on Tracheal Reintubation Among Patients With Hypoxemic Respiratory Failure Following Abdominal Surgery

A Randomized Clinical Trial

Samir Jaber

2016



No. at risk

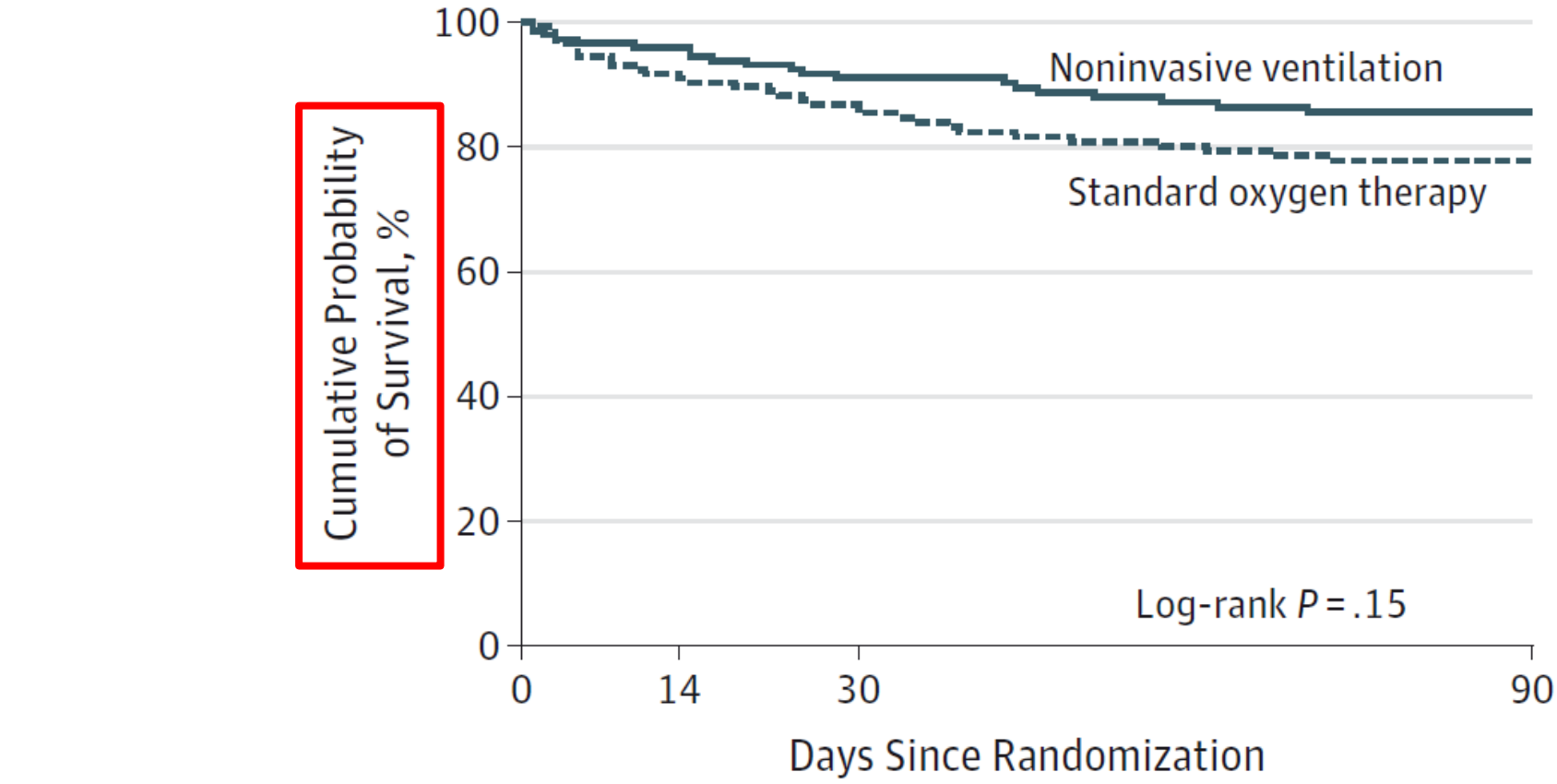
Standard oxygen therapy	145	79	76	71
Noninvasive ventilation	148	99	90	87

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

A Randomized Clinical Trial

Samir Jaber

2016



No. at risk

Standard oxygen therapy	145	132	125	102
Noninvasive ventilation	148	141	131	109

VNI : Etat des lieux,
Controverses, Perspectives

Préventive en

POST-EXTUBATION

D'OÙ
VENONS-NOUS ?

OÙ EN
SOMMES-NOUS ?

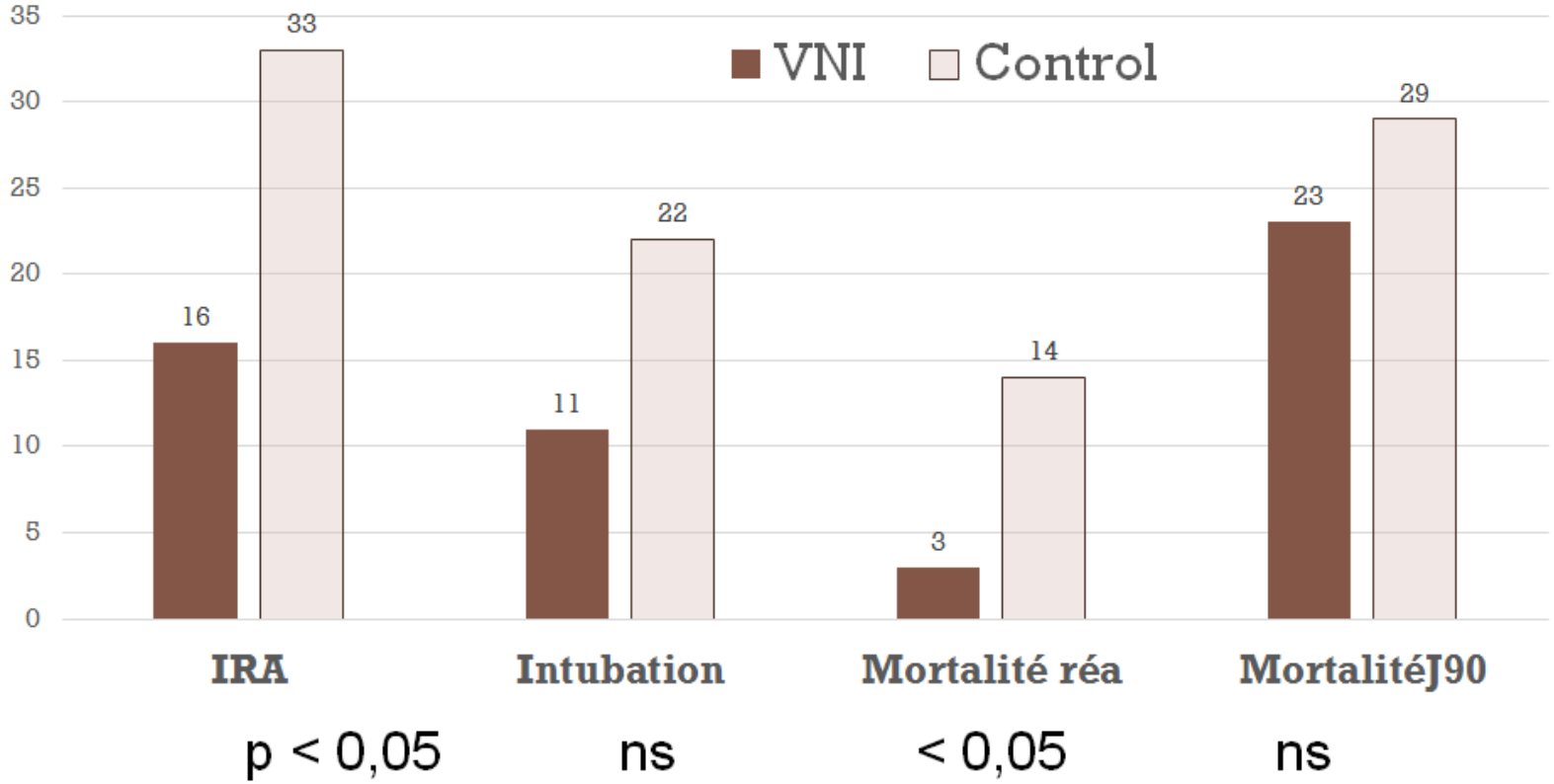
OÙ
ALLONS-NOUS ?

Early Noninvasive Ventilation Averts Extubation Failure in Patients at Risk

A Randomized Trial

2006

Miquel Ferrer, Mauricio Valencia, Josep Maria Nicolas, Oscar Bernadich, Joan Ramon Badia, and Antoni Torres



Age > 65 Ans, Cardiaque, SAPS II > 12

Consensus commune

RÉSUMÉ

organisée conjointement par
la SFAR, la SPLF et la SRLF

Ventilation Non Invasive
au cours de l'insuffisance respiratoire aiguë (nouveau-né exclu)

Avec la participation de la SFMU,
du SAMU de France,
du GFRUP
et de l'ADARPEF

Tableau 2 – Niveaux de reccommandation pour les indications de la VNI

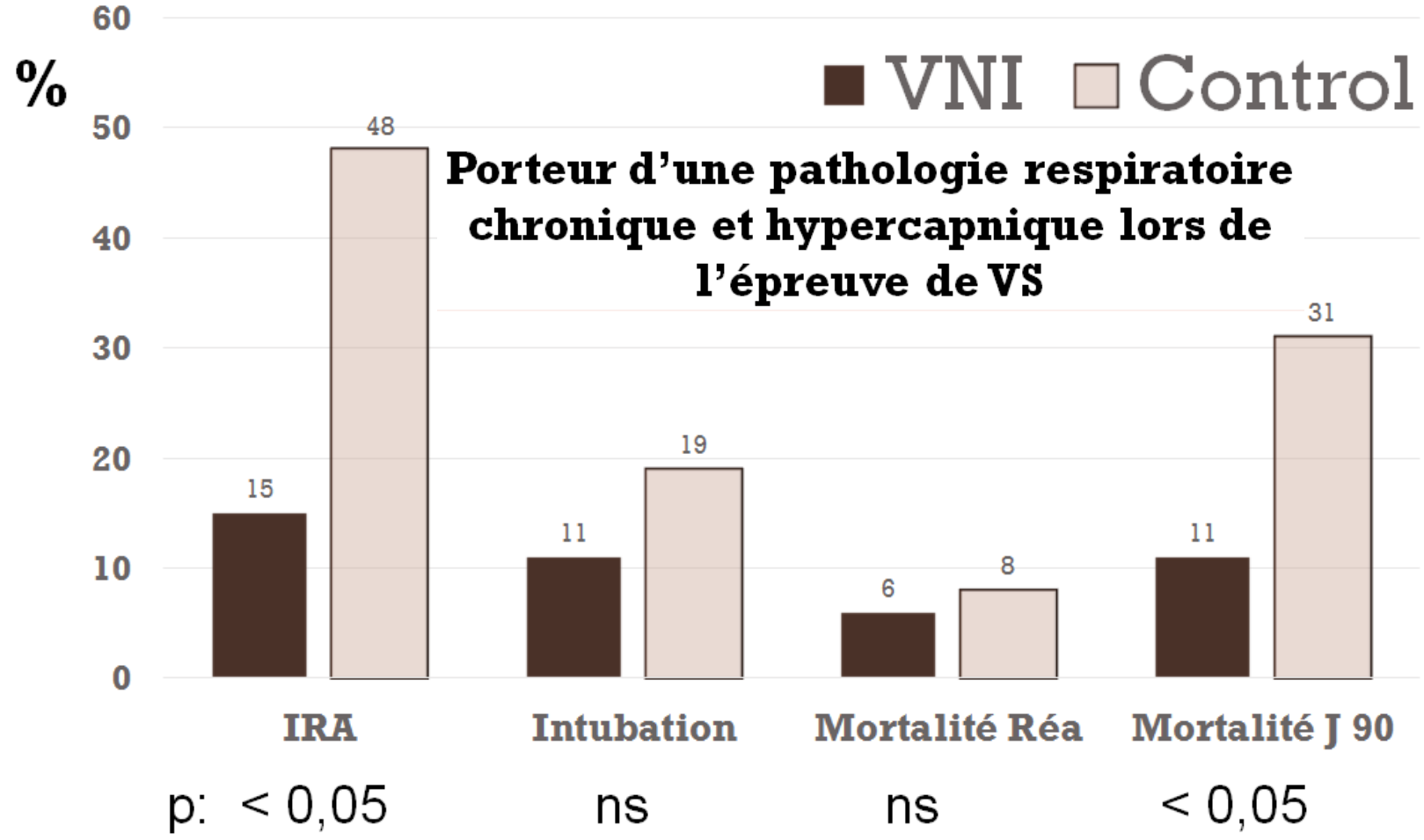
Intérêt non établi de façon certaine Il faut probablement faire (G2+)	Prévention d'une IRA post extubation

THE LANCET

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

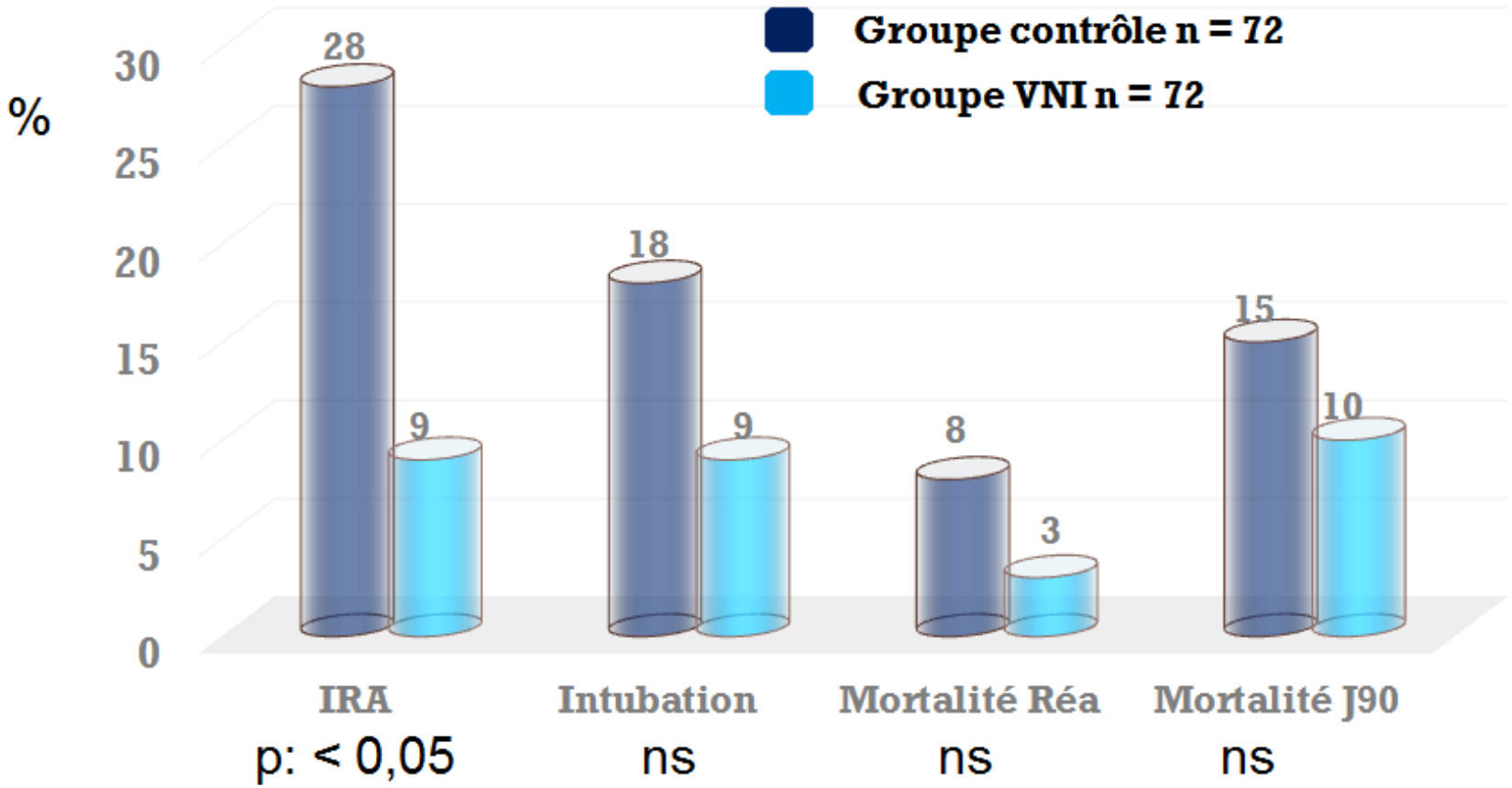
2009

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



Sequential Noninvasive Ventilation After Extubation in Patients with Chronic Respiratory Disorders: a multicenter randomized controlled trial (VHYPER) 2017

Frédéric Vargas[1,2], Marc Clavel[3], Pascale Sanchez-Verlan[4], Sylvain Garnier[5], Alexandre Boyer[1], Hoang-Nam Bui[1], Benjamin Clouzeau[1], Charline Sazio[1], Aissa Kerchache[6], Olivier Guisset[7], Antoine Bénard[8], Julien Asselineau[8], Bernard Gauche[9], Didier Gruson[1], Stein Silva[4,10]; Philippe Vignon[3], Gilles Hilbert[1,2]

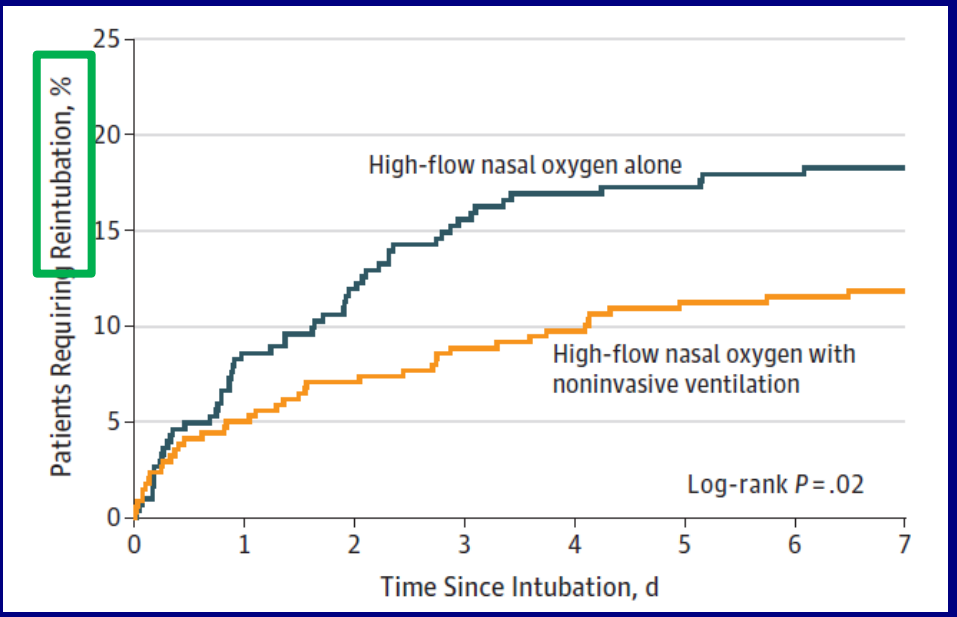


Effect of Postextubation High-Flow Nasal Oxygen With Noninvasive Ventilation vs High-Flow Nasal Oxygen Alone on Reintubation Among Patients at High Risk of Extubation Failure

A Randomized Clinical Trial

Arnaud W. Thille,

2019



Those at high risk of reintubation were older than 65 years or had an underlying chronic cardiac or lung disease.

	No. (%)			
	High-Flow Nasal Oxygen Alone (n = 302)	High-Flow Nasal Oxygen With NIV (n = 339)	Absolute Difference, % (95% CI)	*P* Value
Primary Outcome				
Reintubation at day 7	55 (18)	40 (12)	−6.4 (−12.0 to −0.9)	.02
Postextubation respiratory failure at day 7	88 (29)	70 (21)	−8.5 (−15.2 to −1.8)	.01
Reintubation				
At 48 h	36 (12)	24 (7)	−4.8 (−9.6 to −0.3)	.04
At 72 h	47 (16)	30 (9)	−6.7 (−11.9 to −1.7)	.009
Mortality				
At day 28	33 (11)	39 (12)	0.6 (−4.4 to 5.5)	.82
At day 90	65 (21)	62 (18)	−3.2 (−9.5 to 2.9)	.30

Consensus commune

organisée conjointement par
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et de l'ADARPEF

RÉSUMÉ

Pneumopathies / ARDS

Immunodéprimé

IRA **FOB-LBA**

POST-OP.

Chir. Abdominale - Thoracique

Préventive en **POST-EXTUBATION**

O_2HDN pour prévenir l'évolution vers l'IRA

IRA Réanimation

Chaque fois que possible : **VNI** !!

HYPOXEMIE : VNI + O_2HDN

INTUBATION VM

EVALUATION : à **1-2 heures , régulière**

IRA non améliorée ?

STADE IRA ?

Tardif

Précoce

QUELS PARAMÈTRES PEUVENT ÊTRE OPTIMISÉS ?

Protocole **Interface** **Monitoring** **Expérience** **Formation** **…**