Décision d'extubation en Réanimation

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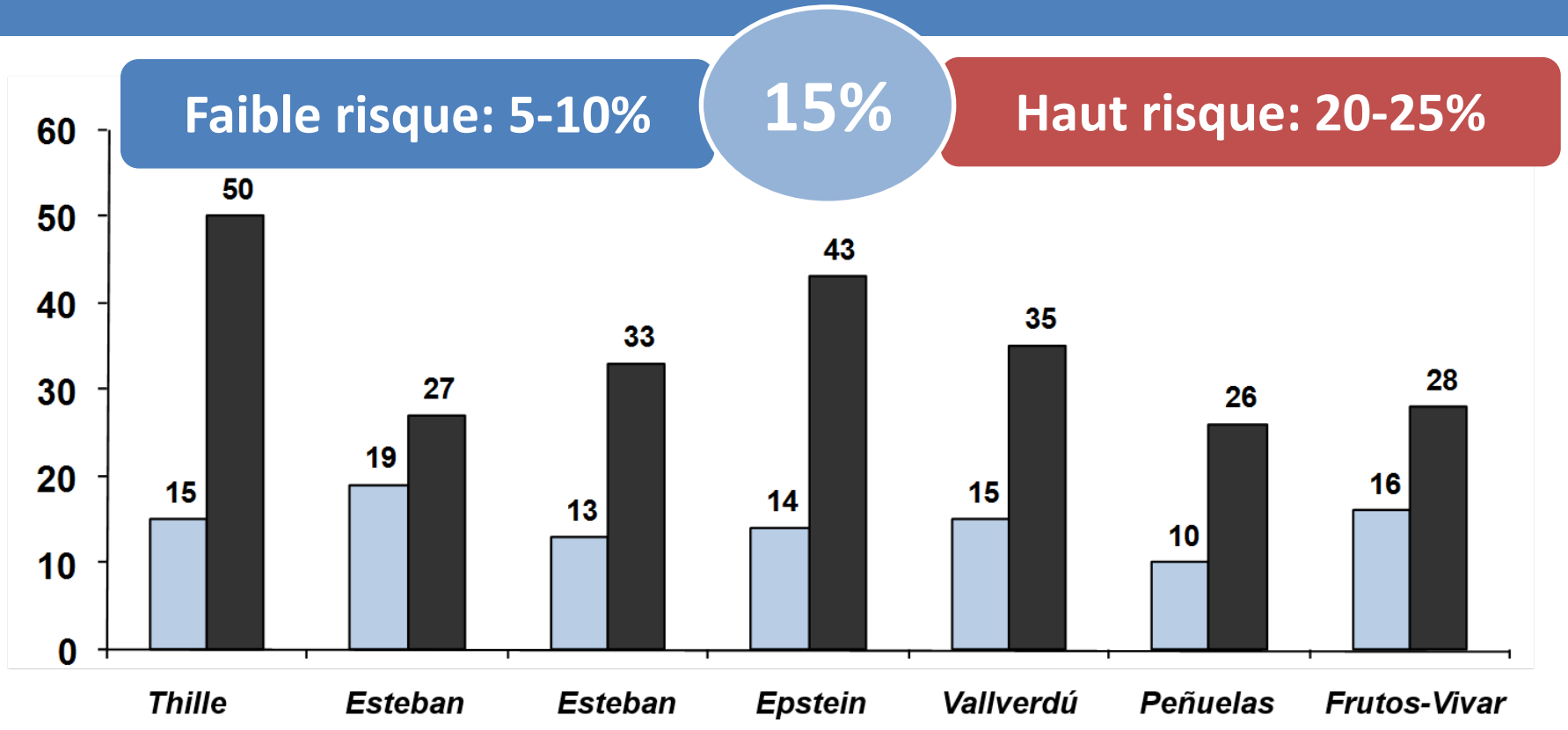
Conflicts of interest

None

High mortality in case of reintubation

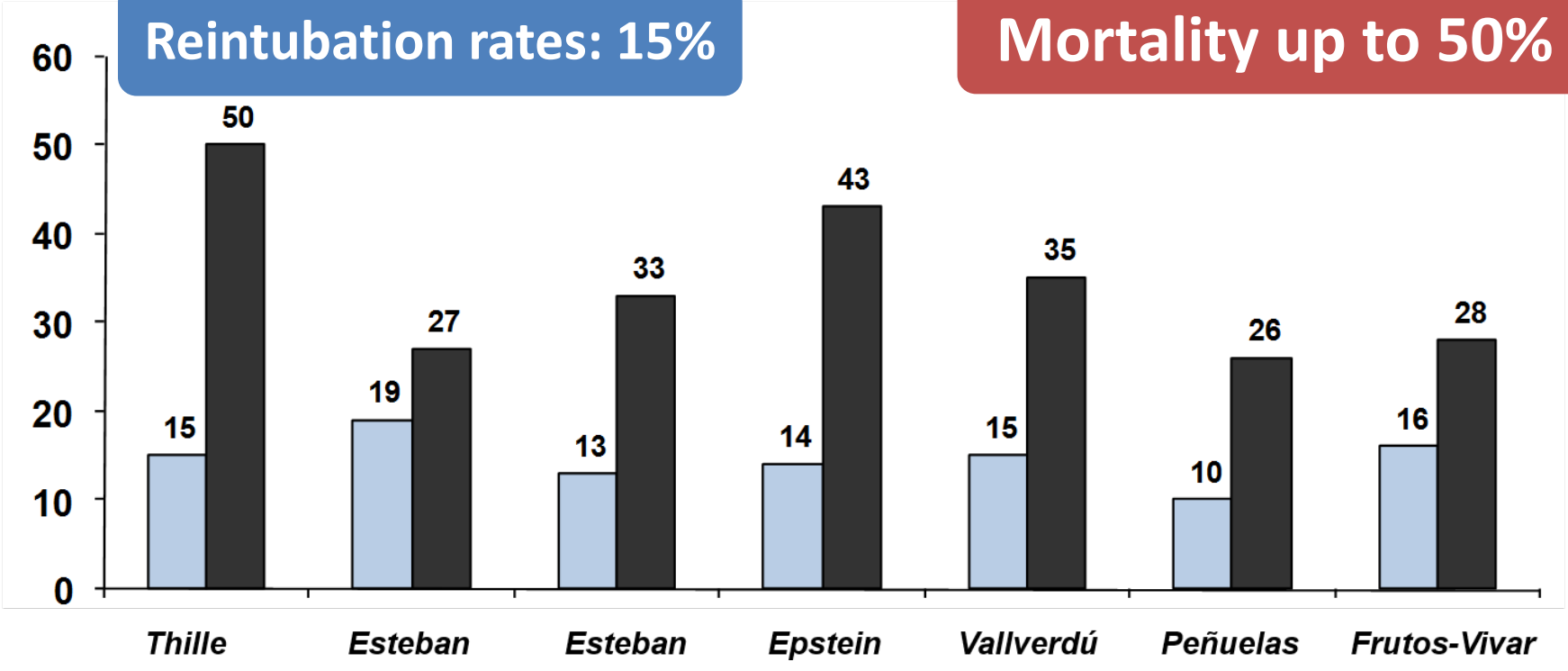


Weaning from the ventilator and extubation in ICU, Current Opinion Crit Care 2013

High mortality in case of reintubation

Reintubation rates: 15%

Mortality up to 50%



Weaning from the ventilator and extubation in ICU, Current Opinion Crit Care 2013

Facteurs associés à la mortalité

Independent Effects of Etiology of Failure and Time to Reintubation on Outcome for Patients Failing Extubation

SCOTT K. EPSTEIN and RONALD L. CIUBOTARU

Pulmonary and Critical Care Division, Department of Medicine, Tupper Research Institute, New England Medical Center, Tufts University School of Medicine, Boston, Massachusetts

TABLE 3

CAUSES OF EXTUBATION FAILURE

Décès: 31/74 = 42%

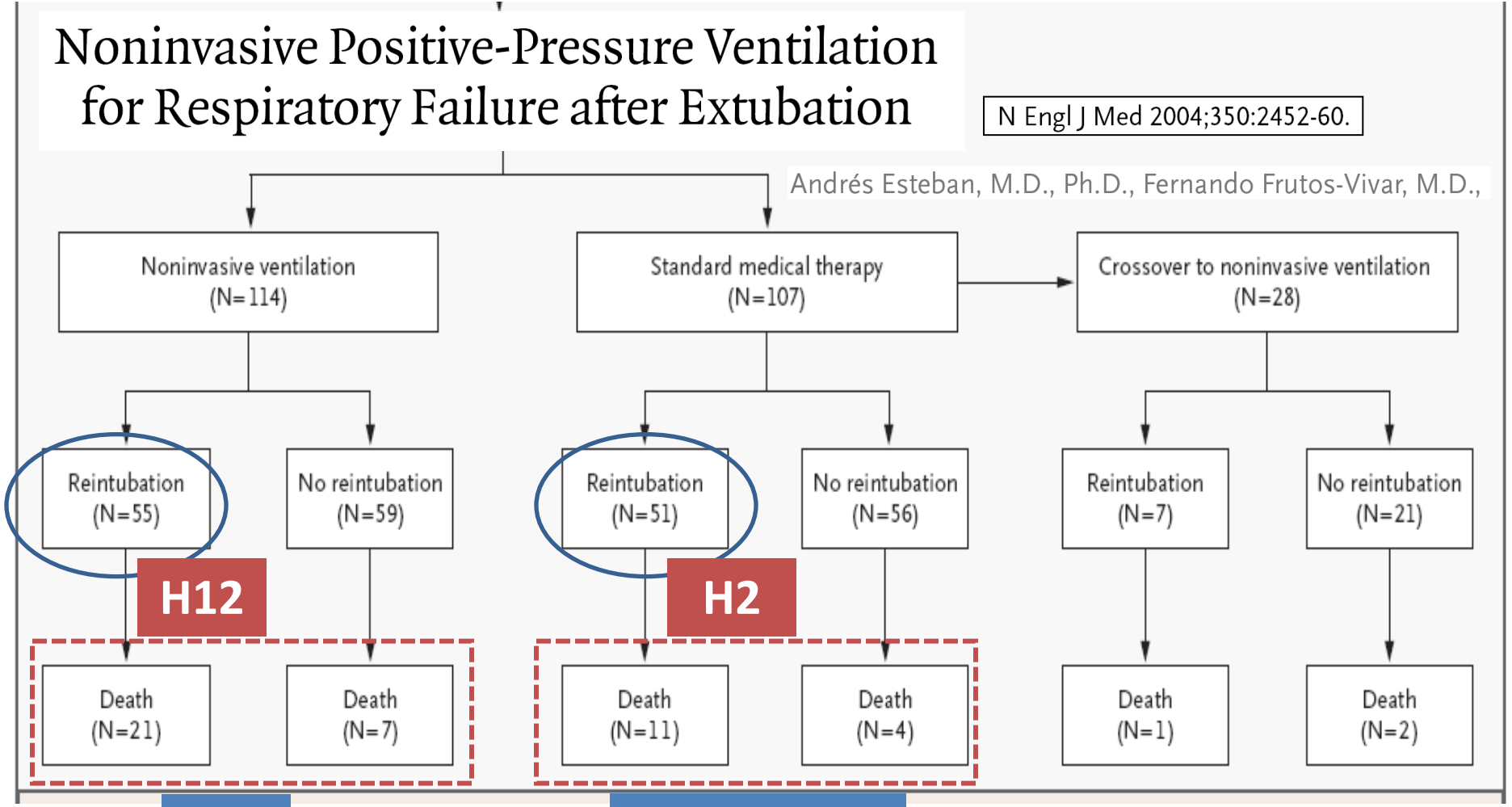
	Patients*		Deaths†	
Cause of Extubation Failure	(*n*)	(%)	(*n*)	(%)
Respiratory failure	21	28	12	57
Congestive heart failure	17	23	8	47
Aspiration/excess secretions	12	16	2	17
Upper airway obstruction	11	15	2	18
Encephalopathy	7	9	3	43
Other	6	8	4	67

Epstein et al., Am J Respir Crit Care Med 1998; 158:489-493

Noninvasive Positive-Pressure Ventilation for Respiratory Failure after Extubation

N Engl J Med 2004;350:2452-60.

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



25%

14%, $p<0.05$

Causes de l'échec?

1- Séparation du ventilateur: épreuve de sevrage

2. Extubation

Spécificité (faux positifs): 85%

- *Performances cardio-respiratoires*
- *Dysfonction diaphragmatique??? Fatigue > 1h*
- *Altération de l'état neurologique*
- *Contrôle des voies aériennes: toux – sécrétions - déglutition*
- *Obstruction des voies aériennes supérieures*

TABLE 4

REASONS FOR REINTUBATION IN 61 PATIENTS*

Reason for Reintubation	Number of Patients
Upper-airway obstruction	9
Hypoxemia	20
Respiratory acidosis	7
Signs of increased respiratory work	23
Impaired clearance of secretions	17
Cardiac failure	4
Atelectasis	5
Decreased consciousness	11
Other causes	5†
Unknown causes	3

* More than one condition could be present in a single patient.

† Two patients were reintubated because of cardiac arrest, and one patient each for tracheal granuloma, pneumonia, and upper gastrointestinal hemorrhage requiring endoscopy.

Esteban et al., Am J Respir Crit Care Med 1999; 159:512-518.

Risk Factors for and Prediction by Caregivers of Extubation Failure in ICU Patients: A Prospective Study*

(*Crit Care Med* 2015; 43:613–620)

Arnaud W. Thille, MD, PhD[1,2,3]; Florence Boissier, MD[3]; Hassen Ben Ghezala, MD[3];
Keyvan Razazi, MD[3]; Armand Mekontso-Dessap, MD, PhD[3]; Christian Brun-Buisson, MD[3]

533 patients under mechanical ventilation (18 months)

↓

Planned extubation: N = 310

↓

At least 24h of MV and without do-not reintubate order : N = 225

↓

Reintubation before 7 days: N = 31 (14%) --> **6%**

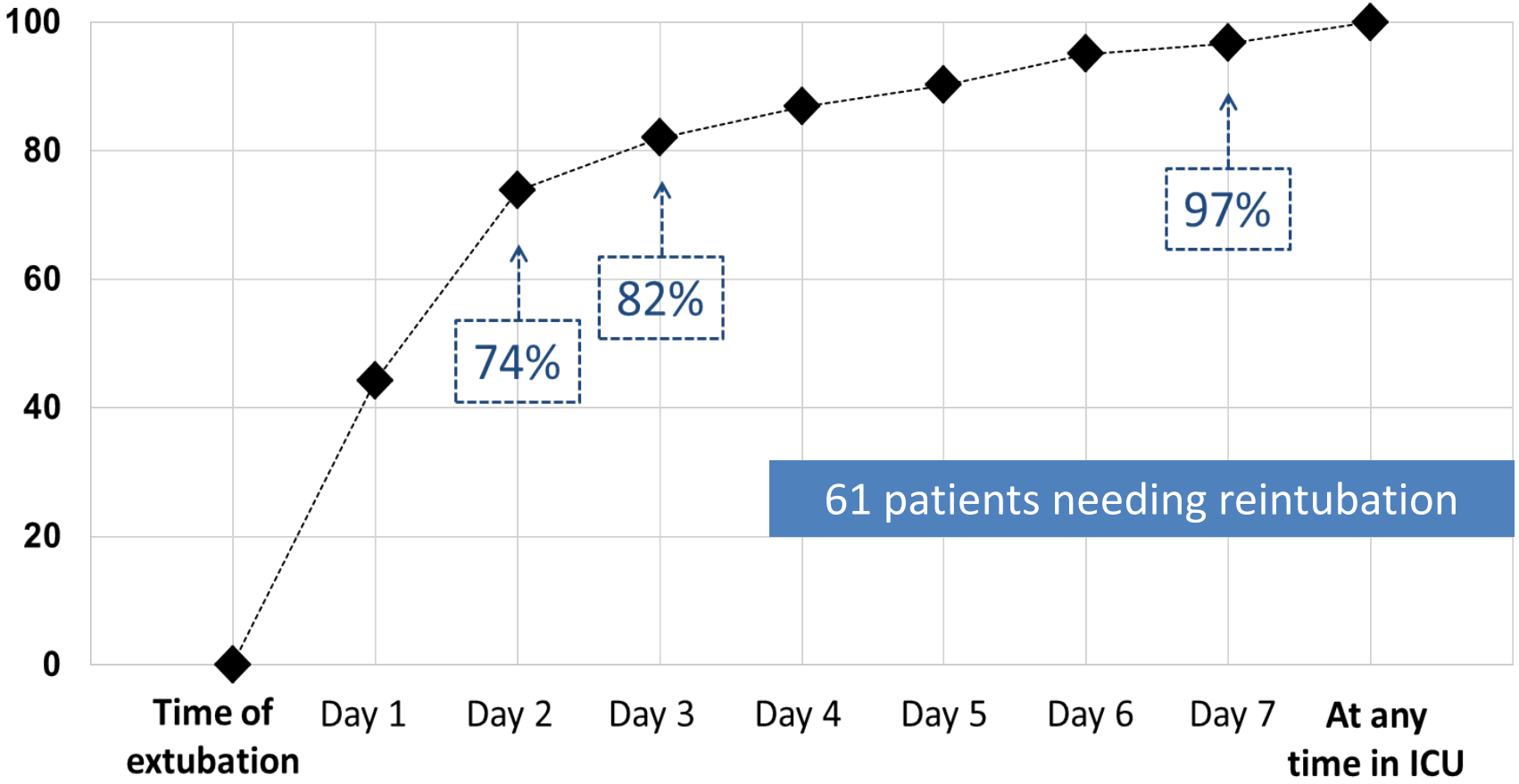
Extubation Failure: Definition?

According to the International Consensus Conference on Weaning (ERJ 2007):

Reintubation, Initiation of NIV, or Death
within the 48 hours following planned extubation.

Probability of reintubation over the time in case of reintubation (%)

Thille AW et al., Crit Care 2016; 20:48.



Extubation Failure: Definition?

According to the International Consensus Conference on Weaning (ERJ 2007):

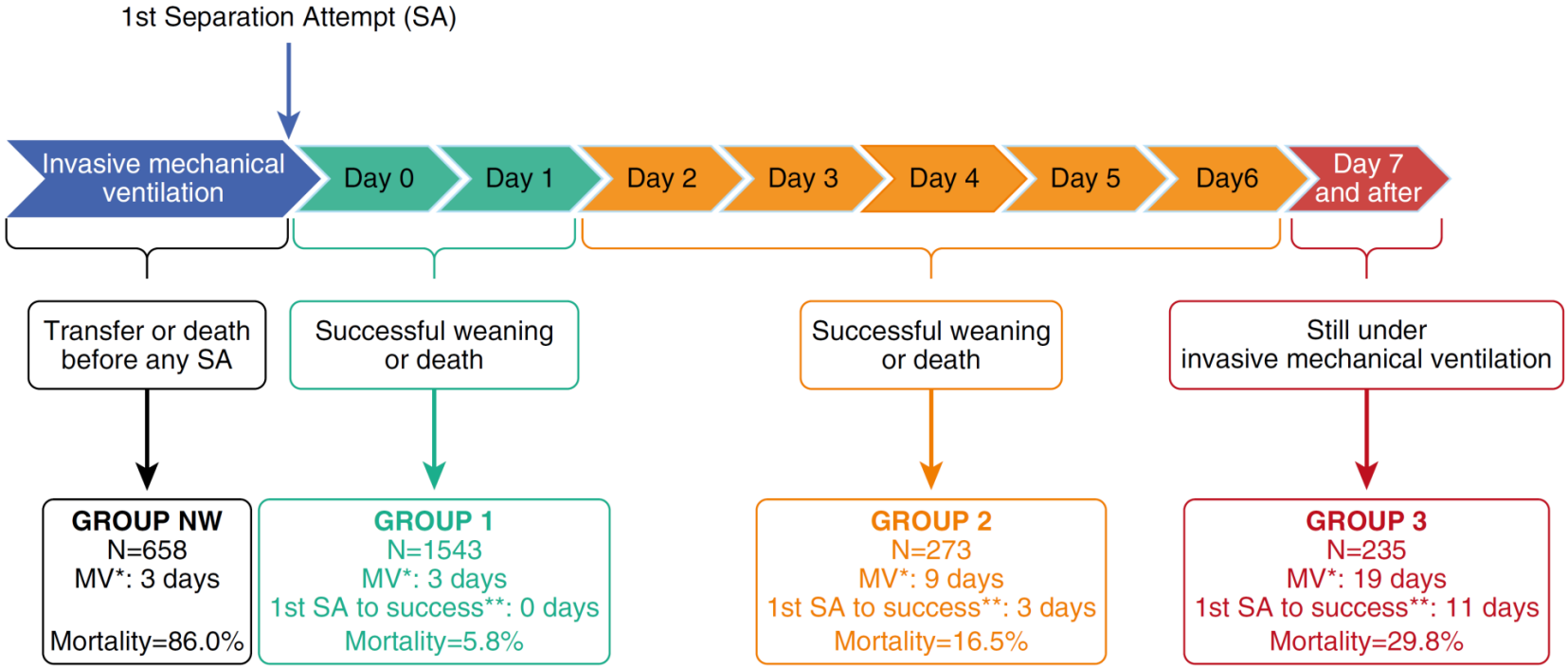
Reintubation, Initiation of NIV, or Death
within the 48 hours following planned extubation.

Reintubation < 7 days
after excluding patients with do-not-reintubate order

ORIGINAL ARTICLE Am J Respir Crit Care Med Vol 195, Iss 6, pp 772–783, Mar 15, 2017

Epidemiology of Weaning Outcome according to a New Definition
The WIND Study

Gaëtan Béduneau[1,2*], Tài Pham[3,4,5*], Frédérique Schortgen[6], Lise Piquilloud[7,8], Elie Zogheib[9,10], Maud Jonas[11], Fabien Grelon[12], Isabelle Runge[13], Nicolas Terzi[14,15,16,17], Steven Grangé[1], Guillaume Barberet[18], Pierre-Gildas Guitard[19], Jean-Pierre Frat[20,21,22], Adrien Constan[6], Jean-Marie Chretien[23], Jordi Mancebo[24], Alain Mercat[7], Jean-Christophe M. Richard[25], and Laurent Brochard[26,27]; for the WIND (Weaning according to a New Definition) Study Group and the REVA (Réseau Européen de Recherche en Ventilation Artificielle) Network[‡]

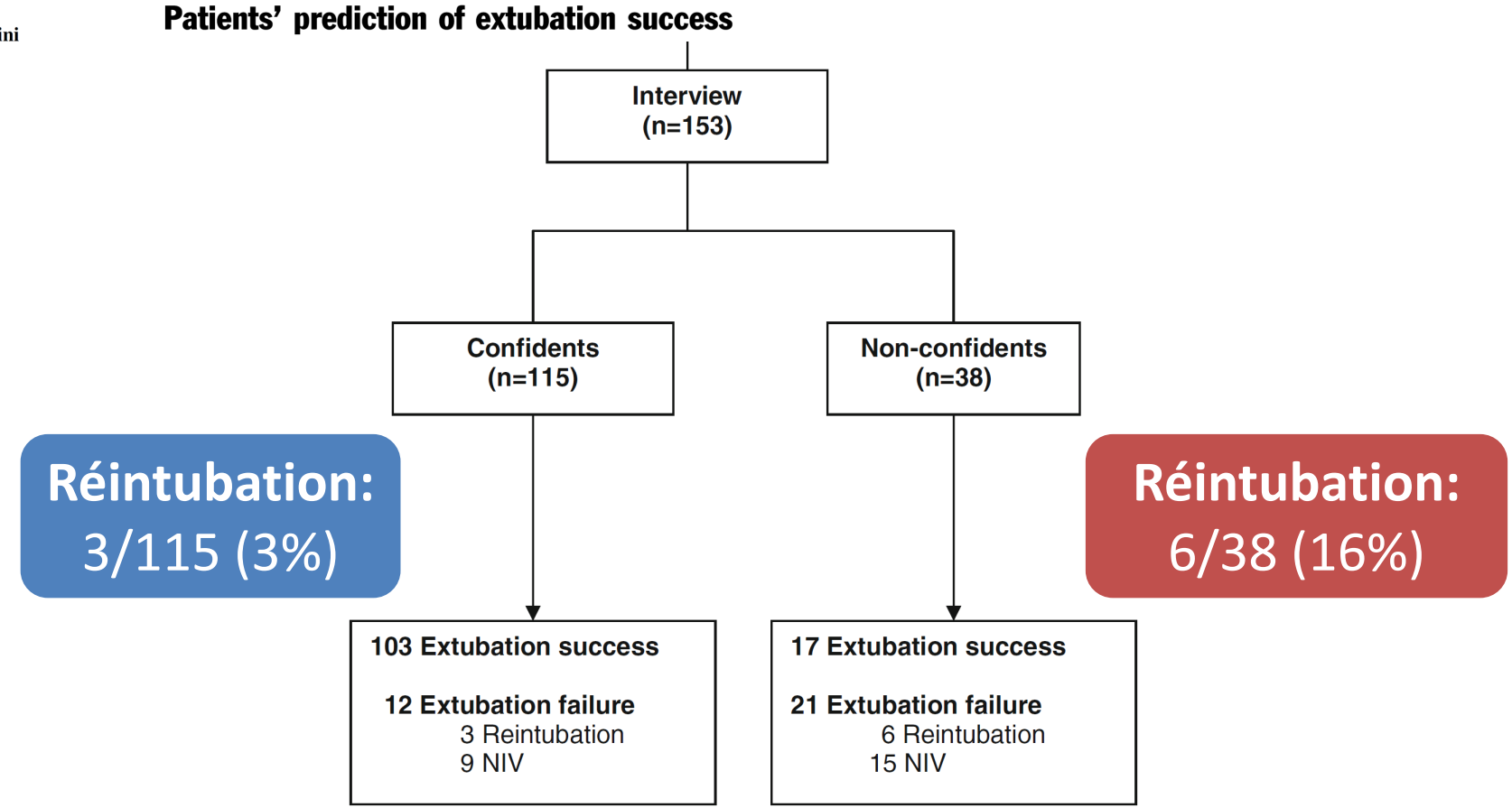


Peut-on prédire l’échec d’extubation?

Intensive Care Med (2010) 36:2045–2052
DOI 10.1007/s00134-010-1984-4

ORIGINAL

Andreas Perren
Marco Previsdomini
Michael Llamas
Bernard Cerutti
Sandor Györik
Giorgio Merlani
Philippe Jolliet



Risk Factors for and Prediction by Caregivers of Extubation Failure in ICU Patients: A Prospective Study*

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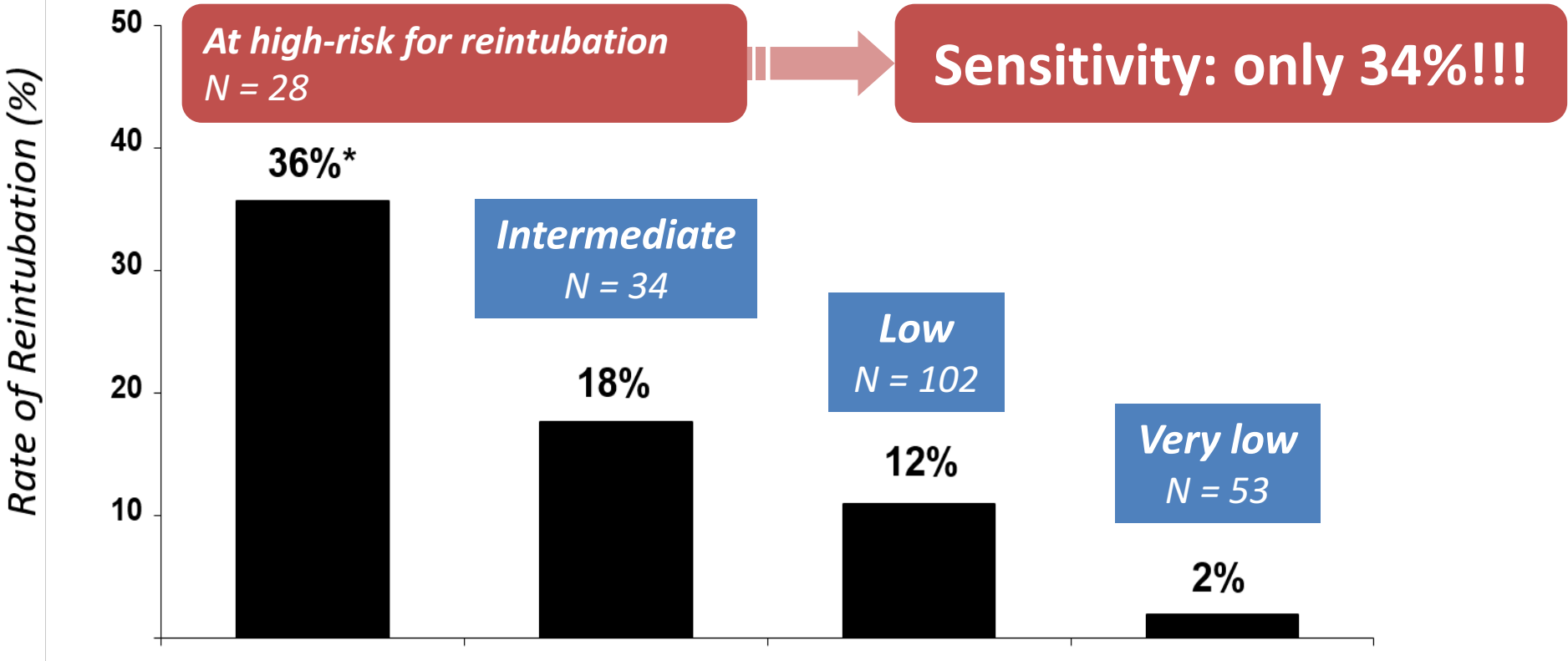


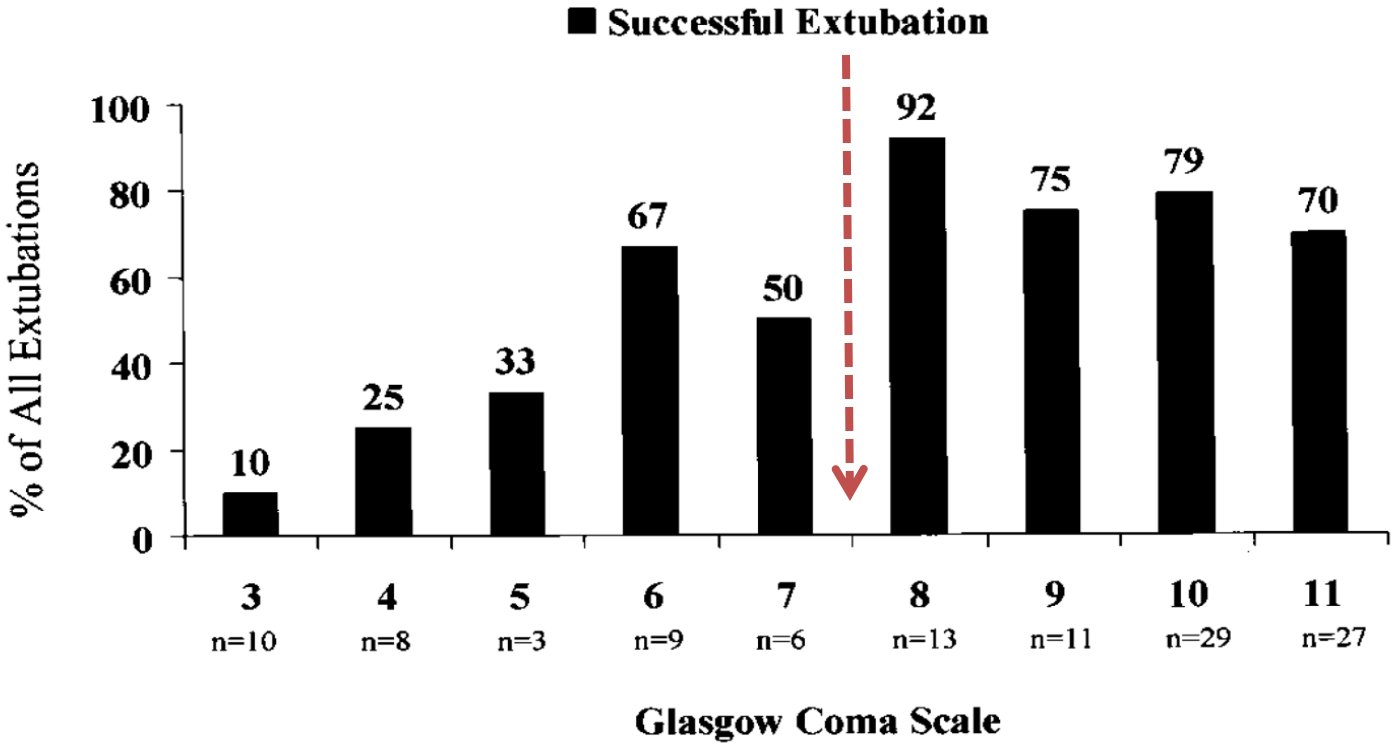
Qui sont les patients à haut risque?

Predictors of Successful Extubation in Neurosurgical Patients

Am J Respir Crit Care Med Vol 163. pp 658–664, 2001

ANDREW M. NAMEN, E. WESLEY ELY, STEPHEN B. TATTER, L. DOUGLAS CASE, MICHAEL A. LUCIA, ALLEN SMITH, SCOTT LANDRY, JOHN A. WILSON, STEVEN S. GLAZIER, CHARLES L. BRANCH, DAVID L. KELLY, DAVID L. BOWTON, and EDWARD F. HAPONIK

Departments of Internal Medicine (Section of Pulmonary/Critical Care), Public Health Sciences, Neurosurgery, and Anesthesiology, Wake Forest University Baptist Medical Center, Winston-Salem, North Carolina; Division of Allergy, Pulmonary, and Critical Care Medicine, Vanderbilt University School of Medicine, Nashville, Tennessee; and Division of Pulmonary and Critical Care Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland



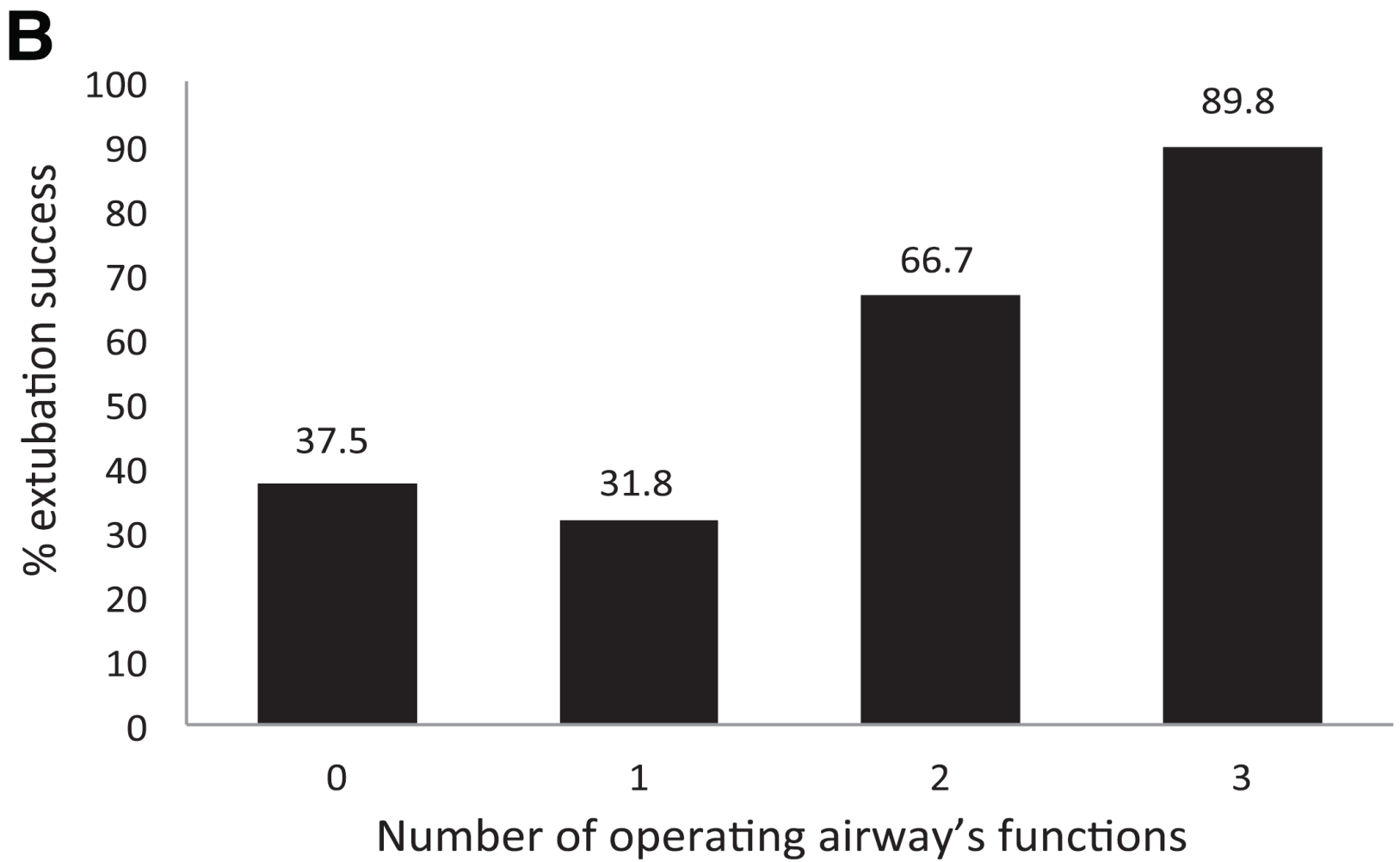
Extubation Failure in Brain-injured Patients

Risk Factors and Development of a Prediction Score in a Preliminary Prospective Cohort Study

Thomas Godet, M.D., Ph.D., Russell Chabanne, M.D., Julien Marin, M.D., Sophie Kauffmann, M.D., M.Sc, Emmanuel Futier, M.D., Ph.D., Bruno Pereira, Ph.D., Jean-Michel Constantin, M.D., Ph.D.

Table 4. Results of Multivariate Analysis

	OR (95% CI)	*P* Value
CRS-R item "visual"	3.4 (1.3–8.6)	0.012
Gag reflex	4.2 (1.3–14.1)	0.02
Deglutition	3.2 (1.2–8.4)	0.021
Cough	3.8 (1.4–9.8)	0.007
AUC	0.82 (0.73–0.91)	


B
100
90
80
70
60
50
40
30
20
10
0
% extubation success
37.5
31.8
66.7
89.8
0
1
2
3
Number of operating airway's functions

Outcomes of extubation failure in medical intensive care unit patients*

(Crit Care Med 2011; 39:2612–2618)

Arnaud W. Thille, MD, PhD; Anatole Harrois, MD; Frédérique Schortgen, MD; Christian Brun-Buisson, MD; Laurent Brochard, MD

Age ≥ 65 ans ou maladie cardio-respiratoire

Taux de réintubation 20-25%

Quels sont les facteurs de risque ?

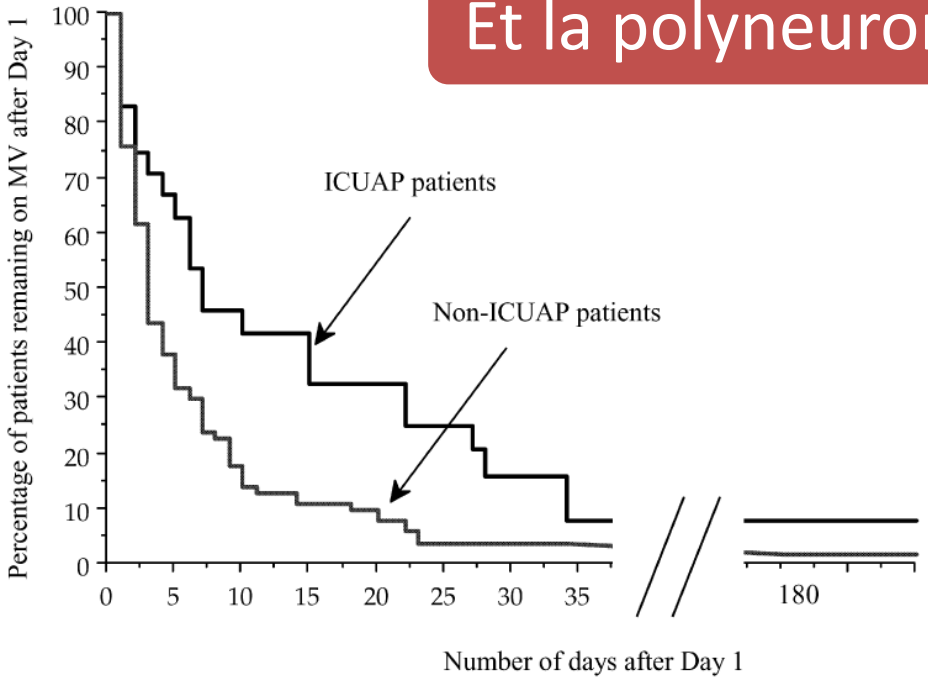
Intensive Care Med (2004) 30:1117–1121
DOI 10.1007/s00134-004-2174-z

ORIGINAL

Bernard De Jonghe
Sylvie Bastuji-Garin
Tarek Sharshar
Hervé Outin
Laurent Brochard

Does ICU-acquired paresis lengthen weaning from mechanical ventilation?

Et la polyneuromyopathie?



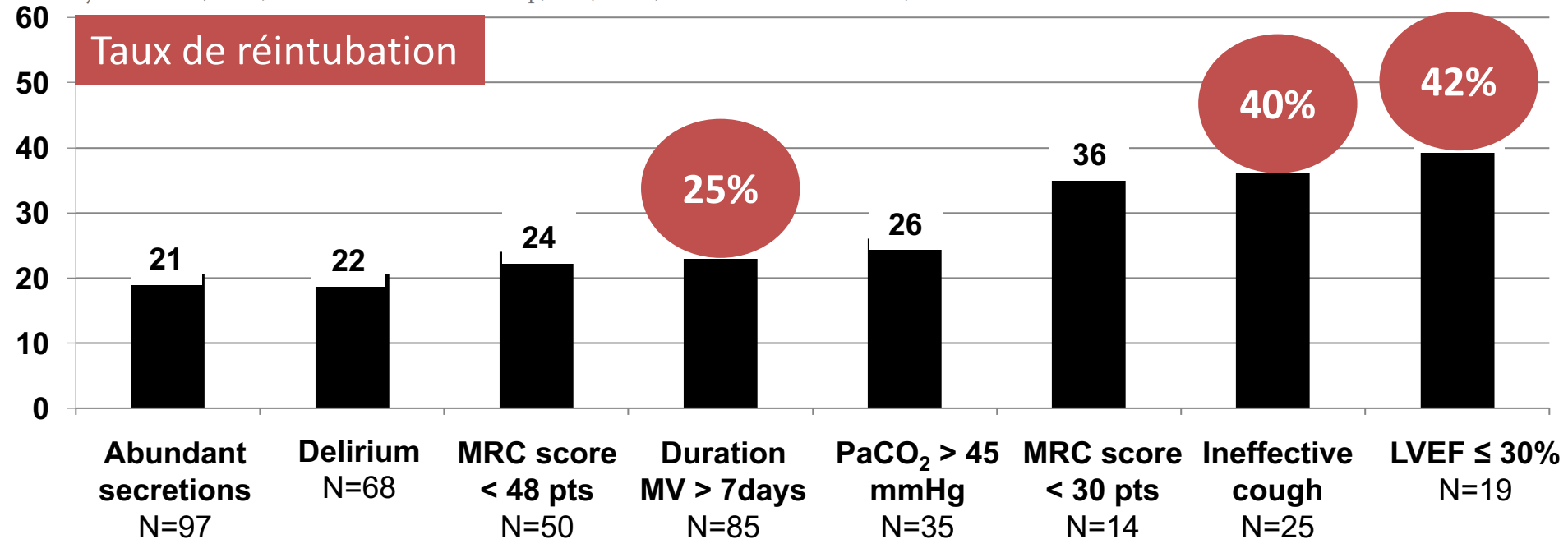
25% des patients après 7 j de VM

De Jonghe et al., JAMA 2002; 288:2859-2867

Risk Factors for and Prediction by Caregivers of Extubation Failure in ICU Patients: A Prospective Study*

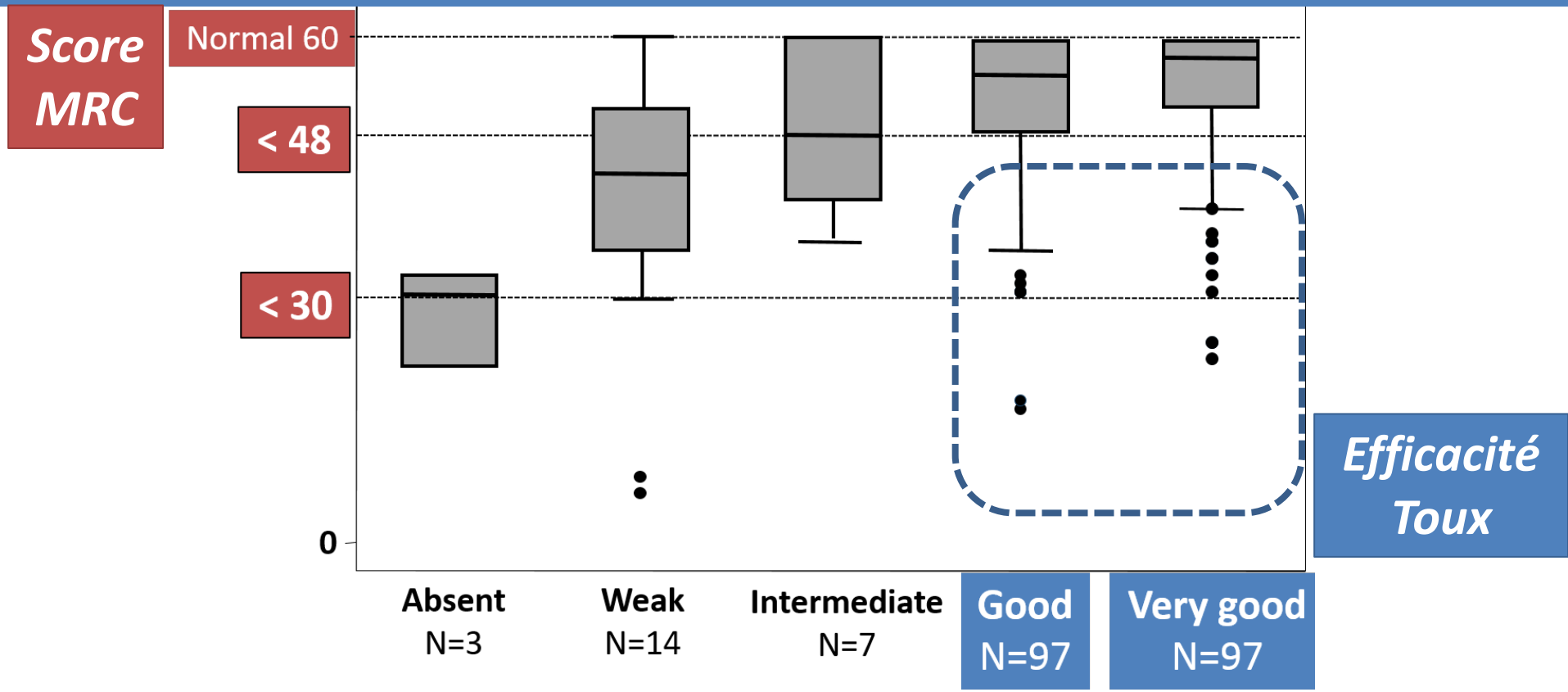
(*Crit Care Med* 2015; 43:613–620)

Arnaud W. Thille, MD, PhD[1,2,3]; Florence Boissier, MD[3]; Hassen Ben Ghezala, MD[3]; Keyvan Razazi, MD[3]; Armand Mekontso-Dessap, MD, PhD[3]; Christian Brun-Buisson, MD[3]



*Si aucun de ces 3 facteurs de risque: seulement **5%** de réintubation (6/120)*

Relation toux MRC score



Sevrage difficile

Group 1 « simple weaning »: Patients who succeed the first weaning trial and are extubated without difficulty.

Group 2 « difficult weaning »: Patients who fail the first weaning trial and require 3 SBT or up to 7 days to achieve successful weaning.

Group 3 « prolonged weaning »: Patients who require more than 7 days of weaning after the first weaning trial.

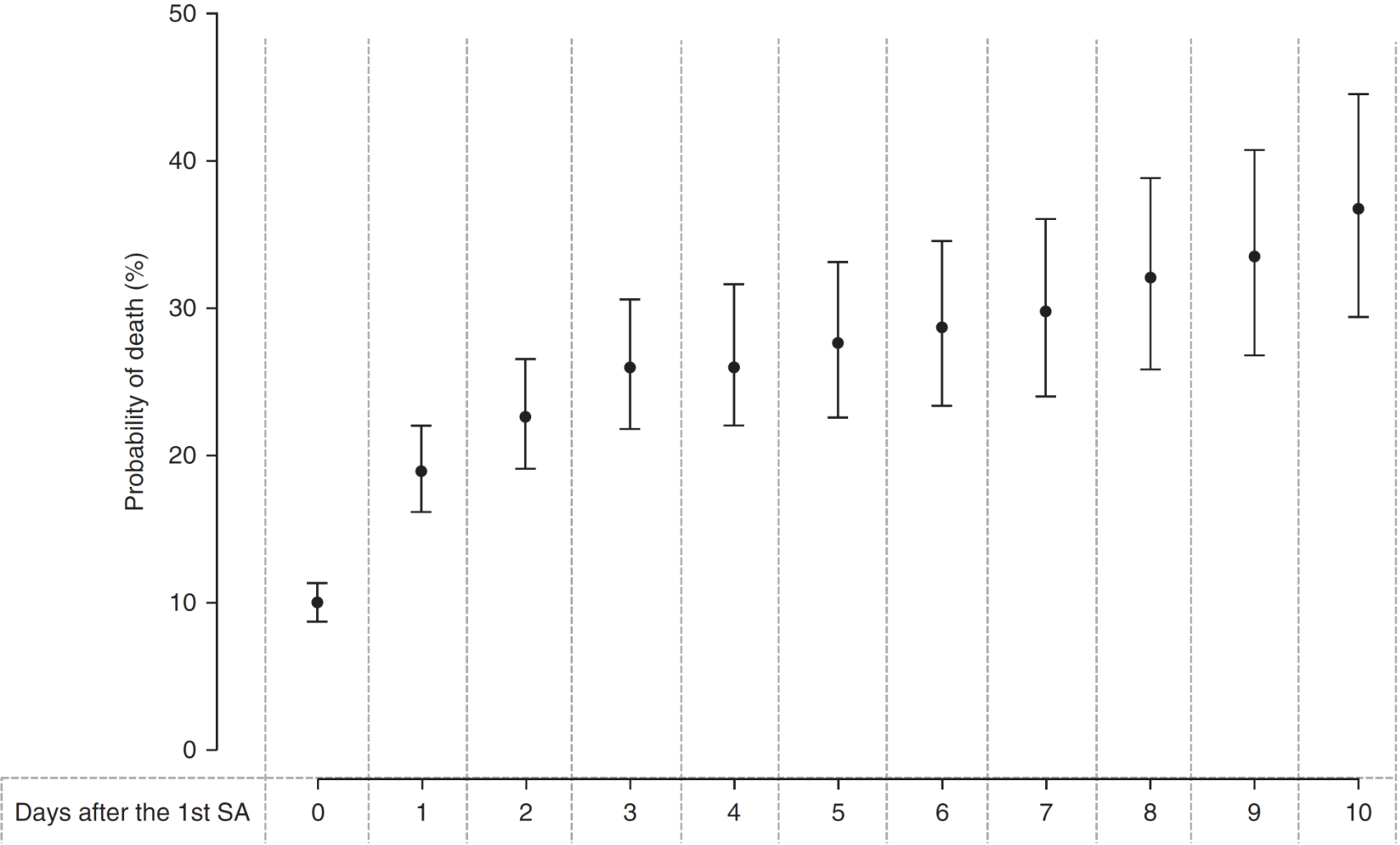
International consensus conference on weaning from mechanical ventilation, ERJ 2007; 29:1033-1056

Sevrage difficile > 24h

Table 3. Factors Associated with a Short Weaning in Patients with No Decision of Withholding/Withdrawal, Bivariate and Multivariable Analysis

	Patients with a Short Weaning (*n* = 1,413)	Patients with a Longer Weaning (*n* = 399)	Bivariate Analysis *P* Value*	Multivariable Analysis	
				OR, 95% CI	*P* Value
Age, yr	58 ± 17	65 ± 14	<0.001	0.98, 0.97–0.99	<0.001
SAPS II at admission, points	44 ± 16	50 ± 18	<0.001		
SOFA at admission, points	6.4 ± 3.5	7.9 ± 3.5	<0.001	0.94, 0.91–0.97	0.003
Admission				2.27, 1.12–4.78	0.024
Medical	968 (68.5)	312 (78.2)	<0.001		
Planned surgery	231 (16.4)	25 (6.3)	<0.001		
Unplanned surgery	214 (15.2)	62 (15.5)	0.91		
Reintubation	19 (1.3)	181 (45.4)	<0.001		

Béduneau et al., Am J Respir Crit Care Med 2017; 195:772-783.


Probability of death (%)
50
40
30
20
10
0
Days after the 1st SA
0
1
2
3
4
5
6
7
8
9
10

ORIGINAL ARTICLE

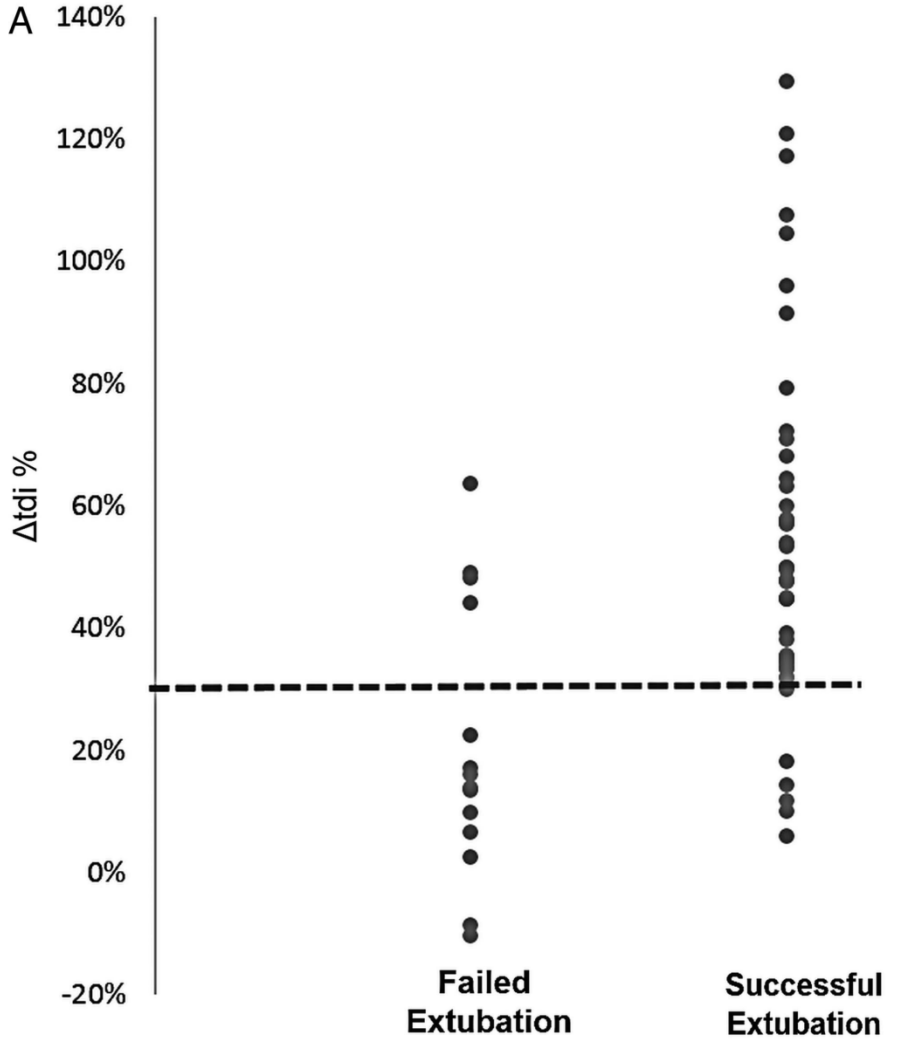
Diaphragm ultrasound as a predictor of successful extubation from mechanical ventilation

Ernest DiNino, Eric J Gartman, Jigme M Sethi, F Dennis McCool

DiNino E, *et al*. *Thorax* 2014;**69**:423–427.

63 patients: 14 échec (22%)

Taux d'échec d'extubation si Δ tdi < 30% = 10/16 (62%)



Quelle épreuve de sevrage?

Official Executive Summary of an American Thoracic Society/American College of Chest Physicians Clinical Practice Guideline: Liberation from Mechanical Ventilation in Critically Ill Adults

Gregory A. Schmidt, Timothy D. Girard, John P. Kress, Peter E. Morris, Daniel R. Ouellette, Waleed Alhazzani, Suzanne M. Burns, Scott K. Epstein, Andres Esteban, Eddy Fan, Miguel Ferrer, Gilles L. Fraser, Michelle Ng Gong, Catherine L. Hough, Sangeeta Mehta, Rahul Nanchal, Sheena Patel, Amy J. Pawlik, William D. Schweickert, Curtis N. Sessler, Thomas Strøm, Kevin C. Wilson, and Jonathon D. Truwit; on behalf of the ATS/CHEST *Ad Hoc* Committee on Liberation from Mechanical Ventilation in Adults

1. For acutely hospitalized patients ventilated >24 h, we suggest that the initial SBT be conducted with inspiratory pressure augmentation (5–8 cm H_2O) rather than without (T-piece or CPAP).

Moderate certainty in the evidence

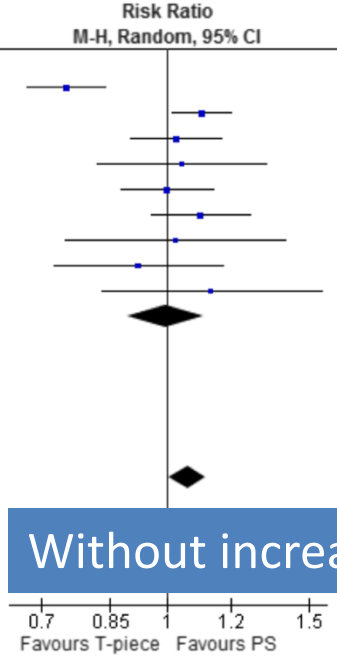
RESEARCH Open Access

Trials directly comparing alternative spontaneous breathing trial techniques: a systematic review and meta-analysis

Karen E. A. Burns[1,2,3], Ibrahim Soliman[1,2], Neill K. J. Adhikari[2,4], Amer Zwein[1,2], Jessica T. Y. Wong[5], Carolina Gomez-Builes[1,2], Jose Augusto Pellegrini[6,7], Lu Chen[1,2], Nuttapol Rittayamai[1,2], Michael Sklar[1,2], Laurent J. Brochard[1,2] and Jan O. Friedrich[1,2*]

Burns *et al. Critical Care* (2017) 21:127
DOI 10.1186/s13054-017-1698-x

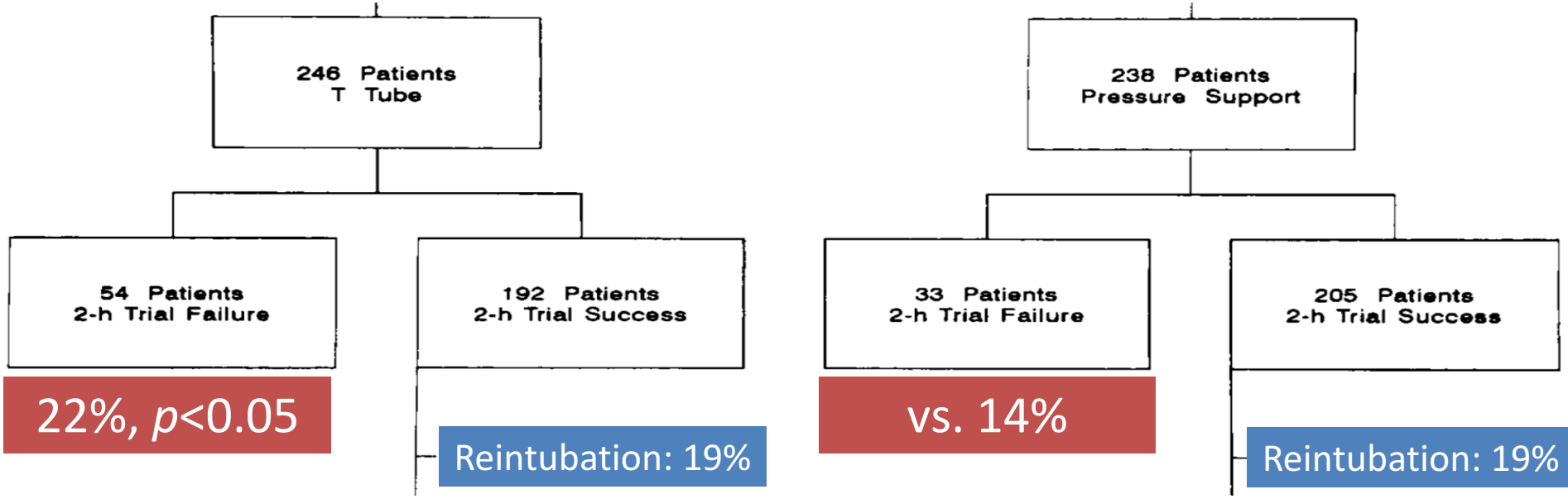
Study or Subgroup	PS Events	PS Total	T-piece Events	T-piece Total	Weight	Risk Ratio M-H, Random, 95% CI
30.1.1 PS vs T-piece						
Chittawatanarat 2015	159	260	212	260	13.8%	0.75 [0.67, 0.84]
Esteban 1997	205	238	192	246	14.8%	1.10 [1.02, 1.20]
Farias 2001	99	125	102	132	13.2%	1.02 [0.90, 1.17]
Haberthur 2002	25	30	24	30	9.1%	1.04 [0.82, 1.32]
Lourenco 2013	14	14	14	14	13.1%	1.00 [0.88, 1.14]
Matic 2004	120	150	80	110	12.8%	1.10 [0.96, 1.26]
Matic 2007	38	70	35	66	7.0%	1.02 [0.75, 1.40]
Teixeira 2015	32	47	51	69	9.1%	0.92 [0.72, 1.17]
Vats 2012	17	20	15	20	7.0%	1.13 [0.83, 1.55]
Subtotal (95% CI)		**954**		**947**	**100.0%**	**1.00 [0.89, 1.11]**
Total events	709		725			
Heterogeneity: $Tau^2 = 0.02$; $Chi^2 = 34.64$, df = 8 (P < 0.0001); $I^2 = 77\%$						
Test for overall effect: Z = 0.06 (P = 0.96)						
30.1.2 PS vs T-piece (excluding Chittawatanarat 2015)						
Subtotal (95% CI)		**694**		**687**	**100.0%**	**1.06 [1.01, 1.12]**
Total events	550		513			
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 3.72$, df = 7 (P = 0.81); $I^2 = 0\%$						
Test for overall effect: Z = 2.18 (P = 0.03)						



Without increased risk of reintubation

Extubation Outcome after Spontaneous Breathing Trials with T-Tube or Pressure Support Ventilation

ANDRÉS ESTEBAN, INMACULADA ALÍA, FEDERICO GORDO, RAFAEL FERNÁNDEZ, JOSÉ F. SOLSONA, INMACULADA VALLVERDÚ, SANTIAGO MACÍAS, JOSÉ M. ALLEGUE, JESÚS BLANCO, DEMETRIO CARRIEDO, MIGUEL LEÓN, MIGUEL A. de la CAL, FRANCISCO TABOADA, JUAN GONZALEZ de VELASCO, EUGENIO PALAZÓN, FRANCISCO CARRIZOSA, ROSER TOMÁS, JOSÉ SUAREZ, and ROSANNE S. GOLDWASSER for the Spanish Lung Failure Collaborative Group

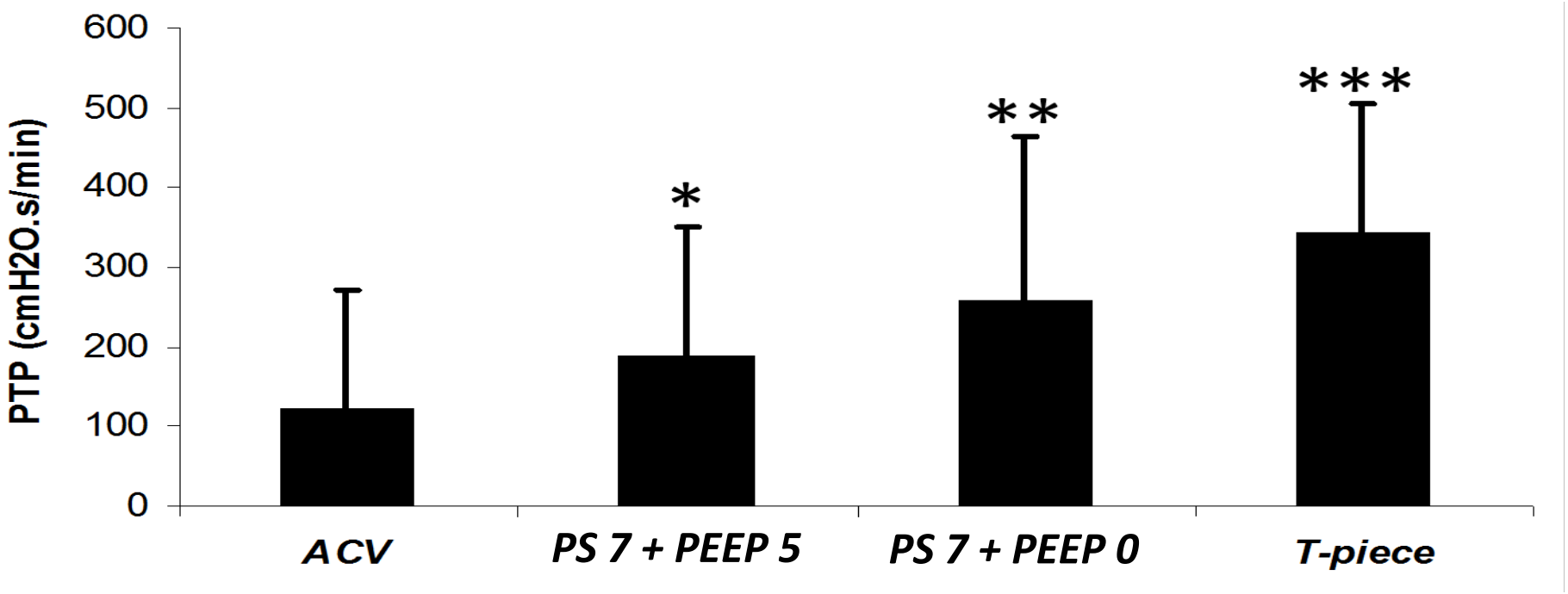


Similar rate of reintubation

Is it the same in patients at high-risk??

Esteban A. et al., Am J Respir Crit Care Med 1997; 156:459-465

Quelle épreuve de sevrage?



Cabello B et al., Intensive Care Med 2010; 36:1171-79

ORIGINAL ARTICLE

Am J Respir Crit Care Med Vol 195, Iss 11, pp 1477–1485, Jun 1, 2017

Effort to Breathe with Various Spontaneous Breathing Trial Techniques

A Physiologic Meta-analysis

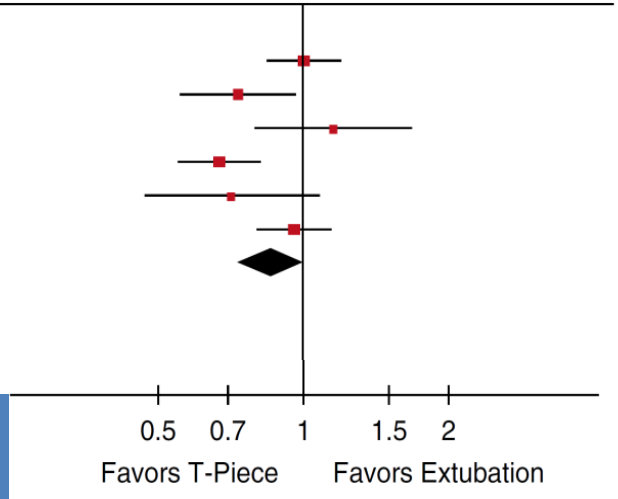
Michael C. Sklar[1,2], Karen Burns[2,3], Nuttapol Rittayamai[4], Ashley Lanys[2], Michela Rauseo[2,5], Lu Chen[2], Martin Dres[2,6], Guang-Qiang Chen[2,7], Ewan C. Goligher[3,8], Neill K. J. Adhikari[3,9], Laurent Brochard[2,3], and Jan O. Friedrich[2,3]

PS0/PEEP0 = T-piece

Study or Subgroup	T-Piece Total	Extubation Total	Weight	Ratio of Means IV, Random, 95% CI
WOB				
*R-Mahul 2016	17	17	20.8%	1.01 [0.84, 1.20]
*R-Mehta 2000	20	20	16.0%	0.73 [0.56, 0.97]
NR-Brochard 1991	11	11	11.9%	1.16 [0.80, 1.69]
NR-Ishaaya 1995	8	8	19.8%	0.67 [0.55, 0.82]
NR-Nathan 1993	7	7	10.6%	0.71 [0.47, 1.07]
NR-Straus 1998	14	14	20.8%	0.96 [0.81, 1.15]
Subtotal (95% CI)	**77**	**77**	**100.0%**	**0.86 [0.72, 1.02]**

Heterogeneity. $Tau^2 = 0.03$; $Chi^2 = 15.34$, df = 5 (P = 0.009); $I^2 = 67\%$

Test for overall effect: Z = 1.74 (P = 0.08)



The work of breathing is not higher after extubation than during T-piece

PROTOCOLE DE SEVRAGE DE LA VENTILATION MECANIQUE

Etiquette du patient

Date : **Nom et signature de l'IDE :**

A faire tous les matins pour tous les patients intubés sans sédation continue quelque soit le mode ventilatoire

1ère étape : Le patient peut-il respirer sans le ventilateur ?

1 - Ventilation : FR ≤ 35/min **et** SpO_2 ≥ 92% avec FiO_2 ≤ 40% **et** PEEP ≤ 8 cmH_2O oui ❒ non ❒

2 - Hémodynamique : absence de vasopresseurs (Noradrénaline/Adrénaline) oui ❒ non ❒

3 - Neurologique : patient réveillé, réponse adaptée à la commande (+1≥ RASS ≥-2) oui ❒ non ❒

4 - Pas de sédation continue (arrêt hypnovel, propofol, sufentanil) oui ❒ non ❒

Si les 4 critères de sevrage sont présents ➙ réaliser une épreuve de sevrage ventilatoire au nez artificiel après le nursing du matin *(Cf. procédure)* : durée 1 heure

Régler le débit d'oxygène selon la FiO_2 du ventilateur (oxygène à 3 L/min si FiO_2 30%, oxygène à 6 L/min si FiO_2 40%)

Critères de mauvaise tolérance de l'épreuve	Avant l'épreuve	5 min après le début	Fin de l'épreuve (H1 ou échec)
Heure de début de l'épreuve : - - h - -			Durée :
Débit d'O_2 : > 6L/min			
SpO_2 : < 90%			
FR : > 35/min			
FC : > 140/min			
PAS : < 90 ou > 180 mm Hg			
Détresse : **T**irage (**T**), **S**ueurs (**S**), **A**gitation (**A**), **M**arbrures (**M**)		**T - S - A - M**	**T - S - A - M**

Arrêt de l'épreuve : à H1 ou en cas de survenue d'un seul critère de mauvaise tolérance

- ► Relever l'ensemble des constantes avant rebranchement et noter la durée de l'épreuve
- ► Entourer le ou les critères de mauvaise tolérance en cas d'échec
- ► Réaliser un gaz du sang avant rebranchement si un cathéter artériel est en place
- ► Reconnecter le patient au ventilateur avec les paramètres ventilatoires préalables

Conclusion : L'épreuve de ventilation spontanée au nez artificiel est un succès **oui ❒** **non ❒**

Si oui ► 2ème étape : Le patient est-il extubable ?

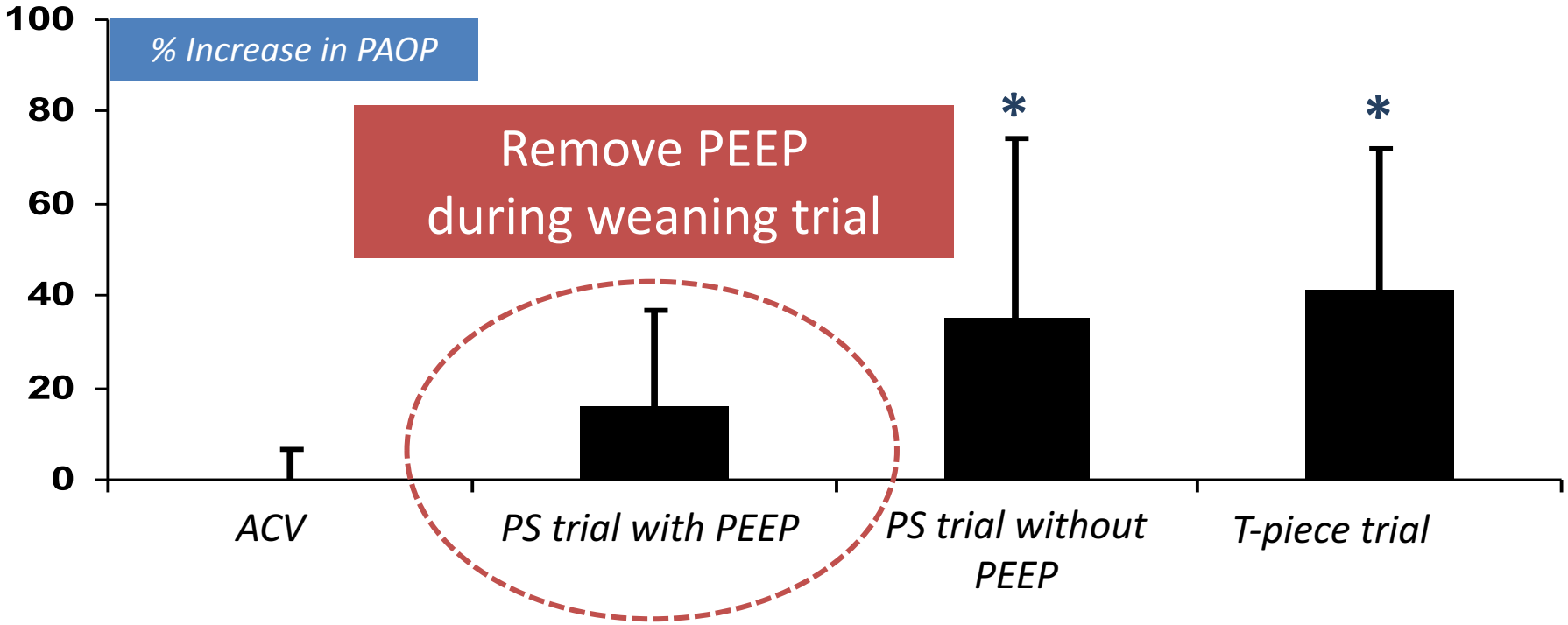
Toux	Absente = 0	Faible = 1	Bonne = 2	Très bonne = 3
Sécrétions	Absente = 0	Peu abondantes =1	Abondantes = 2	Très abondantes = 3
Risque d'encombrement	Non	Oui (Si sécrétions = 2 ou 3 **ET** toux = 0 ou 1)		
Risque d'œdème laryngé évalué par le test de fuite	Non ❒		Oui ❒	

3ème étape : Extubation sur décision médicale (cf. procédure)

Extubation ce jour: Oui ❒

Non ❒ **Motif** ----------

Quelle épreuve de sevrage?



Cabello B et al., Intensive Care Med 2010; 36:1171-79

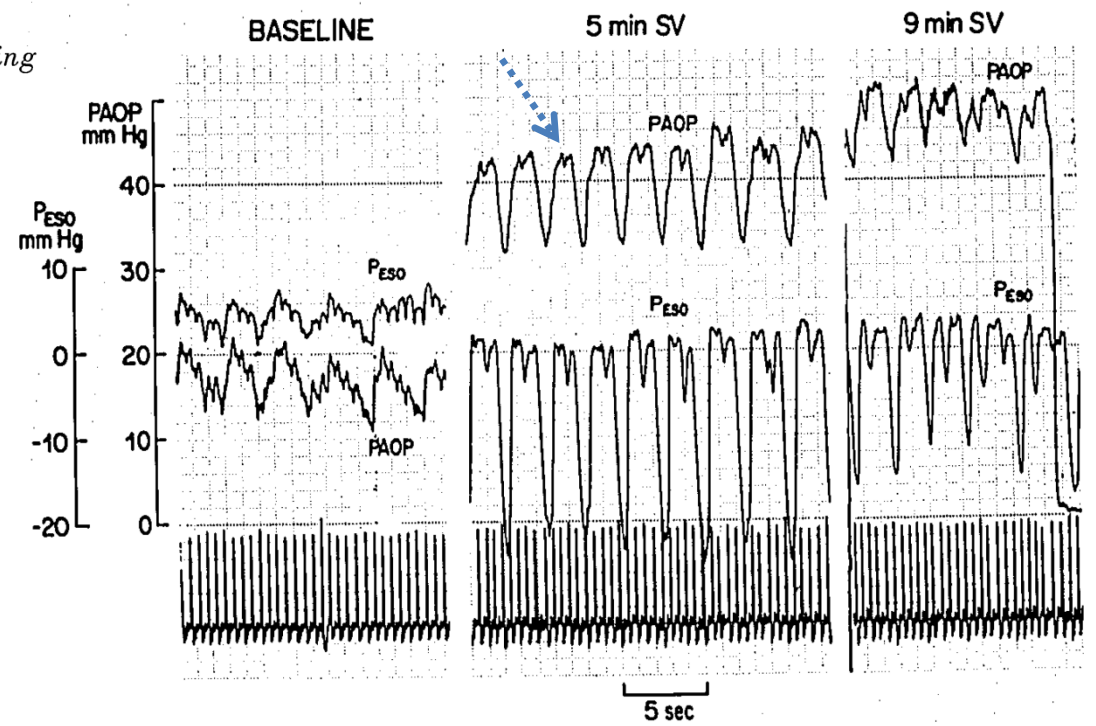
Weaning-induced pulmonary oedema

Anesthesiology
69:171–179, 1988

Acute Left Ventricular Dysfunction during Unsuccessful Weaning from Mechanical Ventilation

Francois Lemaire, M.D., Jean-Louis Teboul, M.D.,† Luc Cinotti, M.D.,‡ Guillen Giotto, M.D.,§ Fekri Abrouk, M.D.,§ Gabriel Steg, M.D.,§ Isabelle Macquin-Mavier, M.D.,¶ Warren M. Zapol, M.D.***

Lemaire, Teboul et al., Anesthesiology 1988; 69:171-179.



Weaning-induced pulmonary oedema

Echocardiographic diagnosis of pulmonary artery occlusion pressure elevation during weaning from mechanical ventilation*

17/39

Bouchra Lamia, MD, MPH, PhD; Julien Maizel, MD; Ana Ochagavia, MD; Denis Chemla, MD, PhD; David Osman, MD; Christian Richard, MD; Jean-Louis Teboul, MD, PhD

Intensive Care Med (2008) 34:1231–1238
DOI 10.1007/s00134-008-1038-3

ORIGINAL

24/46

Nadia Anguel
Xavier Monnet
David Osman
Vincent Castelain
Christian Richard
Jean-Louis Teboul

Increase in plasma protein concentration for diagnosing weaning-induced pulmonary oedema

Incidence : **48%!!**

Extravascular Lung Water, B-Type Natriuretic Peptide, and Blood Volume Contraction Enable Diagnosis of Weaning-Induced Pulmonary Edema*

10/21

Martin Dres, MD[1,2]; Jean-Louis Teboul, MD, PhD[1,2]; Nadia Anguel, MD[1]; Laurent Guerin, MD[1,2]; Christian Richard, MD[1,2]; Xavier Monnet, MD, PhD[1,2]

Official Executive Summary of an American Thoracic Society/American College of Chest Physicians Clinical Practice Guideline: Liberation from Mechanical Ventilation in Critically Ill Adults

Gregory A. Schmidt, Timothy D. Girard, John P. Kress, Peter E. Morris, Daniel R. Ouellette, Waleed Alhazzani, Suzanne M. Burns, Scott K. Epstein, Andres Esteban, Eddy Fan, Miguel Ferrer, Gilles L. Fraser, Michelle Ng Gong, Catherine L. Hough, Sangeeta Mehta, Rahul Nanchal, Sheena Patel, Amy J. Pawlik, William D. Schweickert, Curtis N. Sessler, Thomas Strøm, Kevin C. Wilson, and Jonathon D. Truwit; on behalf of the ATS/CHEST *Ad Hoc* Committee on Liberation from Mechanical Ventilation in Adults

6a. We suggest performing cuff leak test in mechanically ventilated adults who meet extubation criteria and deemed high risk for PES.

6b. For adults who have failed a cuff leak test but are otherwise ready for extubation, we suggest administering systemic steroids at least 4 h before extubation. A repeat cuff leak test is not required.

Very low certainty in the evidence

Moderate certainty in the evidence

	Placebo (n=343)	Methylprednisolone (n=355)	Total (n=698)	p
Laryngeal oedema	22%	3%		<0·0001
No			611 (88%)	
Yes			87 (12%)	
Severity of oedema				0·68
Minor	62 (82%)	10 (91%)	72 (83%)	
Major	14 (18%)	1 (9%)	15 (17%)	
Delay of occurrence*				0·83
≤5 min	36 (47%)	5 (45%)	41 (47%)	
6–30 min	26 (34%)	3 (27%)	29 (33%)	
>30 min	14 (18%)	3 (27%)	17 (20%)	
Reintubation	8%	4%		0·02
No			659 (94%)	
Yes			39 (6%)	
Context of reintubation				0·007
No laryngeal oedema	9 (35%)	11 (85%)	20 (51%)	
Laryngeal oedema				
Reintubation linked to oedema	14 (54%)	1 (8%)	15 (38%)	
Reintubation not linked to oedema	3 (12%)	1 (8%)	4 (10%)	

Bruno François et al., Lancet 2007; 369:1083-89.

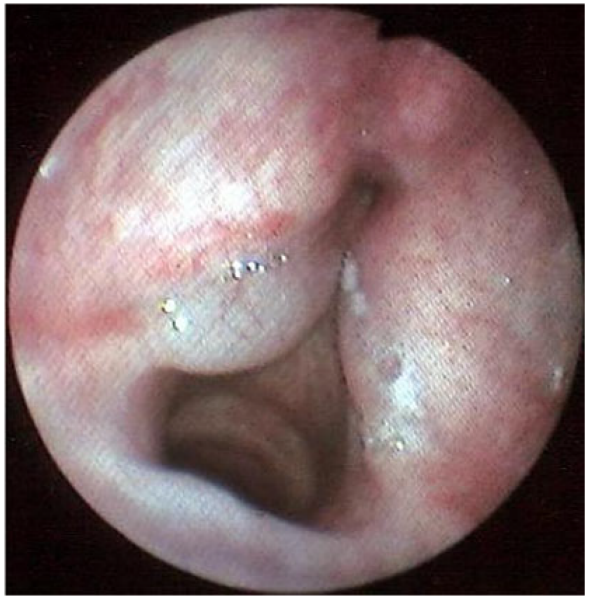


Fig. 1 Post-extubation nonobstructive edema

Tadié JM et al., Intensive Care Medicine 2010; 36:991-998.

Steroids in case of negative cuff leak test at least 4h before extubation

How to Identify Patients With No Risk for Postextubation Stridor?

Eric Maury, Jean Guglielminotti, Marc Alzieu, Tabassum Qureshi, Bertrand Guidet, and Georges Offenstadt

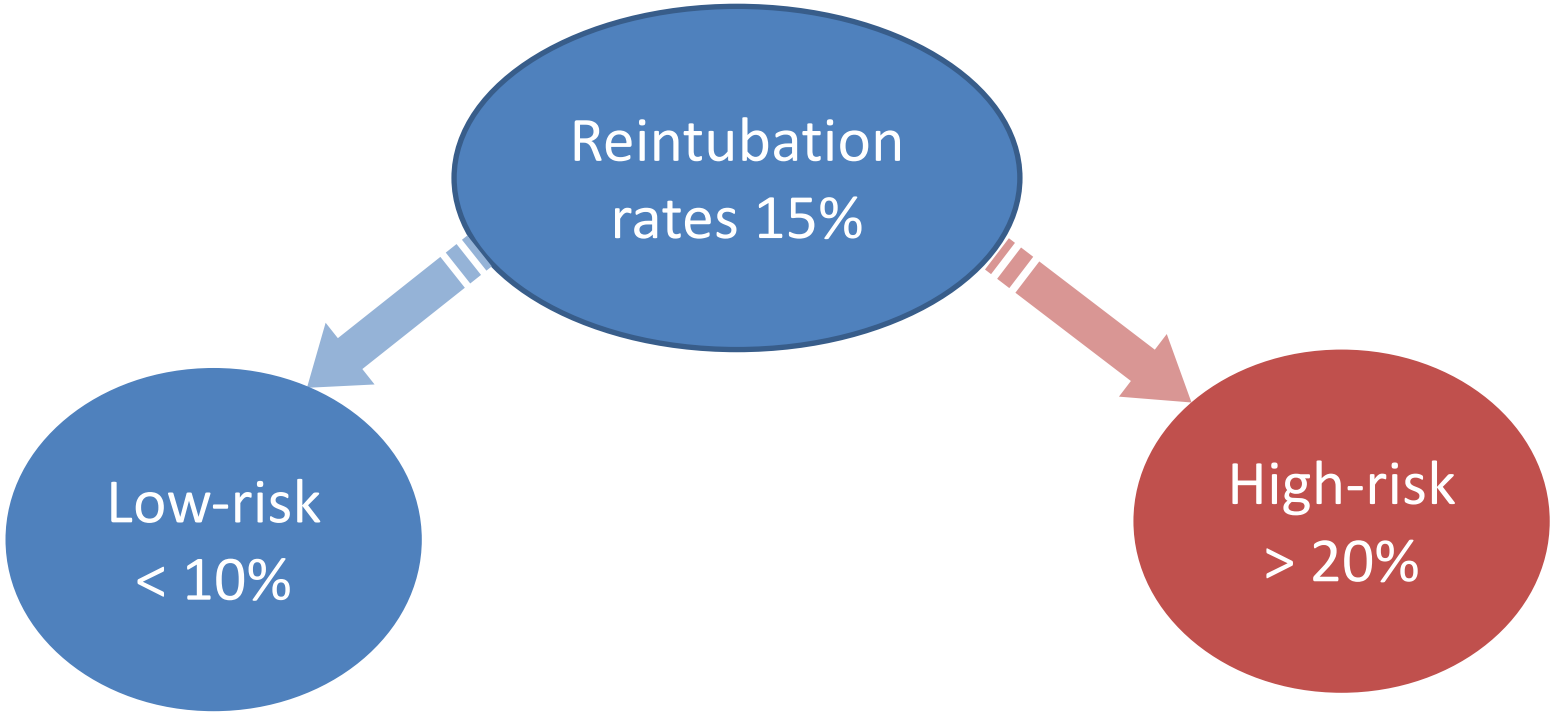
Journal of Critical Care, Vol 19, No 1 (March), 2004: pp 23-28

Table 3. Distribution of Cough and Leak According to the Occurrence of PES

	PES (n = 4)	No PES (n = 111)
Absence of cough after cuff deflation	3 (75%)	23 (21%)*
Absence of leak during tube occlusion	4 (100%)	22 (20%)†
Cough and leak present	0 (0%)	74 (67%)

Choisir un test avec une sensibilité élevée (peu de faux négatifs)

Which strategy of ventilation after extubation?



Prophylactic NIV in patients at high-risk?

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

Lancet 2009; 374: 1082–88

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

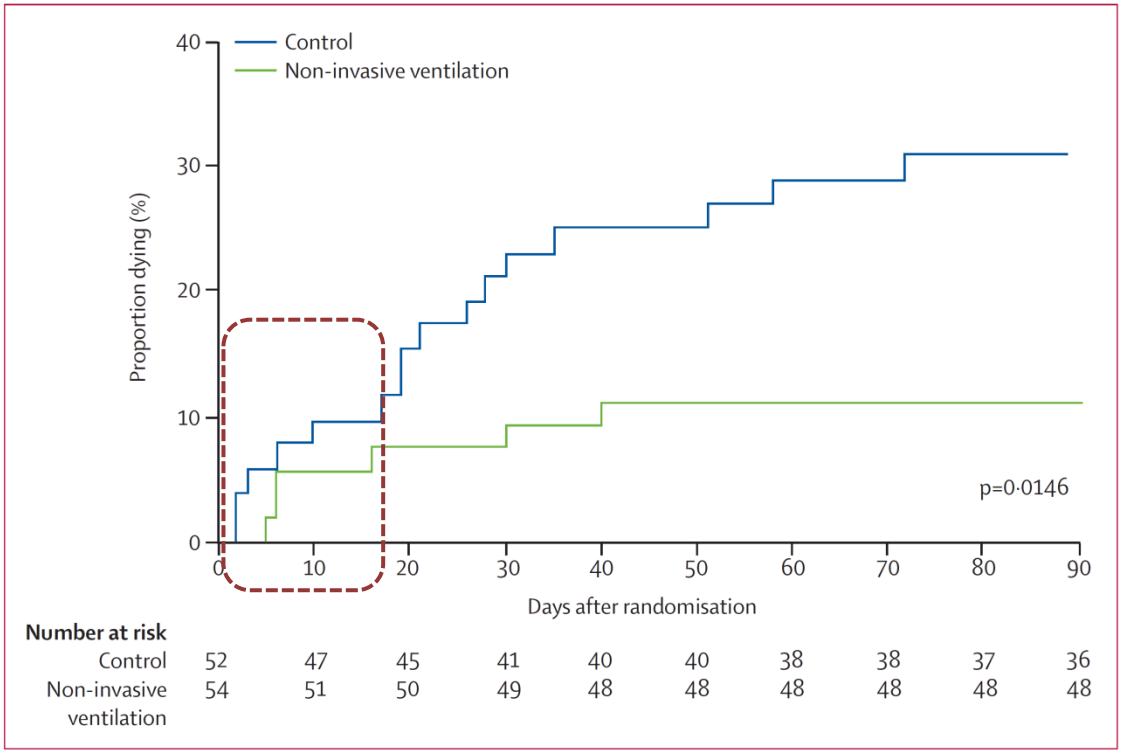


Figure 3: Kaplan-Meier 90-day mortality curve

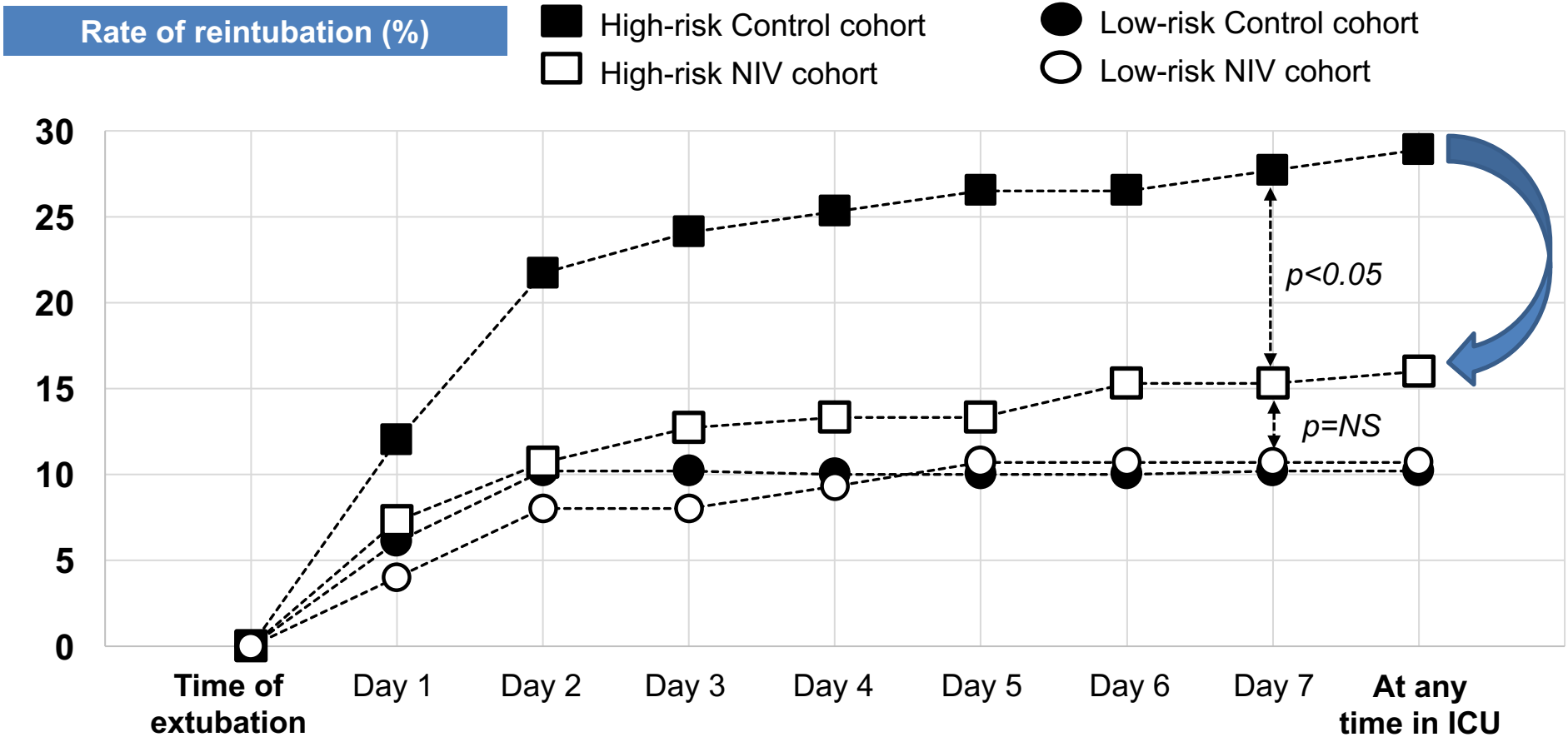
106 patients

$PaCO_2$ > 45 mm Hg

In-ICU Mortality:

n=3 (6%) vs. n=4 (8%), p=0.71

Patients at high-risk: ≥ 65y or underlying cardiac/respiratory disease



Thille AW et al., Crit Care 2016; 20:48.

Use of High-Flow Nasal Cannula?

ORIGINAL ARTICLE

Nasal High-Flow versus Venturi Mask Oxygen Therapy after Extubation

Effects on Oxygenation, Comfort, and Clinical Outcome

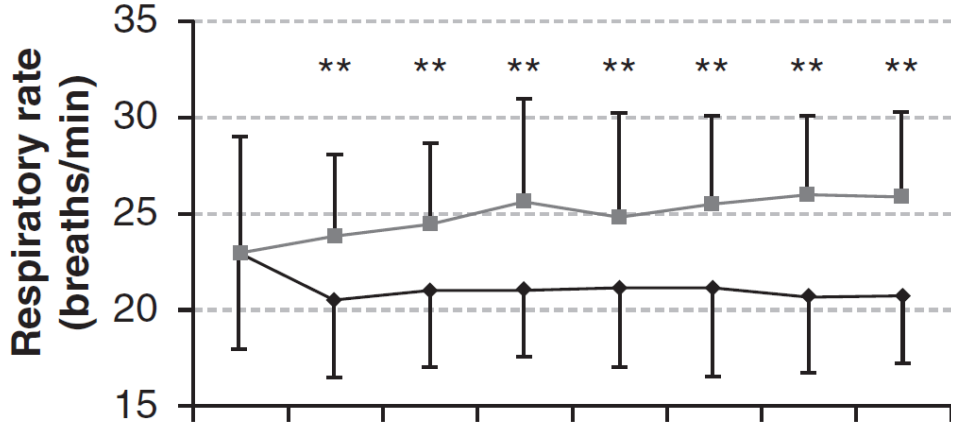
Am J Respir Crit Care Med Vol 190, Iss 3, pp 282–288, Aug 1, 2014

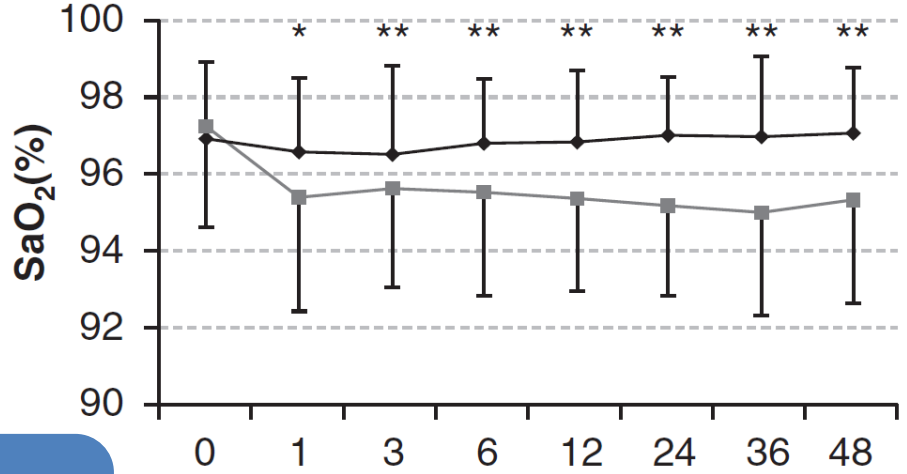
Salvatore Maurizio Maggiore[1], Francesco Antonio Idone[1], Rosanna Vaschetto[2], Rossano Festa[1], Andrea Cataldo[1], Federica Antonicelli[1], Luca Montini[1], Andrea De Gaetano[3], Paolo Navalesi[4,5,6], and Massimo Antonelli[1]

[1]Department of Anesthesiology and Intensive Care, Agostino Gemelli Hospital, Università Cattolica del Sacro Cuore, Rome, Italy; [2]Department of Anesthesia and Intensive Care, Maggiore della Carità Hospital, Novara, Italy; [3]Consiglio Nazionale delle Ricerche, Istituto di Analisi dei Sistemi e Informatica "A. Ruberti," Rome, Italy; [4]Department of Translational Medicine, Università del Piemonte Orientale "A. Avogadro," Alessandria-Novara-Vercelli, Italy; [5]Anesthesia and Intensive Care, Sant'Andrea Hospital, Vercelli, Italy; and [6]CRRF Mons. L. Novarese, Moncrivello (VC), Italy

2 centers (105 patients)

PaO_2/FiO_2 < 300 mm Hg





Reintubation:

O_2 21% vs. HFNC 4%, *p=0.005*

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

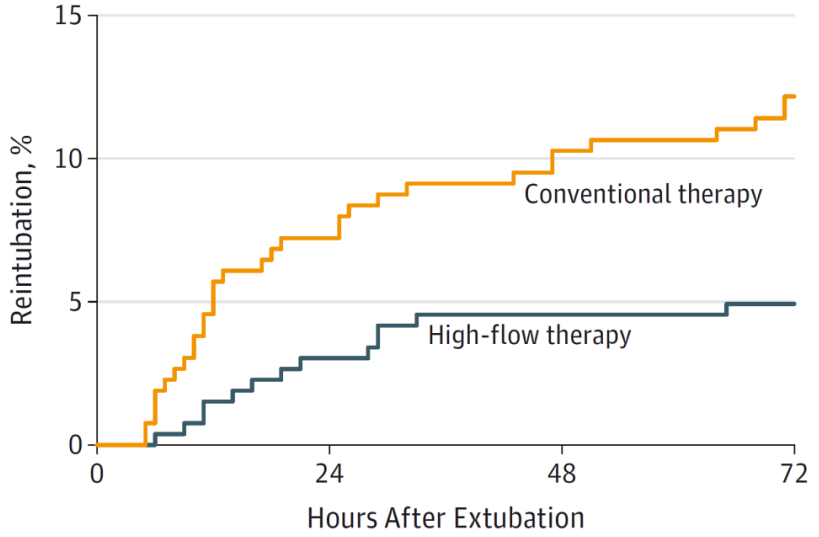
A Randomized Clinical Trial

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
at low-risk for reintubation

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

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

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

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

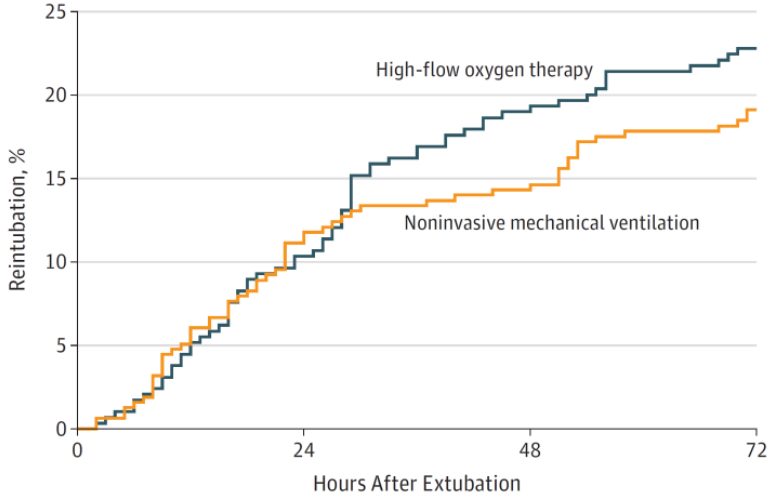
A Randomized Clinical Trial

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
at high-risk for reintubation

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

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

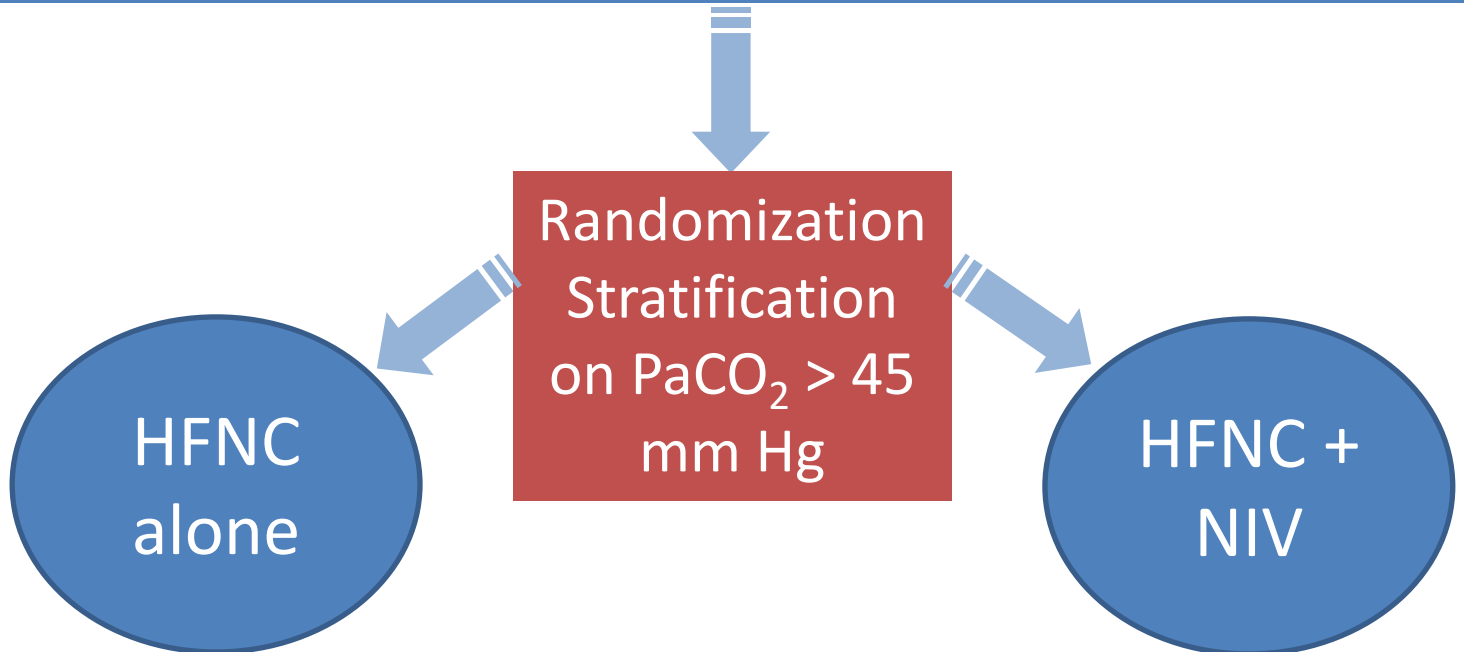


No. at risk				
High-flow oxygen therapy	290	260	234	223
Noninvasive mechanical ventilation	314	279	269	253

High Wean study

600 Patients at high-risk

age ≥ 65y or underlying cardiac/respiratory disease

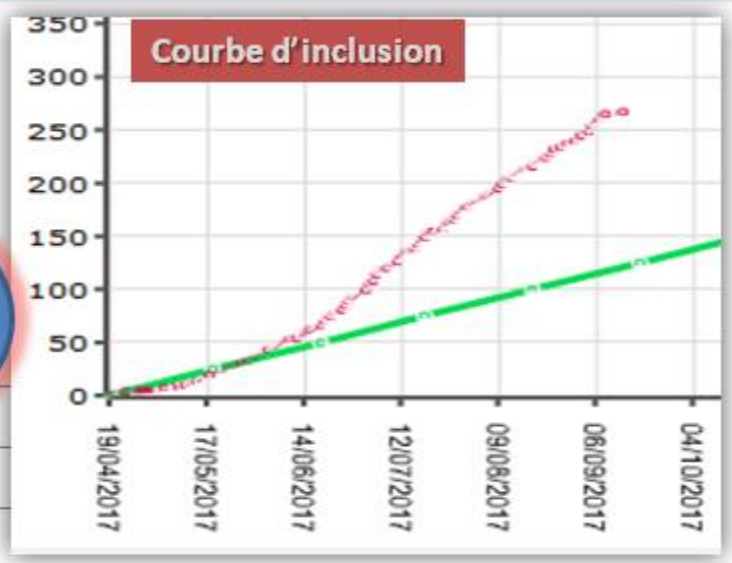


High Wean study

Nous comptons sur vous pour garder cette dynamique exceptionnelle.

Merci pour votre accueil toujours sympathique lors de nos monitoring.

267



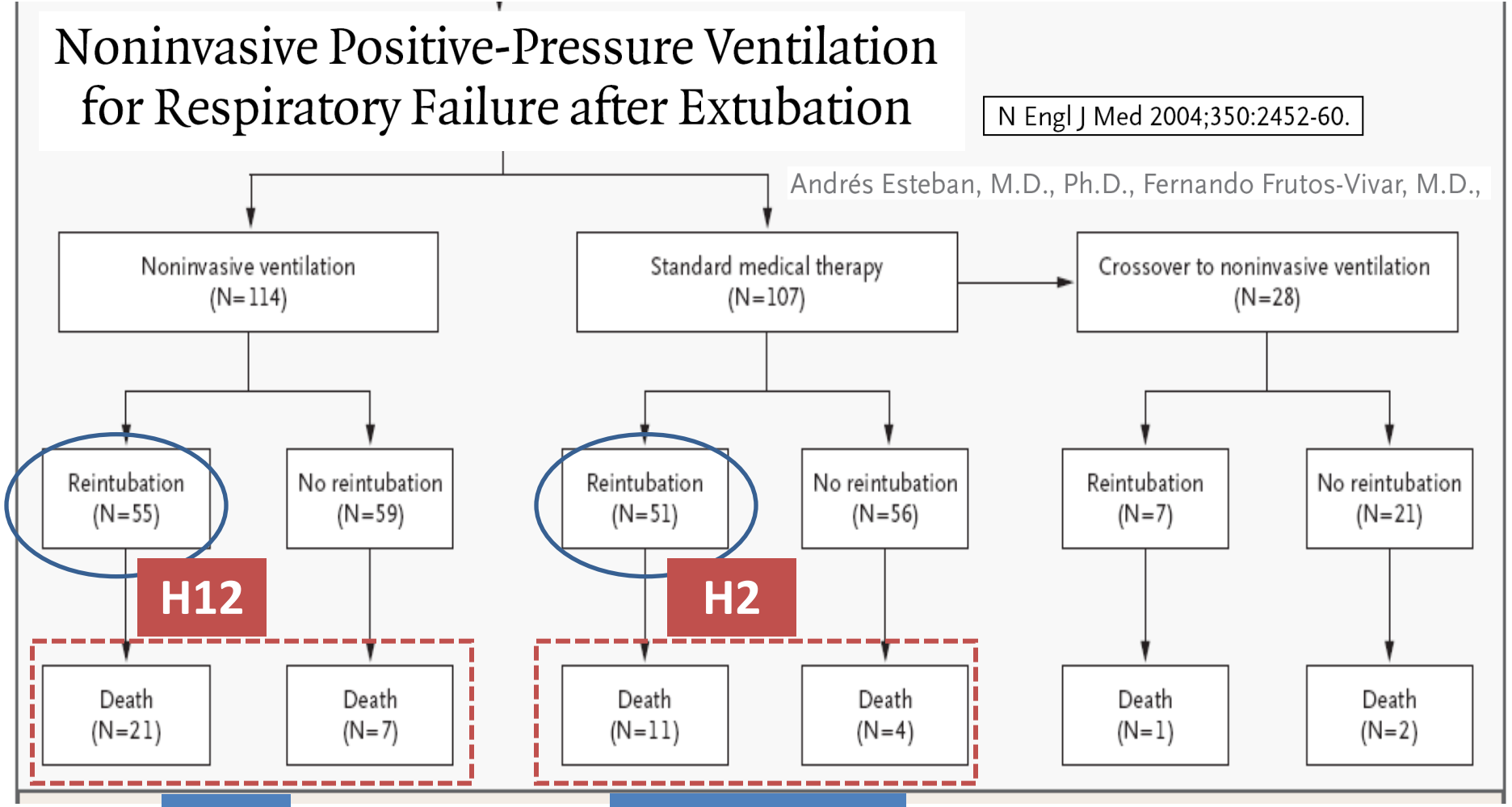
L'équipe HIGH-WEAN

NIV to treat ARF after extubation?

Noninvasive Positive-Pressure Ventilation for Respiratory Failure after Extubation

N Engl J Med 2004;350:2452-60.

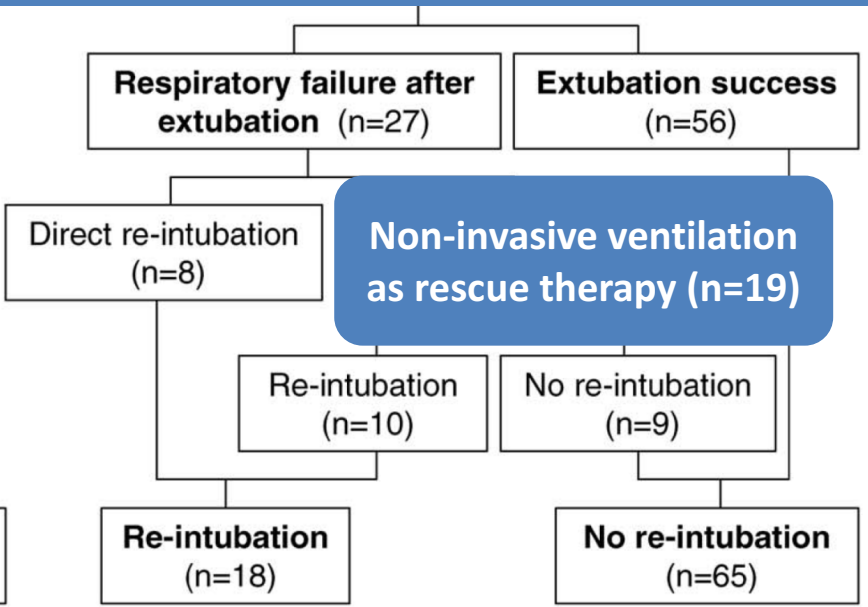
Andrés Esteban, M.D., Ph.D., Fernando Frutos-Vivar, M.D.,



25%

14%, $p<0.05$

NIV to treat ARF after extubation in COPD?



Which reintubation rates?

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)*

Recommandations SRLF

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)

Conclusions

1. Patients at high-risk : age>65y and/or underlying cardiac or respiratory disease

2. T-piece or PS0/PEEP0 adequately mimic work of breathing after extubation but PS may hasten extubation

3. Steroids before extubation

4. High-flow nasal cannula seems better than standard oxygen

5. NIV in patients at high-risk for reintubation

QCM 1

Concernant l'épreuve de sevrage

A. Le travail respiratoire est équivalent en pièce en T et en aide inspiratoire +7 / PEP0

B. Le travail respiratoire est plus élevé après l'extubation

C. Une hypercapnie sans acidose est un critère d'échec en fin d'épreuve

D. L'échec lors de l'épreuve est plus fréquent en pièce en T qu'en aide inspiratoire

E. La réintubation est plus élevée si l'épreuve a été réalisée avec de la PEP

QCM 2

Concernant la réintubation

A. Elle survient dans plus de 20% des cas chez les patients à risque

B. Elle concerne moins de 5 à 10% des patients intubés en réanimation

C. La VNI pourrait réduire le risque chez les patients neurologiques

D. Le risque est réduit en cas d'injection de corticoïdes au moment de l'extubation

E. Plus de 25% des patients réintubés le sont au delà de 48h

QCM 3

Quels sont les items recommandés par les sociétés savantes

A. Utiliser VNI curative chez les patients à haut risque

B. Utiliser la VNI préventive chez les patients BPCO

C. Utiliser l’’oxygène à haut débit chez les patients à haut risque

D. L’administration de corticoïdes 24h avant l’extubation en cas d’absence de fuite

E. Réaliser la première épreuve de sevrage en pièce en T

Réponses QCM

QCM 1: D

QCM 2: A-B-E

QCM 3: B