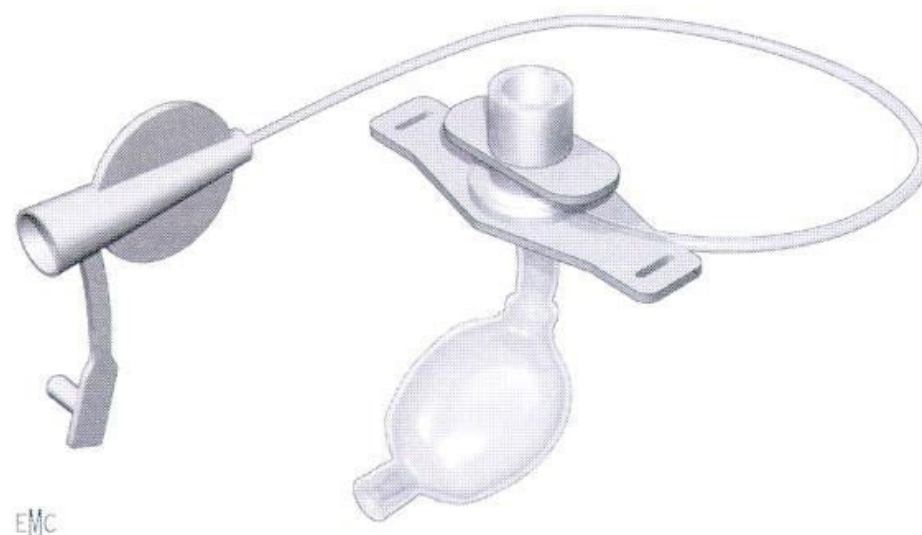


Trachéotomie en Réanimation



DU Kiné
Mai 2024



www.sim-va.com

Pr Hadrien Rozé
Réanimation Polyvalente
Centre Hospitalier Côte Basque



Timing, Complications, and Safety of Tracheotomy in Critically Ill Patients With COVID-19

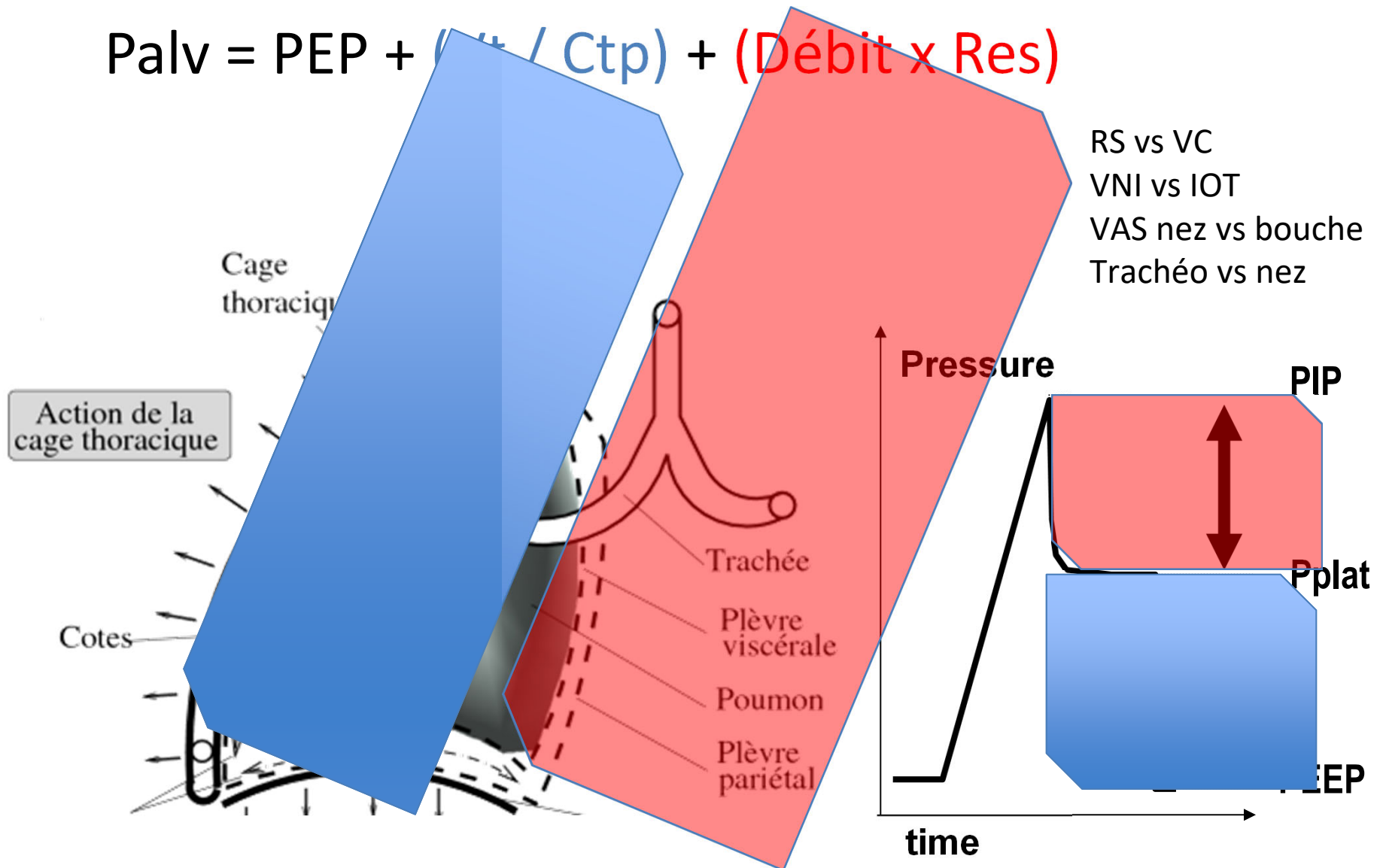
Francesc Xavier Avilés-Jurado, MD, PhD; Daniel Prieto-Alhambra, MD, PhD; Nesly González-Sánchez, MD; José de Ossó, MD; Claudio Arancibia, MD; María Jesús Rojas-Lechuga, MD; Laura Ruiz-Sevilla, MD; Joan Remacha, MD; Irene Sánchez, MD; Eduardo Lehrer-Coriat, MD; Mauricio López-Chacón, MD; Cristóbal Langdon, MD; Josep María Guilemany, MD, PhD; Francisco Larrosa, MD, PhD; Isam Alobid, MD, PhD; Manuel Bernal-Sprekelsen, MD, PhD; Pedro Castro, MD, PhD; Isabel Vilaseca, MD, PhD

JAMA Otolaryngol Head Neck Surg. 2021;147(1):41-48.

Characteristic	Total (N = 50)	Early tracheotomy (n = 32)	Late tracheotomy (n = 18)
Postoperative complications			
Minor diffuse bleeding	6 (12)	5 (15.6)	1 (5.5)
Major bleeding	0	0	0
Air leak	3 (6)	1 (3)	2 (11)
Cannula dislocation	1 (2)	0	1 (5.5)
Tolerance to cuff deflation in survivors (n = 42)	42 (100)	42 (100)	42 (100)
Ability to phonate in survivors (n = 42)	42 (100)	42 (100)	42 (100)
Neurologic impairment			
No	41 (82)	28 (56)	13 (26)
Yes	3 (6)	2 (4)	1 (2)
Dead before examination	6 (12)	2 (4)	4 (8)
Intubation time before tracheotomy, d			
Median (IQR)	9 (4.2)	8 (2)	12.5 (2.25)
Mean (SD)	9.6 (3.6)	7.5 (1.9)	13.2 (3)
Total time receiving IMV, d			
Median (IQR)	18 (6)	17 (5)	20 (5)
Mean (SD)	17.9 (4.5)	16.6 (4.5)	20.5 (3.4)
Time from tracheotomy to IMV withdrawn, d			
Median (IQR)	8 (6)	8 (9)	8 (9)
Mean (SD)	8.5 (4.5)	9.2 (5.1)	7.22 (2.6)
Decannulation rate in survivors	42 (100)	42 (100)	42 (100)
Time to decannulation, d			
Median (IQR)	22 (15)	20 (15)	25 (14)
Mean (SD)	23.7 (12)	22.2 (13)	26.4 (9)

- Equation du mouvement du poumon :

$$P_{\text{alv}} = P_{\text{EP}} + (V_t / C_{\text{tp}}) + (\text{Débit} \times R_{\text{es}})$$

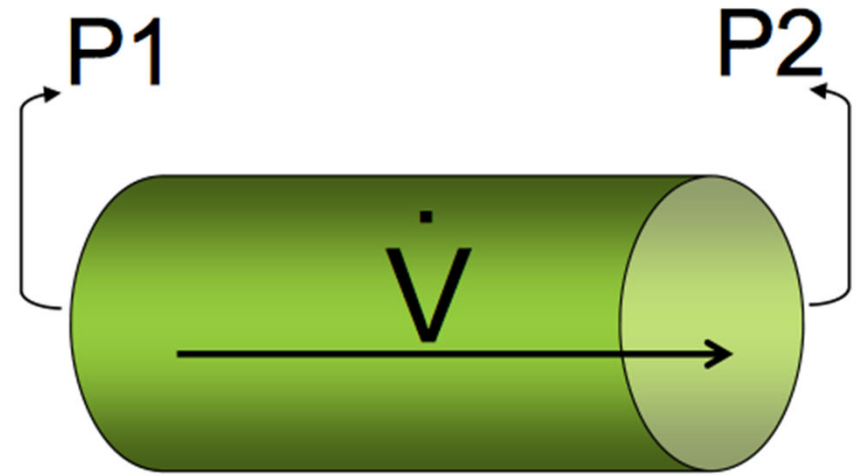


Propriétés résistives

- Ventilation = condition dynamique
 - L'activité des muscles respiratoires doit
 - vaincre l'élasticité pulmonaire (2/3 au repos)
 - vaincre la résistance du système respiratoire au passage de l'air (1/3 au repos)
 - résistances tissulaires ($\approx 20\%$): frottements du tissu pulmonaire
 - résistances des voies aériennes ($\approx 80\%$): résistance à l'écoulement des molécules

- Fluide

- viscosité η
- densité ρ
- conduit de longueur l
- rayon r

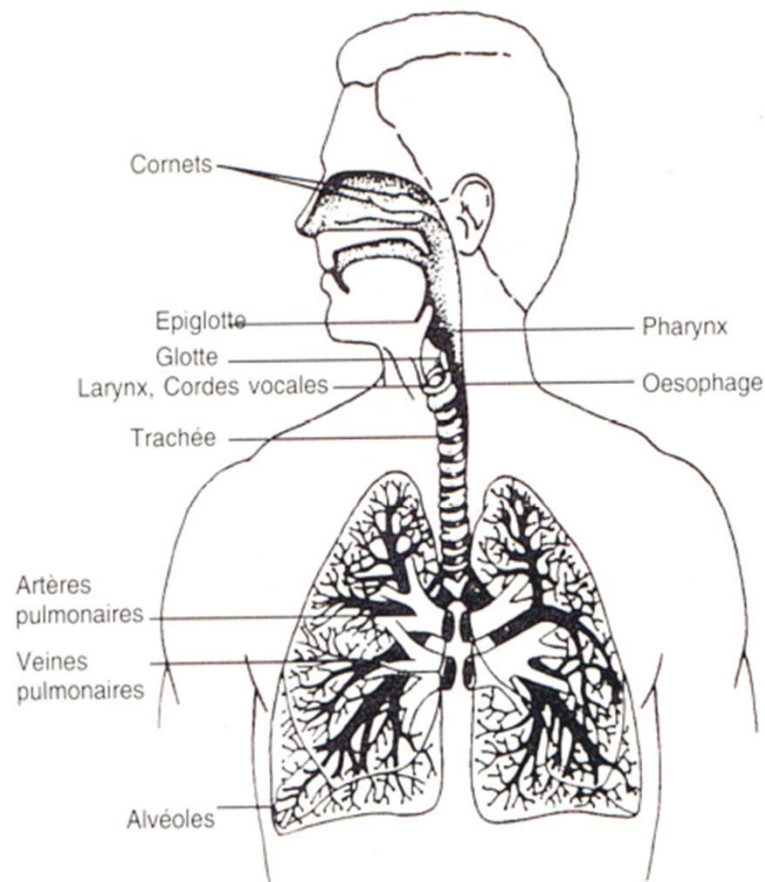


- En écoulement laminaire

$$\dot{V} = \frac{\Delta P^*}{R} \quad R = \frac{8\eta l}{\pi r^4}$$

Résistances pulmonaires

En respiration nasale



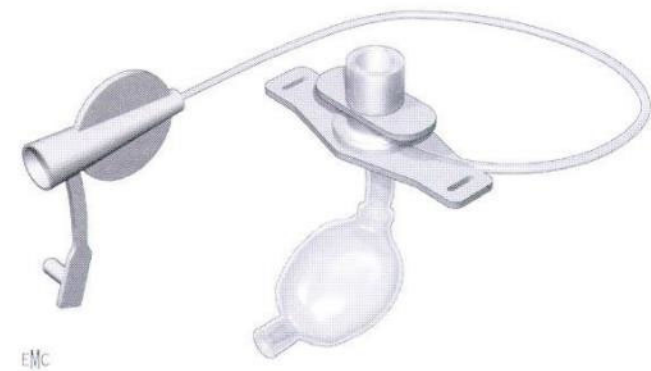
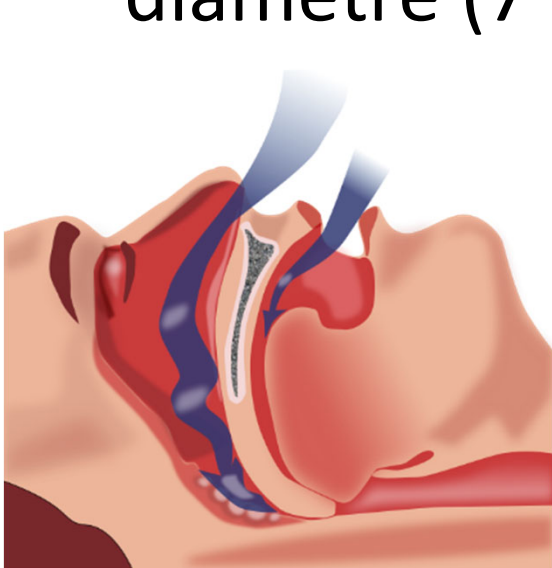
VA extra-thoraciques (nez +++)
50%

Trachée et grosses bronches
40%

G_7 à G_{23}
10%

Resistances Trachéo = VS par le nez

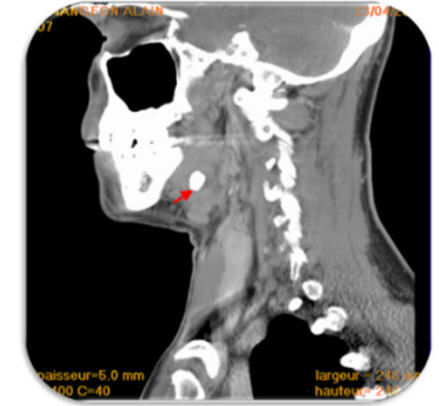
- $R_{\text{trac}} = R_{\text{VS par le nez}}$
- Si IOT la longueur modifie les résistances inspi et expiratoires et $R_{\text{Trac}} < R_{\text{IOT}}$ à même diamètre (7 ou 8)



Espace mort

- L'augmentation de l'effet espace mort (de l'ordre de 25 % chez le sujet normal et pouvant atteindre 60 à 80 % chez le patient BPCO en poussée) est responsable de l'hypercapnie.
- La PaCO_2 est proportionnelle à la production de CO_2 et inversement proportionnelle à la ventilation alvéolaire (VA) :
- **$\text{PaCO}_2 = K \times \text{VCO}_2 / \text{VA}$**
- La ventilation alvéolaire est la différence entre la ventilation totale et la ventilation de l'espace mort :
- **$\text{VA} = \text{Ve} \times \text{VD} / \text{VT} = \text{VE} \times (1 - \text{VD}) / \text{VT}$**
- VD est l'espace mort physiologique, c'est-à-dire la fraction du volume courant qui ne participe pas aux échanges gazeux. VT est le volume courant. Ainsi, en remplaçant VA dans la première équation, on obtient :
- **$\text{PaCO}_2 = K \times \text{VCO}_2 / (\text{VE} \times (1 - \text{VD} / \text{VT}))$**

Espace mort

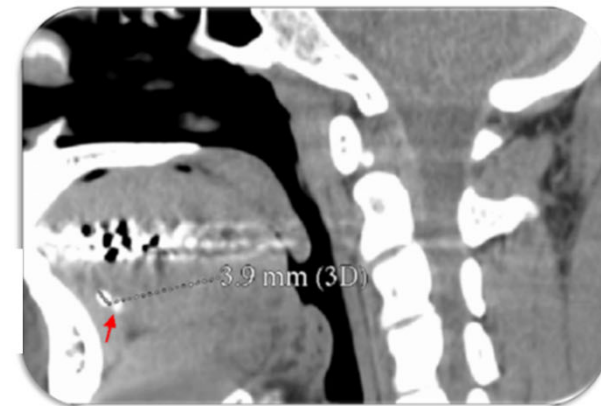


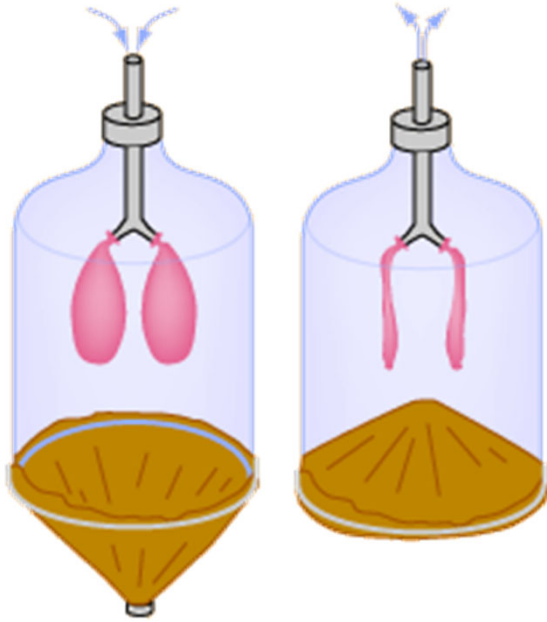
- La trachéo diminue l'espace mort de 156 ml à 230 ml.

Intensive Care Med (2002) 28:1761–1767

- Le VT est poche de 6 ml.kg afin de limiter les asynchronies et l'auto PEP chez les BPCO

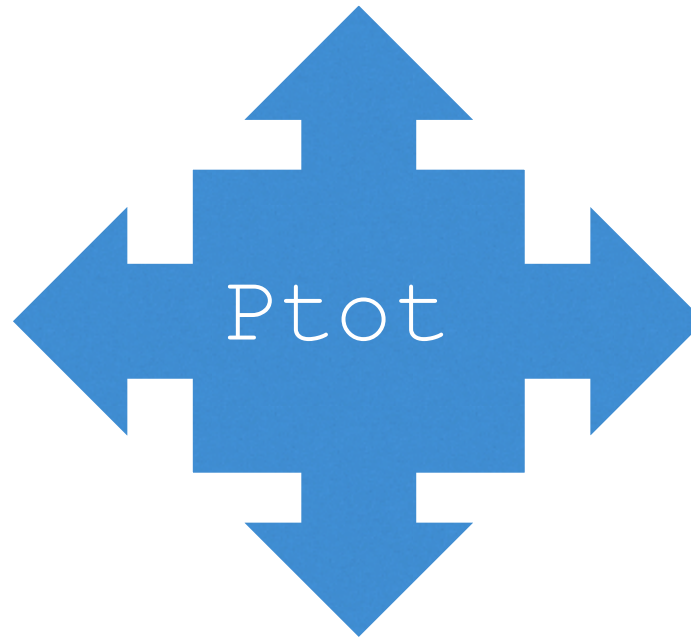
Intensive Care Med (2008) 34:1477–1486





Forces de
rétraction
Élastique du
poumon

Forces opposées
à la ventilation

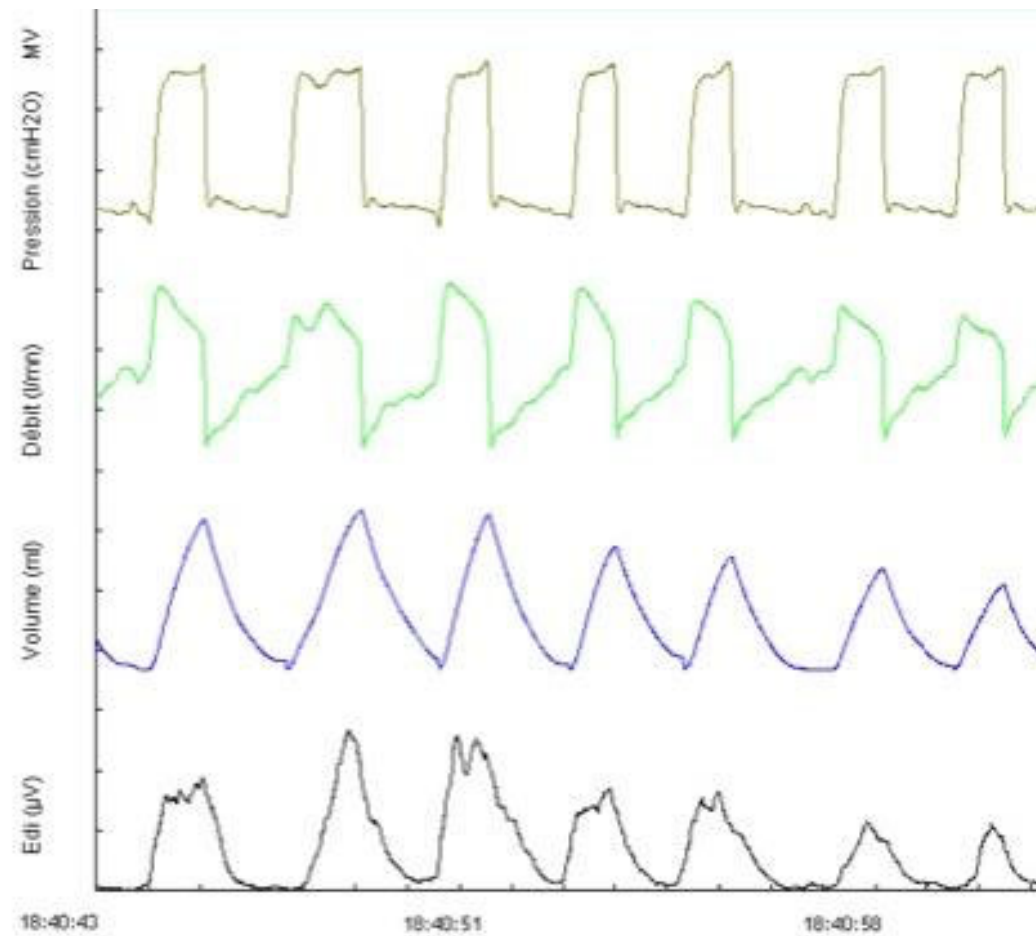


Résistances
à l'écouleme
du gaz

Travail respiratoire
Litres/cmH₂O
Joules

$$P_{tot(t)} = R \cdot \text{Débit}_{(t)} + 1/C \cdot V_{(t)}$$

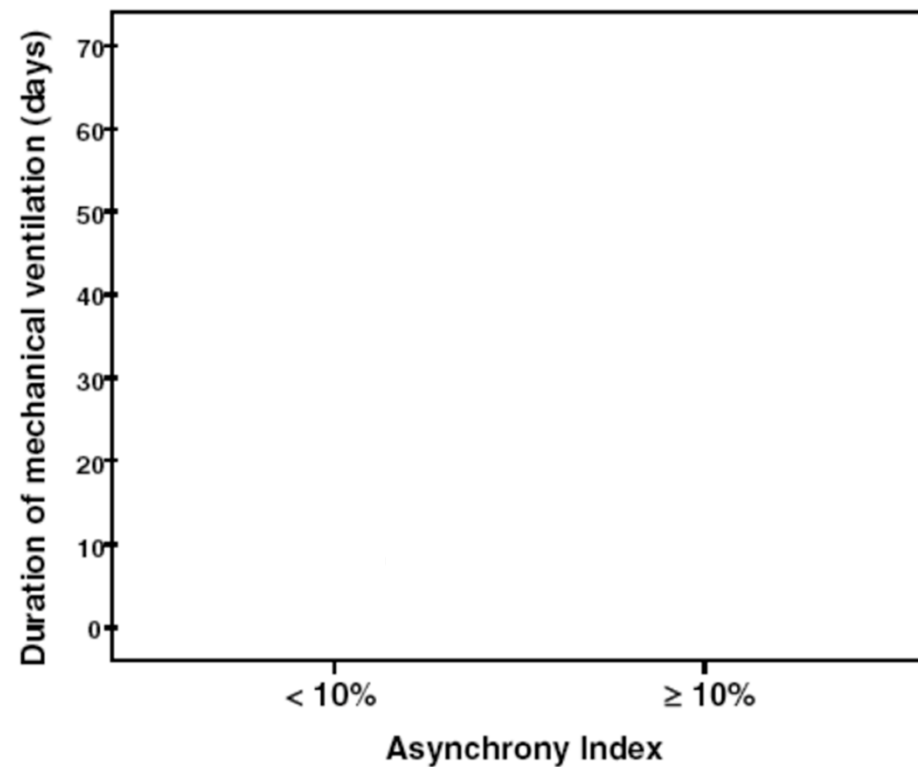
$$P_{tot} = P_{mus} + P_{aw}$$



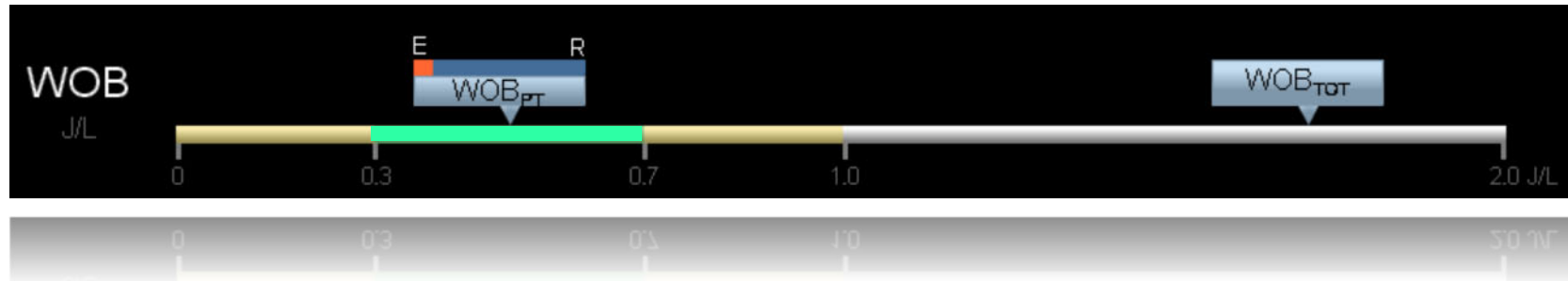


Arnaud W. Thille
Pablo Rodriguez
Belen Cabello
François Lellouche
Laurent Brochard

Patient-ventilator asynchrony during assisted mechanical ventilation



- Assistance en fonction du travail respiratoire



Intensive Care Med (2006) 32:1311–1314
DOI 10.1007/s00134-006-0278-3

PHYSIOLOGICAL NOTE

1 joule = mobilisation de 1l de gaz avec un ΔP de 10 cmH₂O

ϵ_n (joule) $\neq P$

Belen Cabello
Jordi Mancebo

Work of breathing

Review

J Appl Physiol 107: 962–970, 2009.
First published April 30, 2009; doi:10.1152/jappphysiol.00165.2009.

HIGHLIGHTED TOPIC | *The Respiratory Muscles in Chronic Obstructive Pulmonary Disease*

Role of the respiratory muscles in acute respiratory failure of COPD:
lessons from weaning failure

Martin J. Tobin,¹ Franco Laghi,¹ and Laurent Brochard²

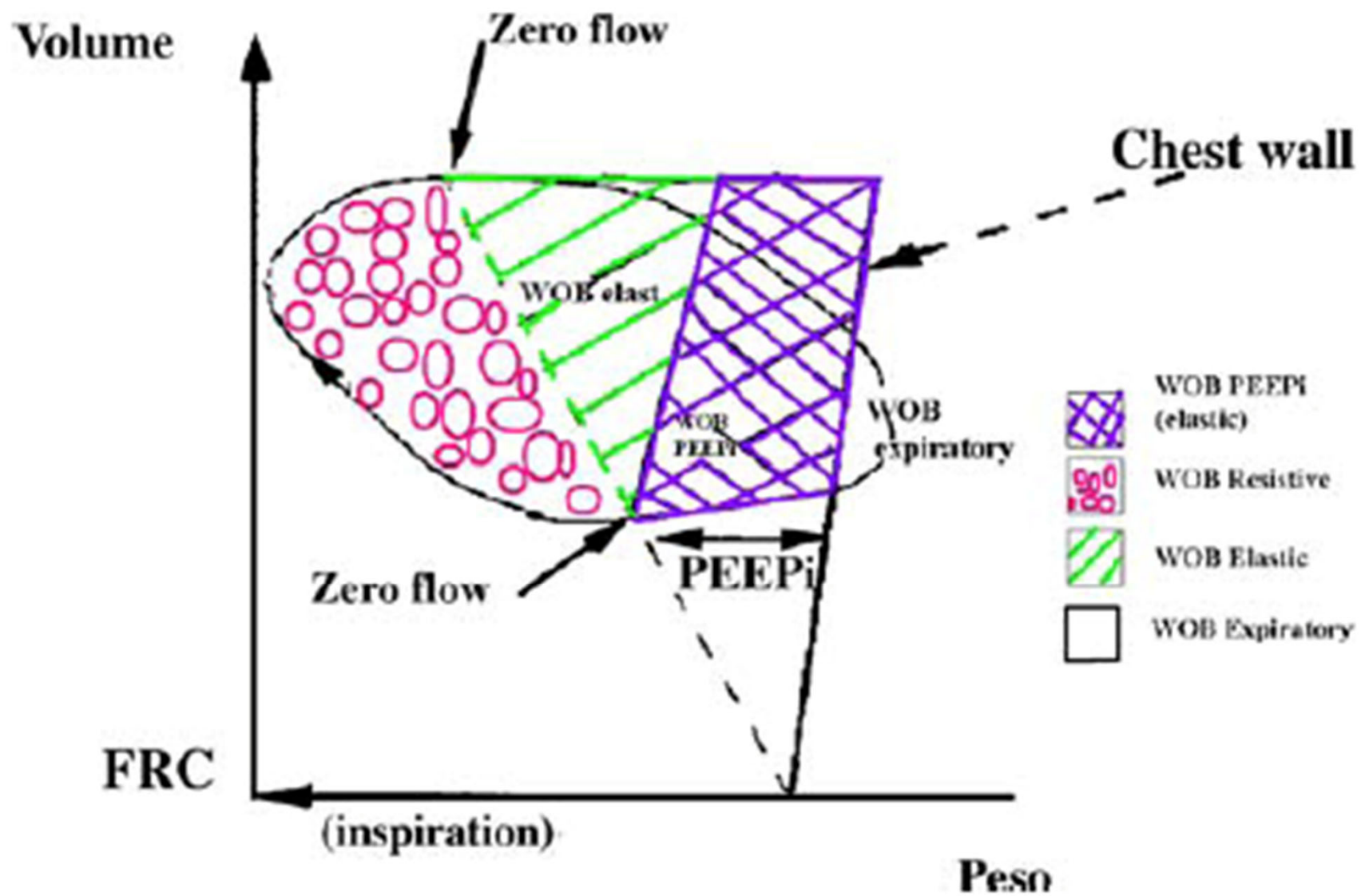


Diagramme de Campbel

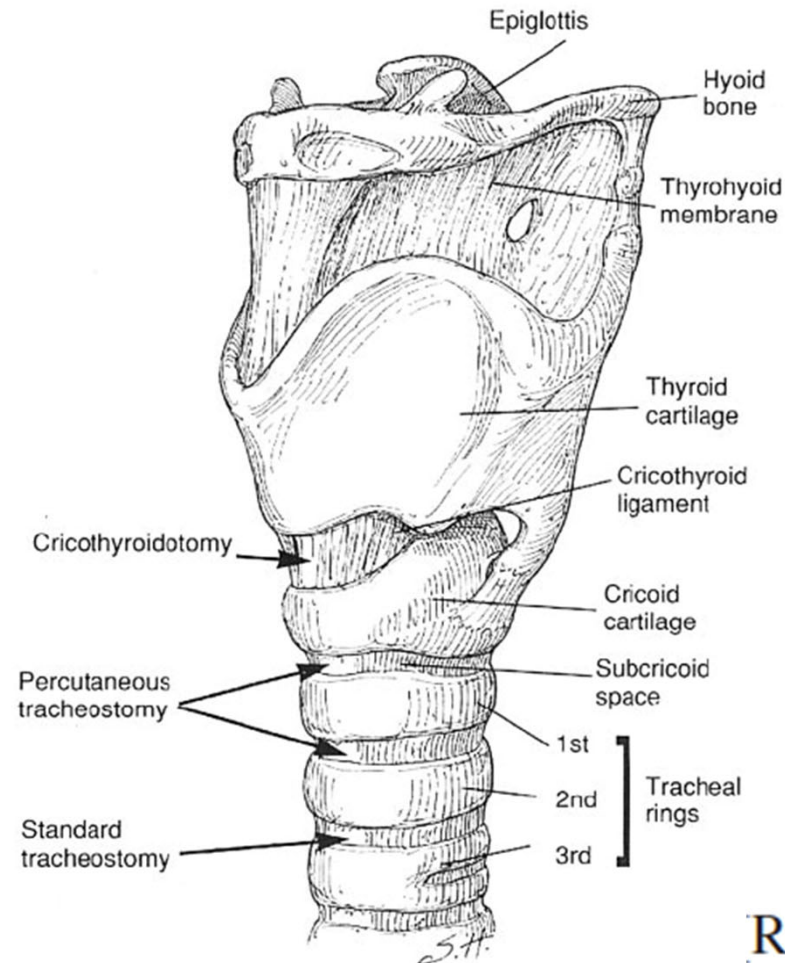
WOB: Travail respiratoire

- 31 BPCO échec de sevrage
- Début SBT: PTP échec 255 (59) cmH₂O.s/min
succès 158 (23)
- Fin SBT : PTP échec 388 (68)*
succès 205 (25)

>> Echec si trop de travail

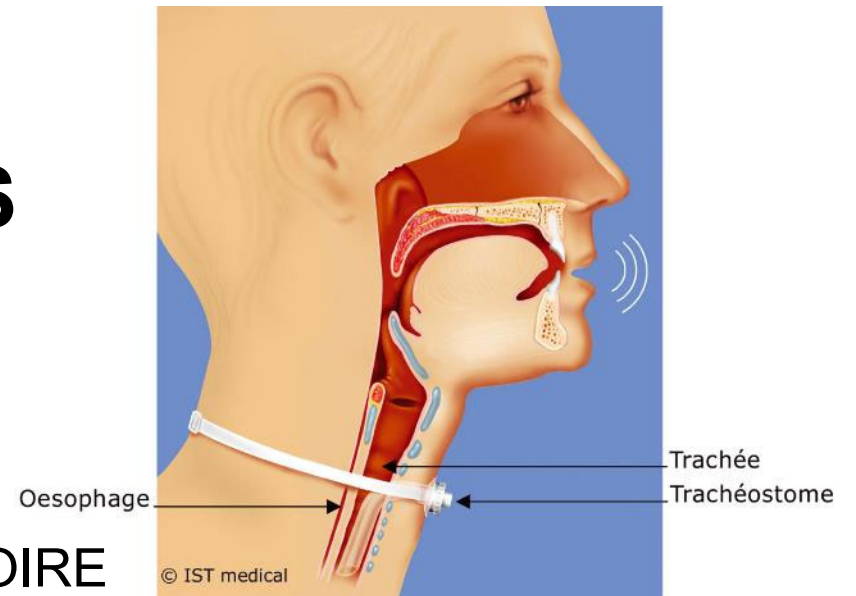
Anatomy and Physiology of Tracheostomy

Scott K Epstein MD



AVANTAGES ATTENDUS

- ④ REDUCTION DU TRAVAIL RESPIRATOIRE
- ④ DIMINUTION DES PNEUMOPATHIES
- ④ SEVRAGE VENTILATOIRE PROGRESSIF
- ④ CONFORT
- ④ SECURITE

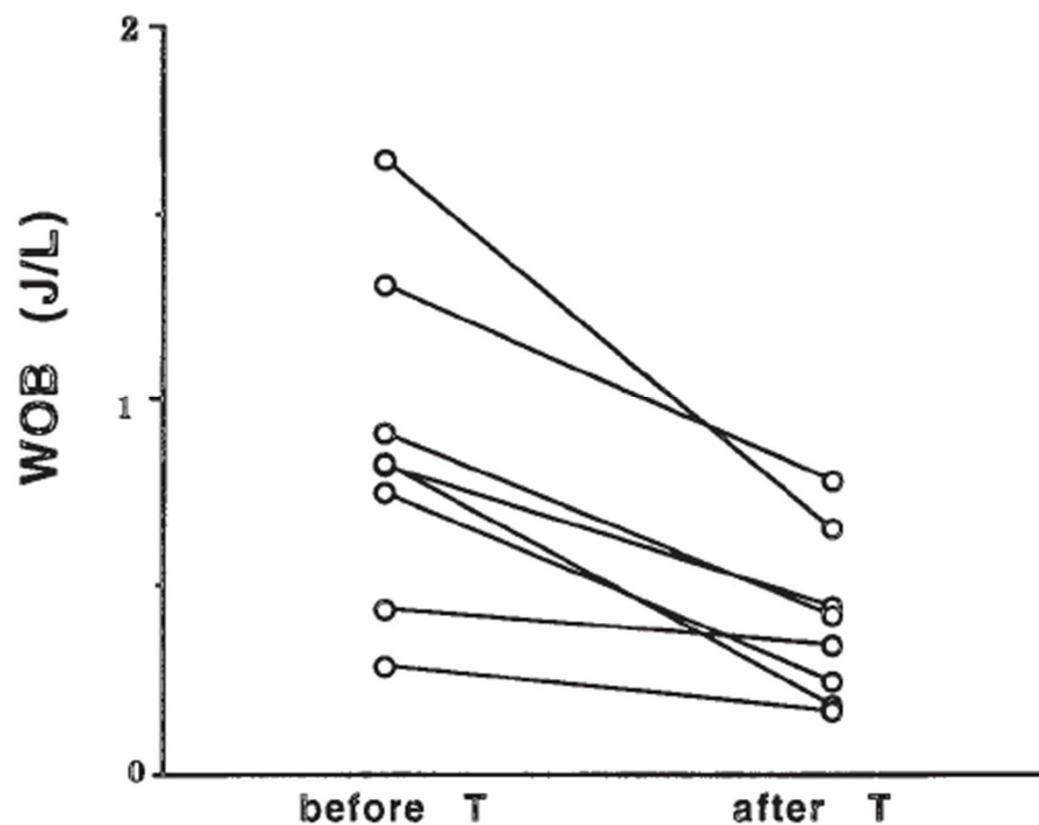


Changes in the Work of Breathing Induced by Tracheotomy in Ventilator-dependent Patients

JEAN-LUC DIEHL, SOUHEIL EL ATROUS, DOMINIQUE TOUCHARD, FRANÇOIS LEMAIRE, and LAURENT BROCHARD

Service de Réanimation Médicale, Hôpital Henri Mondor, AP-HP, Institut Nationale de la Santé et de la Recherche Médicale 492, Université Paris 12, Créteil, France

Am J Respir Crit Care Med Vol 159. pp 383–388, 1999



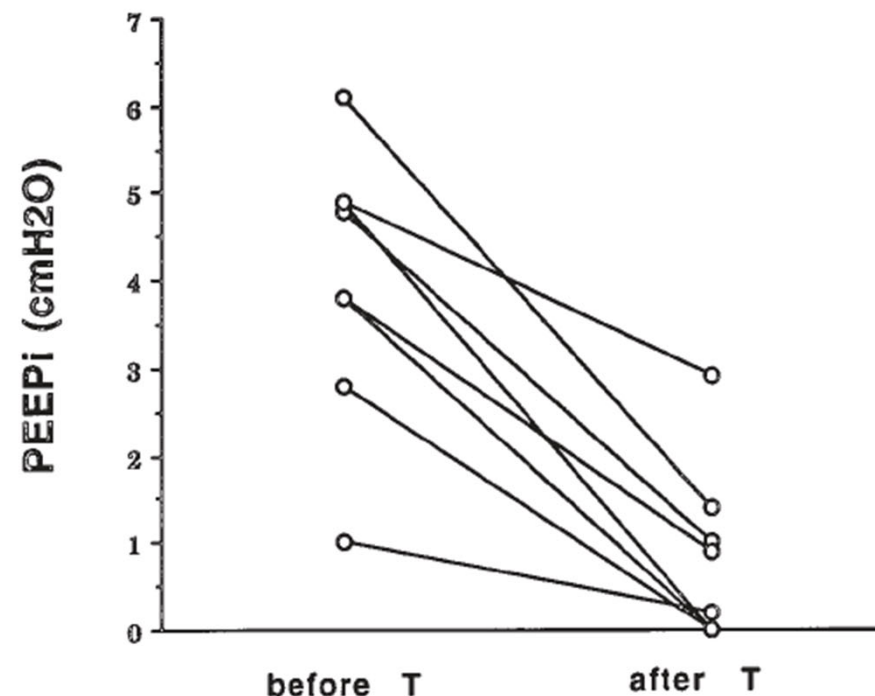
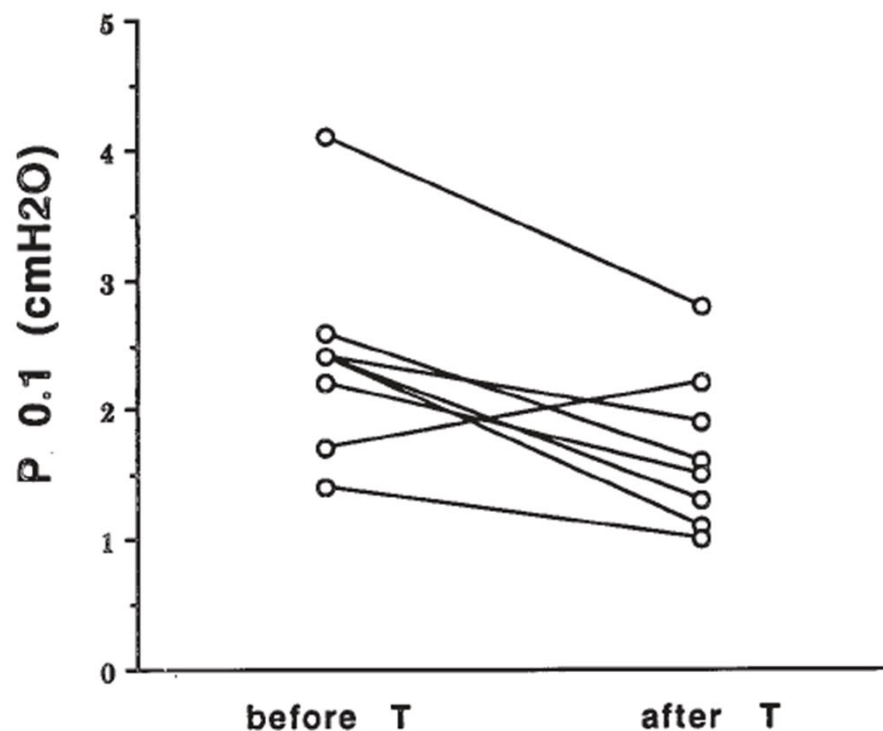
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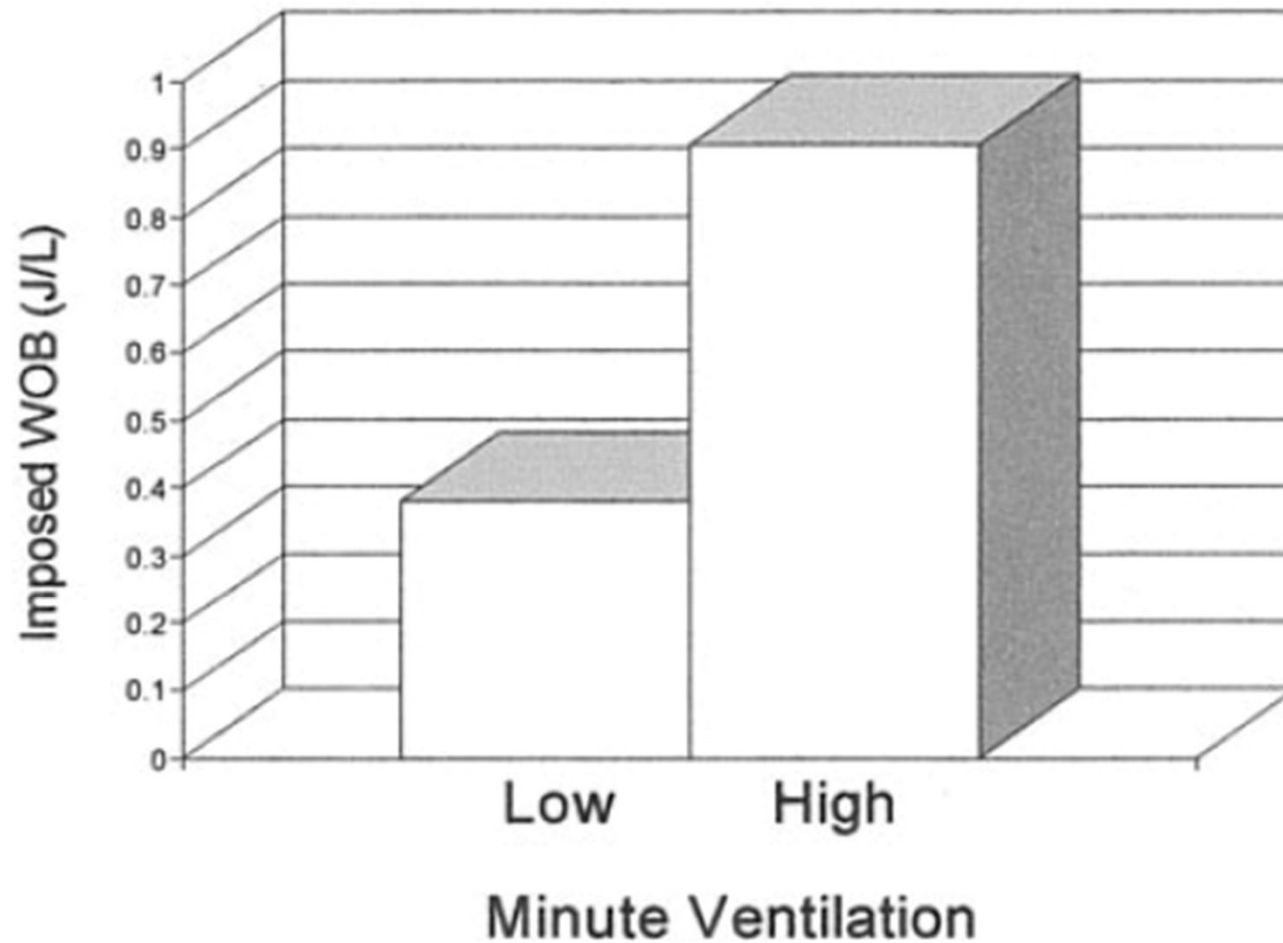


Am J Respir Crit Care Med Vol 159. pp 383–388, 1999



WOB et ventilation minute

10 patients trachéotomisés



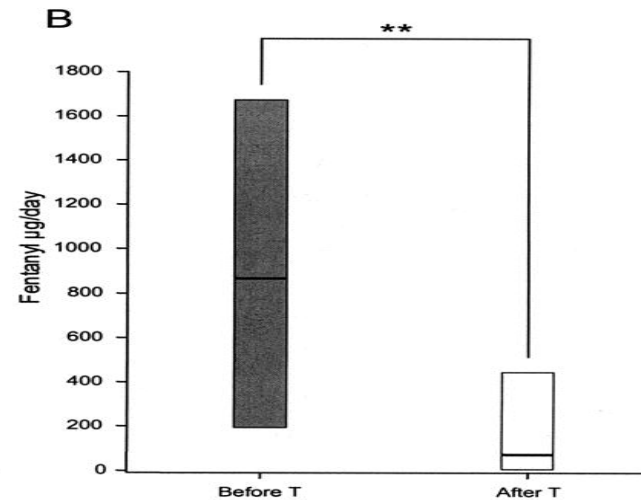
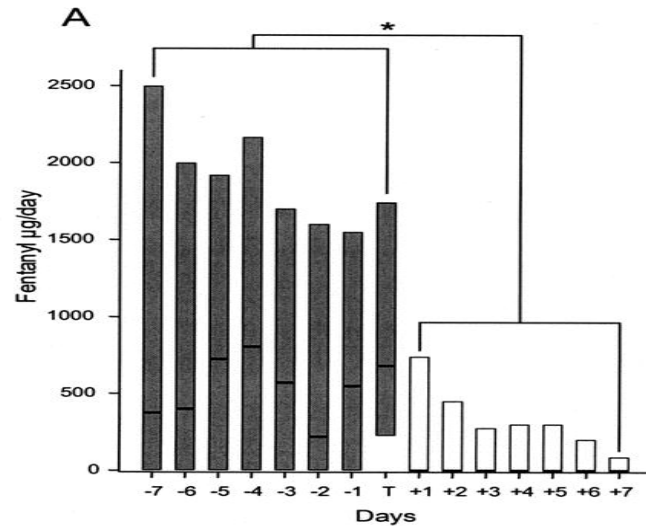
Impact of tracheotomy on sedative administration, sedation level, and comfort of mechanically ventilated intensive care unit patients*

Ania Nieszkowska, MD; Alain Combes, MD, PhD; Charles-Edouard Luyt, MD, PhD; Hichem Ksibi, MD; Jean-Louis Trouillet, MD; Claude Gibert, MD; Jean Chastre, MD

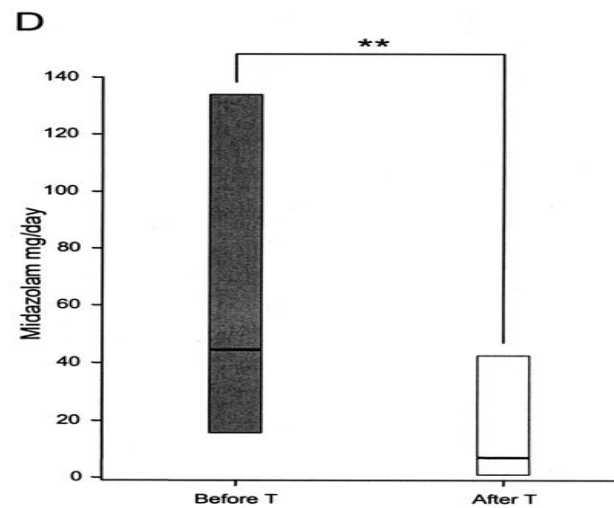
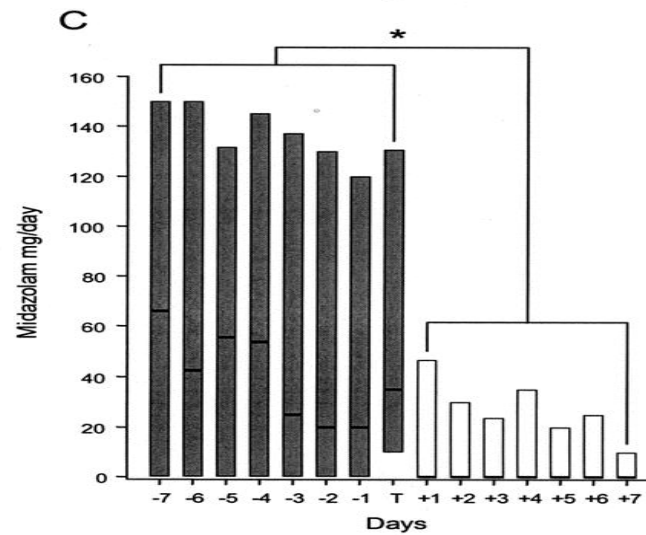


Characteristic	72 patients avant vs après trachéo	Value
At ICU admission		
Age		58 (52,72)
Sex, male, n (%)		43 (59.7)
Type of admission, n (%)		
Surgery		40 (55.6)
Cardiac		38 (52.7)
Other		2 (2.8)
Medical		32 (44.4)
SAPS II		46 (36,66)
McCabe		2 (1,2)
Reason for MV, n (%)		
Acute exacerbation of COPD		7 (9.7)
Acute respiratory failure		29 (40.3)
Postoperative respiratory failure		27 (37.5)
Neurologic		9 (12.5)
On the day of tracheotomy		
SOFA score		7 (5.8,10.0)
Radiologic score		5 (3,7)
Temperature, °C, mean ± SD		37.8 ± 1.0
PaO ₂ /FIO ₂ , mm Hg		197 (150,280)
Shock, n (%)		29 (40.3)

Amélioration du confort

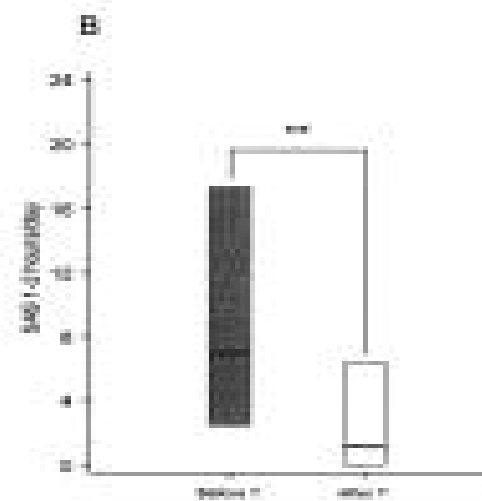
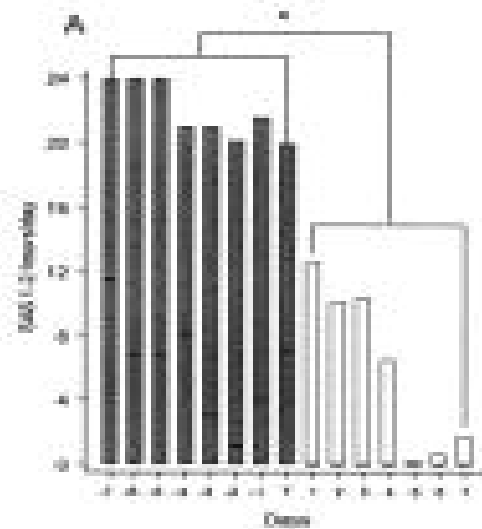


morphinique

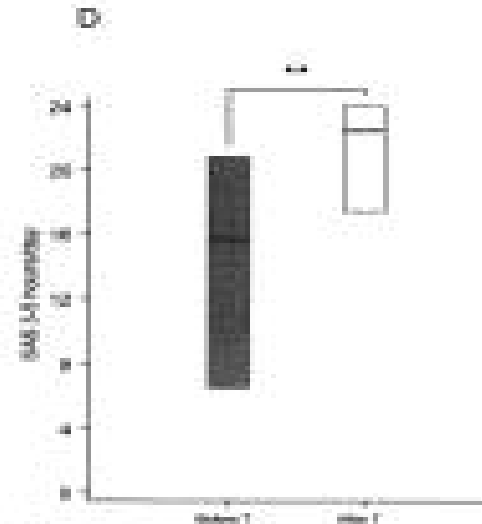
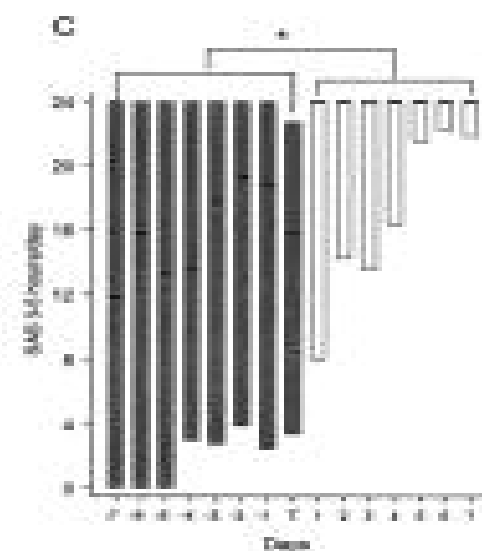


benzodiazépine

Amélioration du confort



profondément sédaté

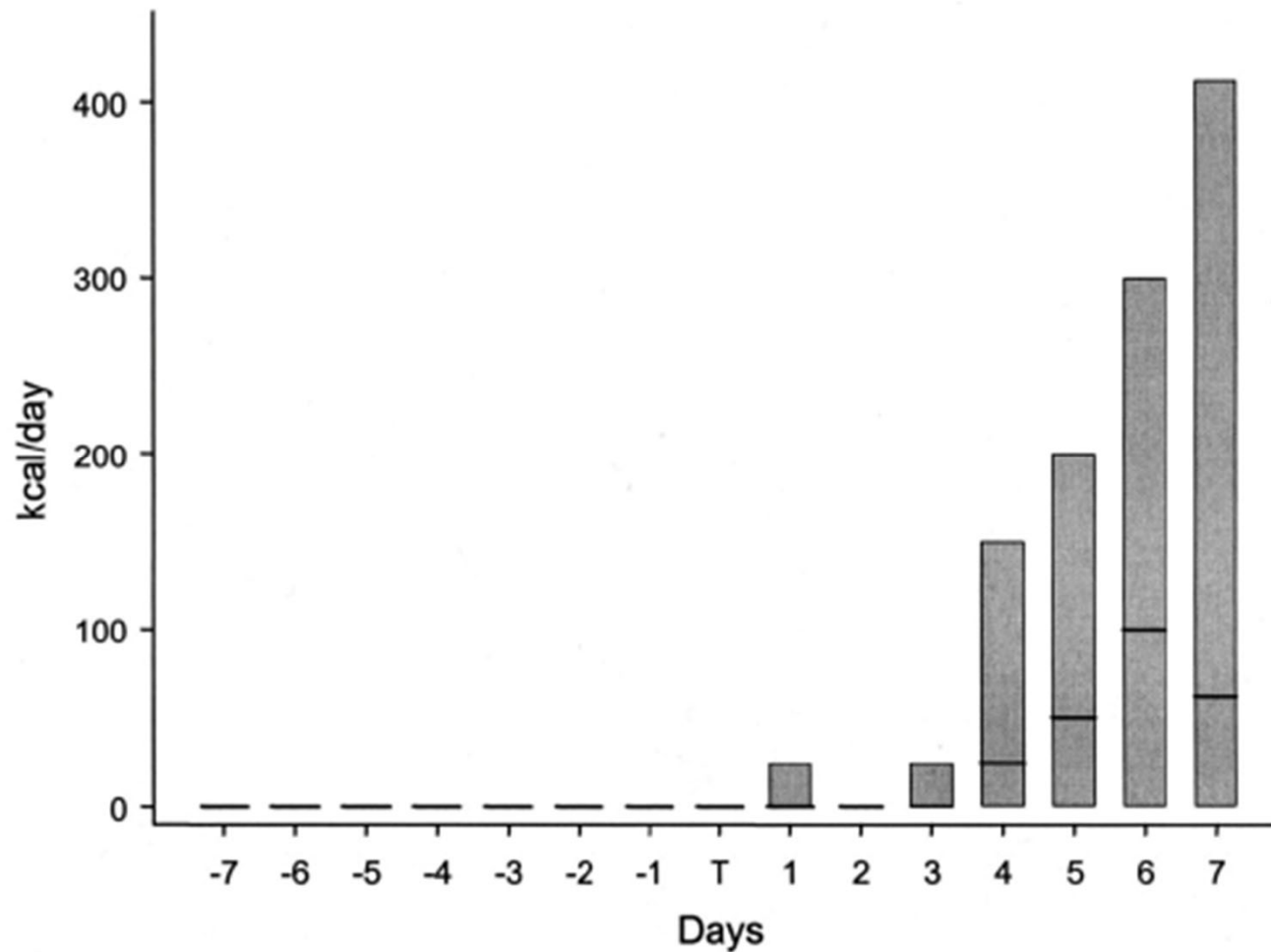


non ou légèrement sédaté

pas de différence pour les périodes d'agitation marquée

Nieszkowska Crit Care Med 2005

Nutrition voie orale

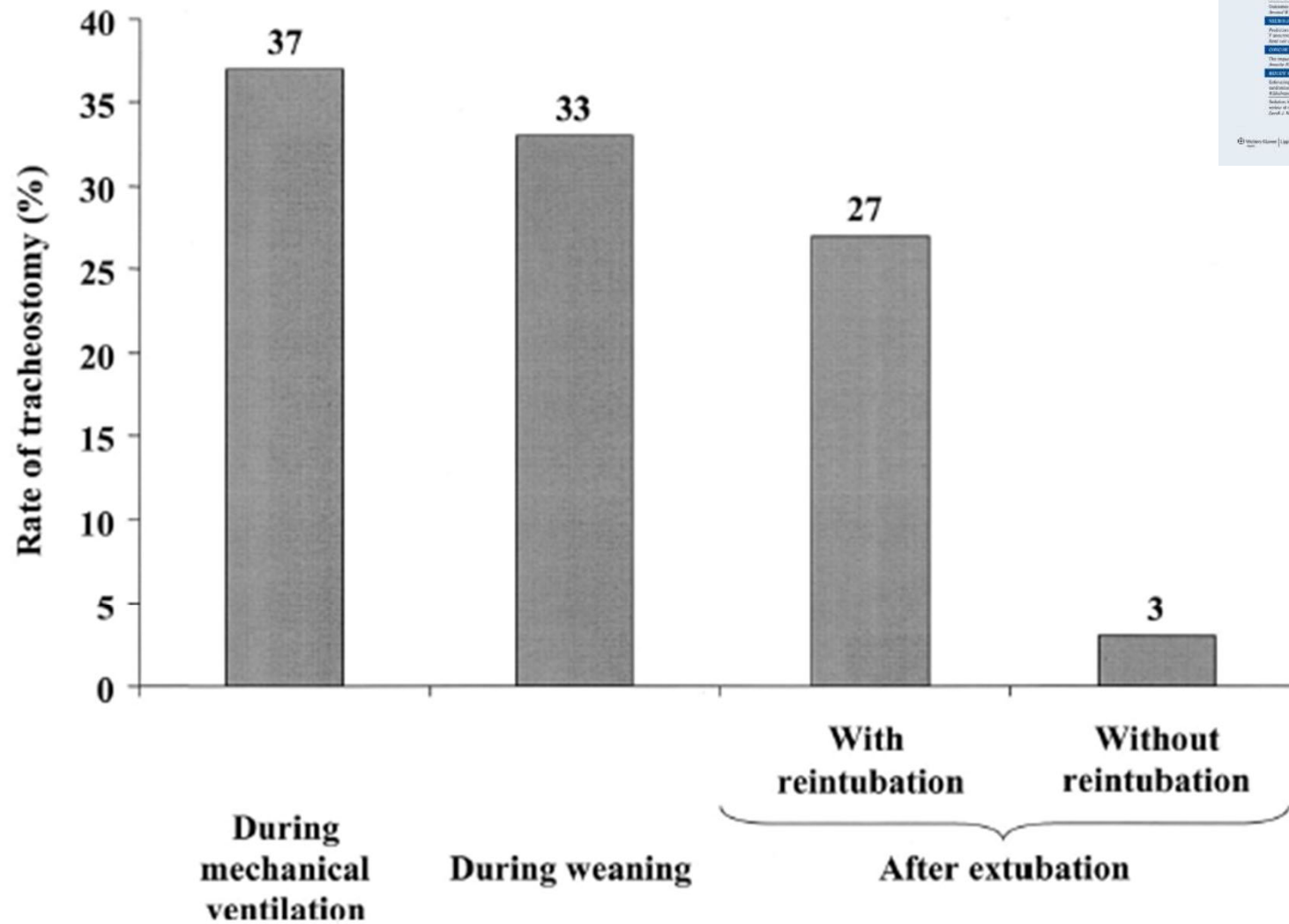


Outcome of mechanically ventilated patients who require a tracheostomy*

Fernando Frutos-Vivar, MD; Andrés Esteban, MD, PhD; Carlos Apezteguía, MD; Antonio Anzueto, MD; Peter Nightingale, MD; Marco González, MD; Luis Soto, MD; Carlos Rodrigo, MD; Jean Raad, MD; Cide M. David, MD; Dimitros Matamis, MD; Gabriel D'Empaire, MD; for the International Mechanical Ventilation Study Group



- Mars 1998, 361 services, 20 pays
- 5 183 patients ventilés > 12 h (- 102 déjà trachéotomisés)
- 546 (10,7 %) trachéotomisés après 12 [7-17] j de VM



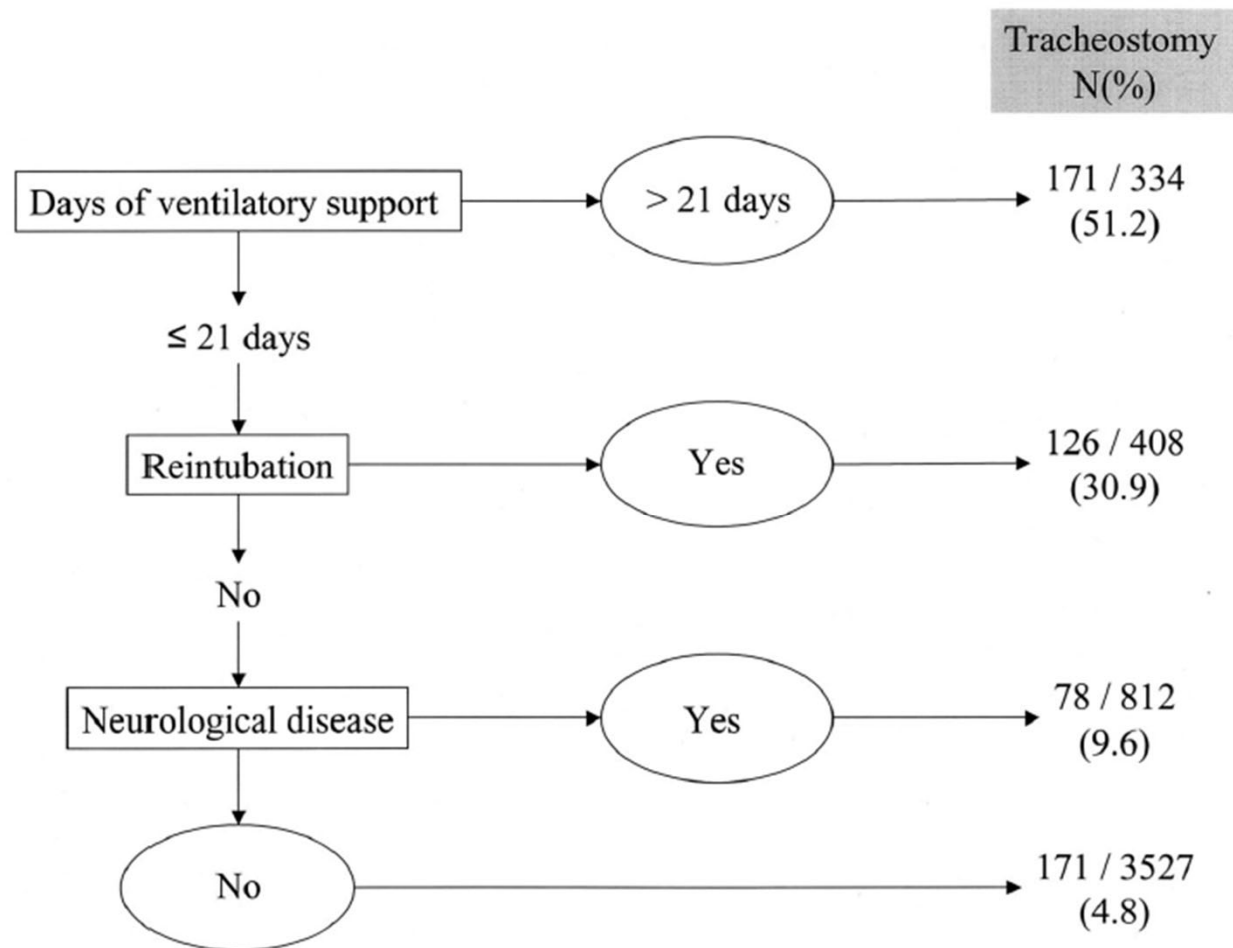


Figure 3. Tree-building of risk factors for tracheostomy obtained by the recursive partitioning method.



Trachéotomisés : Quel devenir ?



	Mortalité en réa	Mortalité hospitalière
Trachéotomie +	20 %	39 %
Trachéotomie -	32 %	40 %

Tracheostomy does not improve the outcome of patients requiring prolonged mechanical ventilation: A propensity analysis*

Christophe Clec'h, MD; Corinne Alberti, MD, PhD; François Vincent, MD; Maïté Garrouste-Orgeas, MD; Arnaud de Lassence, MD; Dany Toledano, MD; Elie Azoulay, MD, PhD; Christophe Adrie, MD; Samir Jamali, MD; Isabelle Zaccaria; Yves Cohen, MD; Jean-François Timsit, MD, PhD; on behalf of the OUTCOMEREA study group



Patients comparables

Variable	Tracheostomy (n = 160)	No Tracheostomy (n = 422)	p Value
Duration of MV $\geq$ 15 days, no. (%)	95 (59.4)	229 (54.3)	.77
Need for reintubation, no. (%)	4 (2.5)	6 (1.3)	.25
MV for neurologic disease, no. (%)	46 (28.8)	126 (27.8)	.67
Chronic respiratory disease, no. (%)	46 (28.8)	101 (22.3)	.11
Do-not-resuscitate order, no. (%)	18 (11.3)	61 (13.4)	.48
Cause of acute respiratory failure, no. (%)			
Postoperative	24 (15)	82 (18.1)	.16
Congestive heart failure	10 (6.3)	32 (7.1)	.99
Cardiac arrest	4 (2.5)	8 (1.8)	.46

Mortalité en réanimation

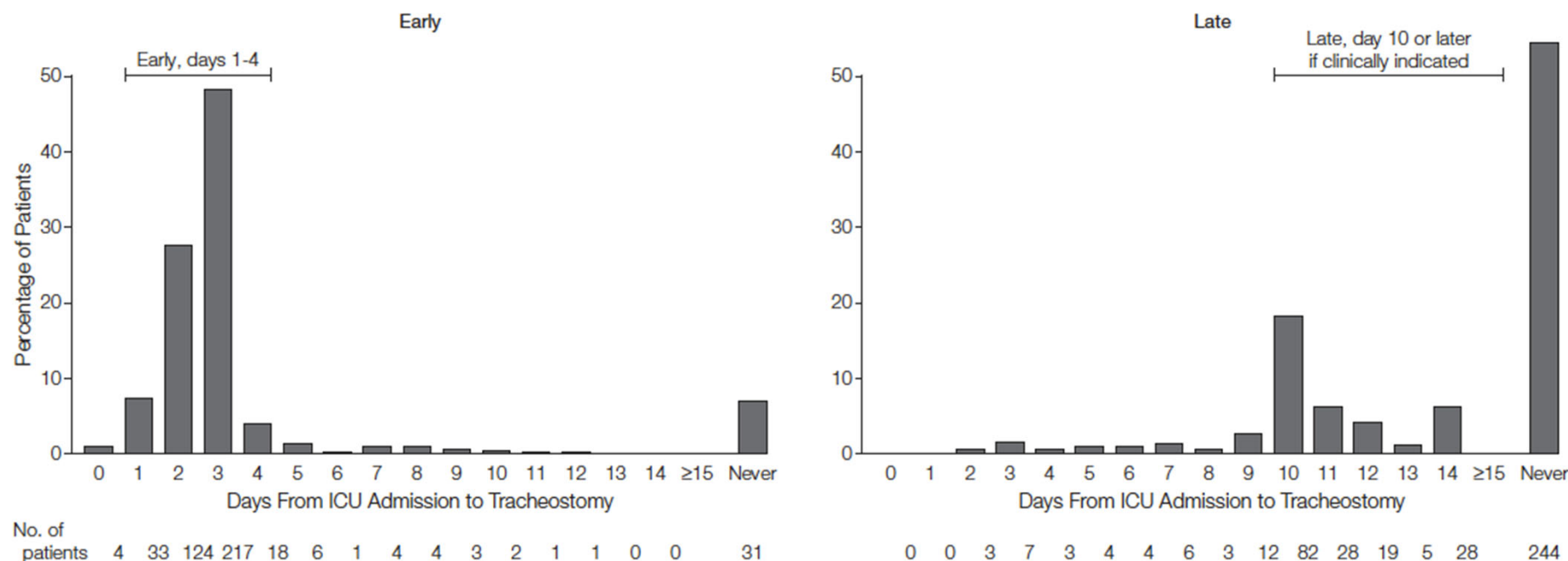
	OR	95% CI	<i>p</i> Value
Model 1			
All patients	0.94	0.63–1.39	.74
Patients with early tracheostomy ^a	0.41	0.10–1.80	.24
Patients with late tracheostomy ^b	0.97	0.65–1.50	.90
Model 2			
All patients	1.12	0.75–1.67	.59
Patients with early tracheostomy ^a	0.78	0.21–2.91	.71
Patients with late tracheostomy ^b	1.16	0.77–1.75	.49

Effect of Early vs Late Tracheostomy Placement on Survival in Patients Receiving Mechanical Ventilation

The TracMan Randomized Trial



JAMA. 2013;309(20):2121-2129

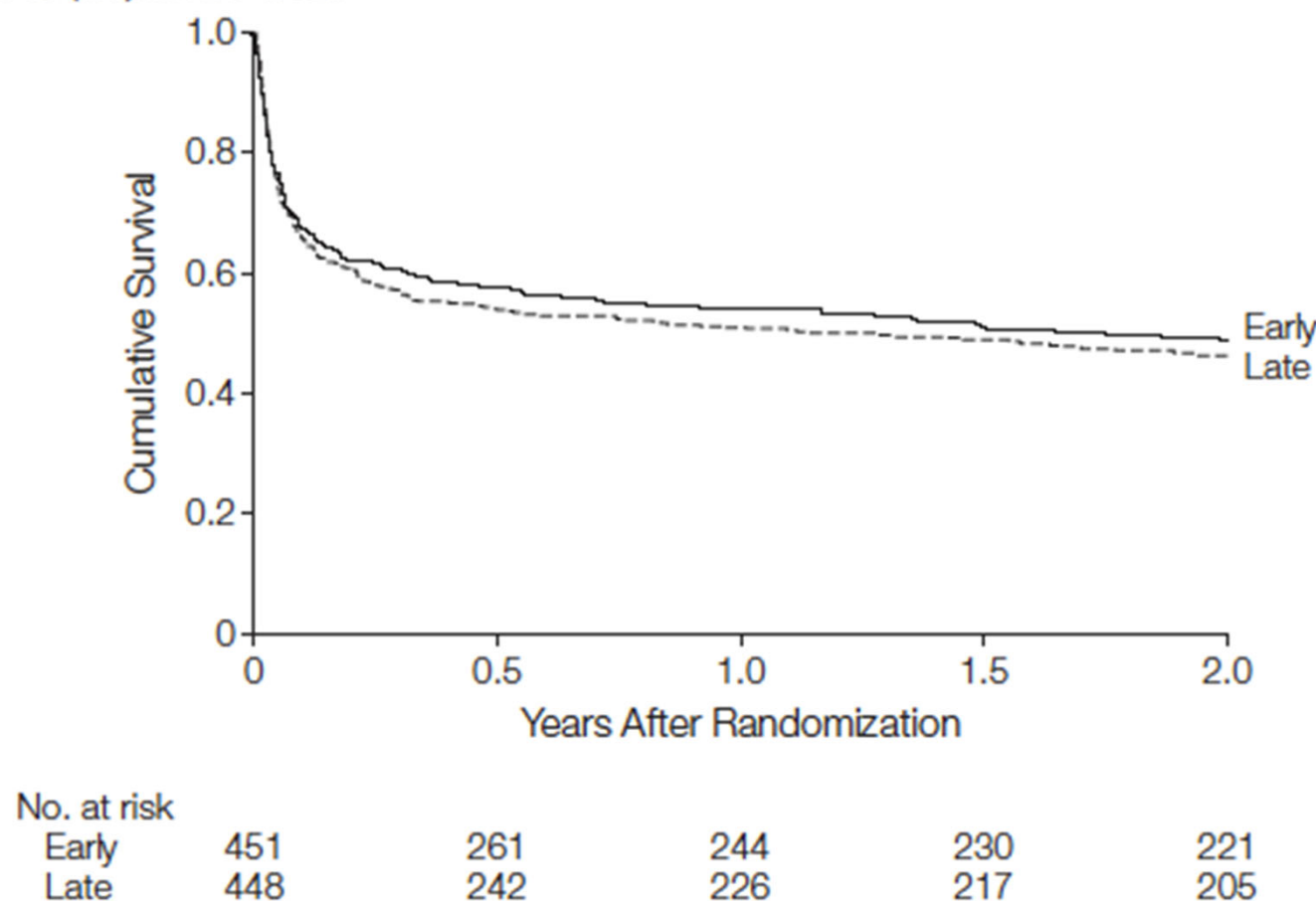


Effect of Early vs Late Tracheostomy Placement on Survival in Patients Receiving Mechanical Ventilation

JAMA[®]
The Journal of the American Medical Association

The TracMan Randomized Trial

JAMA. 2013;309(20):2121-2129





:



TRACHÉOTOMIE PRÉCOCE VERSUS TRACHÉOTOMIE TARDIVE / INTUBATION PROLONGÉE

Trachéotomie précoce: < 8 jours d'intubation

Trachéotomie tardive: > 15 jours d'intubation

Méta-analyse de Griffiths BMJ 2005

Méta-analyse de Wang Chest 2010



Systematic review and meta-analysis of studies of the timing of tracheostomy in adult patients undergoing artificial ventilation

John Griffiths, Vicki S Barber, Lesley Morgan, J Duncan Young

Study	No of patients (n=406)	Timing of tracheostomy		Intensive care setting	Randomisation	Mortality expressed on intention to treat basis	Duration of ventilation and critical care stay expressed on intention to treat basis
		Early	Late				
Bouderka et al 2004 ²⁴	62	5-6 days after admission	Prolonged endotracheal intubation	Unit for patients with head injuries	Randomised; method not stated	Implied	Implied both
Dunham et al 1984 ²⁵	74	3-4 days after initiation of translaryngeal intubation	14 days after initiation of translaryngeal intubation	Trauma unit	Quasi-randomised	Mortality not recorded Pneumonia analysed by intention to treat	Yes
Rodriguez et al 1990 ²⁶	106	1-7 days after admission to intensive care unit	8 or more days after admission to intensive care unit	Surgical unit	Quasi-randomised	Implied	Implied both
Rumbak et al 2004 ¹⁷	120	0-2 days after initiation of mechanical ventilation	14-16 days after initiation of mechanical ventilation	Three medical units	True randomisation	Implied	Yes
Saffle et al 2002 ¹⁶	44	Next available operative day	14 days after burn injury	Burns unit	True randomisation	Implied	Yes

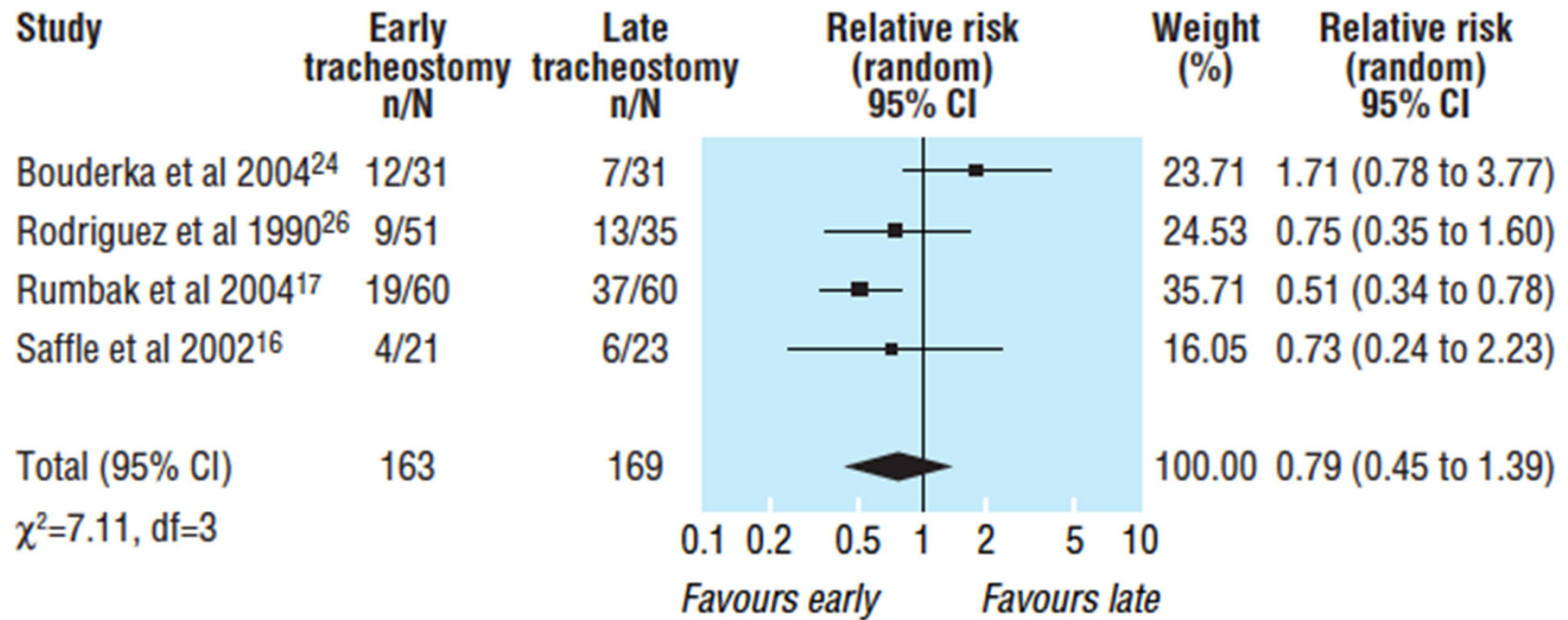
2005 BMJ Griffiths



Systematic review and meta-analysis of studies of the timing of tracheostomy in adult patients undergoing artificial ventilation

John Griffiths, Vicki S Barber, Lesley Morgan, J Duncan Young

Mortalité en réanimation

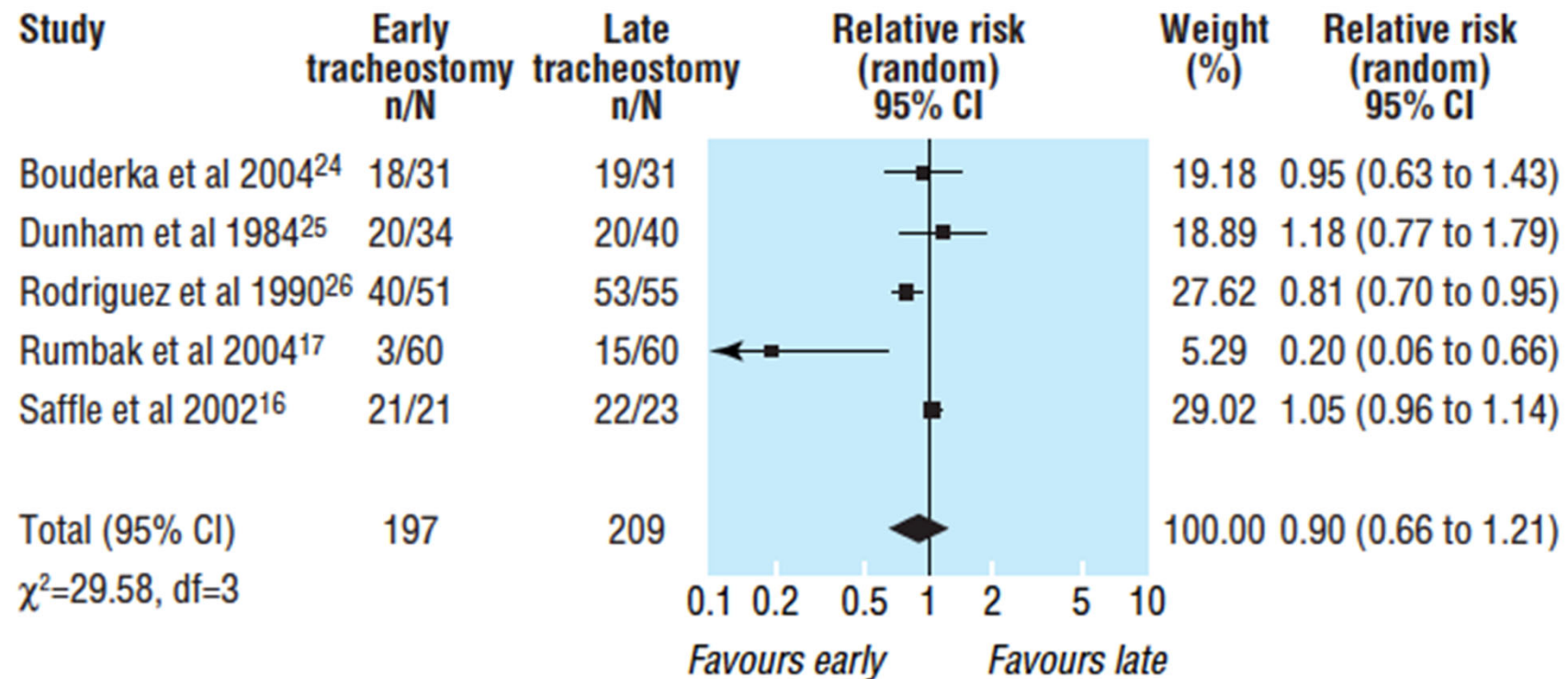




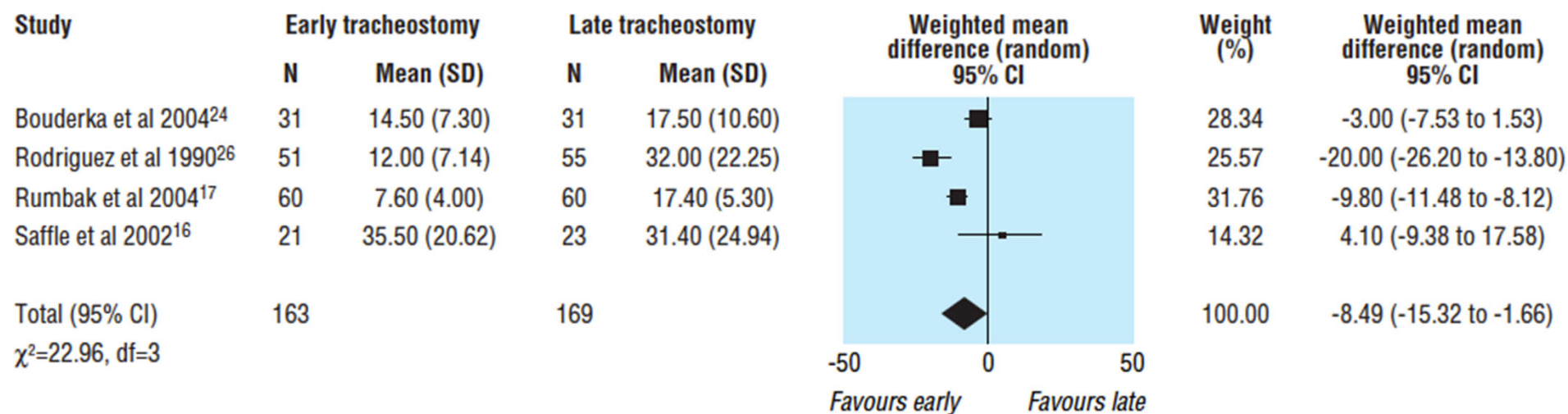
Systematic review and meta-analysis of studies of the timing of tracheostomy in adult patients undergoing artificial ventilation

John Griffiths, Vicki S Barber, Lesley Morgan, J Duncan Young

Pneumonies infectieuses



Durées de ventilation





The Timing of Tracheotomy in Critically Ill Patients Undergoing Mechanical Ventilation

A Systematic Review and Meta-analysis of Randomized Controlled Trials

Fei Wang, MD, PhD; Youping Wu, MD, PhD; Lulong Bo, MD, PhD;
Jingsheng Lou, MD, PhD; Jiali Zhu, MD; Feng Chen, MD, PhD;
Jinbao Li, MD, PhD; and Xiaoming Deng, MD, PhD

Table 1—Characteristics of Included Trials

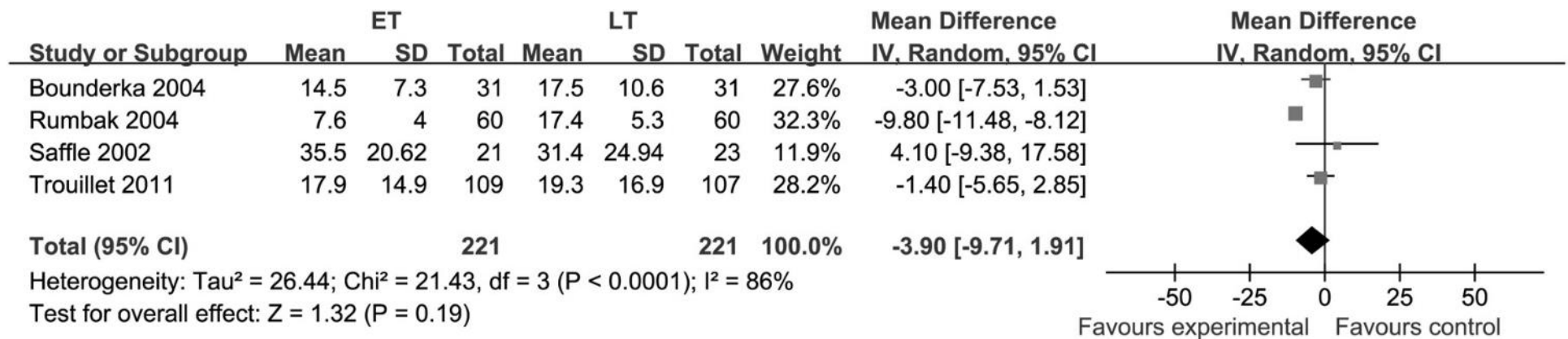
Study/Year	Intensive Care Setting	Timing of Tracheotomy		Mean Age, y		Disease Severity	Weaning Control	Tracheotomy Information	VAP Definition	Intention-to-Treat Analysis
		Early	Late	Early	Late					
Saffle et al ¹⁹ /2002	Burn ICU	Next available operative day	14 d after burn injury	44.5 ± 19.7	51.3 ± 19.2	Not reported	Yes	Performed in the operating room, mostly using surgical technique	CDC criteria	Yes
Boudier et al ²⁰ /2004	Units for head injury patients	5-6 d after admission	Prolonged endotracheal intubation	41.1 ± 17.5	40 ± 19	SAPS score: Early: 5.4 ± 1.5 Late: 6 ± 3.8	No	Not reported	CDC criteria	Implied
Rumbak et al ²¹ /2004	3 Medical ICUs	0-2 d after initiation of MV	14-16 d after initiation of MV	63 ± 10.4	63 ± 9.3	APACHE II score: Early: 27.4 ± 4.2 Prolonged: 26.3 ± 2.6	Yes	Percutaneous dilational tracheotomy procedure	Clinical features with positive protected specimen brushes or BAL cultures	Yes
Barquist et al ²² /2006	Trauma center	Before 8 d of admission	After 28 d after admission	53.7 ± 21.5	49.9 ± 18.3	APACHE II score: Early: 12.1 ± 3.2 Late: 13.1 ± 5.1	Yes	Performed both at the bedside and in the operating room	CDC criteria	Yes
Blot et al ²³ /2006	25 Medical-surgical ICUs	Before 4 d of initiation of MV	After 14 d of initiation of MV	55 (19-88)*	58 (20-88)*	SAPS II score: Early: 59 (17-103)* Late: 50 (15-96)*	Yes	Most often performed at the bedside using a surgical technique	Clinical features with positive cultures of pulmonary secretion samples	Yes
Terragni et al ²⁴ /2010	12 ICUs	6-8 d after endotracheal intubation	13-15 d after endotracheal intubation	61.6 ± 17.4	61.3 ± 16.8	SAPS II score: Early: 51.1 ± 8.7 Late: 49.7 ± 8.6	Yes	Performed at the bedside using percutaneous techniques	Using the simplified CPIS. CPIS > 6 was considered to indicate the presence of VAP	Yes
Trouillet et al ²⁵ /2011	Postcardiac surgery ICU	Before 5 d after surgery	15 d after initiation of MV	64.1 ± 13.3	66.0 ± 12.4	SAPS II score: Early: 47.2 ± 12.4 Late: 45.8 ± 11.4	Yes	Performed at the bedside using percutaneous techniques	Clinical features with positive BAL cultures	Yes

Data are presented as mean ± SD unless indicated otherwise. APACHE = Acute Physiology and Chronic Health Evaluation; CDC = Centers for Disease Control and Prevention; CPIS = Clinical Pulmonary Infection Score; MV = mechanical ventilation; SAPS = Simplified Acute Physiology Score; VAP = ventilator-associated pneumonia.

*Median (range).

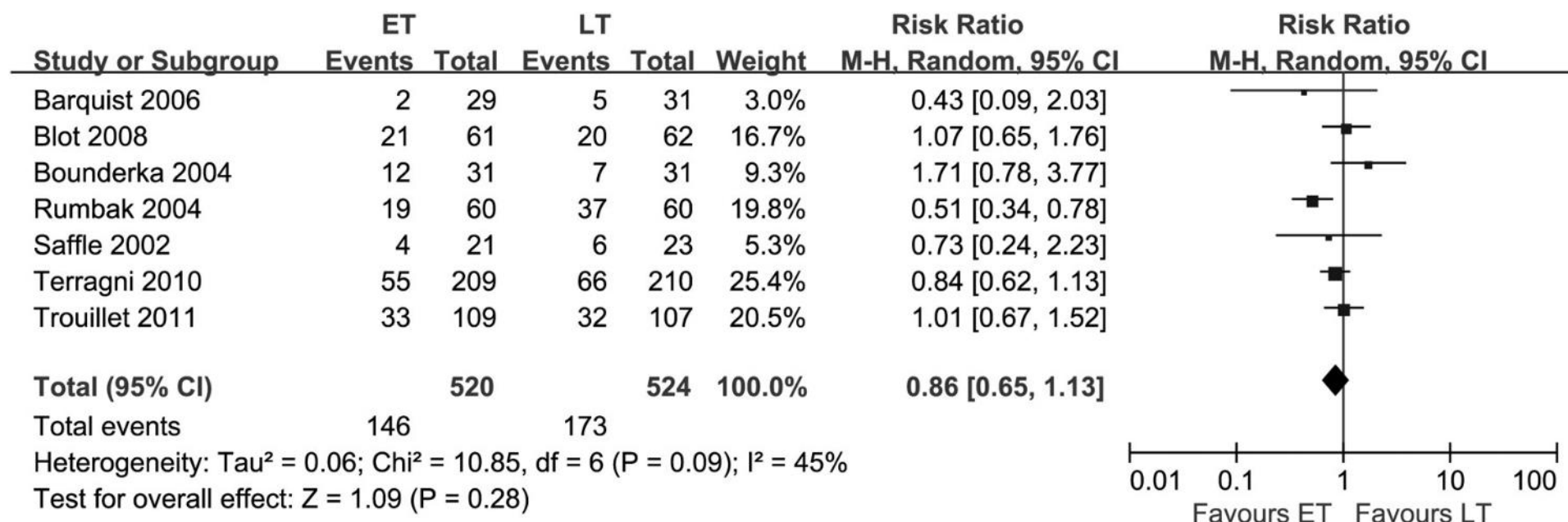
DURÉE DE VENTILATION

(trachéotomie précoce versus tardive)

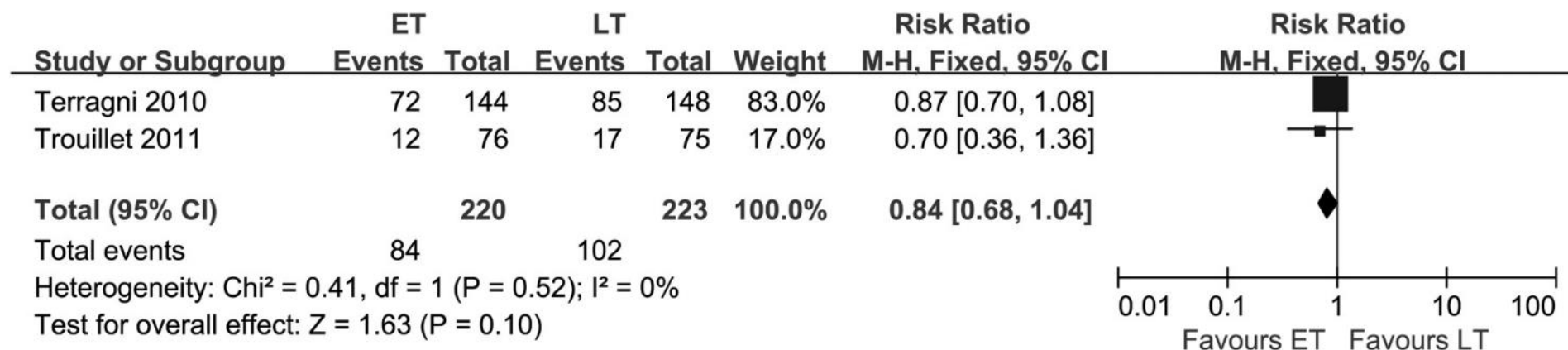


Wang Chest 2011

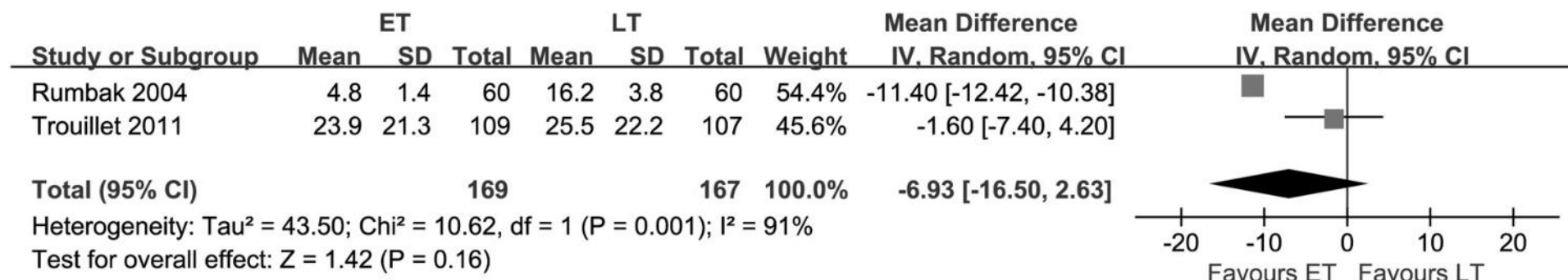
influence sur la mortalité précoce



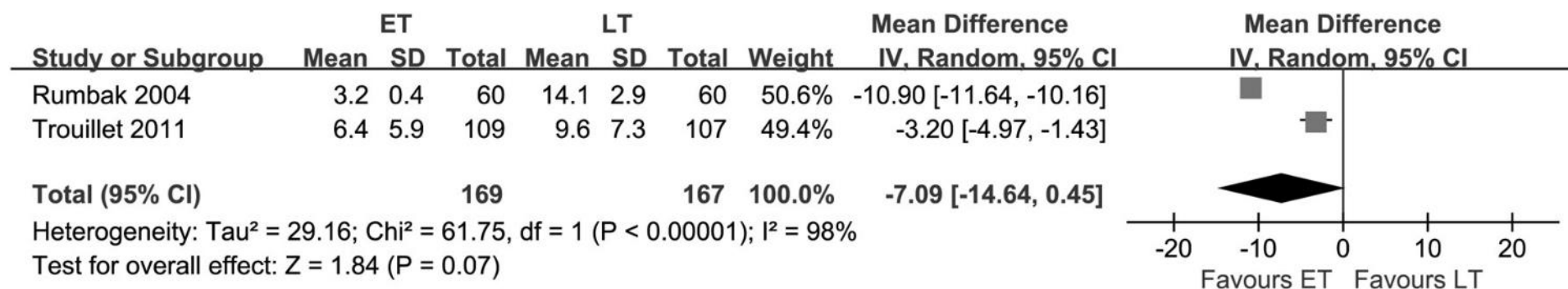
influence sur la mortalité tardive



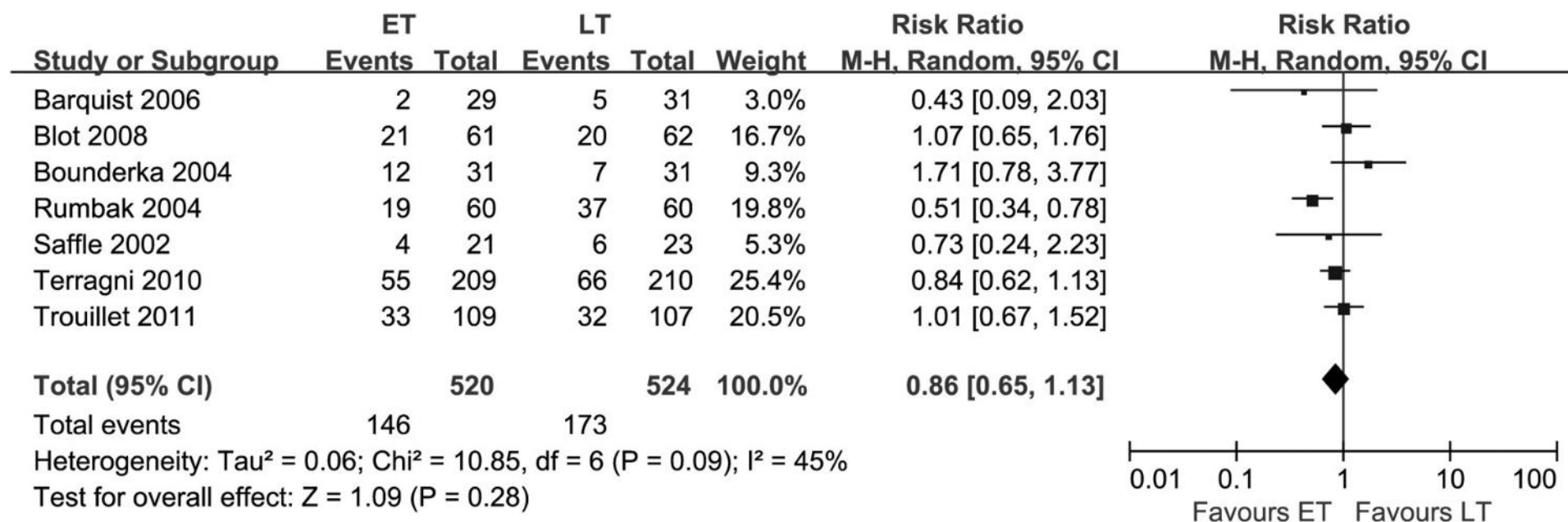
influence sur la durée de séjour en réanimation



influence sur la durée de sédation



MORTALITÉ PRÉCOCE



Wang Chest 2011

Early Percutaneous Tracheotomy Versus Prolonged Intubation of Mechanically Ventilated Patients After Cardiac Surgery

A Randomized Trial*

Jean-Louis Trouillet, MD; Charles-Edouard Luyt, MD, PhD; Marguerite Guiguet, PhD; Alexandre Ouattara, MD, PhD; Elisabeth Vaissier, MD; Ralouka Makri, MD; Ania Nieszkowska, MD; Pascal Leprince, MD, PhD; Alain Pavie, MD; Jean Chastre, MD; and Alain Combes, MD, PhD

Sedation				
Mean duration of intravenous sedation (SD), d [‡]	6.4 (5.9)	9.6 (7.3)	−3.2 (−5.0 to −1.3)	0.007
Mean sedation-free days during 1–28 d (SD)	19.0 (9.1)	15.5 (9.3)	4.5 (1.2 to 6.9)	0.005
Mean cumulative sufentanil dose during 1–15 d (SD), µg/kg	4.0 (6.5)	10.2 (18.2)	−6.2 (−9.9 to −2.5)	0.001
Mean cumulative propofol dose during 1–15 d (SD), mg/kg	32.9 (60.2)	67.8 (116.7)	−34.9 (−60.1 to −9.8)	0.004
Mean cumulative midazolam dose during 1–15 d (SD), mg/kg	2.7 (4.7)	6.4 (14.3)	−3.7 (−6.6 to −0.8)	0.01
Mean days (during 1–15 d) of haloperidol therapy (SD)	1.9 (3.0)	3.2 (4.2)	−1.3 (−2.3 to −0.3)	0.01
Mean cumulative haloperidol dose during 1–15 d (SD), mg/kg	0.26 (0.51)	0.57 (0.92)	−0.3 (−0.5 to −0.1)	0.002
VAP after randomization, n (%)	50 (46)	47 (44)	2.0 (−11.3 to 15.2)	0.77
Sternal wound infection, n (%)	14 (13)	14 (13)	−0.2 (−9.2 to 8.7)	0.96
Bloodstream infection, n (%)	18 (17)	16 (15)	1.5 (−8.1 to 11.3)	0.85
Mean days (during 1–15 d) nurse-assessed as comfortable (SD)	11.8 (3.8)	10.4 (4.4)	1.4 (0.3 to 2.5)	0.01
Mean days (during 1–15 d) with nurse-assessed easy management (SD)	12.0 (3.8)	10.8 (4.4)	1.2 (0.05 to 2.3)	0.04
Received oral nutrition at 15 d, n (%)	91 (83)	57 (53)	30.2 (18.5 to 42.2)	<0.001
Bed-to-chair transfer at 15 d, n (%)	72 (66)	47 (44)	22.1 (9.2 to 35.1)	0.002
Muscle strength assessment (SD)§				
14 d (n = 76, 68)	156.9 (87.0)	134.9 (92.8)	22.0 (−7.7 to 51.6)	0.15
28 d (n = 36, 36)	164.0 (86.1)	176.9 (85.6)	−12.9 (−53.3 to 27.5)	0.52
42 d (n = 21, 21)	170.1 (86.4)	195.4 (67.5)	−25.3 (−73.6 to 23.1)	0.30
56 d (n = 8, 11)	149.7 (70.4)	185.4 (76.0)	−35.7 (−108.0 to 36.6)	0.31

Is the Duration of Mechanical Ventilation Predictable?*

Gilles Troché, MD; and Pierre Moine, MD

CHEST 1997; 112:745-51



- Réanimation chirurgicale
- 195 patients + cohorte de validation (n = 128)
- Prédiction d'une VM ≥ 15 j
- Multiples variables analysées : Age, BMI, type chirurgie, IGS, LIS, OSF, ...
- Régression logistique, ROC curve

Difficile à prévoir !

Parameters	Group 1 (MV≤14 d) (n=177)	Group 2 (MV≥15 d) (n=26)	p Value
Age, yr	59.7±19.6	57.0±20.6	NS (0.52)
BMI	24.5±5.0	24.6±4.2	NS (0.92)
Emergent admission	127 (71.8%)	23 (88.5%)	NS (0.07)
Elective admission	50 (28.2%)	3 (11.5%)	
Alteimer classification			NS (0.39)
0 (medical patients)	38 (21.5%)	7 (26.9%)	
I and II	53 (30.0%)	4 (15.4%)	
III and IV	86 (48.6%)	15 (57.7%)	
Pathology/admission			NS (0.31)
Abdominal surgery	106 (59.9%)	12 (46.2%)	
Orthopedic surgery	3 (1.7%)	6 (23.1%)	
Gynecologic or obstetric disease	6 (3.4%)	0	
Medical disease	42 (23.7%)	8 (30.8%)	
SAPS	15.1±5.6	15.5±4.2	NS (0.77)
GCS	13.0±3.7	12.3±3.6	NS (0.34)
APACHE II	20.7±8.3	22.9±7.7	NS (0.20)
SS	9.2±5.7	12.5±7.5	0.01
OSFI 0	95 (53.7%)	6 (23.1%)	
OSFI I	51 (28.8%)	14 (53.8%)	<0.05
OSFI II, III, or IV	31 (17.5%)	6 (23.1%)	
Albuminemia, g/L	28.1±7.7	24.1±7.5	<0.05

*NS=not significant.

Shock on Admission Day Is the Best Predictor of Prolonged Mechanical Ventilation in the ICU*



Elisa Estenssoro, MD; Francisco González, MD; Enrique Laffaire, MD; Héctor Canales, MD; Gabriela Sáenz, MD; Rosa Reina, MD; and Arnaldo Dubin, MD

- Réanimation polyvalente (Buenos Aires)
- 551 patients (mortalité 31 %), 348 ventilés
- Multiples variables recueillies à J 1
- Ventilation prolongée : > 21 j (**n = 79**, 23 % des ventilés)

Shock on Admission Day Is the Best Predictor of Prolonged Mechanical Ventilation in the ICU*



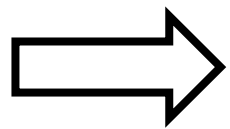
Elisa Estenssoro, MD; Francisco González, MD; Enrique Laffaire, MD; Héctor Canales, MD; Gabriela Sáenz, MD; Rosa Reina, MD; and Arnaldo Dubin, MD

Variables	OR	95% CI	p Value
Shock day 1	2.17	1.25–3.77	0.006
SAPS II	1.04†	1.02–1.06	0.0001
PaO ₂ /FIO ₂ day 1	0.99‡	0.99–1.00	0.125

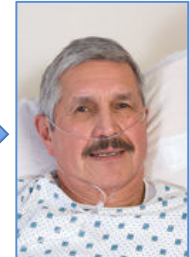
Quels patients trachéotomiser ?

Concept de « chronically ill patients »

- Survivants de situations dramatiques
- Dépendants Ventilation Mécanique
- Dépendants richesse environnement humain et technique
- Sans autre défaillance vitale
- Nombreuses autres affections : séquelle(s) des défaillances viscérales, motrice, déficit nutritionnel, germes nosocomiaux, processus invasifs, ...



Typologie particulière



Mobilizing Patients in the Intensive Care Unit

Improving Neuromuscular Weakness and Physical Function

Dale M. Needham, MD, PhD



Sevrage et Réhabilitation : Décanulation

Intensive Care Med (2003) 29:845–848
DOI 10.1007/s00134-003-1689-z

BRIEF REPORT

Piero Ceriana
Annalisa Carlucci
Paolo Navalesi
Ciro Rampulla
Monica Delmastro
GianCarlo Piaggi
Elisa De Mattia
Stefano Nava

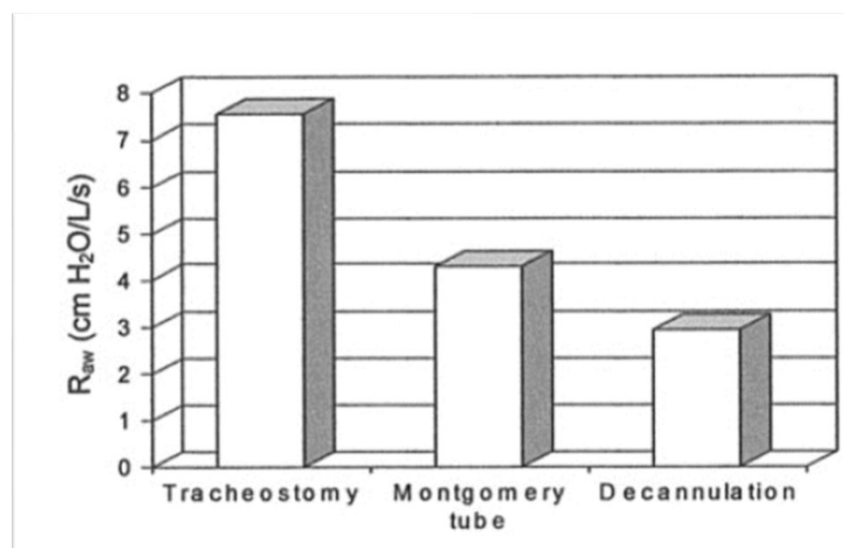
Weaning from tracheotomy in long-term mechanically ventilated patients: feasibility of a decisional flowchart and clinical outcome

« Pré requis »

- **Stabilité clinique**
- **PaCO₂ < 60 mmHg**
- **Absence de délire ou d'autres désordres psychiatriques**
- **Absence de sténose trachéale ou glottique**
- **Toux efficace** , pression expiratoire maximale (PEM) ≥ 40 cmH₂
- **Déglutition correcte**
- **Patient consentant**

Respiratory Muscle Dysfunction Secondary to Chronic Tracheostomy Tube Placement*

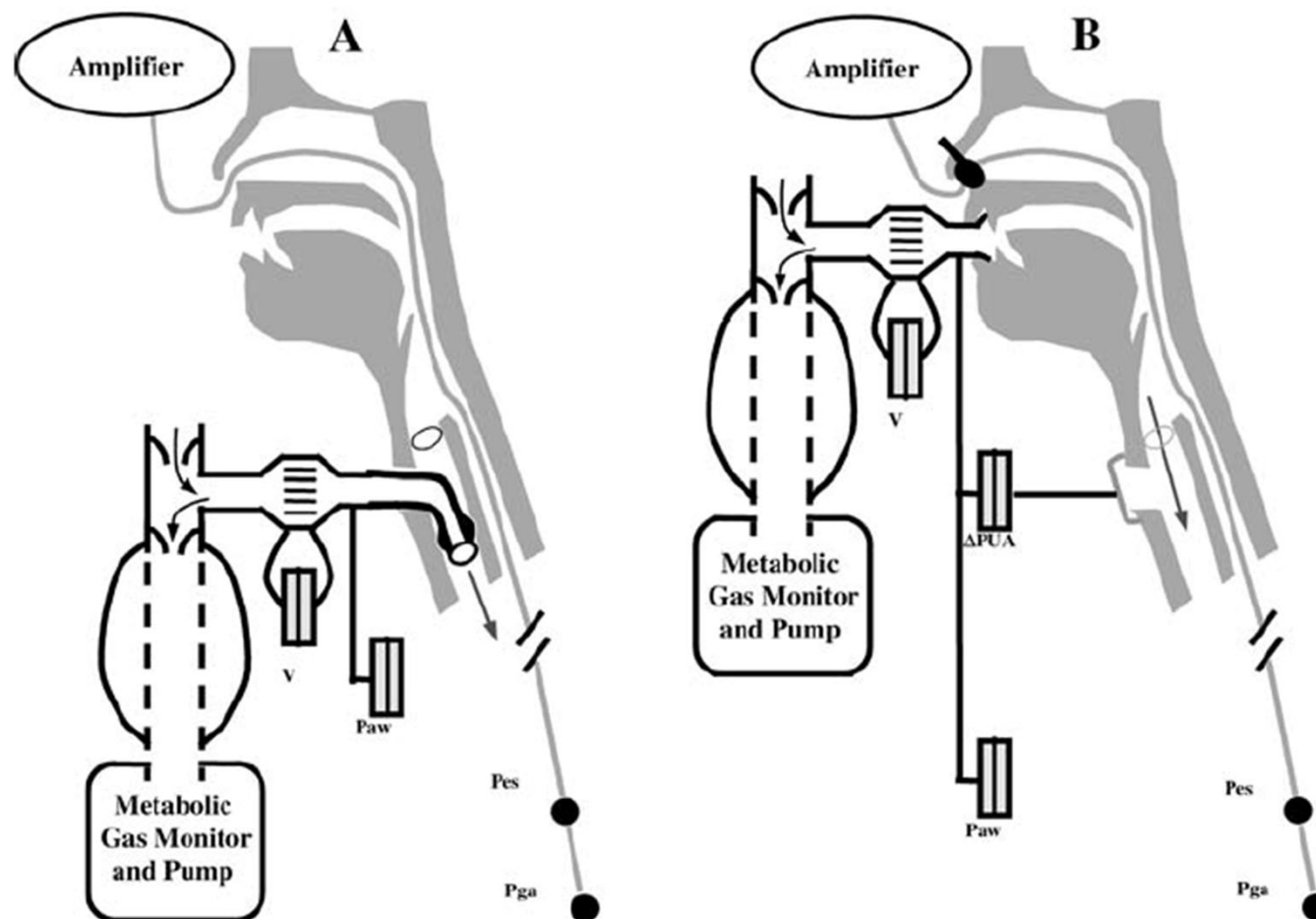
Gerard Criner, M.D.;† Barry Make, M.D., F.C.C.P.;
and Bartolome Celli, M.D., F.C.C.P.



	Tracheostomy†	Montgomery Button	Decannulation	Predicted
FVC (L)	1.17	0.88	1.02	2.94
FEV ₁ (L)	0.52	0.44	0.48	2.32
FEV ₁ /FVC	0.44	0.50	0.47	0.80
FRC (L)	4.50		3.89	2.62
Raw (CmH ₂ O/L/s)	7.55	4.28	2.94	2.29
PO ₂ (mm Hg)	80	80	N‡	N‡
PCO ₂ (mm Hg)	51	54	N‡	N‡

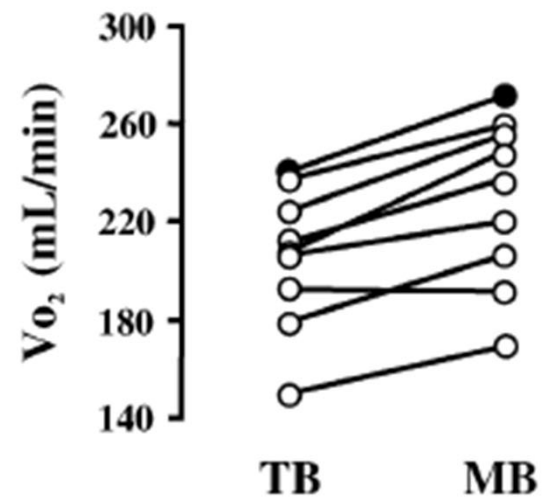
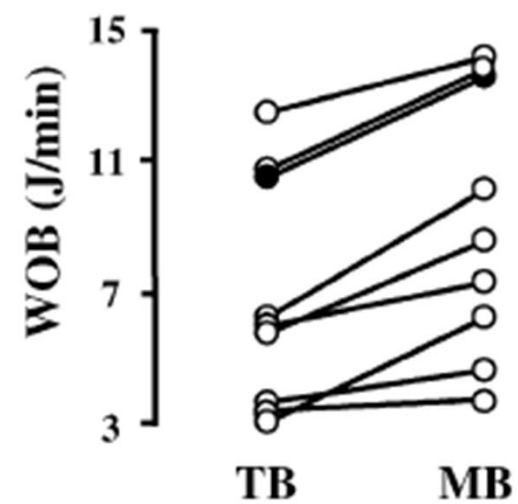
Karim Chadda
Bruno Louis
Lamine Benaïssa
Djillali Annane
Philippe Gajdos
Jean Claude Raphaël
Frédéric Lofaso

Physiological effects of decannulation in tracheostomized patients

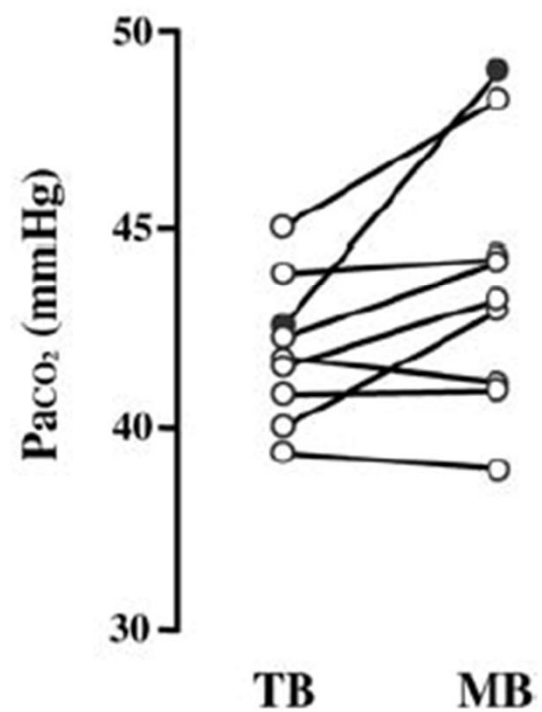
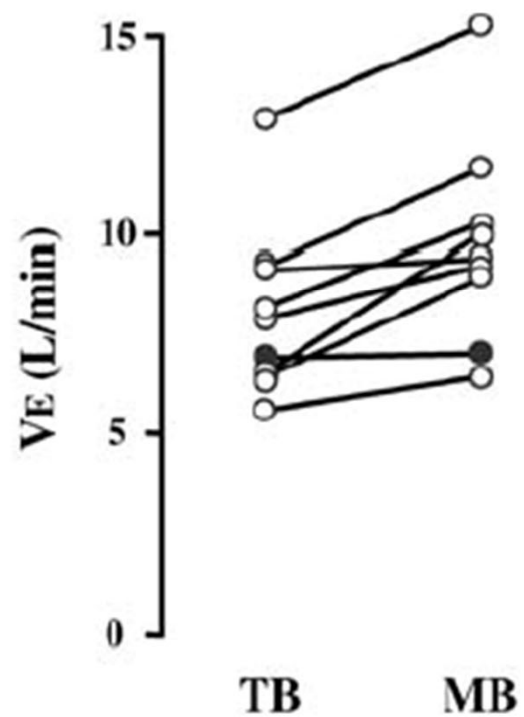


$$V_D^{\text{phys}} + V_D^{\text{circ}} = V_T \times (P_{a\text{CO}_2} - P_{E\text{CO}_2} / P_{a\text{CO}_2})$$

Espace mort augmente après décanulation



TB: Trachéo
MB: Bouche



Décanulation

Nez artificiel
↓
Valve phonatoire
↓
Canule bouchée
↓
Décanulation



Diminution du diamètre
de la canule

CONCLUSIONS

La trachéotomie n' est pas une technique de sevrage

La trachéotomie est bénéfique uniquement par rapport à la ventilation prolongée

La trachéotomie garde toute sa place pour les malades au sevrage très prolongé

Une stratégie visant à aller vers la décanulation est nécessaire

Des structures spécialisées peuvent être intéressantes