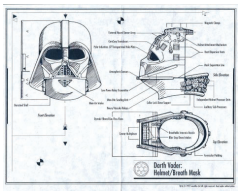
Pneumopathie acquise sous ventilation mécanique



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Réanimation Thoracique
Centre médico-chirurgical Magellan

De quoi parle t-on ?

- **Pneumopathie Communautaire (CAP)**
- **Pneumopathie nosocomiale (HAP)**
  - ➔ > 48h d'hospitalisation
- **PAVM (VAP)**
  - ➔ > 48 à 72h d'intubation
  - ➔ tardive vs précoce (J5)
- Trachéobronchite acquise sous VM (VAT)
- Pneumopathie associé aux soins (HCAP)
  - ➔ Hospit récente, dialysée chronique, EHPAD…

Pourquoi en parlons nous ?

- **2ème** cause d'infection nosocomiale
- **1ère** cause de mortalité
- Incidence de 5 à 67%...
- Risque de **1,5% / j** chez malade ventilé
  - ➔ augmentation durée hospit de 7j
  - ➔ 40 000 $

Warren et al., CCM 2003

Mortalité

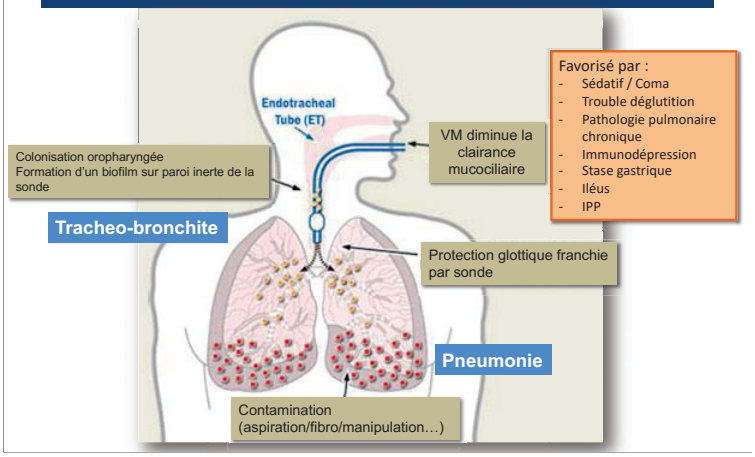
Variable	Patients with VAP: exposed (n = 434)	Patients without VAP: unexposed (n = 2,439)	P value[a]
Male gender, n (%)	315 (72.5)	1,518 (62.2)	0.005
Age, median	62.8	62.7	0.94
SAPS II, median	47.2	46.1	0.06
Admission category			
Medicine, n (%)	292 (67.3)	1,342 (55)	0.0001
Emergency surgery, n (%)	74 (17.1)	595 (24.4)	0.0004
Scheduled surgery, n (%)	68 (15.6)	337 (13.8)	0.36
History of immunosuppression			
Haematological malignancy, n (%)	20 (4.6)	81 (3.3)	0.22
Metastatic cancer, n (%)	20 (4.6)	153 (6.3)	0.21
AIDS, n (%)	11 (2.5)	39 (1.6)	0.26
Corticosteroid therapy, n (%)	82 (18.9)	454 (18.6)	0.94
Anticancer chemotherapy, n (%)	21 (4.8)	125 (5.1)	0.89
Main symptom at ICU admission			
Shock, n (%)	149 (34.3)	731 (29.9)	0.08
Coma, n (%)	100 (23.0)	533 (21.8)	0.62
Acute respiratory failure, n (%)	115 (26.5)	502 (20.5)	0.01
Other chronic illnesses			
Hepatic, n (%)	28 (6.4)	150 (6.2)	0.81
Cardiovascular, n (%)	73 (16.8)	344 (14.1)	0.21
Pulmonary, n (%)	70 (16.1)	330 (13.5)	0.23
Renal, n (%)	14 (3.2)	84 (3.4)	0.81
Diabetes, n (%)	49 (11.2)	202 (8.3)	0.04
ICU mortality, n (%)	119 (27.4)	470 (19.2)	0.0001

Nguile-Makao, ICM 2010

FDR mortalité

- Score APACHE élevé
- Bacteriémie
- Comorbidité importante
- Bactéries résistantes (MDR) :pyo, acinetobacter, enterobactéries…
- Délai dans l'instauration du traitement

Physiopathologie



Diagnostic

Signes radiologiques
Deux clichés radiologiques successifs à partir desquels l'apparition d'un foyer de pneumonie est suspecté
En l'absence d'antécédents de cardiopathie ou de maladie pulmonaire sous-jacentes, un seul examen radiologique suffit
Et au moins un des signes suivants
Température corporelle > 38,3°C sans autre cause
Leucocytes < 4000 /mm^3 ou ≥ 12000 /mm^3
Et au moins deux des signes suivants
Sécrétions purulentes
Toux ou dyspnée
Désaturation ou besoin accru en oxygène ou nécessité d'assistance ventilatoire

Se 69% Sp 75%

SFAR/SRLF 2017

CPIS

Le *Clinical Pulmonary Infection Score* (CPIS) [16]

Température	
≥ 36,5 °C et ≤ 38,4 °C	0 point
≥ 38,5 °C et ≤ 38,9 °C	1 point
≤ 36 °C ou ≥ 39 °C	2 points
Leucocytose	
≥ 4 G/L et ≤ 11 G/L	0 point
< 4 G/L ou > 11 G/L	1 point
si formes immatures ≥ 0,5 G/L	+1 point
Aspirations trachéales	
< 4 + de sécrétions	0 point
≥ 4 + de sécrétions	1 point
si sécrétions purulentes	+1 point
PaO_2/FIO_2	
> 240 ou SDRA	0 point
≤ 240 sans SDRA	2 points
Radiographie thoracique	
absence d'infiltrat	0 point
infiltrat diffus	1 point
infiltrat localisé	2 points
Culture semi-quantitative des sécrétions trachéales (0, 1, 2 ou 3 +)	
bactérie pathogène ≤ 1+	0 point
bactérie pathogène > 1+	1 point
si même bactérie sur Gram	+1 point

Si > 5 pts
Se > 80%

Pugin, ARRD 1991

Prélèvements

- Littérature contradictoire….
- Non invasif vs distal ?
- Quantitatif vs qualitatif ?
- **US guidelines : ECBC, qualitatif**
- **EU guidelines : LBA ou PDP, quantitatif**

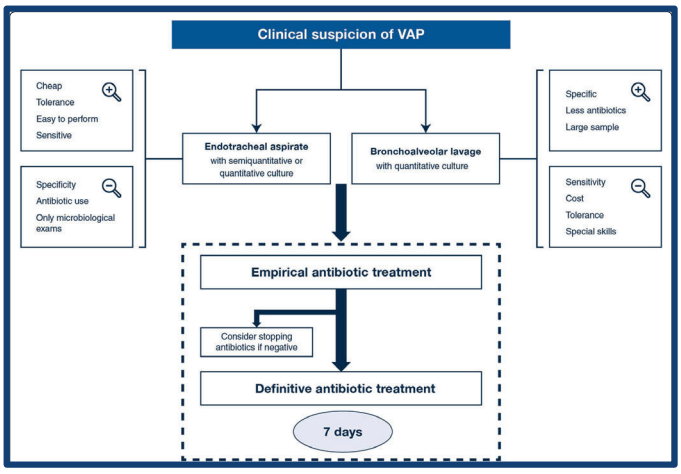
Avant antibiothérapie ++

Intérêt drainage par kinésithérapeute

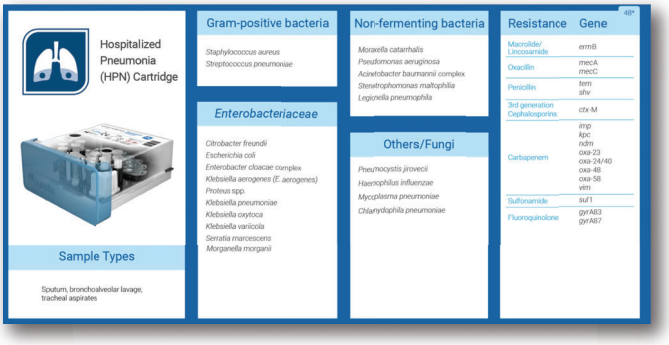
Prélèvements

Type de prélèvements	Sensibilité m±ds (extrêmes)	Spécificité m±ds (extrêmes)
Aspiration trachéale qualitative	(57%-88%)	(14%-33%)
Aspiration trachéale quantitative ≥10^6	76±9% (38%-82%)	75±28% (72%-85%)
Echantillonnage distal non fibroscopique PDP, mini-LBA(≥10^3)	(63%-100%)	(66%-96%)
BTP sous fibroscopie ≥10^3	66±19% (33%-100%)	90±15% (50%-100%)
LBA sous fibroscopie≥10^4	73±18% (42%-93%)	82±19% (45%-100%)

Avant antibiothérapie ++



PCR multiplex



Résultats en 4 à 5h...
Mais pas de différence entre colonisation et infection

Germes

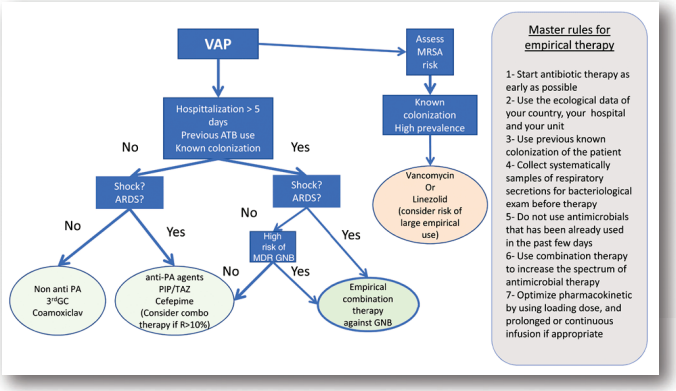
- Entérobactéries (25%)
- Pseudomonas Aeruginosa (20%)
- Staphylocoque Aureus (20%)
- Haemophilus (10%)
- Streptocoques
- Virus et champignons chez ID
- Polymicrobien dans 30% des cas

FDR BMR

Risk factors for multidrug-resistant ventilator-associated pneumonia

Risk factors for MDR pathogens:
▪ IV antibiotic use within the previous 90 days
▪ Septic shock at the time of VAP
▪ ARDS preceding VAP
▪ ≥5 days of hospitalization prior to the occurrence of VAP
▪ Acute renal replacement therapy prior to VAP onset
Risk factors for MDR *Pseudomonas* and other gram-negative bacilli:
▪ Treatment in an ICU in which >10 percent of gram-negative isolates are resistant to an agent being considered for monotherapy
▪ Treatment in an ICU in which local antimicrobial susceptibility rates are not known
▪ Colonization with OR prior isolation of MDR *Pseudomonas* or other gram-negative bacilli
Risk factors for MRSA:
▪ Treatment in a unit in which >10 to 20 percent of *Staphylococcus aureus* isolates are methicillin resistant
▪ Treatment in a unit in which the prevalence of MRSA is not known
▪ Colonization with OR prior isolation of MRSA

Antibiothérapie

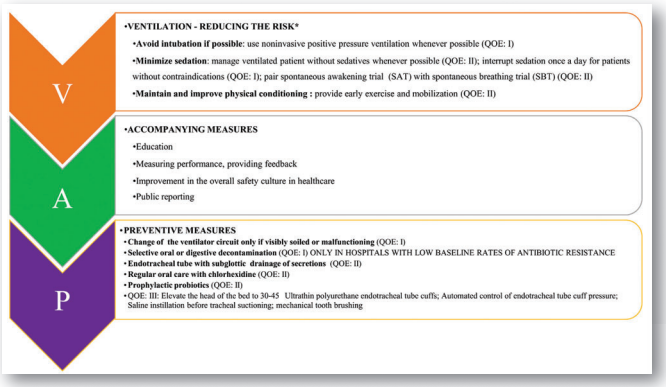


PREVENTION

Facteurs de risques

Host-related risk factors	Intervention-related risk factors
Medical history and underlying illness	Peri-operative transfusion of blood products
Male gender	Duration of the mechanical ventilation
Extreme age	Reintubation
Prior central nervous system disorder	Supine head position in patients receiving enteral nutrition
Immunocompromised	Antibiotic therapy[a]
Acute underlying diseases	Enteral nutrition
Emergent surgery	Absence of subglottic secretion drainage[b]
Neurosurgery	Intra-hospital transports
Thoracic surgery	Continuous sedation, use of paralytic agents
Cardiac surgery	Nasogastric tubes
Burns	Tracheostomy
Re-intervention	Frequent ventilator circuit changes
Acute severity factors	Intracuff pressure of less than 20 cm H_2O
Organ system failure index of at least 3	
Acute renal failure	
Acute respiratory distress syndrome	
ECMO, intra-aortic support	
Ulcer disease	

Principe de prévention



Réduire la ventilation !

•VENTILATION - REDUCING THE RISK*

•**Avoid intubation if possible**: use noninvasive positive pressure ventilation whenever possible (QOE: I)

•**Minimize sedation**: manage ventilated patient without sedatives whenever possible (QOE: II); interrupt sedation once a day for patients without contraindications (QOE: I); pair spontaneous awakening trial (SAT) with spontaneous breathing trial (SBT) (QOE: II)

•**Maintain and improve physical conditioning :** provide early exercise and mobilization (QOE: II)

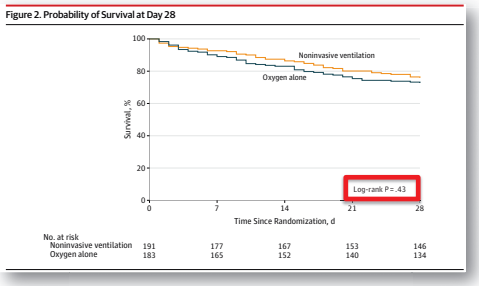
Pneumopathie de l'Immunodéprimé

Outcome	Noninvasive-Ventilation Group (N=26)	Standard-Treatment Group (N=26)	P Value	Relative Risk (95% CI)
Intubation — no./total no. (%)	12/26 (46)	20/26 (77)	0.03	0.60 (0.38–0.96)
Immunosuppression from hematologic cancer and neutropenia	8/15 (53)	14/15 (93)	0.02	0.57 (0.35–0.93)
Drug-induced immunosuppression	3/9 (33)	5/9 (56)	0.32	0.60 (0.20–1.79)
Immunosuppression from the acquired immunodeficiency syndrome	1/2 (50)	1/2 (50)	0.83	1.00 (0.14–7.10)
Initial improvement in PaO_2:FiO_2 — no. (%)	12 (46)	4 (15)	0.02	
Sustained improvement in PaO_2:FiO_2 without intubation — no. (%)	13 (50)	5 (19)	0.02	
Death in the ICU — no./total no. (%)†	10/26 (38)	18/26 (69)	0.03	0.56 (0.32–0.96)
Immunosuppression from hematologic cancer and neutropenia	7/15 (47)	13/15 (87)	0.02	0.54 (0.30–0.96)
Drug-induced immunosuppression	3/9 (33)	4/9 (44)	0.56	0.75 (0.23–2.44)
Immunosuppression from the acquired immunodeficiency syndrome	0/2	1/2 (50)	0.50	0.50 (0.13–2.00)
Total duration of any ventilatory assistance — days				
Among all patients	6±3	6±5	0.59	
Among survivors	5±2	3±5	0.12	
Length of ICU stay — days				
Among all patients	7±3	9±4	0.11	
Among survivors	7±3	10±4	0.06	
Death in the hospital — no./total no. (%)	13/26 (50)	21/26 (81)	0.02	0.62 (0.40–0.95)
Immunosuppression from hematologic cancer and neutropenia	8/15 (53)	14/15 (93)	0.02	0.57 (0.35–0.93)
Drug-induced immunosuppression	4/9 (44)	6/9 (67)	0.33	0.67 (0.28–1.58)
Immunosuppression from the acquired immunodeficiency syndrome	1/2 (50)	1/2 (50)	0.83	1.00 (0.14–7.10)

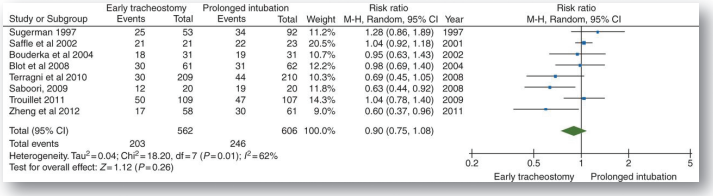
Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

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

A Randomized Clinical Trial



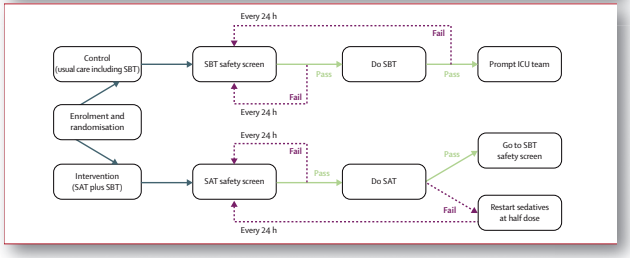
Trachéotomie précoce ?



Szakmany, BJA 2015

Protocole de sevrage

Efficacy and safety of a paired sedation and ventilator weaning protocol for mechanically ventilated patients in intensive care (Awakening and Breathing Controlled trial): a randomised controlled trial

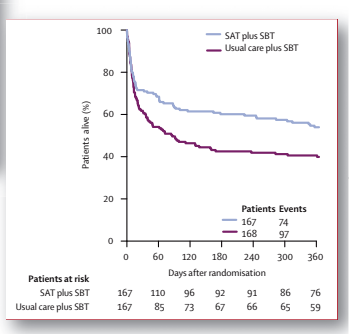


Girard et al, Lancet 2008

	Intervention group (n=167)	Control group (n=168)	p value
Ventilator-free days*			
Mean	14·7 (0·9)	11·6 (0·9)	0·02
Median	20·0 (0 to 26·0)	8·1 (0 to 24·3)	
Time to discharge (days)			
From intensive care	9·1 (5·1 to 17·8)	12·9 (6·0 to 24·2)	0·01
From hospital	14·9 (8·9 to 26·8)	19·2 (10·3 to NA)†	0·04
1-year mortality	74 (44%)	97 (58%)	0·01
Coma	2 (0 to 4)	3 (1 to 7)	0·002
Delirium	2 (0 to 5)	2 (0 to 6)	0·50
RASS at first successful SBT	−1 (−3 to 0)	−2·5 (−4 to 0)	0·0001
Complications			
Any self-extubation	16 (10%)	6 (4%)	0·03
Self-extubation requiring reintubation‡	5 (3%)	3 (2%)	0·47
Reintubation‡	23 (14%)	21 (13%)	0·73
Tracheostomy	21 (13%)	34 (20%)	0·06

Data are mean (SD), n (%), or median (IQR). RASS=Richmond agitation-sedation scale. SAT=spontaneous awakening trial. SBT=spontaneous breathing trial. *Ventilator-free days from study day 1 to 28. †Greater than 25% of patients in the SBT group remained in the hospital at study day 28. ‡Reintubation within 48 hours of extubation.

Table 3: Main outcomes

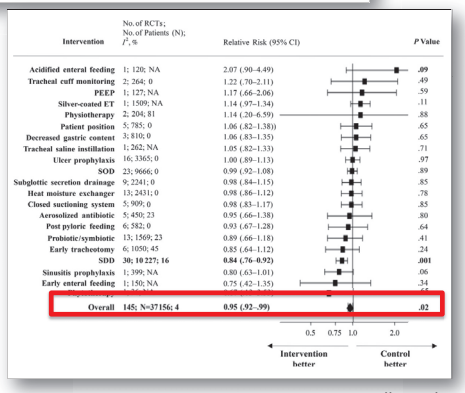


Surveiller / Eduquer

- **ACCOMPANYING MEASURES**
  - Education
  - Measuring performance, providing feedback
  - Improvement in the overall safety culture in healthcare
  - Public reporting

Pneumonia Prevention to Decrease Mortality in Intensive Care Unit: A Systematic Review and Meta-analysis

Antoine Roquilly,[1] Emmanuel Marret,[3] Edward Abraham,[4] and Karim Asehnoune[1,2]



Roquilly et al, CID 2015

Long-Term Impact of a Multifaceted Prevention Program on Ventilator-Associated Pneumonia in a Medical Intensive Care Unit

Lila Bouadma,[1] Emmanuelle Deslandes,[2] Isabelle Lolom,[2] Bertrand Le Corre,[1] Bruno Mourvillier,[1] Bernard Regnier,[1] Raphael Porcher,[2] Michel Wolff,[1,4] and Jean-Christophe Lucet[3]

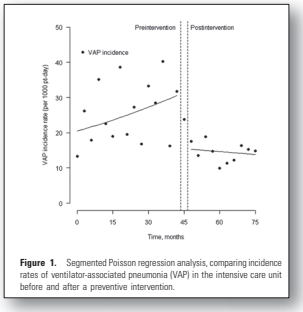
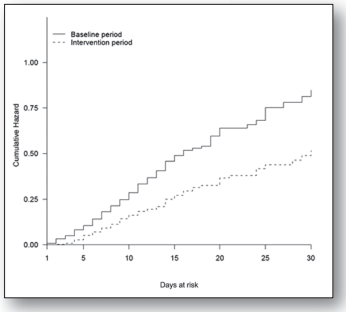


Figure 1. Segmented Poisson regression analysis, comparing incidence rates of ventilator-associated pneumonia (VAP) in the intensive care unit before and after a preventive intervention.

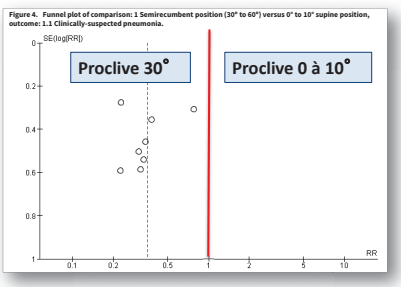


Bouadma et al, CID 2010

Prévenir = BUNDLE

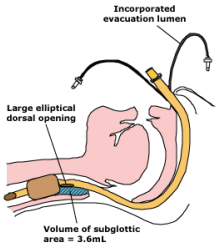
- **PREVENTIVE MEASURES**
  - **Change of the ventilator circuit only if visibly soiled or malfunctioning** (QOE: I)
  - **Selective oral or digestive decontamination** (QOE: I) ONLY IN HOSPITALS WITH LOW BASELINE RATES OF ANTIBIOTIC RESISTANCE
  - **Endotracheal tube with subglottic drainage of secretions** (QOE: II)
  - **Regular oral care with chlorhexidine** (QOE: II)
  - **Prophylactic probiotics** (QOE: II)
  - QOE: III: Elevate the head of the bed to 30-45 Ultrathin polyurethane endotracheal tube cuffs; Automated control of endotracheal tube cuff pressure; Saline instillation before tracheal suctioning; mechanical tooth brushing

Prévenir l'inhalation



Prévenir l'inhalation

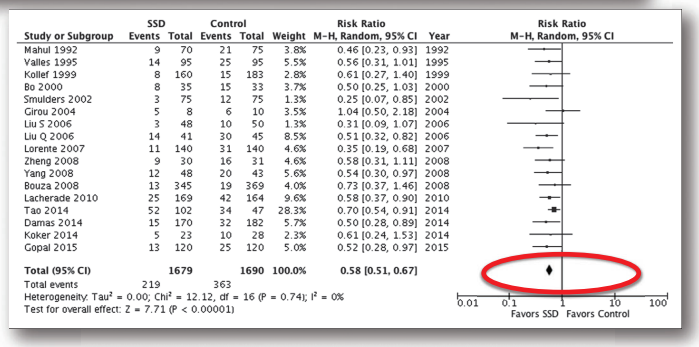
Device for continuous aspiration of subglottic secretions



Representation of a specially designed endotracheal tube that permits the drainage of subglottic secretions. Hi-Lo EVAC tube (Mallinckrodt).

Subglottic Secretion Drainage and Objective Outcomes: A Systematic Review and Meta-Analysis

Daniel A. Caroff, MD[1,2]; Lingling Li, PhD[1]; John Muscedere, MD[3]; Michael Klompas, MD, MPH[1,2]



Study or Subgroup	SSD Events	SSD Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI	Year
Mahul 1992	9	70	21	75	3.8%	0.46 [0.23, 0.93]	1992
Valles 1995	14	95	25	95	5.5%	0.56 [0.31, 1.01]	1995
Kollef 1999	8	160	15	183	2.8%	0.61 [0.27, 1.40]	1999
Bo 2000	8	35	15	33	3.7%	0.50 [0.25, 1.03]	2000
Smulders 2002	3	75	12	75	1.3%	0.25 [0.07, 0.85]	2002
Girou 2004	5	8	6	10	3.5%	1.04 [0.50, 2.18]	2004
Liu S 2006	3	48	10	50	1.3%	0.31 [0.09, 1.07]	2006
Liu Q 2006	14	41	30	45	8.5%	0.51 [0.32, 0.82]	2006
Lorente 2007	11	140	31	140	4.6%	0.35 [0.19, 0.68]	2007
Zheng 2008	9	30	16	31	4.6%	0.58 [0.31, 1.11]	2008
Yang 2008	12	48	20	43	5.6%	0.54 [0.30, 0.97]	2008
Bouza 2008	13	345	19	369	4.0%	0.73 [0.37, 1.46]	2008
Lacherade 2010	25	169	42	164	9.6%	0.58 [0.37, 0.90]	2010
Tao 2014	52	102	34	47	28.3%	0.70 [0.54, 0.91]	2014
Damas 2014	15	170	32	182	5.7%	0.50 [0.28, 0.89]	2014
Koker 2014	5	23	10	28	2.3%	0.61 [0.24, 1.53]	2014
Gopal 2015	13	120	25	120	5.0%	0.52 [0.28, 0.97]	2015
Total (95% CI)		**1679**		**1690**	**100.0%**	**0.58 [0.51, 0.67]**	
Total events	219		363				

Heterogeneity: Tau² = 0.00; Chi² = 12.12, df = 16 (P = 0.74); I² = 0%
Test for overall effect: Z = 7.71 (P < 0.00001)

Risk Ratio M-H, Random, 95% CI
0.01 0.1 1 10 100
Favors SSD Favors Control

Caroff et al, CCM 2016

Lorente *et al. Critical Care* 2014, **18**:R77
http://ccforum.com/content/18/2/R77

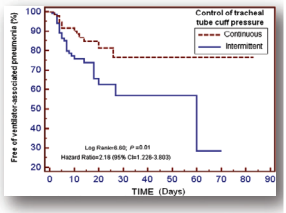
CRITICAL CARE

RESEARCH **Open Access**

Continuous endotracheal tube cuff pressure control system protects against ventilator-associated pneumonia

Leonardo Lorente[1*], María Lecuona[2], Alejandro Jiménez[3], Lisset Lorenzo[1], Isabel Roca[1], Judith Cabrera[1], Celina Llanos[1] and María L Mora[1]

- Etude prospective espagnole monocentrique
- 25 cmH2O
- Continu vs toutes les 8h
- 284 patients
- NS sur durée d'hospit et mortalité



Prévenir : la Décontamination

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Decontamination of the Digestive Tract and Oropharynx in ICU Patients

- Etude multicentrique randomisée
- 13 réas, Pays Bas
- 5939 patients ventilés plus de 72h
- 3 groupes:

→ SDD : Cefotaxime IV 4j + application orale de Tobramycine + Colistine + Ampho B
→ SOD : Pate orale seule
→ Groupe contrôle

De Smet et al, NEJM 2009

Table 2. Primary and Secondary End Points.*

End Point	Study Group: Standard Care (N=1990)	SDD (N=2045)	SOD (N=1904)	Unadjusted Odds Ratio or Hazard Ratio (95% CI)†: Standard Care	SDD	SOD	Adjusted Odds Ratio or Hazard Ratio (95% CI)†: Standard Care	SDD	SOD
Death — no. (%)									
During the first 28 days	544 (27.5)	546 (26.9)	502 (26.6)	1.00	0.94 (0.82–1.08)	0.95 (0.82–1.10)	1.00	0.83 (0.72–0.97)	0.86 (0.74–0.99)
In the ICU	443 (22.3)	440 (21.5)	416 (21.8)	1.00	0.91 (0.79–1.06)	0.97 (0.83–1.13)	1.00	0.81 (0.69–0.94)	0.87 (0.74–1.02)
In the hospital	632 (31.8)	665 (32.6)	584 (30.7)	1.00	0.99 (0.86–1.13)	0.94 (0.82–1.08)	1.00	0.88 (0.76–1.01)	0.85 (0.74–0.98)
Time to outcome for survivors at day 28 — days									
Cessation of mechanical ventilation				1.00	1.06 (0.96–1.18)	1.01 (0.89–1.15)	1.00	1.10 (0.99–1.22)	1.03 (0.90–1.17)
Median	8	7	8						
Interquartile range	3–17	4–15	4–15						
Discharge from ICU				1.00	1.02 (0.92–1.12)	1.00 (0.89–1.11)	1.00	1.09 (0.99–1.21)	1.06 (0.94–1.19)
Median	9	9	9						
Interquartile range	6–19	6–18	6–17						
Discharge from hospital				1.00	1.04 (0.91–1.19)	1.05 (0.91–1.22)	1.00	1.13 (1.01–1.25)	1.13 (0.96–1.32)
Median	29	28	28						
Interquartile range	16–48	16–45	16–47						

De Smet et al, NEJM 2009

Table 3. Cumulative Incidence of ICU-Acquired Bacteremia and Candidemia.*

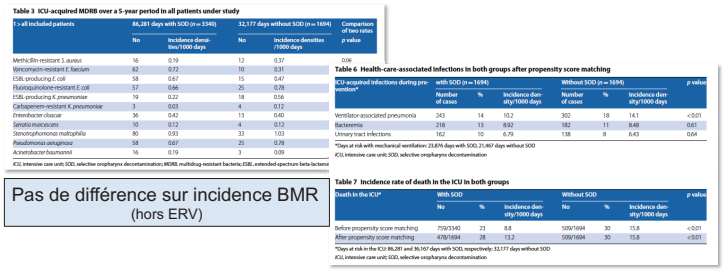
Type of Infection	Study Group			Crude Odds Ratio (95% CI)		
	Standard Care (N = 1990)	SOD (N = 1904)	SDD (N = 2045)	SDD vs. Standard Care	SOD vs. Standard Care	SDD vs. SOD
	no. (%)					
Staphylococcus aureus	22 (1.1)	9 (0.5)	9 (0.4)	0.40 (0.18–0.86)	0.43 (0.20–0.93)	0.93 (0.37–2.40)
Streptococcus pneumoniae	3 (0.2)	1 (0.1)	1 (0.0)	0.32 (0.03–3.12)	0.35 (0.04–3.35)	0.93 (0.06–14.90)
GNF-GNR species†	36 (1.8)	17 (0.9)	16 (0.8)	0.43 (0.24–0.77)	0.49 (0.27–0.87)	0.88 (0.44–1.74)
Enterobacteriaceae	87 (4.4)	59 (3.1)	18 (0.9)	0.19 (0.12–0.32)	0.70 (0.50–0.98)	0.28 (0.16–0.47)
Enterococcus species	55 (2.8)	49 (2.6)	48 (2.3)	0.85 (0.57–1.25)	0.93 (0.63–1.37)	0.91 (0.61–1.36)
Candida species	16 (0.8)	14 (0.7)	8 (0.4)	0.49 (0.21–1.11)	0.91 (0.45–1.85)	0.53 (0.23–1.24)
Patients with at least one episode of bacteremia or candidemia — no. (%)	186 (9.3)	124 (6.5)	88 (4.3)	0.44 (0.34–0.57)	0.68 (0.53–0.86)	0.65 (0.49–0.85)

➔ **Mais augmentation de résistance des germes…**

De Smet et al, NEJM 2009

ORIGINAL

Ecological effects of selective oral decontamination on multidrug-resistance bacteria acquired in the intensive care unit: a case–control study over 5 years



Pas de différence sur incidence BMR (hors ERV)

Diminution VAP et mortalité en réa

Wang et al, ICM 2022

Rôle du pH gastrique ?

Acid Suppressive Medication Use and the Risk for Hospital Acquired Pneumonia

Shoshana J. Herzig MD
Michael D. Howell MD MPH
Long H. Ngo PhD
Edward R. Marcantonio MD SM

Context The use of acid-suppressive medication has been steadily increasing, particularly in the inpatient setting, despite lack of an accepted indication in the majority of these patients.

Objective To examine the association between acid-suppressive medication and hospital-acquired pneumonia.

Table 4. Rates of Hospital-Acquired Pneumonia According to Type of Acid-Suppressive Medication

	Acid-Suppressive Medication	No Acid-Suppressive Medication	Unadjusted OR (95 CI)	Adjusted OR (95 CI)
Proton-Pump Inhibitors[a]				
Total admissions, No.	25374	30956	56330	56330
Hospital-acquired pneumonia, No. ( )	1340 (5.3)	610 (2.0)	2.8 (2.5-3.1)	1.3 (1.1-1.4)[b]
Histamine, Receptor Antagonists[c]				
Total admissions, No.	5686	30956	36642	36642
Hospital-acquired pneumonia, No. ( )	176 (3.1)	610 (2.0)	1.6 (1.3-1.9)	1.2 (0.98-1.4)[b]

Herzig et al., JAMA 2009

Rôle du pH gastrique ?

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 DECEMBER 6, 2018 VOL. 379 NO. 23

Pantoprazole in Patients at Risk for Gastrointestinal Bleeding in the ICU

- Étude prospective, randomisée, multicentrique, internationale
- 3298 patients avec FDR d'hémorragie digestive haute (anticoagulants, choc, ventilation, EER…)
- Pantoprazole 40mg vs Placebo

Rôle du pH gastrique ?

Table 2. Primary and Secondary Outcome Measures.

Outcomes	Pantoprazole	Placebo	Relative Risk (95% CI)*	P Value†
Primary outcome: death by day 90 — no./total no. (%)	510/1642 (31.1)	499/1640 (30.4)	1.02 (0.91–1.13)	0.76
Secondary outcomes				
One or more clinically important events — no./total no. (%)‡	360/1644 (21.9)	372/1647 (22.6)	0.96 (0.83–1.11)	—
One or more episodes of clinically important gastrointestinal bleeding — no./total no. (%)	41/1644 (2.5)	69/1647 (4.2)	0.58 (0.40–0.86)	—
One or more infectious adverse events — no./total no. (%)§	276/1644 (16.8)	279/1647 (16.9)	0.99 (0.84–1.16)	—
Severe adverse reaction — no./total no. (%)¶	0/1644 (0)	0/1647 (0)	—	—
Median percentage of days alive without the use of life support (IQR)‖	92 (60–97)	92 (65–97)	—	—

Prévention : autres mesures

- Pas d'intérêts à l'utilisation de :

- Probiotiques
- Sonde IOT recouvertes d'argent ou forme ballonnet « optimisée »
- Corticoïdes
- Système d'aspiration clos
- Antibioprophylaxie par aérosols
- Changement quotidien du circuit ou filtre

British Journal of Anaesthesia **100** (3): 299–306 (2008)
doi:10.1093/bja/aem403 Advance Access publication February 4, 2008

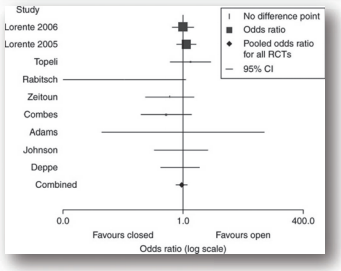
BJA

CME

Closed tracheal suction systems for prevention of ventilator-associated pneumonia

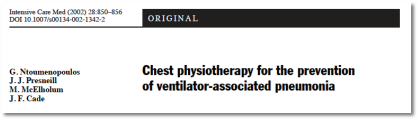
I. I. Siempos[1], K. Z. Vardakas[1] and M. E. Falagas[1 2 3]*

[1]*Alfa Institute of Biomedical Sciences (AIBS), 9 Neapoleos Street, 151 23 Marousi, Athens, Greece.* [2]*Department of Medicine, Henry Dunant Hospital, Athens, Greece.* [3]*Department of Medicine, Tufts University School of Medicine, Boston, MA, USA*



- NS sur incidence PAVM
- Augmentation durée de ventilation et colonisation bactérienne

Impact kinésithérapie ?

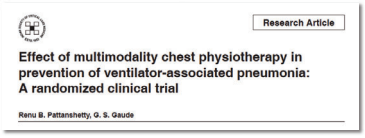

Intensive Care Med (2002) 28:850–856
DOI 10.1007/s00134-002-1342-2

ORIGINAL

G. Ntoumenopoulos
J. J. Presneill
M. McElholum
J. F. Cade

Chest physiotherapy for the prevention of ventilator-associated pneumonia

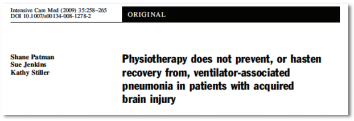
2002, n=60
Diminution VAP


Research Article

Effect of multimodality chest physiotherapy in prevention of ventilator-associated pneumonia: A randomized clinical trial

Renu B. Pattanshetty, G. S. Gaude

2010, n=101
Diminution du score CPIS


Intensive Care Med (2009) 35:258–265
DOI 10.1007/s00134-008-1278-2

ORIGINAL

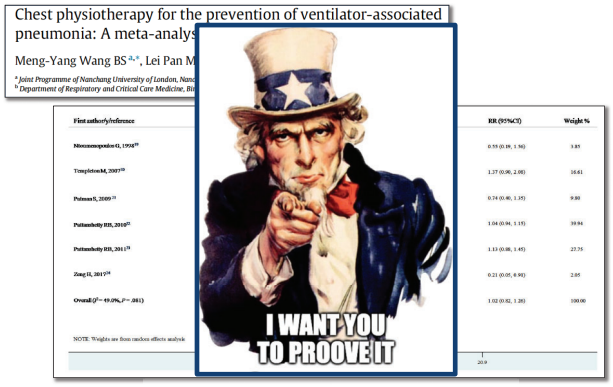
Shane Patman
Sue Jenkins
Kathy Stiller

Physiotherapy does not prevent, or hasten recovery from, ventilator-associated pneumonia in patients with acquired brain injury

2008, n=101, neurolésé
Pas de diminution survenue VAP
ni d'amélioration pronostic si VAP

Donnée contradictoire …

Impact kinésithérapie ?


Chest physiotherapy for the prevention of ventilator-associated pneumonia: A meta-analys

Meng-Yang Wang BS [a,*], Lei Pan M

[*] Joint Programme of Nanchang University of London, Nanc
[b] Department of Respiratory and Critical Care Medicine, Ri

Peu d'études, petits effectifs, hétérogénicité…

Wang et al, AJIC 2019

Prévention

Prévention

Quels moyens de prévention des pneumonies associées aux soins faut-il utiliser pour diminuer la morbimortalité des patients de réanimation ?

R1.1 – Il faut utiliser une approche standardisée multimodale de prévention des pneumonies associées aux soins pour diminuer la morbidité des patients hospitalisés en réanimation.
GRADE 1+, ACCORD Fort

SFAR

srlf
SOCIÉTÉ DE RÉANIMATION DE LANGUE FRANÇAISE

Protocole multimodal de prévention des pneumonies associées aux soins

1 - Favoriser la ventilation non-invasive (notamment en post-opératoire de chirurgie digestive et chez le BPCO)

En cas de nécessité de ventilation invasive

2 - Appliquer un protocole de décontamination digestive sélective avec une antibiothérapie systémique < 5 jours si prévalence de BMR faible (< 20%)

3 - Associer certaines des méthodes suivantes (1ère intention) :
- Favoriser le recours à la VNI pour éviter l'intubation
- Limiter les doses et la durée d'administration de sédatifs et analgésiques liés à la ventilation mécanique
- Initier précocement une nutrition entérale
- Contrôler régulièrement la pression du ballonnet de la sonde endotrachéale
- Réaliser une aspiration sous-glottique (/6-8 heures) à l'aide de sonde endotrachéale adaptée
- Préférer la voie orotrachéale pour l'intubation

NB: l'association d'un proclive > 30° et/ou d'une décontamination oro-pharyngée à la chlorhexidine 0,12 ou 0,2% pourraient être proposée en association à ces mesures malgré une faible efficacité car elles sont peu coûteuses et bien tolérées

4- Éviter d'utiliser les méthodes suivantes :
- Trachéotomie précoce systématique (hors indication spécifique)
- Prophylaxie anti-ulcéreuse (hors indication spécifique)
- Nutrition entérale post-pylorique (hors indication spécifique)
- Administration de probiotiques
- Changement précoce (hors recommandation du constructeur) des filtres humidificateurs en systématique
- Utilisation des systèmes clos d'aspiration endo-trachéale
- Utilisation de sonde d'intubation imprégnée avec un antiseptique, ou à forme « optimisée » du ballonnet
- Décontamination oro-pharyngée à la polyvidone iodée
- Utilisation d'une antibioprophylaxie par aérosols
- Décontamination cutanée quotidienne par antiseptique

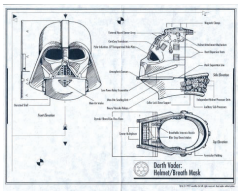
Janvier 2020-CHU0257

CHU Hôpitaux de Bordeaux

Conclusions

- Moins de ventilation… moins de PAVM !
- Diagnostic précoce pour traitement adapté
- **Protocole de service pour prévention = BUNDLE**

Pneumopathie acquise sous ventilation mécanique



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