

Pneumonie acquise sous ventilation mécanique

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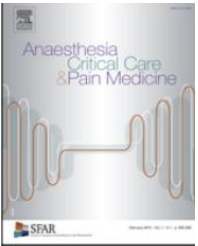


Liens d'intérêts:

MSD : bourse d'études, invitation à congrès, rémunération directe
Pfizer : invitation à congrès, rémunération directe
Eumédica : rémunération directe
Correvio: rémunération directe

PAVM et prévention : que pouvons-nous dire de plus ?

- Les moyens de prévention sont connus
- Une réflexion collégiale au niveau nationale finalisée
- Des résultats internationaux et nationaux satisfaisants



Leone *et al*, Anaesth Crit Care Pain Med 2017

Dudeck *et al*, AJIC 2013

Ochoa-Hein *et al*, AJIC 2020

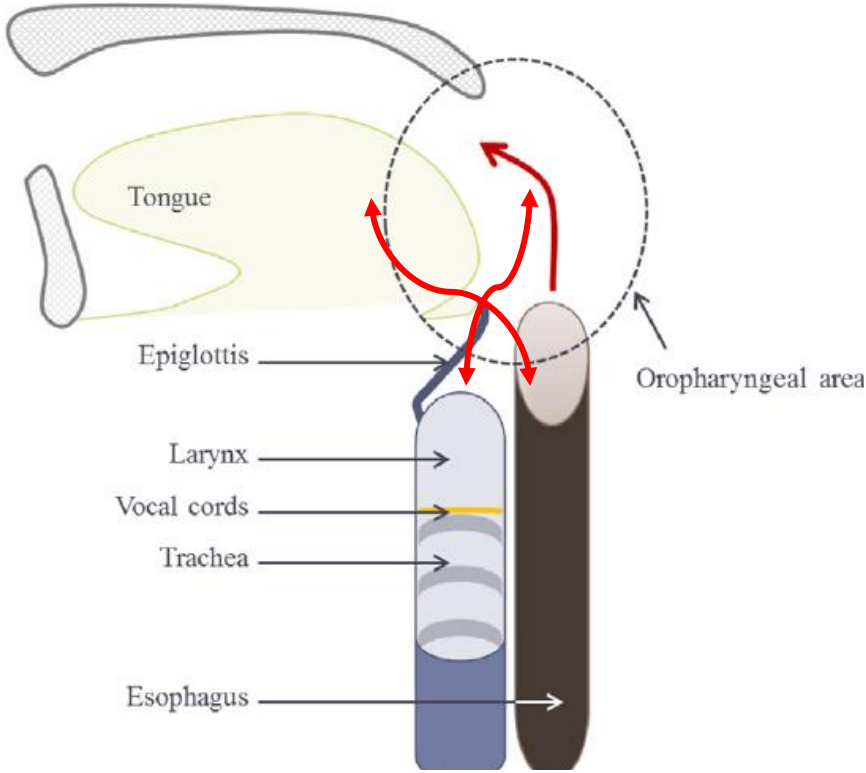
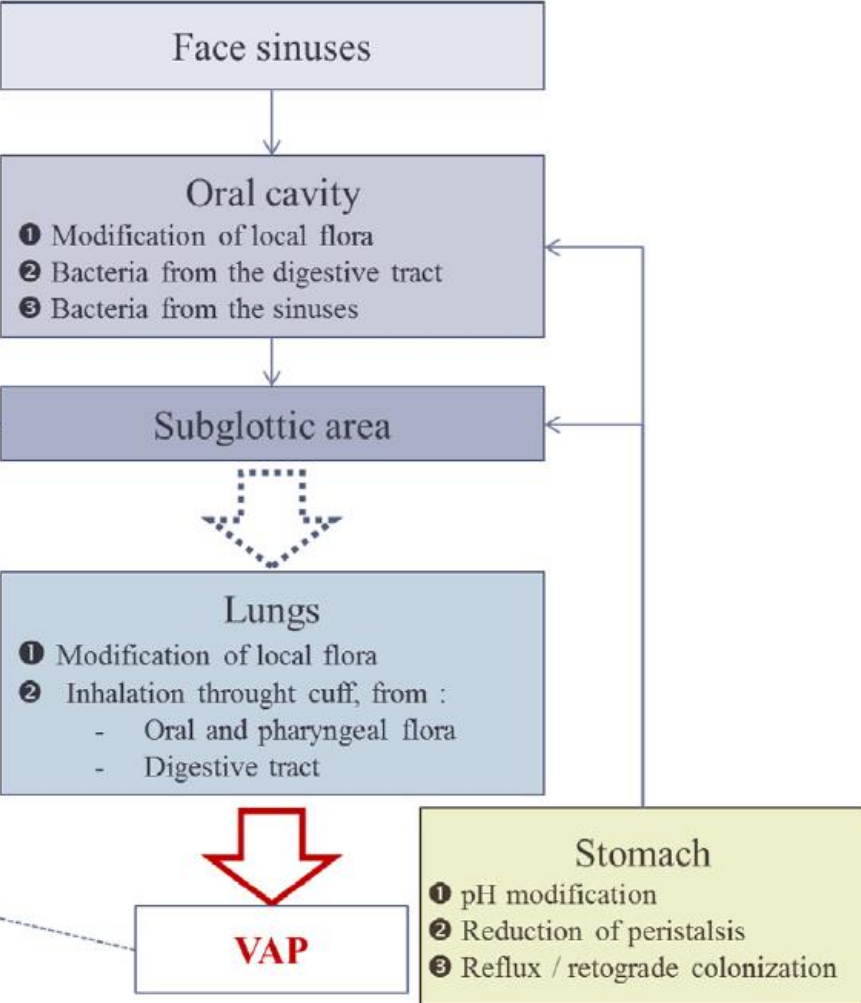
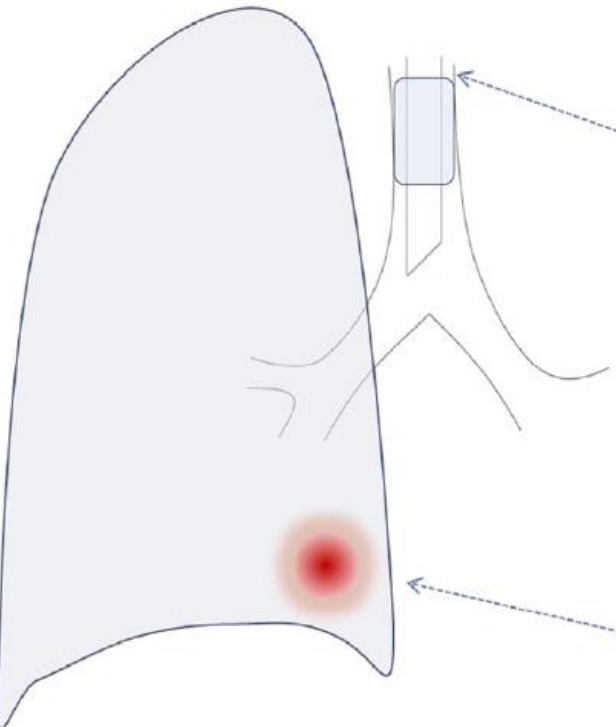
La messe est dite = « Y a plus qu'a »



Rappel : Physiopathologie

Transcolonization

(modification of bacterial flora during invasive mechanical ventilation)



Maitrise du risque infectieux : ce qui marche



Ventilation Reducing the risk

- Avoid intubation
- Minimize sedation
- Improve physical conditions

Accompanying measures

- Education
- Measuring performance, providing feed back
- Safety culture
- Public reporting

Preventing measures

- Change the ventilator cricuit
- Subglottic drainage
- oral care, Elevated the head of the bed (30-40), control of endotracheal tube cuff pressure



Quelles mesures pour quels résultats ?

Intervention	ICU acquired pneumonia	Ventilator-associated events	Days of invasive mechanical ventilation	ICU or hospital length of stay	Mortality
High flow oxygen via nasal cannula ^{21,22}	↓ or ↔	Unknown	↓	↔	↓ or ↔
NIPPV to avoid intubation in suitable patients ²³⁻²⁵	↓	Unknown	↓	↓	↓
NIPPV to speed extubation ^{26,27}	↓	Unknown	↓	↓	↔
Spontaneous breathing trials ²⁸⁻³¹	↓ or ↔	↓	↓	↓	↓ or ↔
Minimizing sedation (SAT or sedation protocols) ³⁷⁻³⁹	↓ or ↔	↓	↓	↓	↔
Early mobility ^{39,40}	↓ or ↔	Unknown	↓	↔	↔
Head of bed elevation ⁴⁹	↓	Unknown	↔	↔	↔
Conical (tapered) endotracheal tube cuffs ^{55,60}	↔	↔	↔	↔	↔
Ultrathin polyurethane endotracheal tube cuff ^{58,59,111}	↓ or ↔	Unknown	↔	↔	↔
Frequent or automated cuff pressure monitoring ^{61,62}	↓ or ↔	↔	↔	↔	↔
Subglottic secretion drainage ^{69,112}	↓	↔	↔	↔	↔
Selective digestive decontamination ^{72,73,80,82,83}	↓	Unknown	↔	↓	↓ ^a
Oral care with chlorhexidine ^{31,73,85-88}	↔	↑ or ↔	↔	↔	↑ or ↔
Stress ulcer prophylaxis ^{31,96,101}	↑ or ↔	↑ or ↔	↔	↔	↔
Probiotics ¹⁰²	↓	Unknown	↔	↔	↔

Quelles questions restent en suspend ?

- Quelles mesures sont à inclure dans les différents bundle ?
 - le, quels sont les éléments de base ?
- Comment mettre en œuvre les bundle au sein de mon institution ?
- Existe-t-il des nouveautés quant à la prévention ?
- Faut-il mesurer/ évaluer différemment les actions mises en œuvre ?

Quelles mesures/ évidence pour les bundles ?

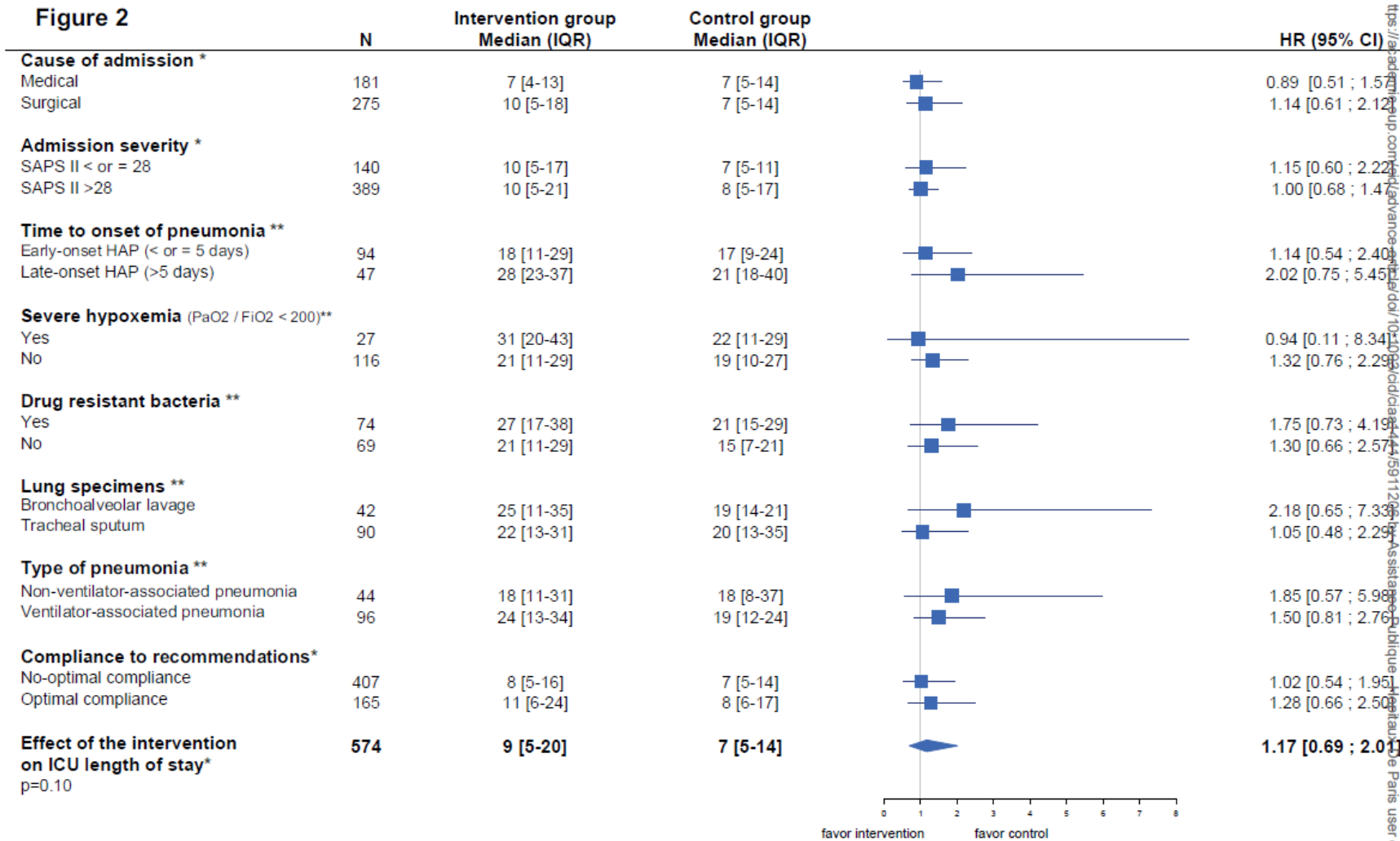
Mesures	Réduction de la durée de ventilation	Réduction de la Mortalité	Réduction des Evènements liés à la Ventilation
Interruption de la sédation	+	+	
Respiration spontanée	+	+	+
Élévation de la tête du lit	+		
Prophylaxie MTE			
Bains de bouche à la Chlorhexidine		-	
Prévention de l'ulcère de stress			

+ = significativement associé à un effet positif

La prévention de l'ulcère de stress était la seule mesure associée à la VAP

Comment mettre en œuvre ?

Surveillance
3



https://academic.oup.com/cid/advance-article-abstract/doi/10.1093/cid/ciaa141/5911266 by Assistance Publique - Hôpitaux de Paris user on 07

Intervention	Registre
3-56)	42% (25-53)
jours	-2.8 jours

Patients at risk

	Control	Intervention
281	231	108
293	228	146
	68	96
	42	75
	26	51
	0	0

Comment mettre en œuvre ?

Model attribute, implementation strategy	Key features
Engagement	
Develop a multidisciplinary team	Team includes representatives from every discipline that cares for a patient receiving mechanical ventilation, including, at a minimum, unit directors, physicians, nurses, and respiratory therapists; other disciplines that could strengthen the team are infection preventionists, pharmacists, nutritionists, physical therapists, and occupational therapists; the multidisciplinary team sets the VAP improvement program goals, defines each step to implement the program, and monitors progress towards reaching the goals
Involve local champions	Identify a local champion (either formally or informally, who is often a physician or nurse with dedicated time, to lead the team; local champions engage stakeholders, educate peers about best practices, maintain momentum, and establish buy-in and ownership among staff and administrators; local champion should know their hospital's interests and needs, know how to shape strategies to match local unit culture, monitor progress, and evolve interventions to maintain progress; establish early and continued communication between local champion and frontline staff
Encourage peer networking	Horizontal networking of peers across units or hospitals promotes and increases compliance with evidence-based practices; encourages collaboration, analysis of performance, accountability, commitment to specific goals, brainstorming solution to common problems, and understanding local strengths and weaknesses

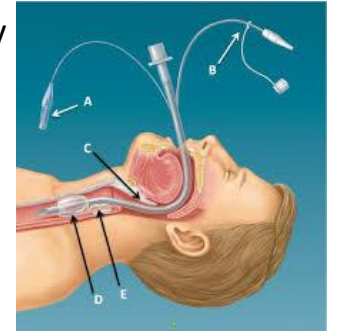
Existe-t-il des nouveautés ?



Polyurethane or Conical Cuffs

Philippart F *et al*, AJCCM 2015
 Jaillette *et al*, ICM 2017

Lacherade JC, Demeter study



Continuous subglottic aspiration

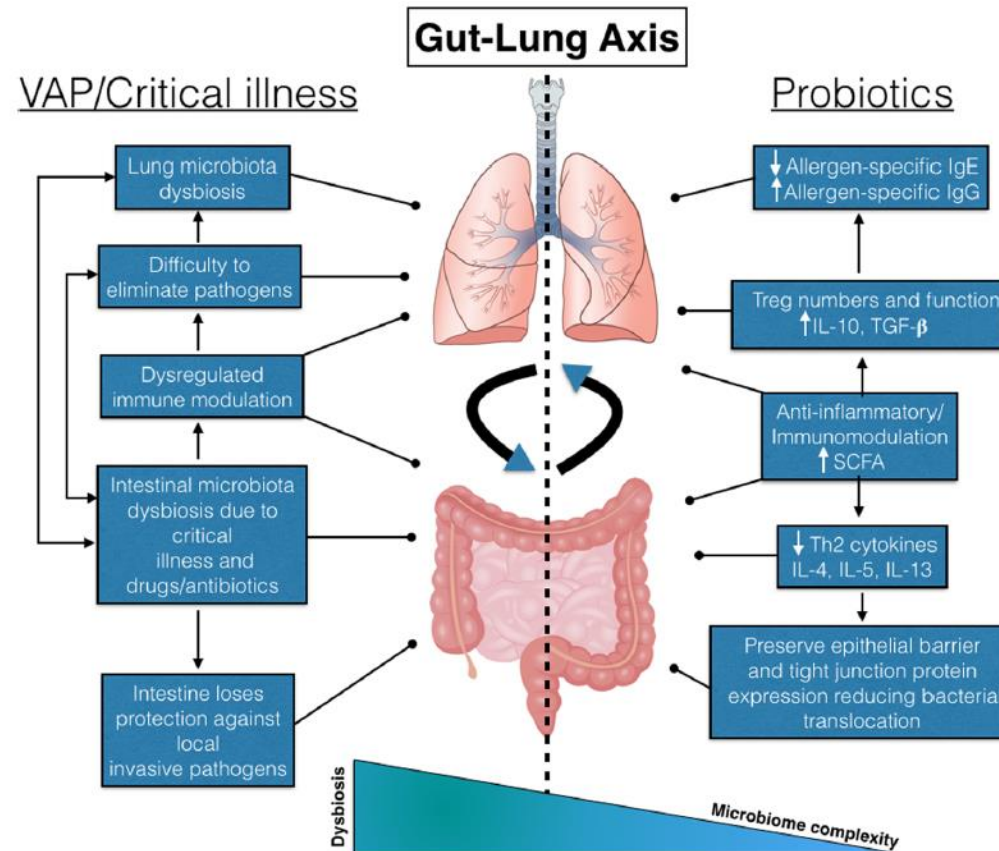


Fig. 1 The gut-lung axis in ventilator-associated pneumonia (VAP) and proposed working mechanism of probiotics. IL interleukin, TGF- β transforming growth factor- β , SCFA short-chain fatty acids

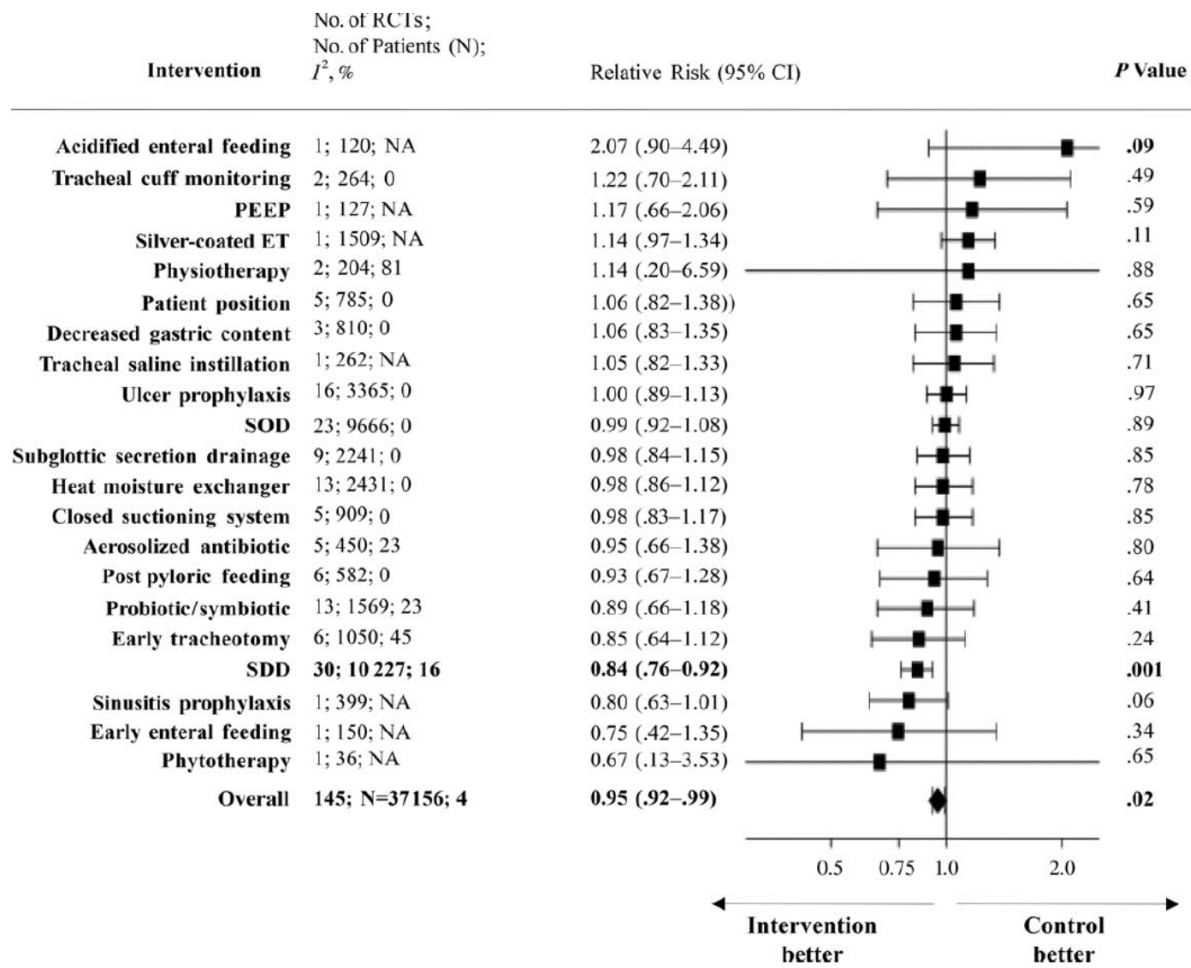
Wiersing *et al*, Crit Care 2017
 Bo *et al*, Cochrane Database 2014

Existe-t-il des nouveautés ?

Author, year	Study design	N (intervention vs. control)	Analyzed N (intervention vs. control)	Details of intervention	Primary outcome
Barraud et al., 2010 [26]	Blinded RCT	87 vs. 80	87 vs. 80	<i>Bifidobacterium bifidum</i> , <i>Lactobacillus acidophilus</i> , <i>Lactobacillus casei</i> , and <i>Lactobacillus rhamnosus</i> GG, 1/day 2×10^{10} CFU in the stomach	28-day mortality
Forestier et al., 2008 [27]	Blinded RCT	118 vs. 118	102 vs. 106	<i>Lactobacillus casei rhamnosus</i> , 1/day 1×10^9 CFU in the mouth and stomach	Time of first <i>Pseudomonas aeruginosa</i> acquisition
Klarin et al., 2008 [28]	Open-label RCT	25 vs. 25	23 vs. 21	<i>Lactobacillus plantarum</i> 299, 2/day 1×10^{10} CFU in the mouth	Subsequent samples
Knight et al., 2009 [33]	Blinded RCT	150 vs. 150	130 vs. 129	<i>Lactobacillus paracasei</i> , <i>Lactobacillus plantarum</i> , <i>Leuconostoc mesenteroides</i> , and <i>Pediococcus pentosaceus</i> , 2/day 1×10^{10} CFU in the stomach	VAP
Morrow et al., 2010 [29]	Blinded RCT	73 vs. 73	68 vs. 70	<i>Lactobacillus rhamnosus</i> GG ₂ , 2/day 1×10^9 CFU in the oropharynx and stomach	VAP incidence
Rongrungruang et al., 2015 [32]	Open-label RCT	75 vs. 75	75 vs. 75	<i>Lactobacillus casei</i> Shirota, 1/day 8×10^9 CFU in the mouth and stomach	VAP
Shinotsuka et al., 2008 [30]	Open-label RCT	16 vs. 12	12 vs. 16	<i>Lactobacillus johnsonii</i> La1, 2/day 1×10^9 CFU in the stomach	Colonization of gastrointestinal tract and trachea
Zeng et al., 2016 [31]	Open-label RCT	125 vs. 125	118 vs. 117	<i>Bacillus subtilis</i> and <i>Enterococcus faecalis</i> , 3/day 9×10^9 in the stomach	VAP

Table 2 Incidence of VAP (percentage of total patients and number of VAP episodes/1000 ventilator days)

Author, year	Incidence VAP			Incidence VAP		
	Intervention group (percentage of patients [n = patients])	Control group (percentage of patients [n = patients])	Relative risk (95% CI)	Intervention group (VAP episodes/ 1000 ventilator days)	Control group (VAP episodes/ 1000 ventilator days)	Relative risk
Morrow et al., 2010 [29]	19.1% (n = 68)	40.0% (n = 70)	0.5 (0.3 to 0.8)			
Rongrungruang et al., 2015 [32]	24.0% (n = 75)	29.3% (n = 75)	0.8 (0.3 to 0.6)	22.6	30.2	0.8
Klarin et al., 2008 [28]	4.3% (n = 23)	14.3% (n = 21)	0.3 (0.0 to 2.7)			
Knight et al., 2009 [33]	9.0% (n = 130)	13.0% (n = 129)	0.7 (0.4 to 1.4)	13.0	14.6	0.9
Forestier et al., 2008 [27]	23.5% (n = 102)	22.6% (n = 106)	1.0 (0.6 to 1.7)			
Barraud et al., 2010 [26]	26.4% (n = 87)	18.7% (n = 80)	1.4 (0.8 to 2.5)	23.0	14.6	1.6
Zeng et al., 2016 [31]	36.4% (n = 118)	50.4% (n = 117)	0.7 (0.5 to 1.0)			



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Conclusions

- Rien de nouveau « opérationnel »
- Abandon de certains composants des « bundle »
- Nombreux arguments pour un rôle du et « des » microbiotes
- En attendant la « manipulation » des microbiotes.....