VAP ?

To Bundle or not to bundle…

Implémentation d'un bundle de soins "prévention de la pneumonie acquise sous ventilation"

P. REPER, MD, intensivist

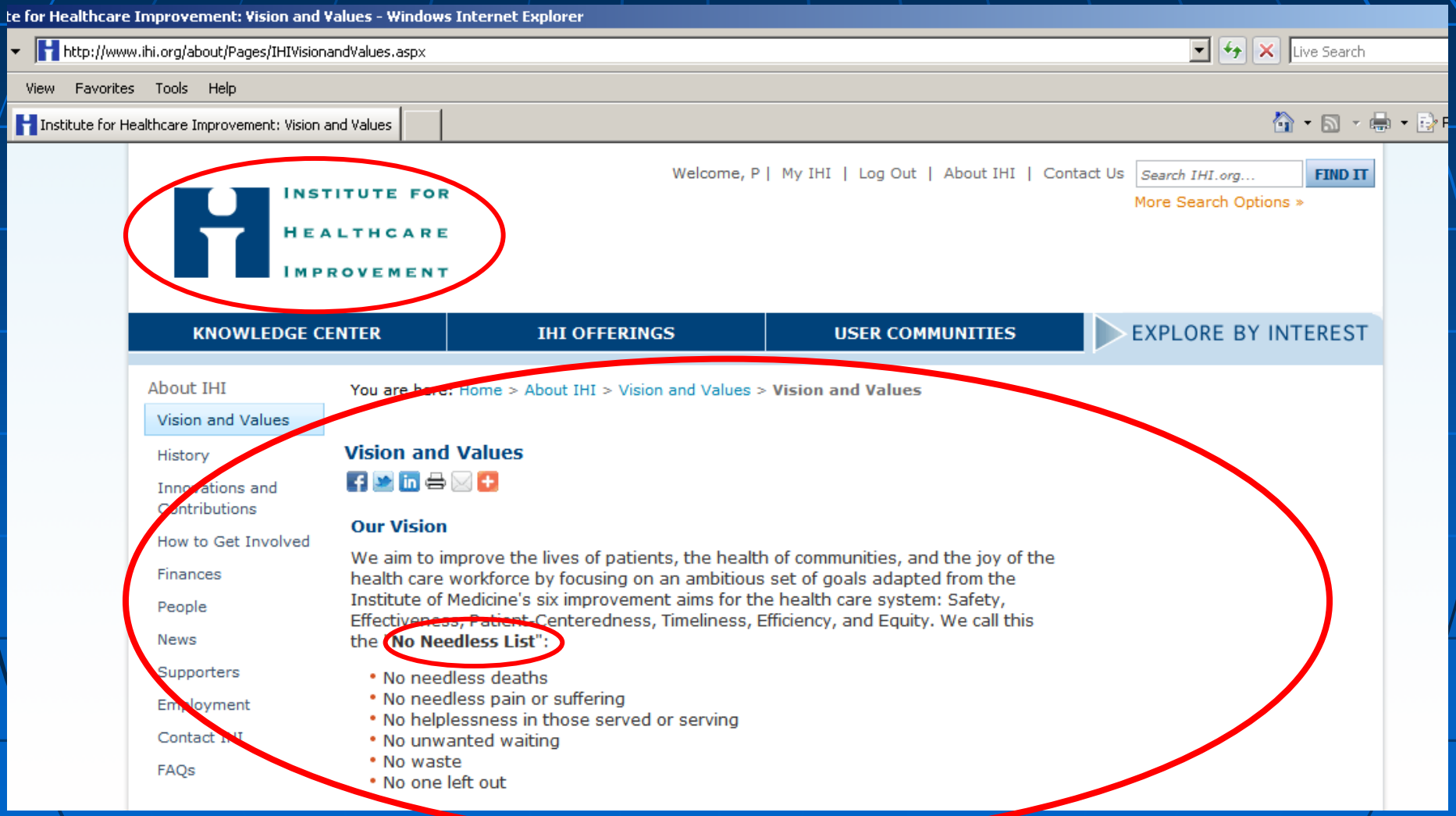
CHUB 12-2012

- VAP ?
- VAP Bundle ?
  - International
  - Be :
    - SPF
    - USI

- **Introduction**
  - Mortality related to VAP 30-50%
    - → Attributable mortality 2-25%
  - Associated with
    - → Longer duration of ventilation
    - → Increased LOS
  - Important indication for antibiotics
    - → Effect on ecology

- **Introduction**

  - Society pressure
    - → Patient safety concern
    - → VAP as a preventable nosocomial complication
    - → Public reporting VAP incidence ! …
  - Increased awareness among health care workers
    - → Decrease of VAP incidence desirable
    - → Complete eradication possible?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Vision and Values
Our Vision
We aim to improve the lives of patients, the health of communities, and the joy of the health care workforce by focusing on an ambitious set of goals adapted from the Institute of Medicine's six improvement aims for the health care system: Safety, Effectiveness, Patient-Centeredness, Timeliness, Efficiency, and Equity. We call this the "No Needless List":
• No needless deaths
• No needless pain or suffering
• No helplessness in those served or serving
• No unwanted waiting
• No waste
• No one left out

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WORKSPACE

This page shows the improvement work of a specific project — the aim, goal, and a run chart tracking improvement over time.

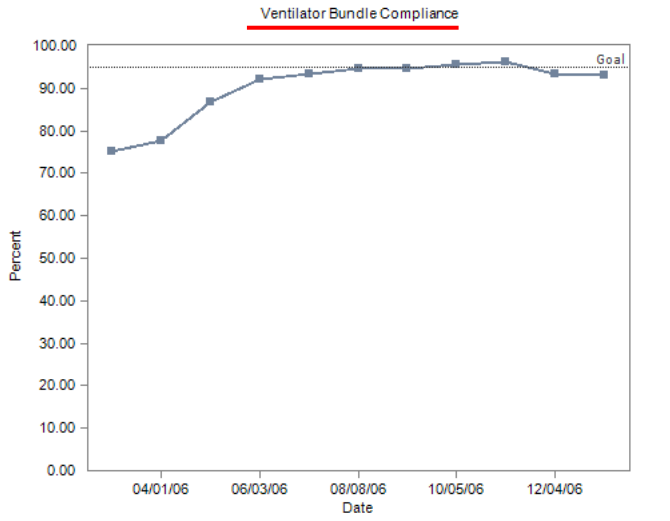
Critical Care:Intensive Care

See detailed information about this measure

Compliance with the Ventilator Bundle

St. Joseph's Hospital
Elmira, New York, United State
Hospital-Community

Aim: Implement Ventilator Bundles with Compliance Rate of >95%



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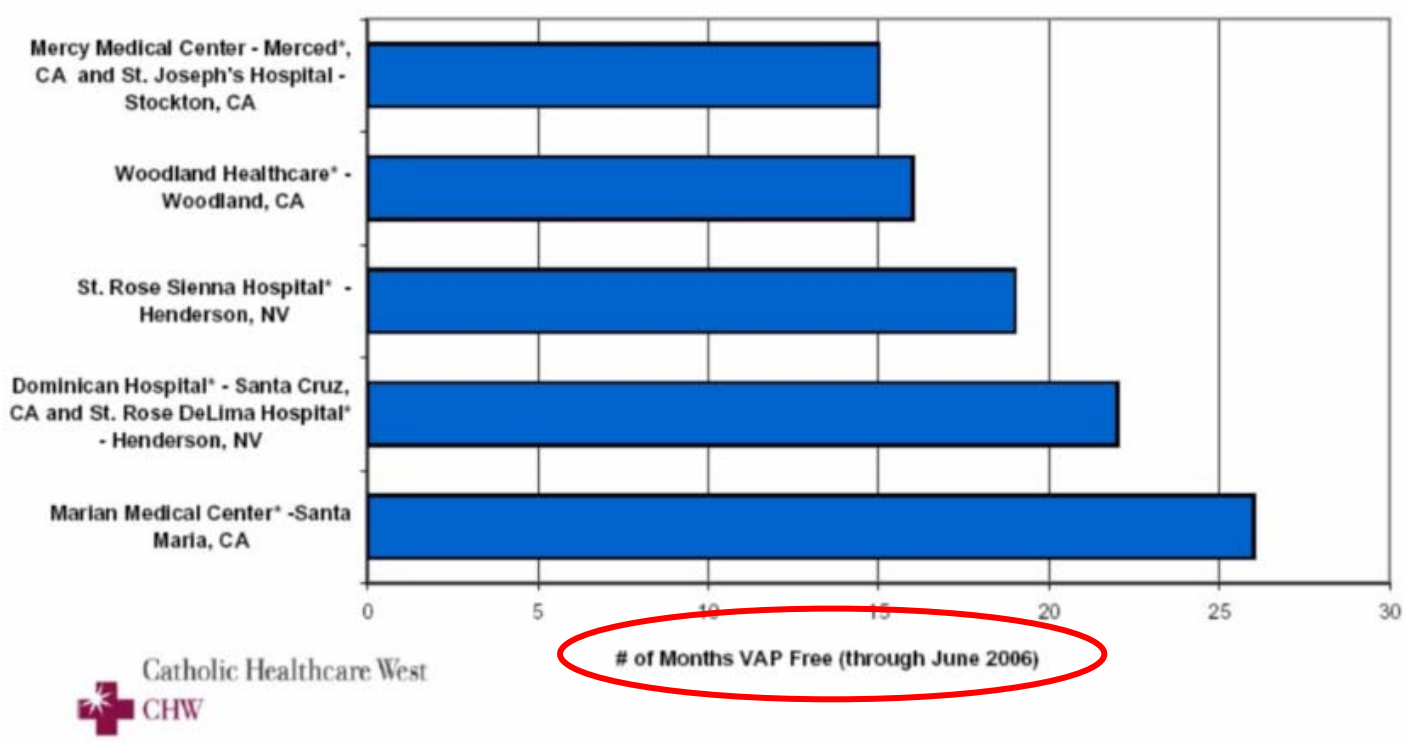
- **Overview**
  - VAP as a preventable complication?
  - VAP definition as a problem
  - Strategies to prevent VAP
  - Treating VAT to prevent VAP?
  - Care bundles to prevent VAP
  - Conclusion

- **Can we prevent VAP?**



Definition: VAP

- Pneumonia (PNEU) that occurs in a patient who was intubated and ventilated at the time of or *within* 48 hours before the onset of the pneumonia.
- If the PNEU develops in a patient within 48 hours of discharge from a location, indicate the discharging location on the infection report, not the current location of the patient

VAP Definition

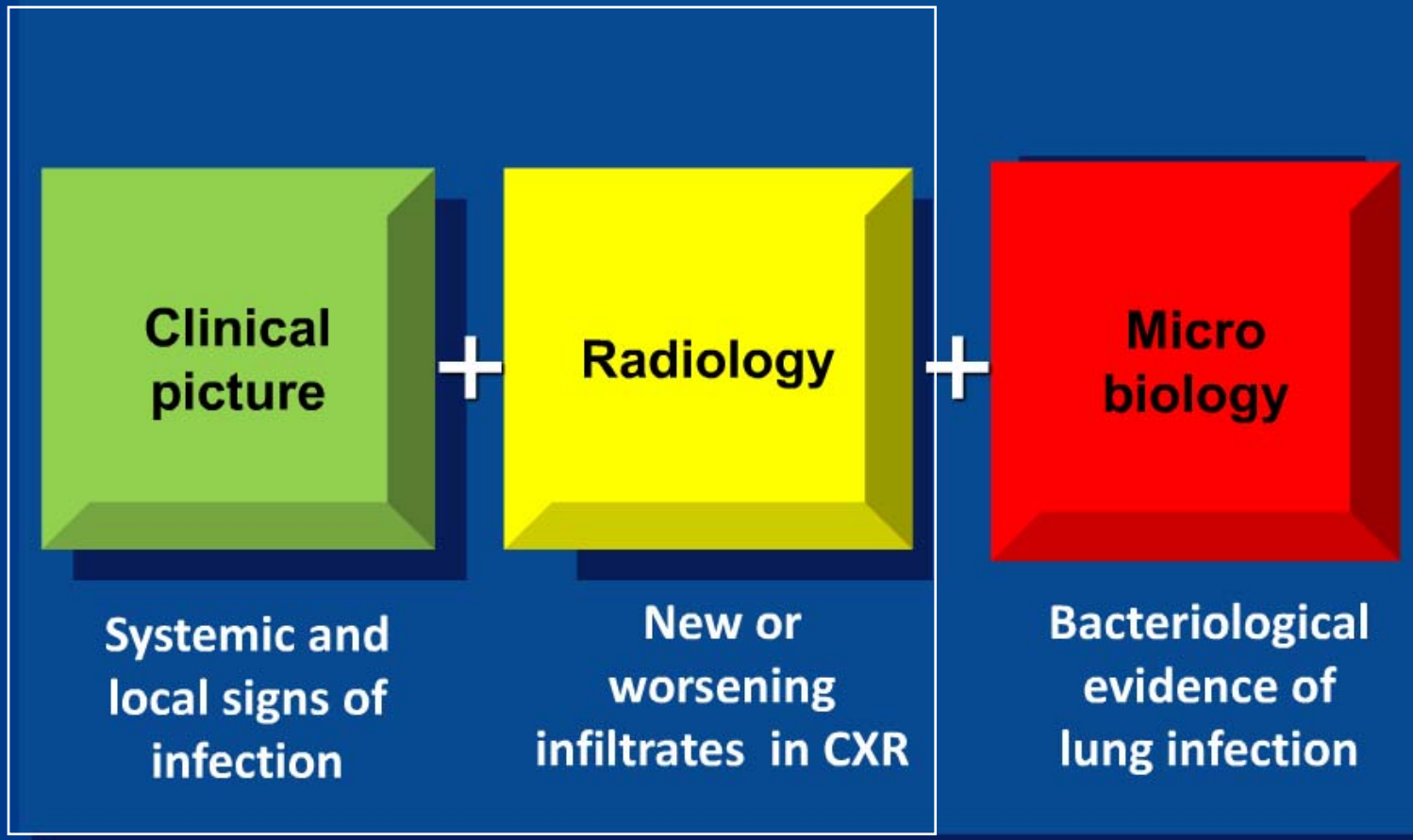
The VAP is defined by means of clinical and radiological criteria using the Clinical Pulmonary Infection Score (CPIS) :

1. **A new and persistent infiltration in the chest X-ray in patients mechanically ventilated for more than 48 h.**
2. **Body temperature above 38.5 or below 36°C.**
3. **White cell count above 12,000/µl or below 4000/µl.**
4. **Purulent tracheobronchial secretion (TBS).**
5. **Impairment of pulmonary function as defined by the *Pa*O2/*Fi*O2 ratio.**
6. **The absence of alternative sources of infection such as urinary tract infection or peritonitis.**

A score of 6 or more points using the CPIS criteria is needed to define pneumonia

Pugin et all. ARRD, 1991

Diagnosis of VAP



Incidence of VAP (cohorts) is variable

Safdar et al - Crit Care Med 2005; 33:2184 -2193

Table 1. Incidence of ventilator-associated pneumonia (VAP) in patients requiring mechanical ventilation in prospective cohort studies and nonrandomized trials

First Author, Year	Minimum Duration of Mechanical Ventilation as Inclusion Criteria	No. of Patients Requiring Mechanical Ventilation	No. with VAP (%)	Diagnosis of VAP[a]	Patient Population
Moine, 2002 (29)	≥96 hrs	764	89 (12)	Clinical and PSB/BAL	Medical-surgical ICU
Timsit, 1996 (30)	>48 hrs	387	56 (14)	Clinical and PSB/BAL	Medical-surgical ICU
Kollef, 1997 (107)	>48 hrs	680	63 (9)	Clinical and mini-BAL	Cardiac surgery ICU
Stoller, 2003 (106)	Any	146	2 (1)	Clinical	Medical ICU, NR
Kollef, 1997 (111)	>12 hrs	521	77 (15)	Clinical	Medical-surgical ICU
Kollef, 1995 (31)	>120 hrs	314	87 (28)	Clinical	Medical-surgical, trauma, neurologic ICU
Bonten, 1996 (32)	Any	141	31 (22)	Clinical and PSB/BAL	Me
Rello, 1996 (33)	Any	83	21 (25)	BAL	Me
Elatrous, 1996 (34)	Any	73	28 (38)	Clinical an	Me
Alvarez-Lerma, 1996 (35)	Any	16,872	530 (3)	Cl	
Kappstein, 1992 (36)	>24 hrs	270	78 (29)	Clinical	Ma
Warren, 2003 (7)	>24 hrs	819	127 (16)	Clinical	Me
Bouza, 2003 (37)	Any	356	28 (8)	Clinical	Car
Kanafani, 2003 (38)	≥48 hrs	70	33 (47)	Clinical	Medical-surgical ICU and respiratory care unit
Eggimann, 2003 (39)	>48 hrs	452	127 (28)	Clinical and BAL	Me
Rello, 1991 (40)	>48 hrs	264	58 (22)	Clinical and bronchoscopy	Me
Cook, 1998 (41)	≥48 hrs	1,014	177 (17)	Clinical and PSB/BAL	Me
Papazian, 1996 (42)	>48 hrs	586	97 (17)	Clinical and PSB/BAL	Me
Memish, 2000 (43)	Any	202	41 (20)	Clinical	Me
Ibrahim, 2001 (44)	Any	880	132 (15)	Clinical	Me
Rello, 2002 (45)	>24 hrs	9,080	842 (9)	ICD-codes	Me
Apostolopoulou, 2003 (46)	≥24 hrs	175	56 (32)	Clinical	Me
Souftanou, 2000 (47)	>48 hrs	198	67 (34)	Clinical	Me
Simsek, 2001 (48)	Any	1,716	36 (2)	Clinical	Ca
Beck-Sague, 1996 (49)	Any	145	15 (10)	Clinical	Su
Akca, 2000 (50)	>48 hrs	260	81 (31)	Clinical	Me
Bochicchio, 2004 (51)	Any	714	125 (18)	Clinical	Trauma ICU
Hess, 1995 (52)	>24 hrs	3,423	174 (5)	Clinical ± PSB	Medical-surgical ICU
Ibrahim, 2000 (53)	Any	1,855	397 (21)	Clinical	Medical-surgical ICU
Kollef, 1993 (54)	>24 hrs	277	43 (16)	Clinical	Me
Fagon, 1996 (55)	≥48 hrs	1,118	313 (28)	PSB/BAL	Me
Rodriguez, 1991 (56)	Any	294	130 (44)	Cli	
Fink, 1998 (57)	Any	637	52 (8)	Clinical	
Heyland, 1999 (8)	>48 hrs	1,014	177 (17)	Clinical and PSB/BAL	Me
Baker, 1996 (108)	Any	514	30 (6)	Clinical and PSB/BAL	Tr
Bercault, 2001 (9)	≥48 hrs	1,144	141 (12)	Clinical and PSB	Medical-surgical ICU
Daumal, 1999 (110)	≥48 hrs	361	55 (15)	Clinical and PSB	Medical-surgical ICU
Ibrahim, 2002 (109)	≥24 hrs	150	60 (40)	Clinical ± BAL	Medical-surgical ICU

3%

44%

38 prospective studies
48,112 patients
Pooled cumulative incidence
9.7% (95% CI, 7.0 -12.5).

Incidence of VAP (RCTs) is variable

Safdar et al - Crit Care Med 2005; 33:2184 -2193

Table 2. Incidence of ventilator-associated pneumonia (VAP) in patients requiring mechanical ventilation in control groups of randomized trials

First Author, Year	Duration of Mechanical Ventilation at Inclusion Criteria	No. of Patients Requiring Mechanical Ventilation	No. With VAP (%)	Diagnosis of VAP*	Patient Population
Preventive strategy: selective digestive decontamination					
Wiener, 1995 (58)	≥48 hrs	31	8 (26)	Clinical	Medical-surgical ICU
Winkler, 1992 (59)	≥48 hrs	92	19 (29)	Clinical and BAL	Medical-surgical ICU
Ferrer, 1994 (60)	>72 hrs	63	10 (24)	Clinical and PSB/BAL	Respiratory ICU
Pugin, 1991 (61)	>48 hrs	27	21 (78)	Clinical	Surgical ICU
Gastinne, 1992 (62)	≥24 hrs	225	33 (15)	Clinical	Medical-surgical ICU
Cockerill, 1992 (63)	>72 hrs	75	14 (19)	Clinical	Medical-surgical trauma ICU
Sanchez Garcia, 1998 (64)	>48 hrs	140	66 (79)	Clinical	Medical-surgical, trauma ICU
Bergmans, 2001 (65)	>48 hrs	139	38 (27)	Clinical and BAL or PSB	Medical-surgical, trauma, neurologic ICU
Verwaest, 1997 (66)	≥48 hrs	195	40 (22)	Clinical and bronchoscopy	Medical-surgical ICU
Lingsma, 1997 (67)	≥48 hrs	168	61 (41)	NR	Trauma ICU
Rocha, 1992 (68)	>72 hrs	54	25 (46)	Clinical	Medical-surgical ICU
Kvietys, 1983 (69)	>120 hrs	60	25 (42)	Clinical and BAL/PSB	Neurosurgical ICU
Quinio, 1996 (70)	Any	72	37 (51)	Clinical	Trauma ICU
Aerts, 1991 (71)	≥5 days	39	10 (26)	Clinical	Medical-surgical ICU
Abele-Horn, 1997 (72)	>96 hrs	39	23 (77)	Clinical	Medical-surgical ICU
Continuous subglottic suction					
Smulders, 2002 (73)	Any	73	12 (16)	Clinical	General ICU
Yalim, 1995 (75)	Any	95	25 (26)	Clinical and PSB/BAL	Medical-surgical ICU
Mahul, 1992 (74)	>72 hrs	73	21 (28)	Clinical and BAL	Medical-surgical ICU
Kollef, 1999 (76)	Any	193	16 (9)	Clinical	Cardiac surgery
Treatment of sinusitis					
Holzapfel, 1999 (77)	>7 days	200	51 (26)	PSB	Medical-surgical ICU
Ventilator circuit changes					
Kollef, 1995 (78)	>120 hrs	153	44 (29)	Clinical	Medical-surgical ICU
Long, 1986 (79)	Any	234	26 (11)	Clinical	Medical and neurosurgical ICU
Dreyfuss, 1991 (80)	>48 hrs	58	8 (21)	Clinical and PSB/BAL	Medical-surgical ICU
Semirecumbent position					
Drakulovic, 1999 (81)	Any	67	16 (34)	Clinical and PSB/BAL	Medical ICU
Heat moisture exchanger vs. heated humidification					
Dreyfuss, 1995 (82)	>48 hrs	70	8 (11)	Clinical and PSB/BAL	Medical-surgical ICU
Kirton, 1997 (83)	Any	140	46 (33)	Clinical	Trauma ICU
Hurst, 1987 (84)†	≥48 hrs	50	7 (13)	Clinical	Medical ICU
Rouston, 1982 (85)	Any	63	9 (15)	Clinical	Medical-surgical ICU
Boots, 1997 (112)	≥48 hrs	41	7 (17)	Clinical	Medical-surgical ICU
Kollef, 1999 (86)	Any	147	15 (10)	Clinical	Medical-surgical ICU
Memish, 2001 (105)	≥48 hrs	120	19 (16)	Clinical	Medical-surgical ICU
Ileus ulcer prophylaxis					
Apte, 1982 (87)	Any	18	9 (50)	Clinical	Medical ICU
Mets, 1983 (88)	Any	79	15 (19)	Clinical	Trauma ICU
Hamoch, 1999 (113)	≥48 hrs	57	12 (21)	Clinical	Surgical ICU
Ben-Menachem, 1994 (89)	≥24 hrs	199	6 (6)	Clinical	Medical ICU
Eddleston, 1994 (90)	≥4 days	32	0 (0)	Clinical	Medical-surgical ICU
Pickworth, 1993 (91)	Any	39	6 (15)	Clinical	Trauma ICU
Eddleston, 1995 (92)	Any	30	3 (10)	Clinical	Medical-surgical ICU
Thomason, 1996 (93)	≥24 hrs	92	26 (17)	Clinical	Medical-surgical/trauma ICU
Prod'hom, 1994 (94)	≥24 hrs	93	18 (22)	Clinical	Medical-surgical ICU
O'Keefe, 1998 (95)	Any	47	10 (21)	Clinical	Trauma ICU
Cook, 1998 (96)	≥48 hrs	604	98 (16)	Clinical and PSB/BAL	Medical-surgical ICU
Mustafa, 1995 (97)	Any	13	3 (29)	None	Medical-surgical ICU
Bonten, 1995 (98)	Any	74	16 (22)	Clinical and PSB/BAL	Medical-surgical ICU
Daily changes in suction catheters					
Kollef, 1997 (114)	>12 hrs	263	39 (15)	Clinical	Medical-surgical ICU
Dumas, 2001 (99)	>48 hrs	53	10 (19)	Clinical	Medical-surgical ICU
Closed vs. open suction					
Zeitoun, 2001 (100)	>48 hrs	23	7 (30)	Clinical	Medical-surgical ICU
Johnson, 1994 (101)	Any	16	8 (50)	Clinical	Trauma, general surgery ICU
Enteral feeding					
Bonten, 1996 (102)	Any	30	5 (17)	PSB/BAL	Medical-surgical ICU
Kearns, 2000 (103)	>24 hrs	23	3 (13)	Clinical	Medical ICU
Prophylactic antibiotics					
Sirvent, 2007 (104)	Any	50	25 (50)	PSB/BAL	Head trauma, coma

51 control group of randomized studies
4,802 patients
Pooled cumulative incidence
22.8% (95% CI, 18.8 -26.9%)

Incidence of VAP (histology) is variable

Klompas M- JAMA 2007; 297:1583

Table 2. Studies of the Accuracy of Clinical Findings in Ventilated Patients With Histologically Confirmed Pneumonia

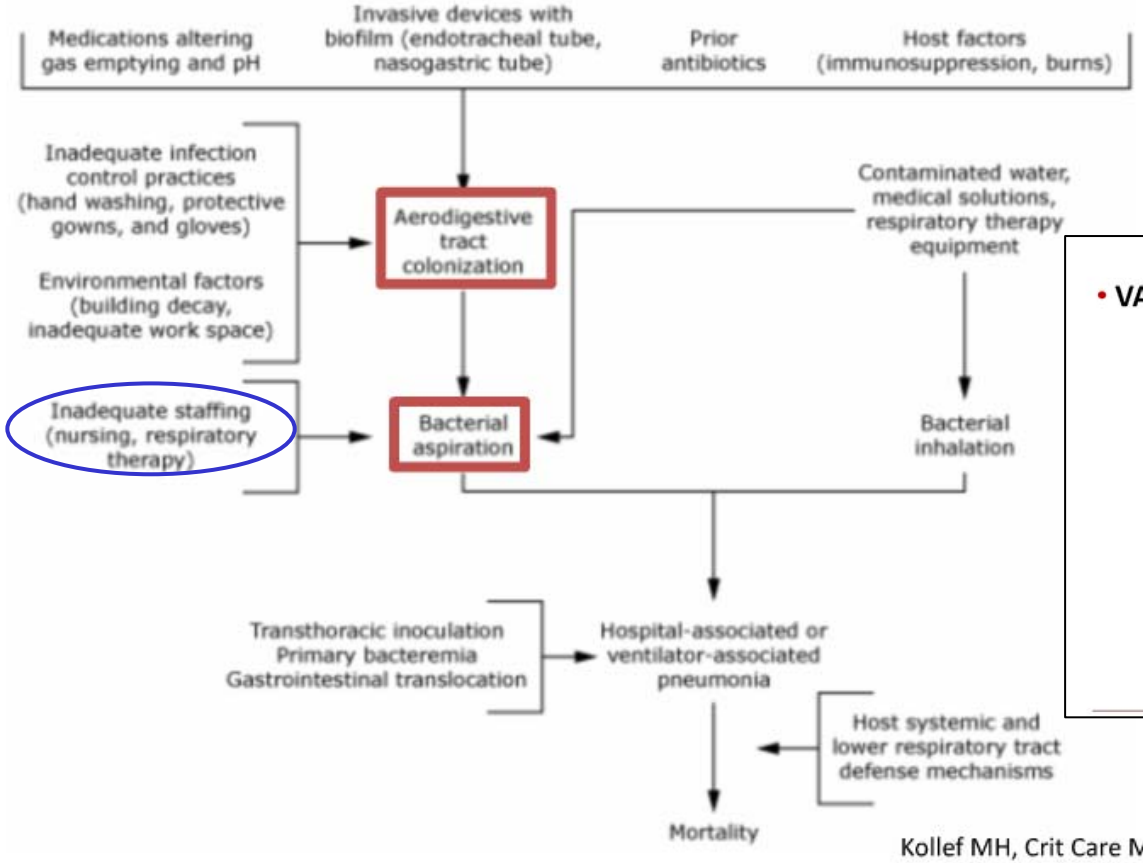
Source	Setting	Gold Standard(s)	Biopsy Size	No. of Patients	Proportion Receiving Antibiotics, %	Pneumonia, No. (%)	
						Histology	Histology and Culture
Independent*							
Chastre et al,[38] 1984	Paris, France	Histology alone	1 × 1 × 1 cm	26	54	6 (23)	
Rouby et al,[39] 1992	Paris, France	Histology and culture	Whole lung	83	82	43 (52)	38 (46)
Wunderink et al,[40] 1992	Toledo, Ohio	Histology alone	Both lungs	69	NR	24 (35)	
Torres et al,[41] 1994	Barcelona, Spain	Histology alone	NR	30	100	18 (60)	8 (27)
Papazian et al,[42] 1995	Marseille, France	Histology and culture	1-2 g	38	66	18 (47)	12 (32)
Kirtland et al,[43] 1997	Seattle, Wash	Histology alone	2 × 3 × 1 cm	39	97	9 (23)	1 (3)
Papazian et al,[44] 1997	Marseille, France	Histology and culture	Whole lung	28	39	13 (46)	9 (32)
Fàbregas et al,[45] 1999	Barcelona, Spain	Histology and culture	2 × 2 × 2 cm	25	68	23 (92)	13 (52)
Petersen et al,[10] 1999†	Copenhagen, Denmark	Histology alone	1 cm³	141	79	77 (55)	
Nonindependent‡							
Rouby et al,[46] 1989§	Paris, France	Histology alone	3 cm³	59	NR	30 (51)	
Marquette et al,[47] 1995	Lille, France	Histology alone	Both lungs	28	46	19 (68)	
Fàbregas et al,[32] 1996‖	Barcelona, Spain	Histology alone	2 × 2 × 2 cm	25	68	23 (92)	
Bregeon et al,[48] 2000	Marseille, France	Histology and culture	2 × 2 × 2 cm	27	48	14 (52)	9 (33)
Balthazar et al,[49] 2001	Campinas, Brazil	Histology and culture	7 × 4 × 4 cm	37	100	NR	20 (54)

Abbreviation: NR, not reported.
*Patients selected for study inclusion independently of their clinical findings (all level 3).
†Study includes 2 analyses: analysis 1 was of accuracy of clinical diagnosis of pneumonia and included all autopsied patients and hence was independent; analysis 2 was of the accuracy of individual clinical findings to diagnose pneumonia and included only patients with clinical diagnosis of pneumonia (n = 37) and hence was not independent.
‡Patients selected for study inclusion on the basis of their clinical findings (all level 4).
§Case-control study in which cases were established at autopsy but control patients were selected clinically on the basis of normal daily chest radiograph findings and Pao_2 >80 with Fio_2 = 0.30%.
‖Insufficient data for definitive determination.

Summary prevalence, 47%; 95% CI, 35%-59%)

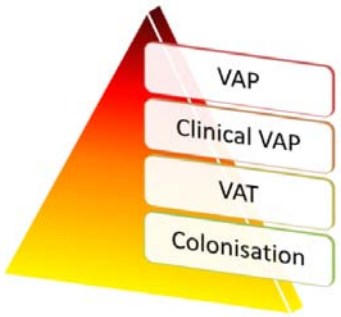
- **VAP as a preventable disease**
  - Current definition of VAP makes comparison difficult e.g. bilateral infiltrates
    - → High sensitivity
    - → Low specificity
  - Differences in microbiological diagnosis
    - → Tools used for diagnosis affect VAP rate
  - Until objective marker of VAP available
    - → Comparison of VAP rates inappropriate

• Pathogenesis of VAP



Kollef MH, Crit Care Med 2004 32: 1396-405.

• **VAP definition**



Lisboa T, Crit Care Med 2009 37: 2657-9.

• Risk factors for VAP

• Intubation • Invasive mechanical ventilation • Sedation and curarization
• Coma • Trauma • Surgery
• Advanced age • Preexisting lung disease • Immune suppression • Malnutrition

Torres A, Intensive Care Med 2009 35: 9-29.
Torpy JM, JAMA 2007 297: 1616.

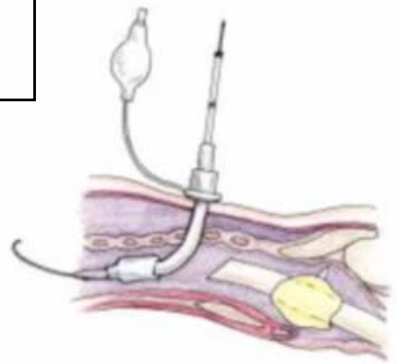
- **VAP prevention**
  - Some risk factors cannot be modified
  - Pathophysiology of VAP important basis for preventive strategies
    - → **Aspiration of micro-organisms**
    - → Impaired host defenses
    - → **Endotracheal tube**
    - → Not the ventilator as such
  - Room for improvement, but zero VAP rates?

- **General measures to prevent VAP**

  - Hand hygiene – alcohol desinfection
  - Microbiological surveillance
  - Decrease AB consumption
  - VAP education
  - Adequate staffing levels

- **Specific measures to prevent VAP**

  - Avoidance of invasive ventilation – NIV
  - Orotracheal intubation over nasotracheal intubation
  - Reduce duration of ventilation
  - Early tracheostomy
  - Patient positioning

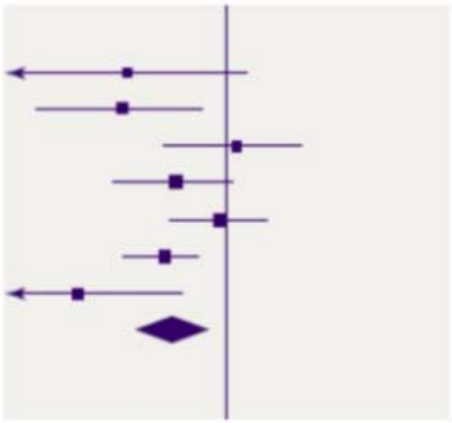


- **VAP prevention: oral antiseptics**
  - Decrease in bacterial contamination of oral secretion
  - Data mostly on chlorhexidine
    → Variable effect on VAP in individual studies

- **VAP prevention: oral antiseptics**

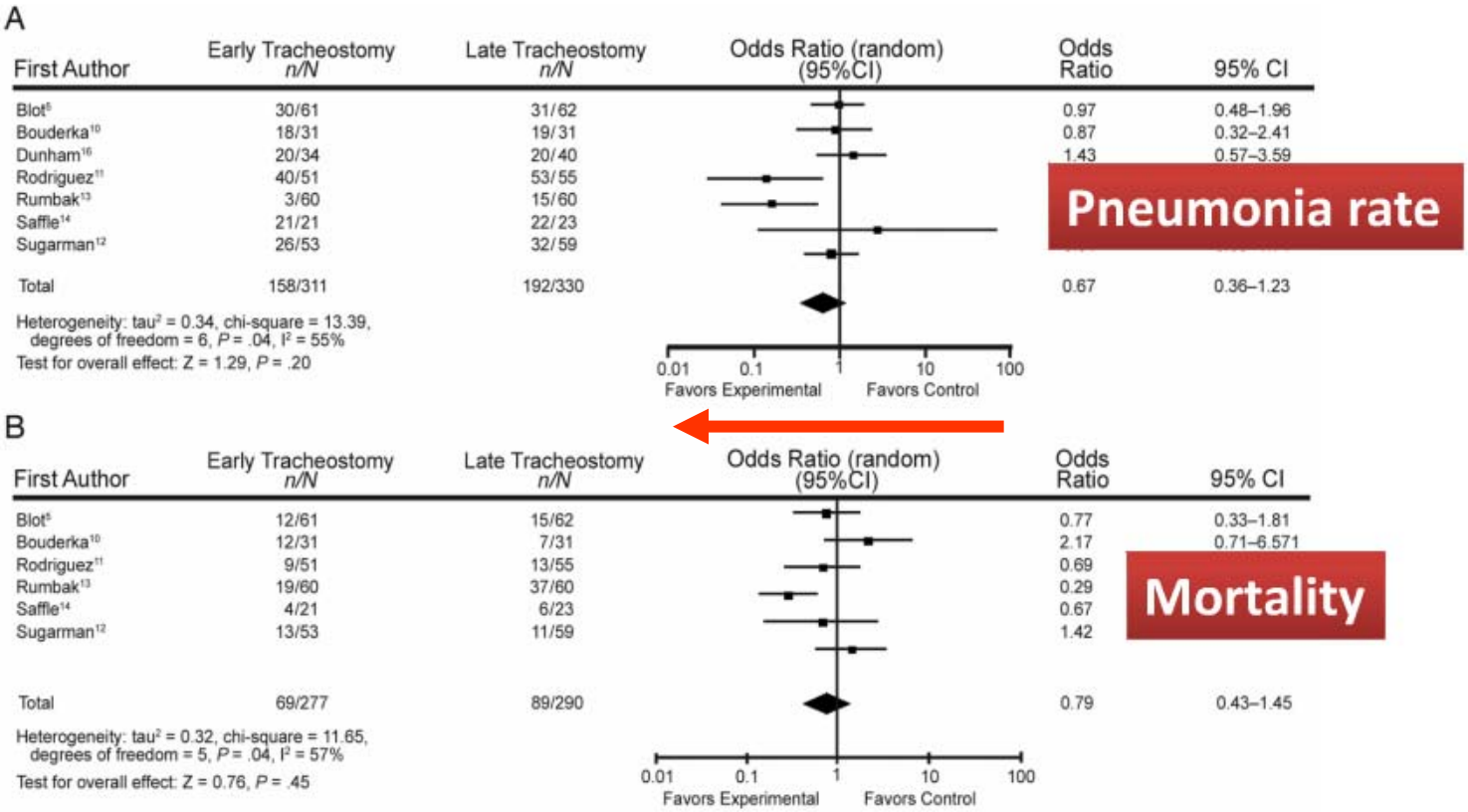
  - Oral antiseptics: meta analysis

Antiseptics					
De Riso 1996[w4]	3/173	9/180		4.11	0.35 (0.10 to 1.26)
Fourrier 2000[w5]	5/30	15/30		7.18	0.33 (0.14 to 0.80)
Fourrier 2005[w6]	13/114	12/114		8.79	1.08 (0.52 to 2.27)
Koeman 2006[w7]	13/127	23/130		10.33	0.58 (0.31 to 1.09)
MacNaughton 2004[w11]	21/101	21/93		12.01	0.92 (0.54 to 1.57)
Segers 2005[w9]	35/485	67/469		14.81	0.51 (0.34 to 0.75)
Seguin 2006[w8]	3/36	25/62		5.07	0.21 (0.07 to 0.64)
Subtotal (95% CI)	1066	1078		62.29	0.56 (0.39 to 0.81)
Test for heterogeneity: χ^2=11.59, df=6, P=0.07, I^2=48.2%					
Test for overall effect: z=3.08, P=0.002					



Chan EY, BMJ 2007 334: 889.

- **VAP prevention: early tracheostomy**



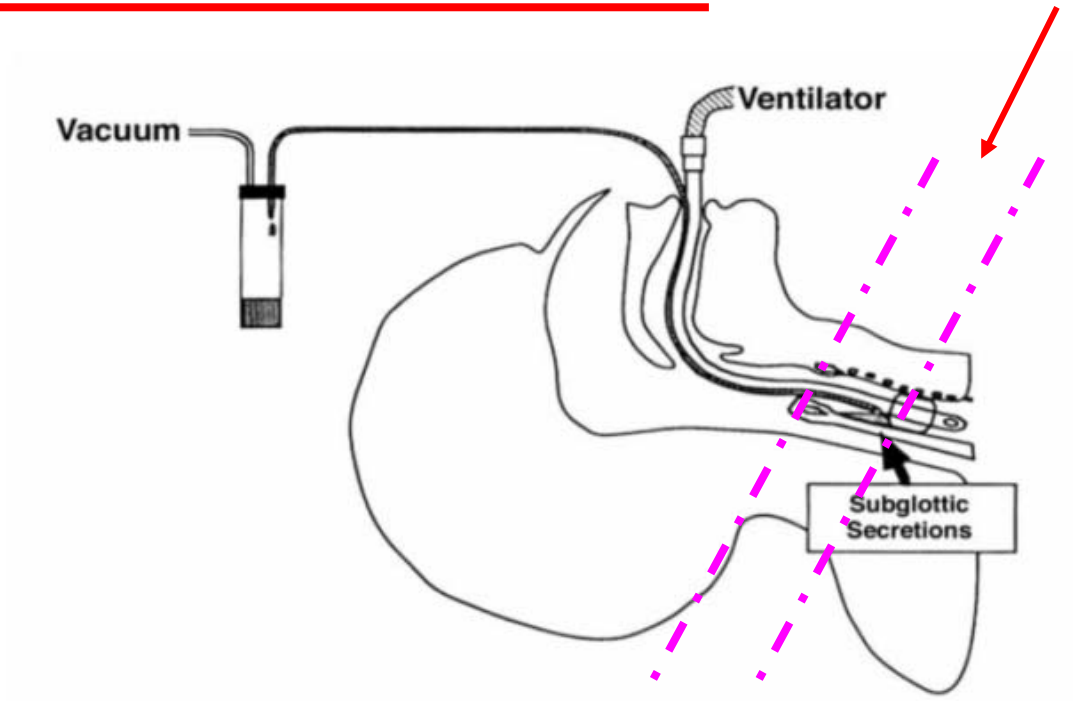
Durbin CG, Jr., Respir Care 2010 55: 76-87.

- **VAP prevention: positioning**

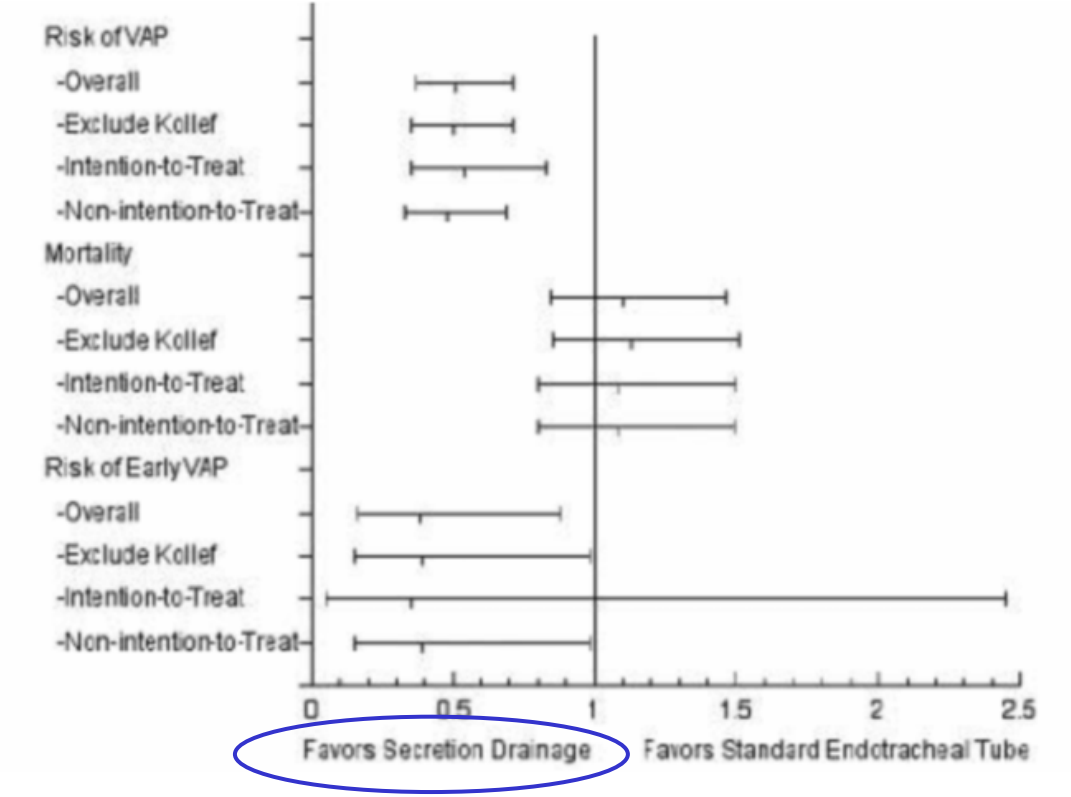
  - Elevation of the head of bed
    - → Decreases reflux and aspiration
    - → Supine position: OR 2.9
    - → Few studies – no recent data
    - → Challenge in daily care

VAP prevention: endotracheal tube

- Subglottic secretion drainage (SSD)



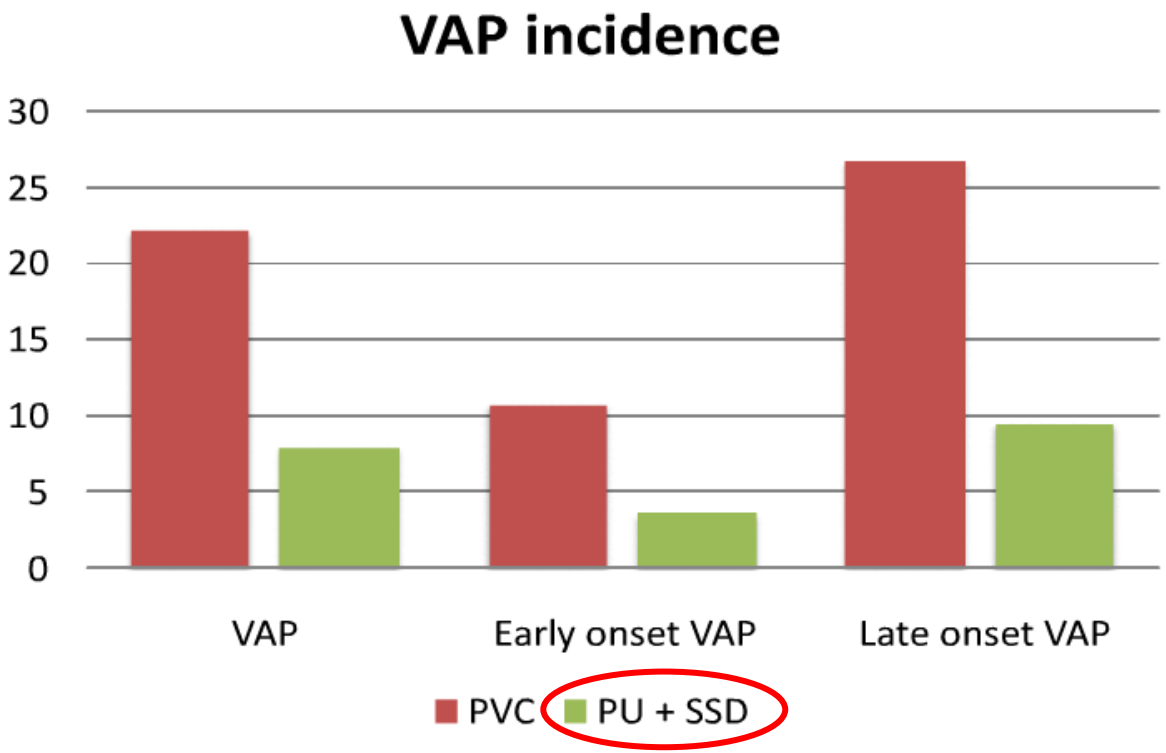
- **VAP prevention: endotracheal tube**



Dezfulian C, Am J Med 2005 118: 11-8.

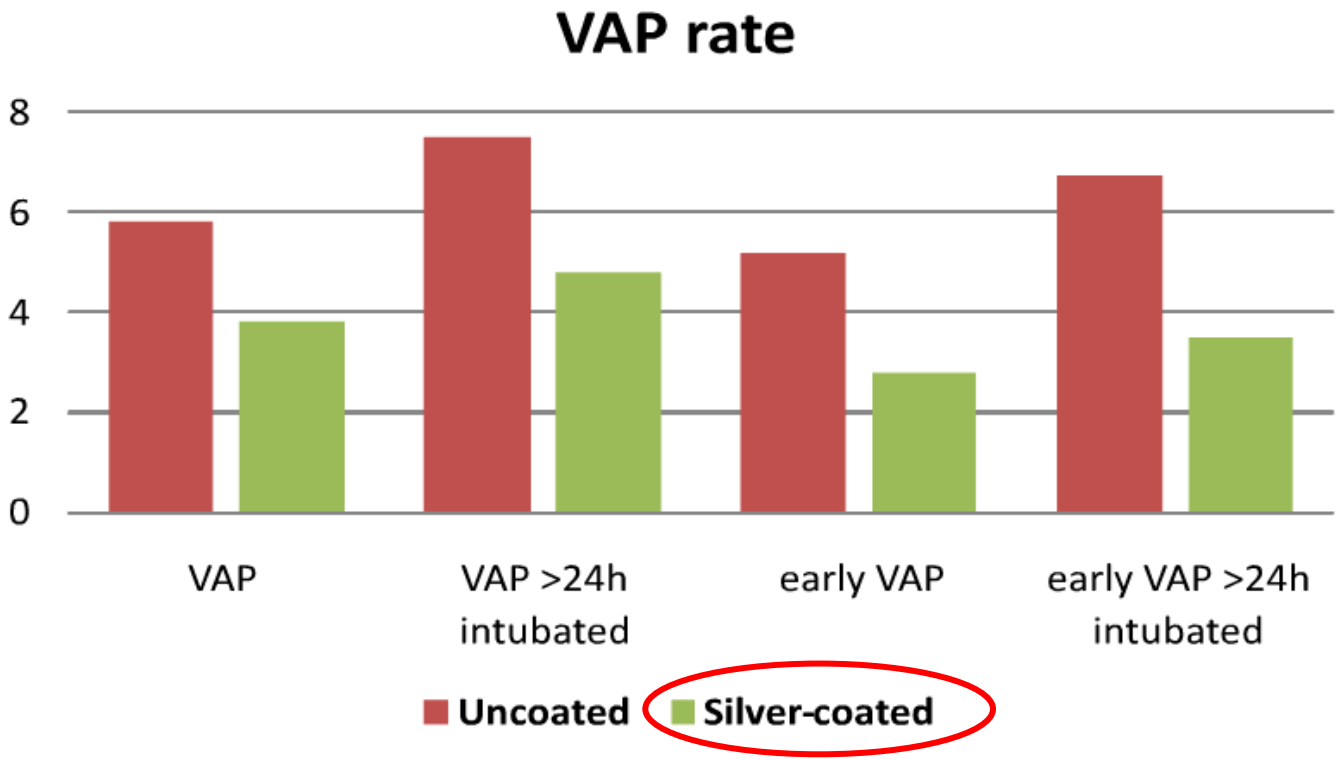
- **VAP prevention: endotracheal tube**
  - Ultrathin PU cuffs
    - → Avoidance of folds in the cuffs that allow aspiration
    - → Early data suggest reduced incidence of early VAP in selected populations
    - → Potential effect of altered shape

- **VAP prevention: endotracheal tube**



Lorente L, Am J Respir Crit Care Med 2007 176: 1079-83.

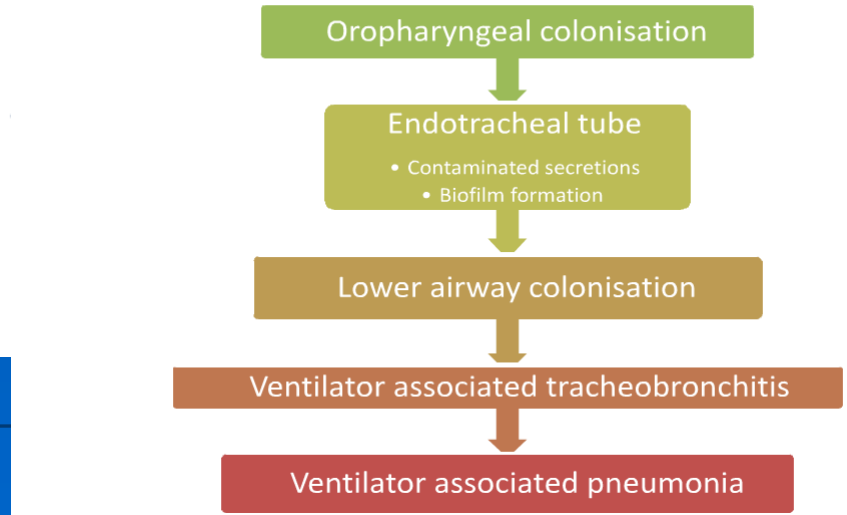
- **VAP prevention: endotracheal tube**



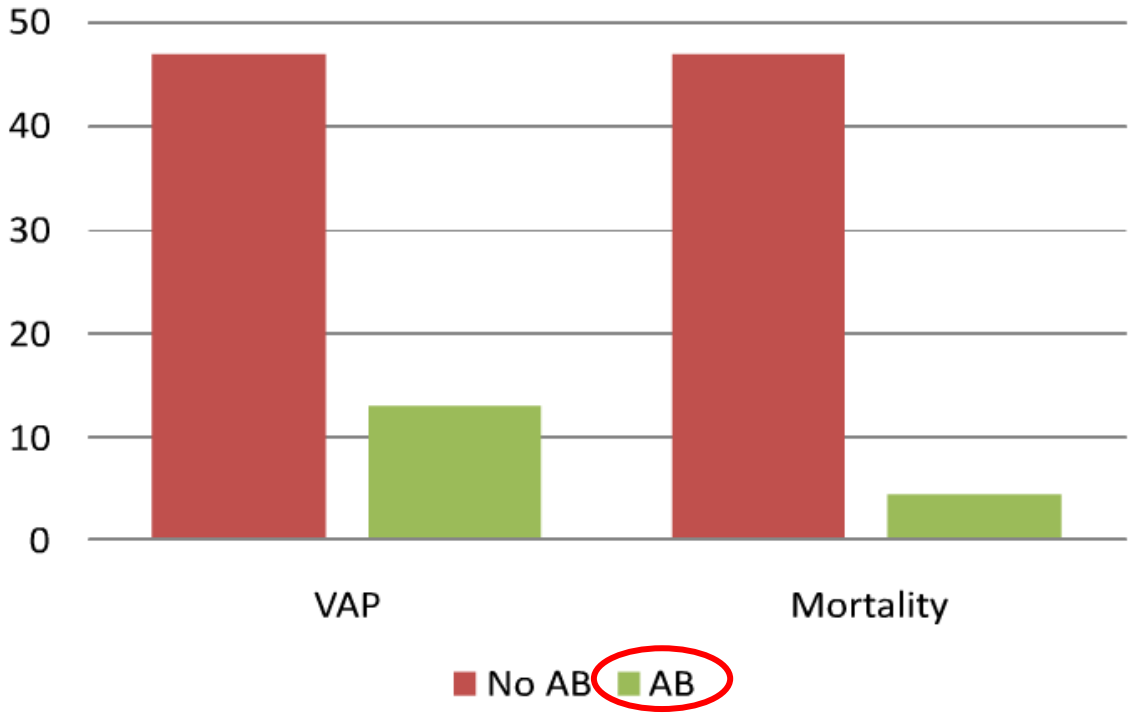
Kollef MH. JAMA 2008 300: 805-13.

- **VAT and VAP**

  - Ventilator associated tracheobronchitis
    - → Positive ETA
    - → X-ray no infiltrate
  - VAT as a prelude to VAP



- **Treatment of VAT to prevent VAP**



Nseir S, Crit Care 2008 12: R62.

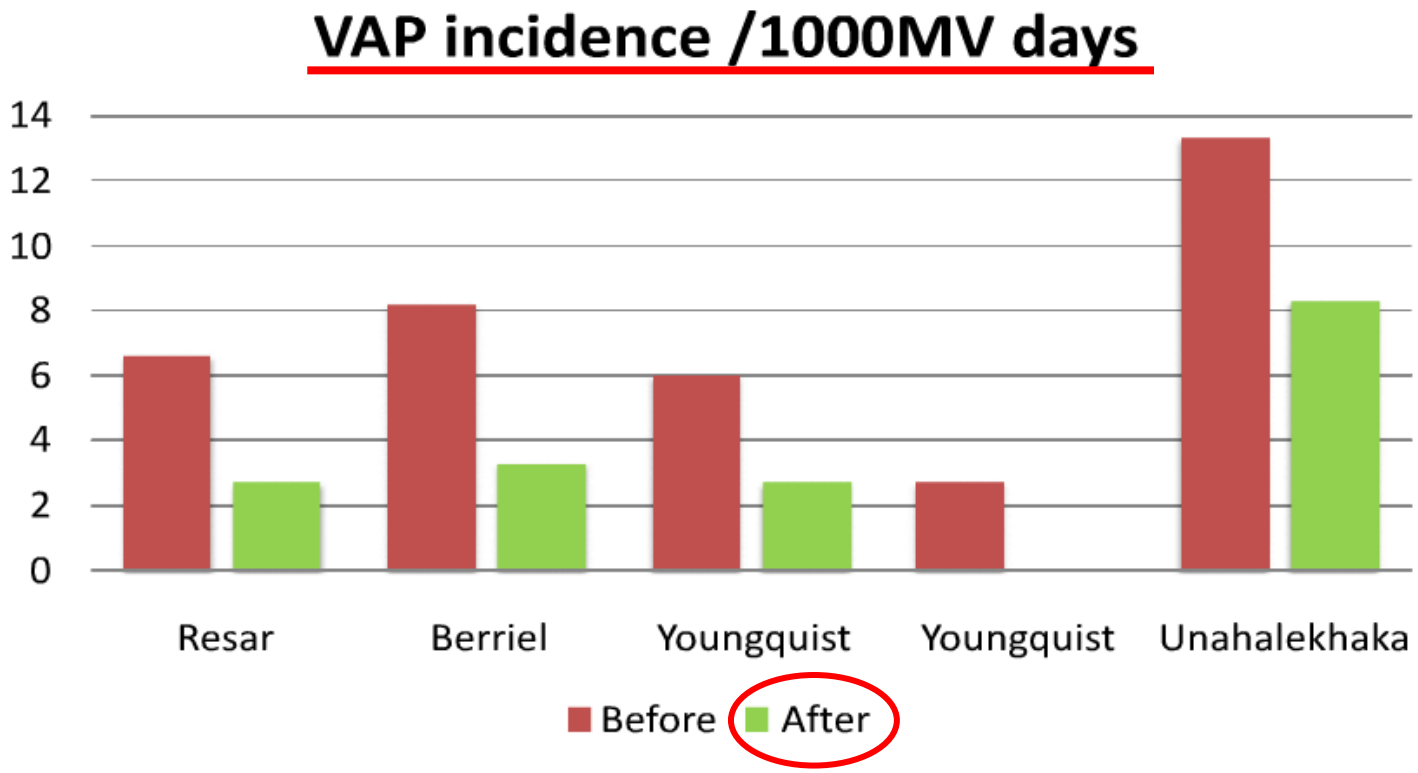
- **Bundles to reduce VAP** !

  - "a small, straightforward set of practices— generally three to five—that, when performed collectively and reliably, have been proven to improve patient outcomes"

100K lives campaign (IHI – US)

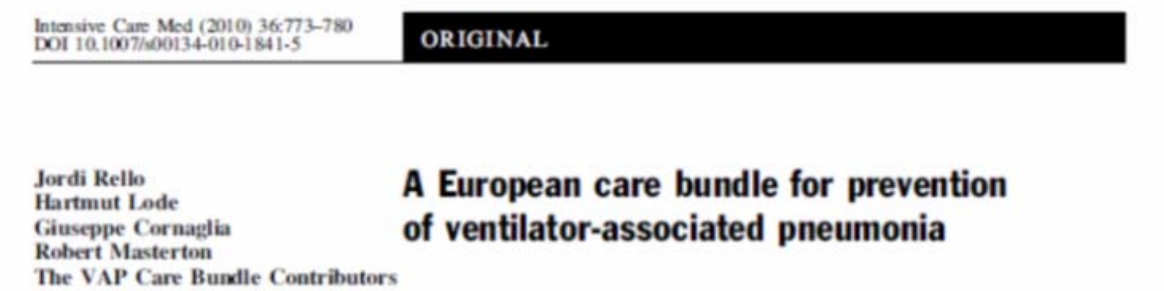
- The components of the **IHI Ventilator Bundle**
  - → Elevation of the **head of the bed**
  - → Daily "**sedation vacations**" and assessment of readiness to extubate
  - → **Peptic ulcer** disease **prophylaxis**
  - → **Deep venous thrombosis prophylaxis**
  - → Daily oral care with **chlorhexidine**

Bundles to reduce VAP



Zilberberg MD, Crit Care Med 2009 37: 305-9.

- **The European Care Bundle for VAP prevention**



Intensive Care Med (2010) 36:773–780
DOI 10.1007/s00134-010-1841-5

ORIGINAL

Jordi Rello
Hartmut Lode
Giuseppe Cornaglia
Robert Masterton
The VAP Care Bundle Contributors

A European care bundle for prevention of ventilator-associated pneumonia

- EBM approach
- 12 experts of different backgrounds
- Multicriteria decision analysis
  - → How effective is the intervention, how good is the evidence, how easy is the intervention, ...

Rello J, Intensive Care Med 2010 36: 773-80.

The European Care Bundle for VAP prevention

- The 5 elements in the European Care Bundle:
  1. Not implementing **ventilatory circuit changes** unless specifically indicated
  2. The use **of strict hand hygiene** using alcohol
  3. The use of appropriately **educated** and trained **staff**
  4. The incorporation of **sedation vacation and weaning protocols** into patient care
  5. Oral care with **chlorhexidine**

Rello J, Intensive Care Med 2010 36: 773-80.

Bundles to reduce VAP

- Reported effects of the IHI Ventilator Bundle !
  - → Not all studies are positive – selection bias
  - → Non blinded studies - poor measurement of VAP rates before bundle implementation
  - → Pressure to show improvement
- Remaining issues and concerns ?
  - → What components should be in a bundle?
  - → Implementation
  - → Adherance over time variable
  - → Monitoring and auditing

Conclusions

- We cannot completely eradicate VAP ?
- VAP prevention elements
  - → Avoidance of mechanical ventilation
  - → General infection control strategies
  - → Specific measures to reduce VAP
    - Aimed at orotracheal colonisation and the ETT
- Care bundles may facilitate all of the above

Prévention de la pneumonie liée à la ventilation

P. Damas, P Reper, L. Huyghens
Collège de médecine intensive
(SPF Santé Publique)

Mécanisme

Inhalation de micro-organismes provenant de la flore nasale, oropharyngée ou gastrique

- **liée à l'intubation ou aux circonstances de l'intubation**
- **liée à la présence d'un tube endotrachéal**

Incidence et conséquences

nviron 86% des pneumopathies nosocomiales
liées à la ventilation mécanique
usqu'à 45% des patients en réanimation
aux de mortalité élevé : de 20% à 33%

- **Augmentation de la durée de ventilation**
- **Prolongation du séjour en réanimation:**

  4-6 jours en moyenne
- **Augmentation des coûts**
- **Sélection de germes résistants**

Une littérature considérable
existe concernant le diagnostic de la VAP.
Le sujet reste toujours controversé.

IAIS

Il s'agit clairement du *diagnostic le plus fréquemment posé aux soins intensifs*
et qui conduit à la prescription d'une quantité importante d'antibiotiques.

Si l'on veut *réduire les pressions de sélection*
et l'émergence de germes multi résistants,

Démarche du SPF Santé publique
d'amélioration

de la qualité et

de la sécurité des patients

En 2010: groupe de travail

pour élaborer le projet VAP-Bundle:

prévention par l'implémentation du VAP
bundle (2011/2012)

BUNDLE ?

- ***Institute for Healthcare Improvement (IHI):***
  - ✓ **concept de bundles**
  - ✓ **soutenir les soignants dans la prestation de soins les meilleurs**
  - ✓ **possibles à des groupes de patients spécifiques.**
- ***Bundle :***

  Ensemble de trois à cinq interventions "evidence-based" .
- ***Principe :***

  Lorsqu'un ensemble d'interventions sont appliquées de *manière conjuguée*, elles améliorent l'état du patient.
- ***Procédures devraient faire partie de la pratique courante*:**

  ni difficiles à comprendre,

  ni difficiles à appliquer

- **Mais…..**

Enquête belge mai 2011

67 USI

- 941 lits - 772 occupés (82%)

296 patients ventilés

76 traités pour une VAP (25%)

« Tubes et circuits »

Modalités :

- *Intubation orale*: 244 (83%)
- *Trachéotomie* : 47 (16%)

Ballonnet :

- *en PVC*: 166 (57%)
- *en polyuréthane*: 127 (43%)

Aspiration sous glottique: 67 (23%)

Aspiration système fermé: 57 (19%)

Mesure de pression du ballonnet :

VAP Bundle « belge »

Analgo Sédation revue tous les jours,
« plan » de sédation, de sevrage…

Pression du ballonnet entre 20 et 30 cm H_2O

Décontamination chlorhexidine

Position entre 30 et 45°

Aspiration sous glottique encouragée

Arrêt /Adaptation de la sédation

Arrêter sans déconnexion la sédation
Permettre l'éveil
Maintien arrêt si patient coopérant
Reprendre sédation si agitation ou détresse à vitesse moitié
Privilégier l'analgésie
Adapter par bolus si nécesaire
Extuber des que possible

Interruption de la sédation

Kress et al NEJM 2000

128 patients randomisés

Sédation propofol ou midazolam

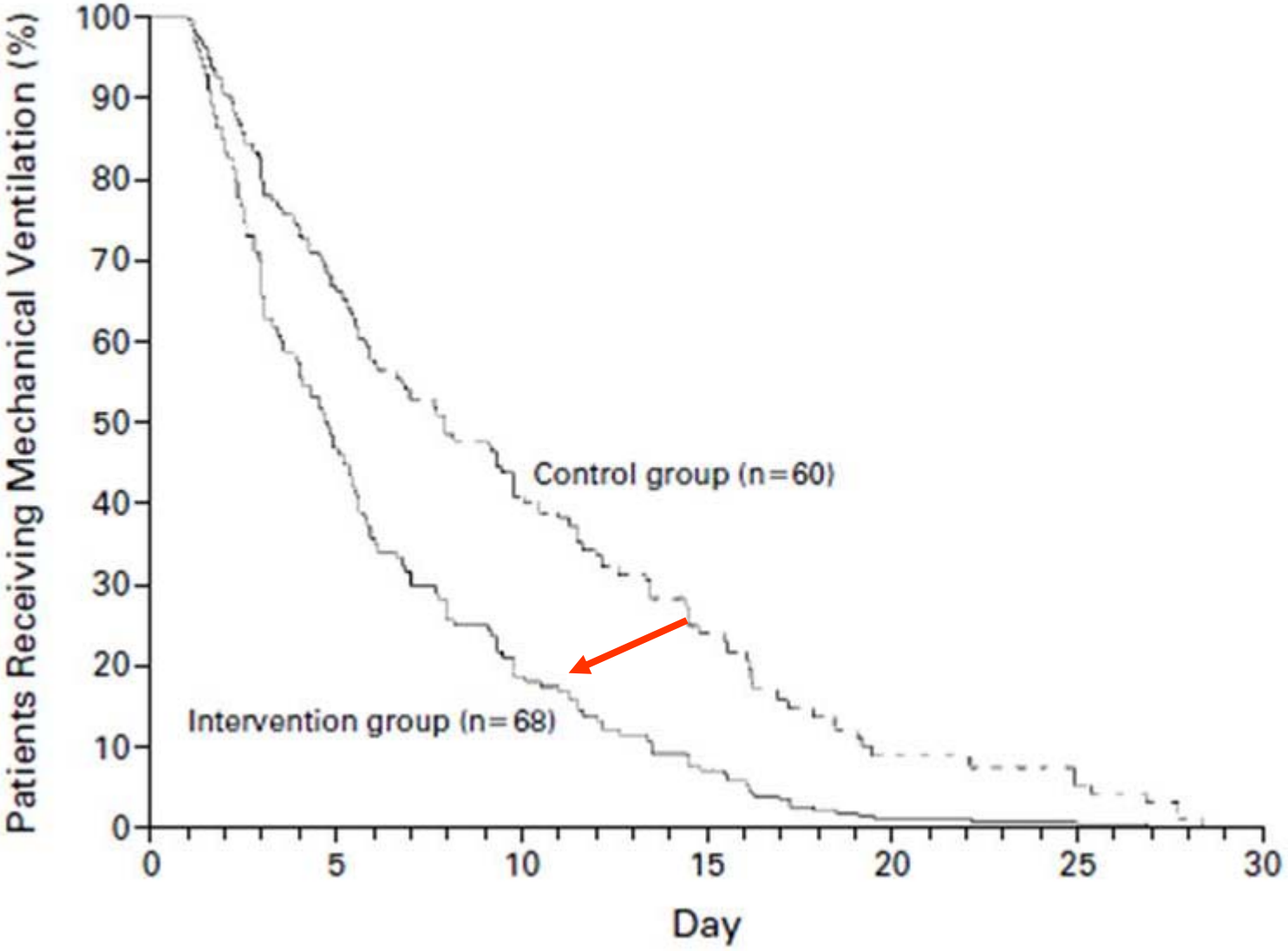
Analgésie par morphine

Médiane ventilation:

4.9 j vs 7.3 j (p = 0.004)

Médiane de séjour:

6.4 j vs 9.9 j (p= 0.02)


Patients Receiving Mechanical Ventilation (%)
100
90
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
Day
Control group (n=60)
Intervention group (n=68)

P. ballonnet & Soins de bouche

Contrôle pression du ballonnet

Contrôle emplacement sonde gastrique

Aspiration buccale

Aspiration hypopharynx

Brossage des dents pdt 1 à 2 min
chlorhexidine 0.2%

Application gel buccal à la chlorhexidine 1%


Mallinckrodt Pressure Control
27
*25
cmH2O

Chlorhexidine

2000: Fourrier: 0.2%

30 vs 30*pts* de 60 à 16.7%

2005: Fourrier: 0.2%

114 vs 114 *pts* de 10.5 à 11.4%

2006: Segers: 0.12%

491 vs 500 *pts* de 15.8 à 9.3%

2006: Koeman: 2% 385 patients

Décontamination par chlorhexidine

Koeman et al Am JRCCM 2006

Etude hollandaise dans 5 hôpitaux: 385 patients

Comparaison en double aveugle de

3 groupes de patients

- Placebo: vaseline
- Vaseline + *Chlorhexidine 2%*
- Vaseline + Chlorhexidine 2% + Colistine

Application 4 x/j.

Décontamination par chlorhexidine

Koeman et al Am JRCCM 2006

- **Incidence VAP:**
  - 23% placebo
  - 10% CHX
  - 13% CHX/Col
- **Pas de différence**
  - durée séjour
  - ✓ durée ventilation

Position du patient

Van Nieuwenhoven et al CCM 2006

45 ° vs 10°; 112 pts vs 109

4 ICU, 3 CHU

Mesure continue pdt 1 semaine

Diagnostic de VAP par fibroscopie

Position du patient

Objectif non atteint

durant 85% du temps

au jour 1: élévation moyenne:

9.8° vs 28.1°

au jour 7: élévation moyenne:

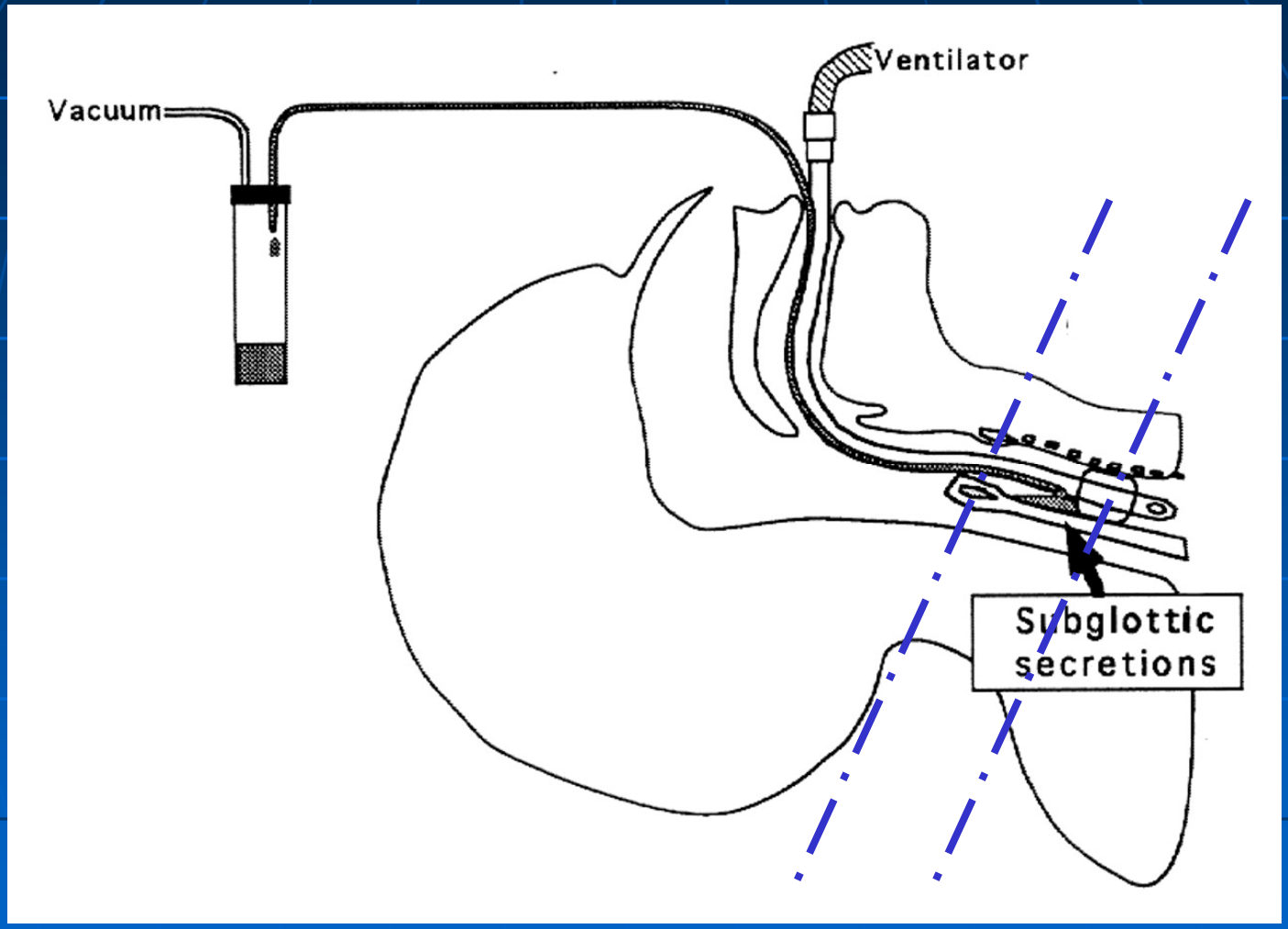
16.1° vs 22.6°

Position du patient

- **Incidence VAP:** 6.5% vs 10.7%

- *Médiane de ventilation:* 6j vs 6j
- *Médiane de séjour:* 10j vs 9j
- *Mortalité :* 33% vs 33%

Diagram of continuous aspiration of subglottic secretions



Valles, J. et. al. Ann Intern Med 1995;122:179-186

Aspiration sous glottique

Lacherade et al AJRCCM 2010

Etude multicentrique (4)

333 patients inclus (169 SD+, 164 SD-)

VAP : **14,8%** (SD+) vs **25,6%** (SD-) **p = 0,02**

Densité des VAP: 17 vs 34 /1000 JV


OHMEDA
MALLINCKRODT
EVAC Suction system

Différences entre patients avec VAP et sans VAP dans l'enquête belge?

Oui !! :

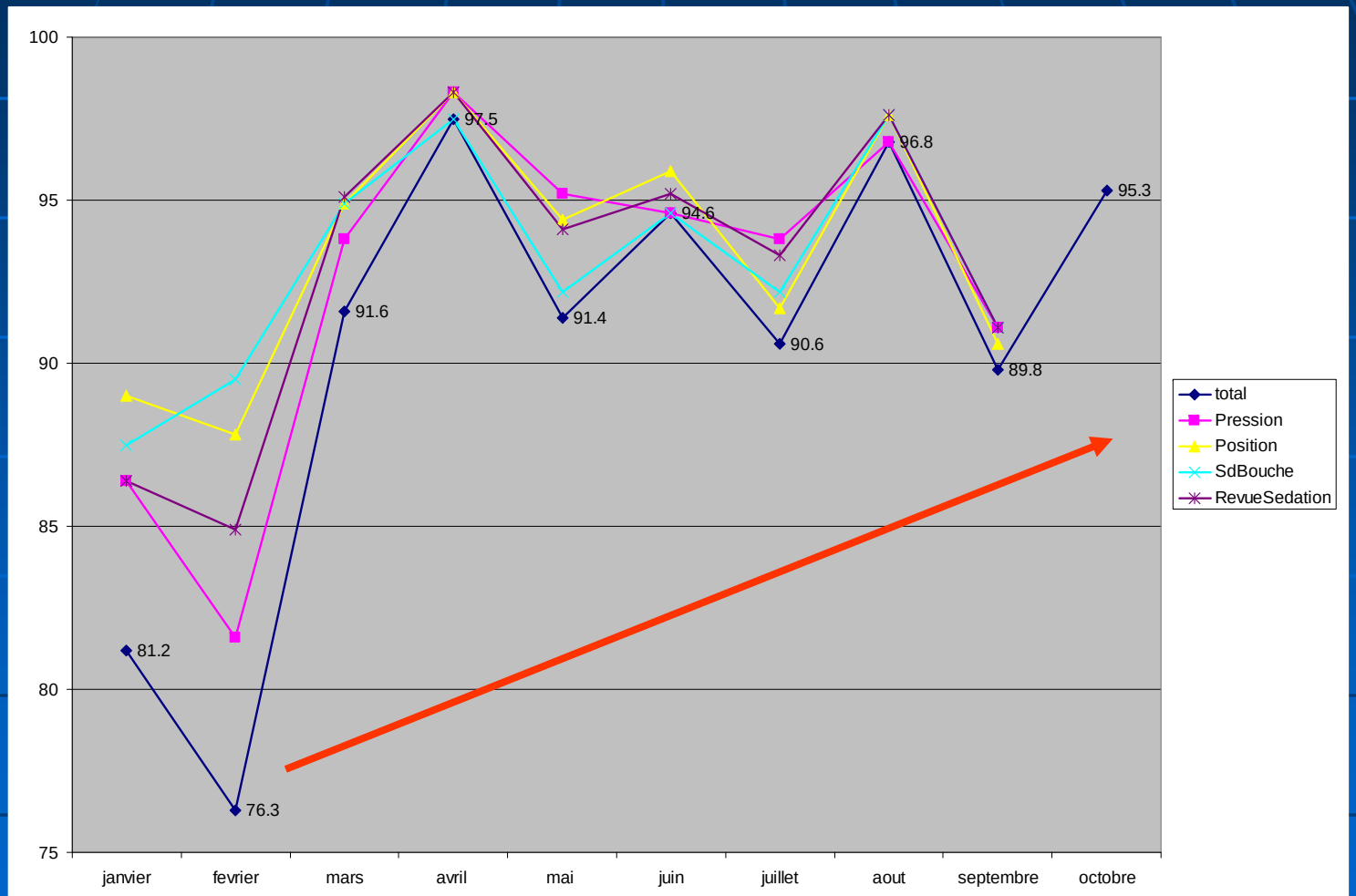
- *l' alimentation entérale*

  est un facteur de risque

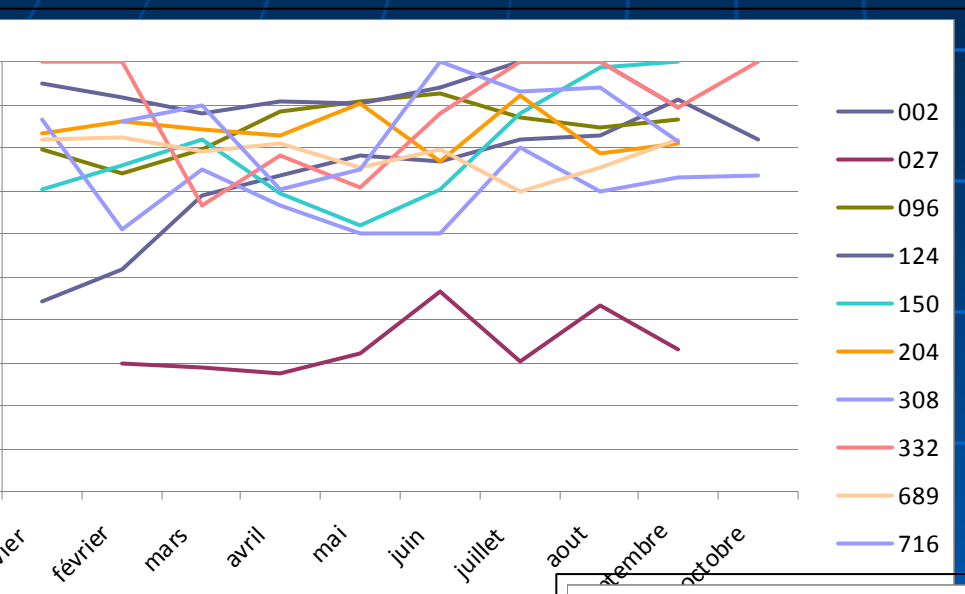
- *l'utilisation de la chlorhexidine*

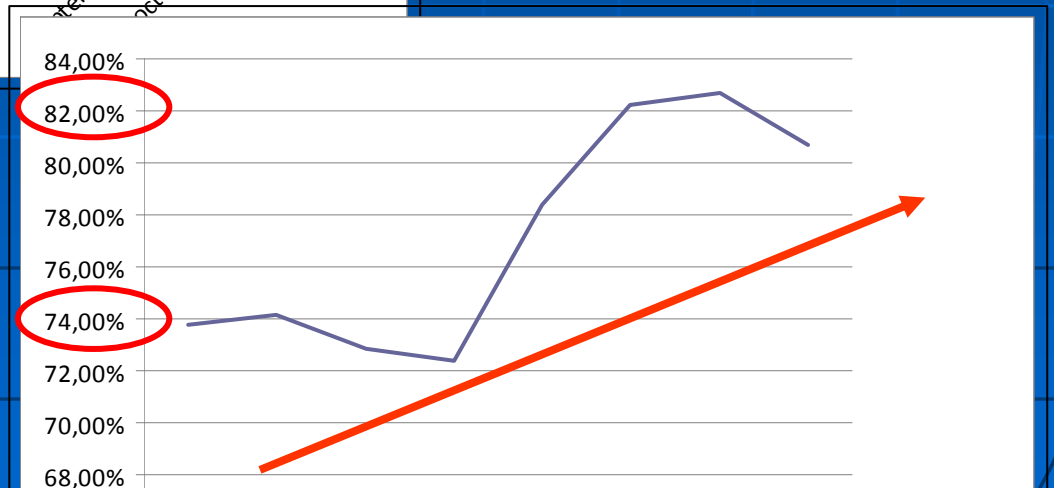
  protège

Projet VAP 2012: qques résultats …



Projet VAP 2012: qques résultats …





Conclusions

Il y a une *logique* pour
combiner les procédures de prévention

L'implémentation demande
du *temps* et de *l'investissement*

Il ne faut *pas attendre* une preuve de
l'amélioration du devenir des patients

La *réduction* des infections
et de la consommation des antibiotiques
est un *but en soi.*