

FROM ZERO TO HERO

A HISTORY OF 10y OF QUALITY IMPROVEMENT IN VAP PREVENTION

BACKGROUND

- VAP is a ICU-specific nosocomial infection:
 - arising in specific circumstances
 - after several days of mechanical ventilation
- Consequences of VAP:
 - important additional costs in healthcare
 - extension of length of stay, both in ICU and in the hospital
 - own attributable or accompanying mortality
- A sudden rise in VAP-incidence in 2007, urged the intensivists of the az Sint-Blasius:
 - to improve quality of care
 - by systematical introduction of evidence based measures against the occurrence VAP

METHODS

- HELICS-definitions (eCDC)
- Peer review of possible VAP's
- PDCA-cycle:
 1. Review of evidence
 2. Training of ICU-staff
 3. Data collection
 4. Report data every quarter to staff



X-ray	<p>Pneumonia (PN1-PN5)</p> <p>Two or more serial chest X-rays or CT-scans with a suggestive image of pneumonia for patients with underlying cardiac or pulmonary disease. In patients without underlying cardiac or pulmonary disease one definitive chest X-ray or CT-scan is sufficient.</p> <p>and at least one of the following</p> <ul style="list-style-type: none">▪ Fever > 38 °C with no other cause▪ Leukopenia (<4000 WBC/mm³) or leucocytosis (≥ 12 000 WBC/mm³) <p>and at least one of the following (or at least two if clinical pneumonia only = PN4 and PN5)</p> <ul style="list-style-type: none">▪ New onset of purulent sputum, or change in character of sputum (color, odor, quantity, consistency)▪ Cough or dyspnea or tachypnea▪ Suggestive auscultation (rales or bronchial breath sounds), ronchi, wheezing▪ Worsening gas exchange (e.g., O₂ desaturation or increased oxygen requirements or increased ventilation demand) <p>and according to the used diagnostic method</p> <p>a - Bacteriologic diagnostic performed by :</p> <p><i>Positive quantitative culture from minimally contaminated LRT specimen (PN1)</i></p> <ul style="list-style-type: none">▪ Broncho-alveolar lavage (BAL) with a threshold of ≥ 10⁴ colony forming units (CFU)/ml or ≥ 5 % of BAL obtained cells contain intracellular bacteria on direct microscopic exam (classified on the diagnostic category BAL).▪ Protected brush (PB Wimberley) with a threshold of ≥ 10³ CFU/ml▪ Distal protected aspirate (DPA) with a threshold of ≥ 10³ CFU/ml <p><i>Positive quantitative culture from possibly contaminated LRT specimen (PN2)</i></p> <ul style="list-style-type: none">▪ Quantitative culture of LRT specimen (e.g. endotracheal aspirate) with a threshold of 10⁶ CFU/ml <p>b - Alternative microbiology methods (PN3)</p> <ul style="list-style-type: none">▪ Positive blood culture not related to another source of infection▪ Positive growth in culture of pleural fluid▪ Pleural or pulmonary abscess with positive needle aspiration▪ Histologic pulmonary exam shows evidence of pneumonia▪ Positive exams for pneumonia with virus or particular germs (<i>Legionella</i>, <i>Aspergillus</i>, mycobacteria, mycoplasma, <i>Pneumocystis carinii</i>)<ul style="list-style-type: none">○ Positive detection of viral antigen or antibody from respiratory secretions (e.g., EIA, FAMA, shell vial assay, PCR)○ Positive direct exam or positive culture from bronchial secretions or tissue○ Serocconversion (ex : influenza viruses, <i>Legionella</i>, <i>Chlamydia</i>)○ Detection of antigens in urine (<i>Legionella</i>) <p>c - Others</p> <p>Positive sputum culture or non-quantitative LRT specimen culture (PN4)</p> <ul style="list-style-type: none">▪ No positive microbiology (PN5) <p>Note: PN1 and PN2 criteria were validated without previous antimicrobial therapy</p>
Symptoms	
Microbiology	

METHODS

2008

Poster

Closed airway suctioning

MDI-port

ETT w/ PU-cuff

Cuff pressure measurement manual adjustment



2009

Stop closed suctioning

ETT w/ PVC tapered shaped cuff & subglottic suctioning sideline

Automated intermittent subglottic suctioning

Continuous cuff pressure measurement automatic adjustment



2011

Oral Care w/ Chlorhexidine 0,2%

Oral care system permitting social control
(1 item to be used during every shift)

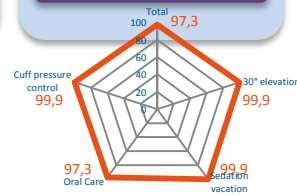


2012

Belgian VAP-bundle project:

- 30° head elevation
- sedation vacation?
- cuff pressure control
- oral care w/ Chlorhexidine
- optional: subglottic suctioning

Compliance measurement



2014

RASS

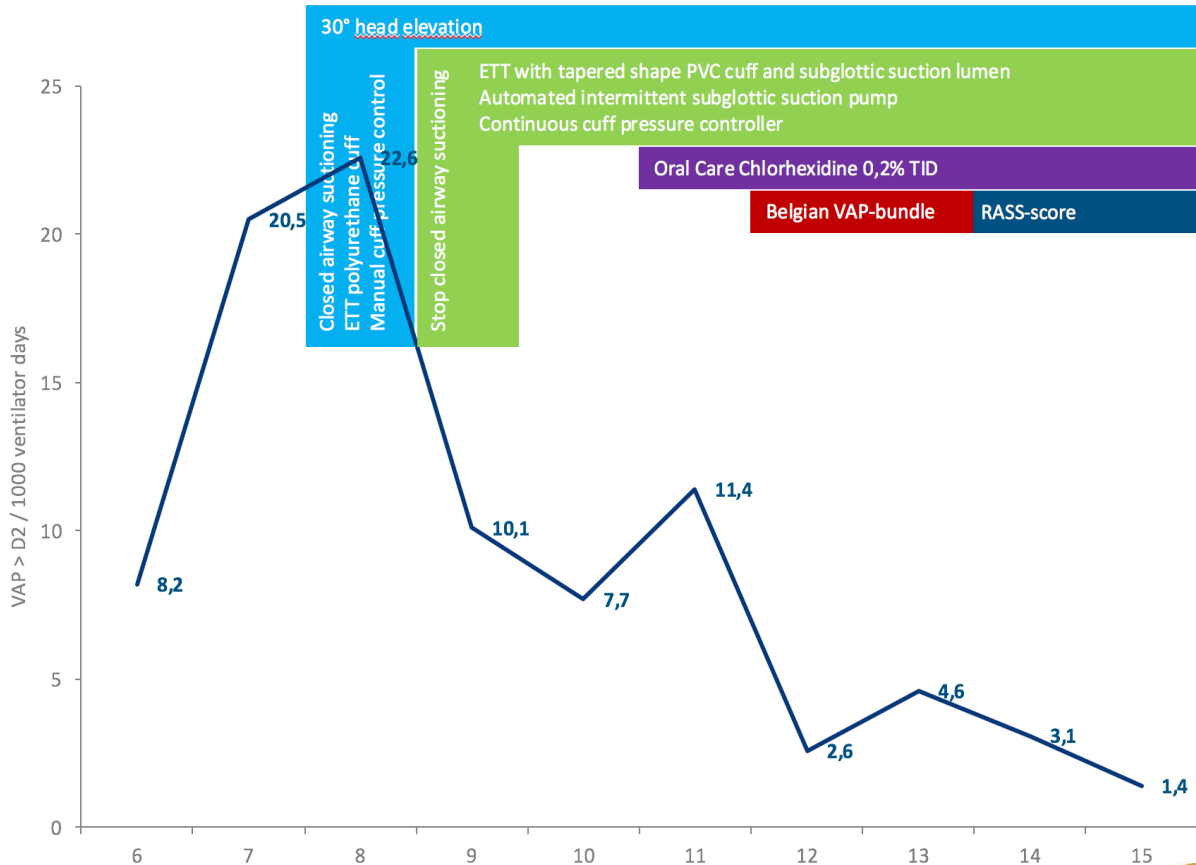
Richmond Agitation Sedation Scale (RASS)	RASS Description
1-4	Awake, alert and oriented
+3	Fully oriented and obeys commands
+2	Follows commands, oriented, eye contact
+1	Minimal response to commands
0	Not applicable
-1	Minimal to no eye response to commands
-2	Follows commands with assistance or cueing
-3	Minimal verbal response or eye contact. No eye contact
-4	Unconscious or deeply sedated
-5	Deeply sedated or anesthetized

STUDY POPULATION

Patients with LOS > 48h	6	7	8	9	10	11	12	13	14	15	p
Patients (n)	358	344	330	332	344	339	349	377	370	383	-
Age (y, mean)	66,5	64,2	67,6	66,5	67,2	65,1	64,4	66,1	66,7	65,6	NS
LOS (d, median)	5	5	5	5	5	5	5	5	5	5	NS
SAPS-II (mean)	41	38	39	42	39	40	39	37	36	36	P < 0,00001
Patient days	2941	2714	2423	2295	2336	2316	2415	2346	2460	2445	
Ventilator days	978	1074	798	793	649	701	778	650	654	709	P < 0,00001
Ventilator use (VD/1000 PD)	333	396	329	345	279	303	322	277	266	293	P < 0,00001
VAP (n)	8	22	18	8	5	8	2	3	2	1	P < 0,00001

Statistical tests: ANOVA and Chi square, where appropriate. www.OpenEpi.com, updated 2015/05/04, accessed 2016/04/20.

RESULTS



CONCLUSION

**THE SYSTEMATIC USE OF
EVIDENCE BASED AND
PDCA-CYCLE DRIVEN
PROCESS IMPROVEMENTS
MAY CONTRIBUTE TO
REDUCE VAP-INCIDENCE**

