From Zero to Hero:
10 years of Quality Improvement in VAP Prevention

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> Introduction

VAP is an ICU-specific nosocomial infection, causing important additional costs in healthcare, extending ICU and hospital length of stay, with its 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.

> Objectives

Implementation of a quality improvement program by systematic introduction of evidence based measures and suppor-ted by PDCA-cycle methodology.

> Methods

Since 2004, HELICS-definition is used for diagnosis of VAP. After the 2007 rise in VAP-incidence, we started using PDCA-cycle methodology for evidence based process improvement measures:

2008: tracheal suction protocol, hand hygiene, prevention of colonization of ventilator tubing, guideline HME change, oral care with hexetidin, manual cuff pressure control, 30° head elevation, ETT fixation, gastric residue control, removal of gastric tube ASAP, ETT with polyurethane barrel shaped cuff, closed airway suctioning, mini metered dose inhaler

2009: stop using closed air suctioning, a new ETT with PVC tapered shaped cuff and subglottic suctioning sideline, a digital continuous cuff pressure controller, and an automated subglottic suctioning pump for intermittent subglottic suctioning

2011: oral care with chlorhexidine 0,2% and an oral care system permitting social control

2012: Belgian VAP-bundle, with continuous compliance measurement

2014: Richmond Agitation Sedation Score to adjust the depth of sedation

Training for ICU staff was organized before every new measure.

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

> Results

The 2008 measures appeared to be ineffective: VAP-incidence continued to rise. Nurses identified ineffective tracheal suctioning by the closed airway suctioning system as an important pro-blem.

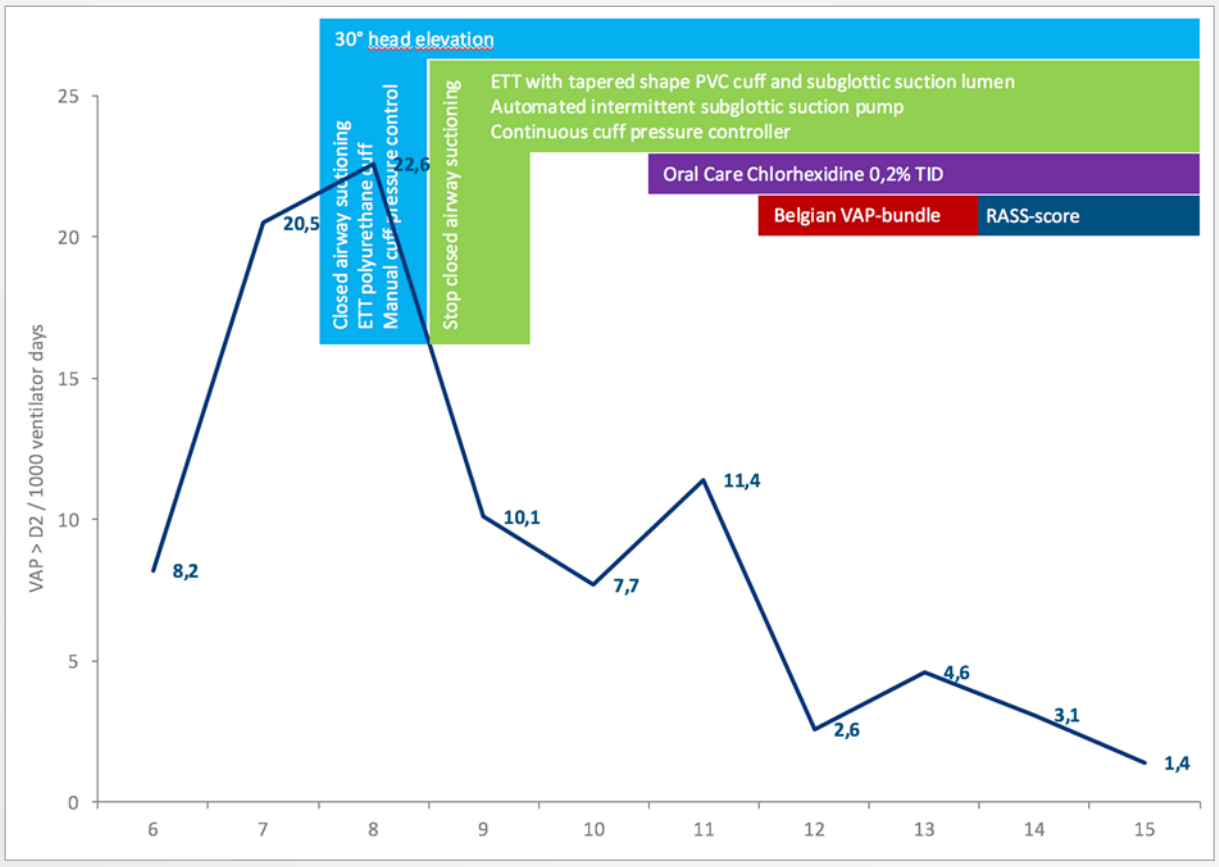
After stopping using the closed airway suctioning system and the introduction of 3 new technologies in 2009, VAP-incidence reduced by half.

The introduction in 2011 of oral care with chlorhexidine 0,2% and an oral care system permitting social control gave no further improvement of the results.

In 2012 and in 2013, although almost all VAP-bundle elements already were used in our ICU, the formal implementation of the Belgian VAP-bundle (with > 97% overall compliance in both 2012 and 2013) caused an impressive further decline in VAP-incidence. Potentially, the addition of sedation control affected VAP-incidence.

After the Belgian VAP-bundle project was stopped in 2014, we implemented the use of the RASS to adjust depth of sedation. VAP-incidence further dropped to its lowest level in 10 years.

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)	66,6	64,2	67,6	66,5	67,2	65,1	64,6	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



> Conclusions:

This continuous quality improvement program shows that the systematic use of evidence based and PDCA-cycle driven process improvements may contribute to reduce VAP-incidence.