AMITA Adventist Medical Center, Bolingbrook

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Jamal Williams RT, Director of Respiratory Therapy & Infusion Clinic

AMITA Adventist Medical Center- **Bolingbrook**

AAMC Bolingbrook is 1 of 3 acute care hospitals in Will County

Hospital opened January 14, 2008

124 Bed Community Hospital

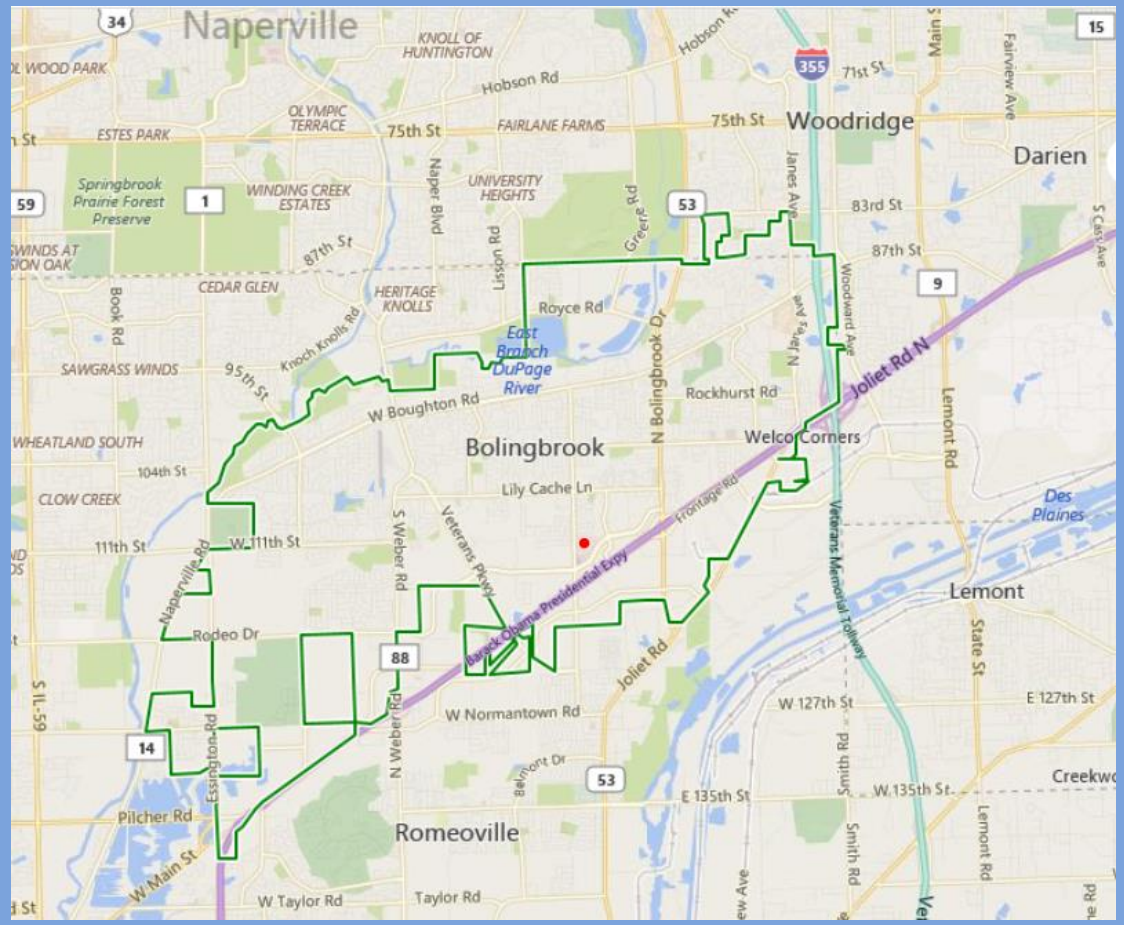
12 Bed Intensive care unit- Average daily census 6.5

No ventilators utilized outside of the ICU

Long Term Care Facility (LTC) located across the street

Bolingbrook, Illinois

- Southwest suburb of Chicago partially in both Will and DuPage
- 2017 US Census = **75,201**
- Bolingbrook is the 17th largest incorporated place in Illinois and the state's 2nd largest village



Time of Change in Healthcare

The NEW ENGLAND JOURNAL of MEDICINE

Perspective

OCTOBER 18, 2007

Nonpayment for Performance? Medicare's New Reimbursement Rule

Meredith B. Rosenthal, Ph.D.

"Centers for Medicare and Medicaid Services (CMS) announced its decision to cease paying hospitals for some of the care made necessary by 'preventable complications'"

Ventilator-associated pneumonia

Affects ~5-10% of ventilated patients

Increases ICU length of stay by ~4-7 days

Increases hospital length of stay by ~14 days

Crude mortality rate 30-50%

Attributable mortality 8-12%

Adds ~$10-50,000 to cost of hospital stay

CMS 1533-P, 2007
Safdar et al, *Crit Care Med* 2005; 33:2184
Tejerina et al, *J Crit Care* 2006; 21:56
Muscedere et al, *J Crit Care* 2008;23:5-10
Eber et al, *Arch Intern Med* 2010;170:347-353
Nguile-Makao et al, *Intensive Care Med* 2010;36:781-9
Beyersmann et al, *Infect Control Hosp Epidemiol* 2006;27:493

The OLD Definition…… subjective related to x-rays

X-ray

Patient with underlying diseases[1,2] has 2 or more serial x-rays with one of the following:

- ❑ New or progressive and persistent infiltrate
- ❑ Consolidation
- ❑ Cavitation
- ❑ Pneumatoceles, in ≤1 y.o.

Patient without underlying diseases[1,2] has 1 or more serial x-rays with one of the following:

- ❑ New or progressive and persistent infiltrate
- ❑ Consolidation
- ❑ Cavitation
- ❑ Pneumatoceles, in ≤1 y.o.

Horan, Andrus &Dudeck, *AJIC* 2008; v36: 328

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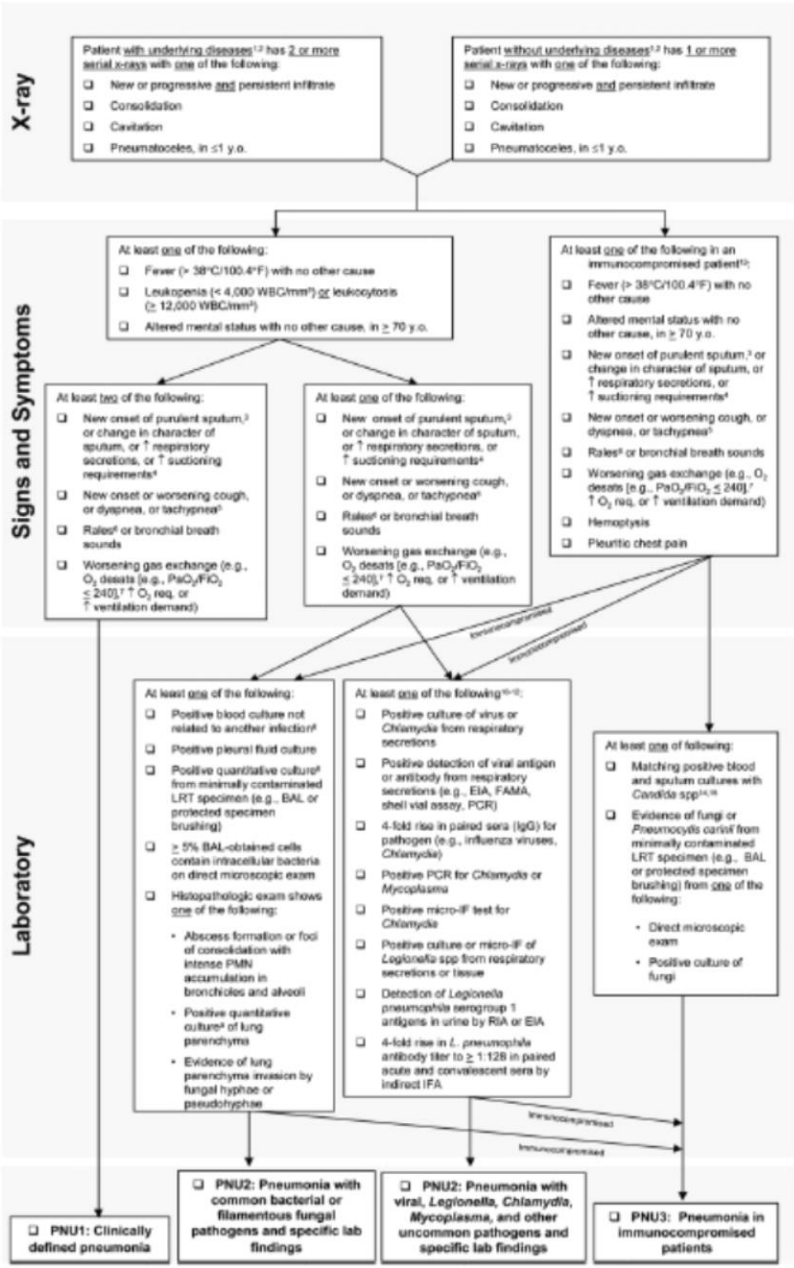


Fig 1. Pneumonia flow diagram

The challenge of VAP diagnosis

Many complications of critical care present with subjective clinical signs that mimic VAP:

- Radiographic opacities
- Fever
- Abnormal white blood cell count
- Impaired oxygenation
- Increased pulmonary secretions

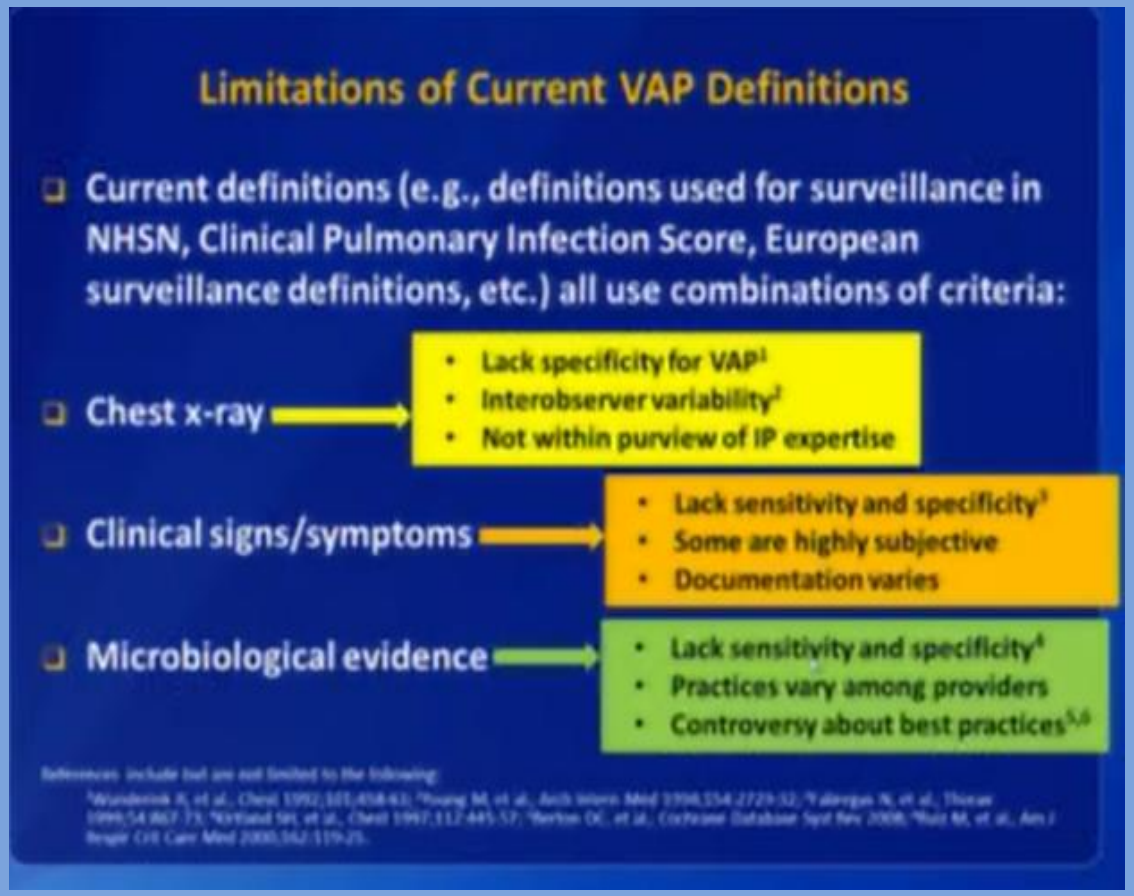
Subjective
Non-specific

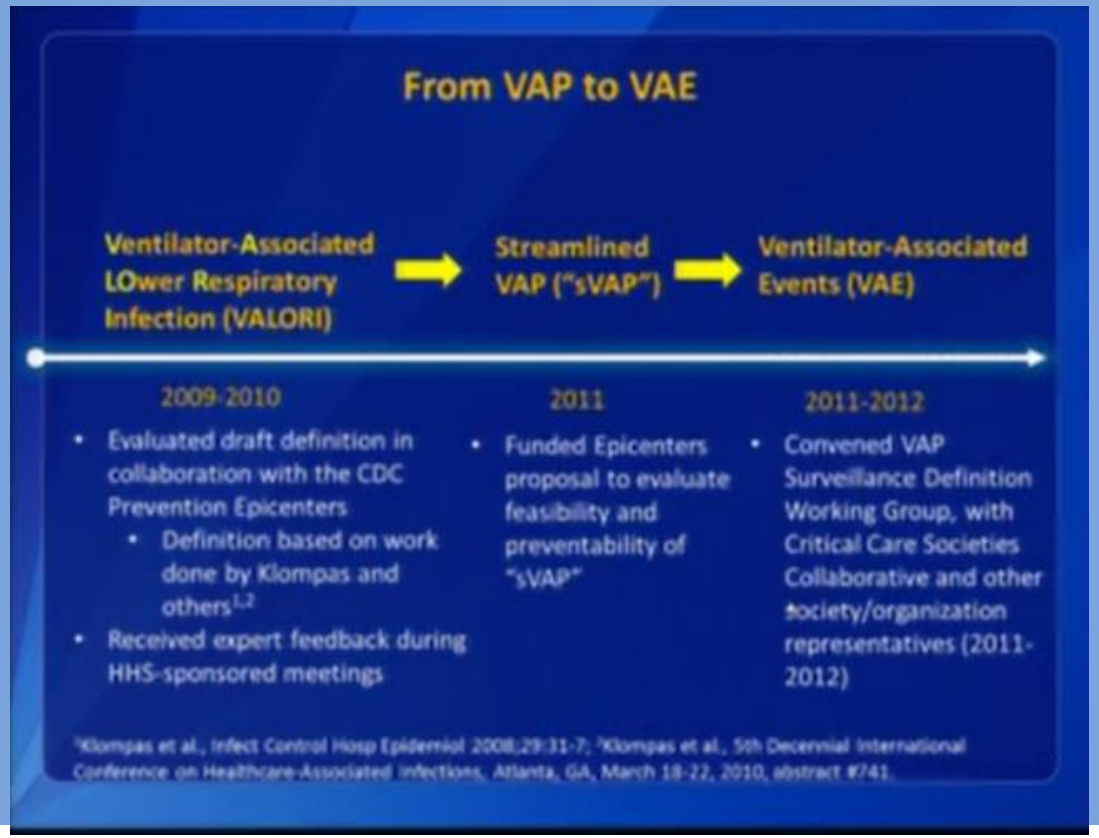
NHSN surveillance definition for VAP

Patient must fulfill each of the three categories below:

Chest Radiograph	*Any one of the following:* 1. New, progressive, or persistent infiltrate 2. Consolidation 3. Cavitation
Systemic Signs	*Any one of the following:* 1. Temperature >38°C 2. WBC <4,000 or >12,000 WBC/mm^3 3. For adults 70 years old, altered mental status with no other recognized cause
Pulmonary Signs	*Any two of the following:* 1. New onset of purulent sputum, or change in character of sputum, or increased respiratory secretions, or increased suctioning requirements 2. New onset or worsening cough, or dyspnea, or tachypnea 3. Rales or bronchial breath sounds 4. Worsening gas exchange, increased oxygen requirements, or increased ventilation demand

In THE YEAR 2012 definitions for VAP were subjective





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The Joint Commission

2012 National Patient Safety Goals
(proposed)

1. **Prevent ventilator-associated pneumonia**
2. Prevent catheter-associated urinary tract infections

Institute for Healthcare Improvement

Rapid Response Teams

Evidence-based care for MI

Prevent adverse drug events

Prevent central line infections

Prevent ventilator-associated pneumonia

Improving surveillance definitions for ventilator-associated events

Better surveillance □ Better care

Premier healthcare alliance
January 15, 2013

Michael Klompas MD, MPH, FRCPC, FIDSA

Harvard Medical School Department of Population Medicine

Brigham And Women's Hospital, Boston, MA

CDC

American Thoracic Society

We help the world breathe

Society of Critical Care Medicine

The Intensive Care Professionals

American College of Chest Physicians

American Association for Respiratory Care

American Association of Critical-Care Nurses

IDSA

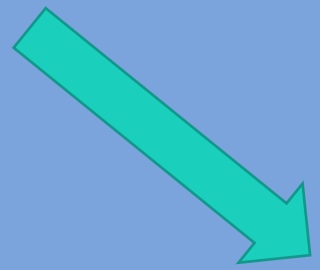
SHEA

The Society for Healthcare Epidemiology of America

APIC

Council of State and Territorial Epidemiologists

Leaders in Applied Public Health Epidemiology



An alternative approach to surveillance

Broaden the focus from pneumonia alone to the syndrome of ventilator complications in general

- More accurate description of what can be reliably determined using surveillance definitions
- Emphasizes the importance of preventing ***all*** complications of mechanical ventilation, not just pneumonia

Streamline the definition using quantitative criteria

- Reduce ambiguity
- Improve reproducibility
- Enable electronic collection of all variables

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Where to start ?

Start Small
THINK BIG

Moving the process along- getting the air behind our sail !

Following APIC 2012 National Conference introduced the new definition

- ICU leadership
- RT leadership
- Intensivists
- Pulmonologists

First step – Engage the Respiratory Therapists and Nurses in ICU

New definitions introduced at RT & ICU department meetings

RTs attend the daily ICU team rounds -report the FiO2 and PEEP

ICU added the FiO2 and PEEP

to their rounding sheets

Amita Health Adventist Southern Regional Hospitals

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HIIN Gap Analysis

GREAT LAKES
PARTNERS FOR PATIENTS

Illinois | Michigan | Wisconsin
Powered by the MHA Keystone Center

Accelerating Improvement at the Point of Care

Great Lakes Partners for Patients - Gap Analysis Surveys

Choose a survey: *

- ○ Adverse Drug Events (ADE) - Anticoagulation Safety
- ○ Adverse Drug Events (ADE) - Glycemic Management
- ○ Adverse Drug Events (ADE) - Opioid Safety
- ○ Antimicrobial Stewardship
- ○ Clostridium difficile (C.Diff)
- ○ Catheter-associated Urinary Tract Infections (CAUTI)
- ○ Central Line-associated Blood Stream Infections (CLABSI)
- ○ Falls
- ○ MRSA
- ○ Pressure Injuries
- ○ Readmissions Reduction
- ○ Sepsis & Septic Shock
- ○ Surgical Site Infections (SSI)
- ○ Ventilator-associated Events (VAE)
- ○ Venous Thromboembolism (VTE)

Hospital Improvement Innovation Network (HIIN) MEETINGS

- Leads and team members from all over the southern region
- Defined opportunities to improve patient care
  13 VAE events in one year region-wide prior to initiative
- Set attainable goals to decrease Ventilator Associated Event region-wide
- GOAL: To decrease VAE by 50% by 12/31/2016
- Met and exceeded our goals for 2016, 2017 and 2018 (to date)

PEEP & FiO2 forms developed

- IP attended Respiratory Therapy (RT) department meeting
- RT on night shift given accountability to look at the previous days Lowest FiO2/PEEPs maintained for one hour & log on the worksheet
- RT attend the daily ICU patient care rounds and reports the previous days FiO2 /PEEPS
- Data sheets submitted to IP when patient extubated
- IP monitor accuracy of the data submitted and reported findings to RT Manager

- Educational opportunity for IP to collaborate with RT for the accuracy

Adventist Bolingbrook Hospital
Keeping you well

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Respiratory Care Department
VAE Data Collection Worksheet

VAE Data Collection Process:

1. Begin tracking utilizing this worksheet once the patient is put on the ventilator
2. Night shift (preferably) is to fill out this form accordingly for the previous day's data (0000-2359).
3. Communicate and exchange data during ICU patient care rounds as well as shift report
4. Document and submit form once patient is extubated

Date	Vent Day (#)	PEEP (lowest)	FiO2 (lowest)	RT Initials
	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			

PATIENT STICKER

Patient Room Number: _____

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Clinical rounding sheet in ICU

DATE	PICC CM	DRIPS	VAP PREVENTION	GLUCOSE MANAGEMENT	NEEDS:	
ICU DAY _____	_____		O ET reposition	*# gluc > 180 in last 24 hrs* _____	O Tracheostomy	O Diabe
FOLEY DAY ___	PICC		O Sedation vacation	O Name of physician notified of elevated glucose? _____	O PEG tube	O Woun
RESTRAINTS	DSG Δ		O Ramsey _____	O What adjustments made for glucose? _____	O Foley D/C	O Family
CAM-ICU _____	_____		O Weaning assessment	O Endotool initiated? _____	O Lines D/C	O Transf
			O Plateau psr ____	O Transition off Endotool? _____	O Swallow eval	O LTR fa
			O Vent orders		O PT/OT	
			O Vent sedation		O Dietician	
			O Fi02____PEEP___			

PATIENT STICKER	ADMIT REASON	HISTORY	ROOM

PHYSICIANS	ADDITIONAL CONSULTS	FAMILY / DPOAHC	ALLERGIES
	☐ SOCIAL SERVICE ☐ CASE MGT ☐ PT/OT ☐ DIABETES ☐ NUTRITION ☐ SPEECH		

ADVANCED DIRECTIVES	PNEUMOCCAL VACCINE	MRSA RESULT:	CORE MEASURES
☐ DPOAHC ☐ FULL CODE ☐ DNI ☐ PARTIAL DNR ☐ DNR	DATE: REFUSED: ____ INFLUENZA VACCINE DATE: REFUSED:____	ISOLATION:	☐ MI ☐ CHF ☐ PNEUMONIA ☐ SCIP ☐ CVA ☐ VTE ☐ STROKE

PNEUMONIA	MI	CHF
☐ CXR / CT scan	☐ Lipid profile within 12 hrs.	☐ BNP _____
☐ Cultures before antibiotics	☐ LVF assessed _____	☐ LVF assessed_____
☐ Smoking cessation	☐ ASA	☐ ACE/ARB ------ renal insufficiency
	☐ Beta Blocker	☐ Smoking cessation
	☐ ACE/ARB ____renal insufficiency	☐ Heart failure teaching
	☐ Cardiac Rehab	
	☐ Smoking cessation	

SEPSIS	VAP	SCIP
☐ Central line	☐ Mechanical Ventilation orders	☐ Abx prior to surgery
☐ Lactate level	☐ Sedation orders	☐ Abx DC'd 24 hrs. post-surgery
☐ Hyperglycemia protocol	☐ Oral care ordered	☐ Foley DC'd within 48 hrs.
	☐ Oral gastric tube	☐ Beta Blocker

STROKE	VTE PREVENTION	SUICIDAL PATIENTS
☐ Antithrombotic for 48 hrs.	☐ Medication_____	☐ Sitter ordered
☐ Lipid profile	☐ SCDs	☐ Social work consulted
☐ Dysphagia screen	PUD PROPHYLAXIS	☐ Psychiatric consult
☐ Afib anticoagulation	☐ Protonix	☐ Petitioned
☐ PT / OT / Rehab	☐ Pepcid	
☐ Smoking cessation	☐ Other _____	
☐ Stroke education		

TUBES / LINES / INSERTION DATE / REMOVAL DATE

LINE:	INSERT DATE:	REMOVAL DATE:	DEVICE:	INSERT DATE:	REMOVAL DATE:
Central Line			ETT (size_____)		
PICC Line			Foley		
Arterial Line			Chest Tube		
Dialysis Catheter			Tracheostomy (size_____)		
TD Catheter (Swan)			PEG Tube		
Cordis Sheath					
IABP					

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VAE Calculator

http://www.cdc.gov/nhsn/VAE-calculator/index.html

There are 4 Qualifying Antimicrobial Days (QADs) in a row so this meets the definition of an IVAC. Click on "Go to VAP" button to determine if this case conforms to a Possible or Probable Ventilator-Associated Pneumonia (VAP) definition.

MV Day	Date	Hide... Min. PEEP (cmH_2O)	Hide... Min. FiO_2 (30 - 100)	VAE	36°> T >38°	4,000 cells/mm³ ≥ WBC ≥ 12,000 cells/mm³	Add... Remove... CEFOTAXIME	QAD
1	10/01/2012	10	100		☐	☐	☐	
2	10/02/2012	8	80		☐	☐	☐	
3	10/03/2012	5	50		☐	☑	☐	
4	10/04/2012	5	40		☑	☐	☑	yes
5	10/05/2012	8	50	IVAC	☐	☐	☑	yes
6	10/06/2012	8	60		☐	☐	☑	yes
7	10/07/2012	5	50		☐	☐	☑	yes
8	10/08/2012	5	40		☐	☐	☐	
9	10/09/2012				☐	☐	☐	
10	10/10/2012				☐	☐	☐	
11	10/11/2012				☐	☐	☐	

Legend: VAE Window | VAE Date | Qualifying Antimicrobial Day (QAD) | Cumulative QAD

Fictitious data entry

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Ventilator-associated pneumonia and oral care: A successful quality improvement project

Kathleen Hutchins, RN, MSN, CIC, George Karras, MD, Joan Erwin, RN, BSN, Kevin L. Sullivan, RN, BSN,
Critical Care Unit, Mercy Medical Center, Springfield, MA

PlumX Metrics
DOI: https://doi.org/10.1016/j.ajic.2008.12.007

Abstract | Full Text | Images | References

Background
Ventilator-associated pneumonia (VAP) is a nosocomial pneumonia that develops in patients on mechanical ventilation for ≥48 hours. VAP develops at an estimated rate of 1% to 3% per day of mechanical ventilation.

Methods
Quality improvement project. Mechanically ventilated patients received the following oral care every 4 hours: the teeth were brushed with cetylpyridinium chloride (changed to 0.12% chlorhexidine gluconate in 2007) using a suction toothbrush, the oral cavity was cleansed with suction swabs treated with hydrogen peroxide, a mouth moisturizer was applied, deep oropharyngeal suctioning was performed, and suction catheters were used to control secretions. The primary efficacy variable was a diagnosis of VAP in patients mechanically ventilated for ≥48 hours.

Results
The historical average rate of VAP in 2004 was 12.6 cases/1000 ventilator-days. After the inception of the quality improvement project, VAP rates decreased to 4.12 (VAP cases/days of ventilation × 1000) for May to December 2005, to 3.57 for 2006, and to 1.3 for 2007.

Conclusion
The use of an oral care protocol intervention and ventilator bundle led to an 89.7% reduction in the VAP rate in mechanically ventilated patients from 2004 to 2007.

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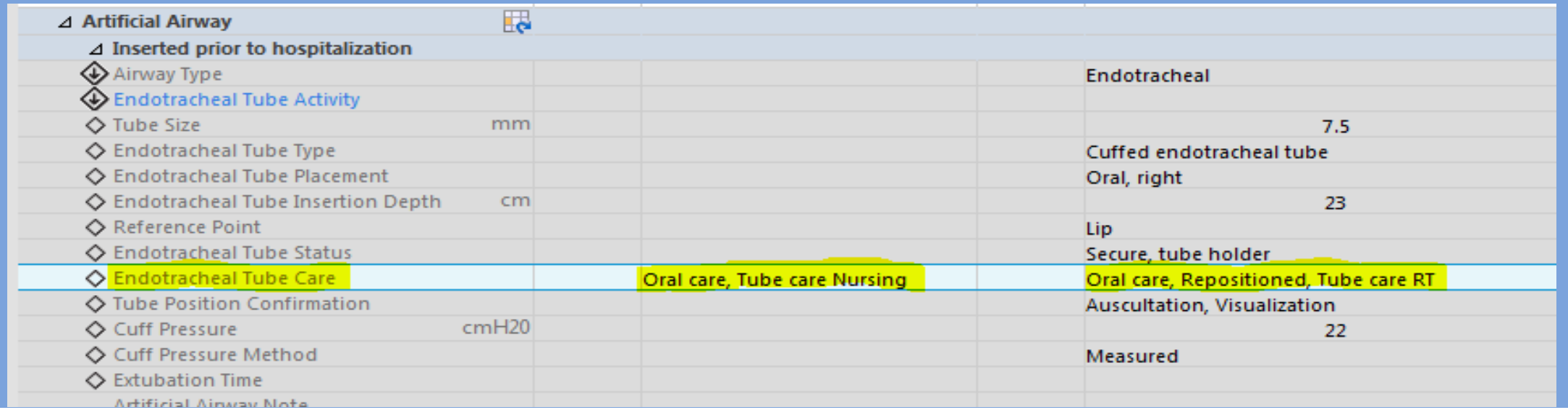
Initiated Q 2 hour oral care

- Collaboration between ICU nurses and RTs to alternate the oral care given to the patient
- Documentation in the Electronic Medical Record

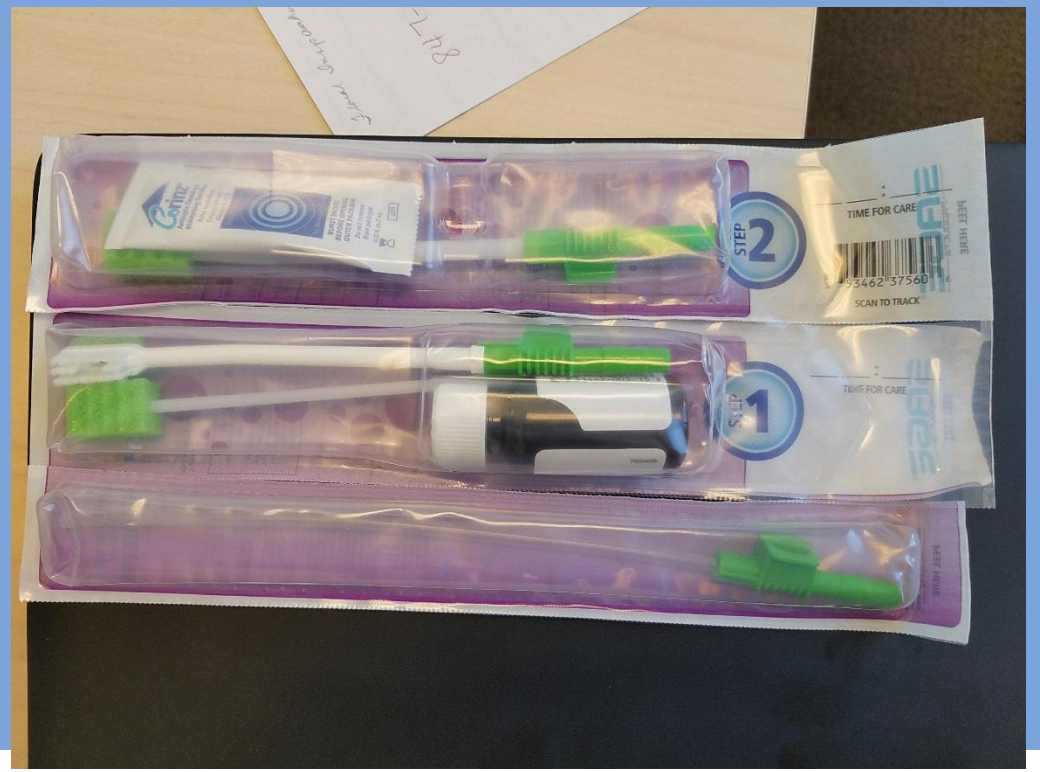


Artificial Airway			
Inserted prior to hospitalization			
Airway Type			Endotracheal
Endotracheal Tube Activity			
Tube Size	mm		7.5
Endotracheal Tube Type			Cuffed endotracheal tube
Endotracheal Tube Placement			Oral, right
Endotracheal Tube Insertion Depth	cm		23
Reference Point			Lip
Endotracheal Tube Status			Secure, tube holder
Endotracheal Tube Care		Oral care, Tube care Nursing	Oral care, Repositioned, Tube care RT
Tube Position Confirmation			Auscultation, Visualization
Cuff Pressure	cmH20		22
Cuff Pressure Method			Measured
Extubation Time			
Artificial Airway Note			

Evidence based -Oral Care Every Two Hours

Obtained kits for oral care with all equipment included

- Oral cleansing with 0.12% Chlorhexidine Gluconate (CHG)
- Oral rinse
- Covered Yankauer in kit
- Toothbrush and tooth sponge as suction tools



Tube position changes Every Shift

Photo from https://www.vitalitymedical.com

Cuff Pressure checks

Policy states every 8 Hrs.

Bolingbrook - Every Vent check Q4 Hrs.

Artificial Airway							
Patient Position		Head of bed...		Head of bed...		Head of bed...	Head of bed...
Artificial Airway							
Endotracheal 09/23/2018 00:40 In...							
Airway Type				Endotracheal			Endotracheal
Tube Size	mm			7.5			7.5
Endotracheal Tube Type				Cuffed end...			Cuffed end...
Endotracheal Tube Placement				Oral, right			Oral, right
Endotracheal Tube Insertion ...	cm			23			23
Reference Point				Lip			Lip
Endotracheal Tube Status				Secure, tube...			Secure, tube...
Endotracheal Tube Care				Oral care, Tu...			Oral care, Tu...
Tube Position Confirmation				Auscultation			Auscultation
Cuff Pressure	cmH20			28			28
Cuff Pressure Method				Measured			Measured

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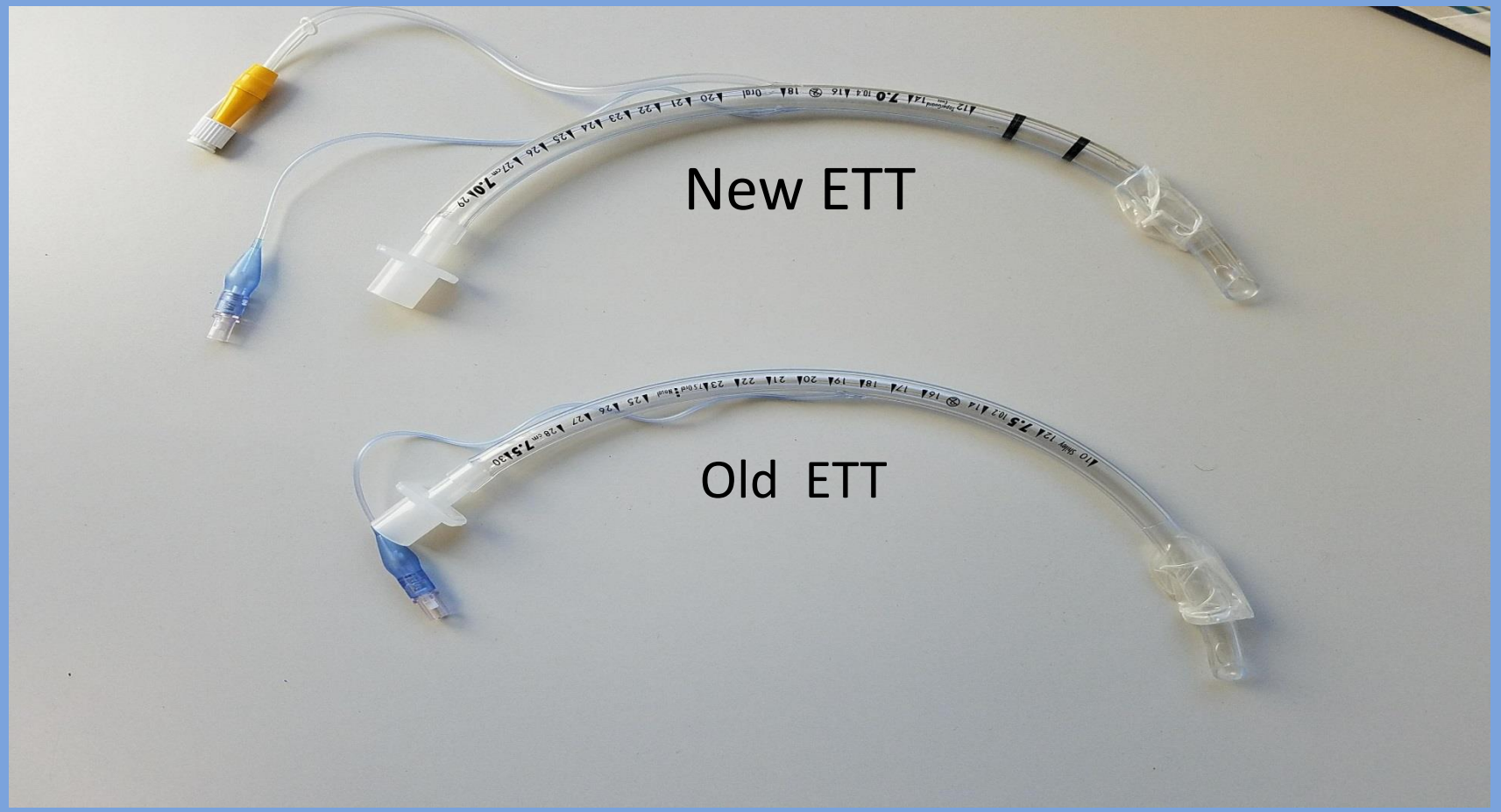
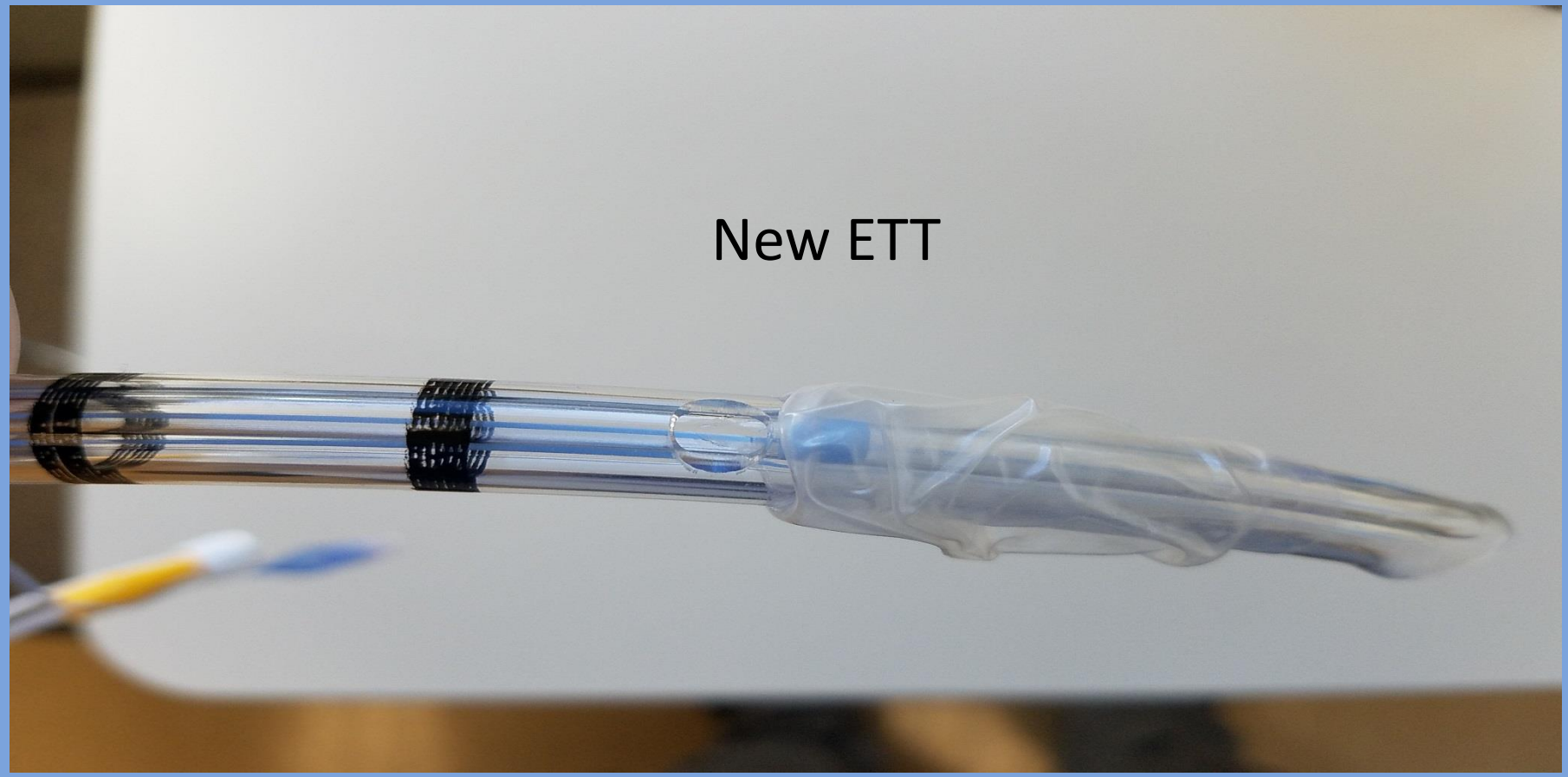
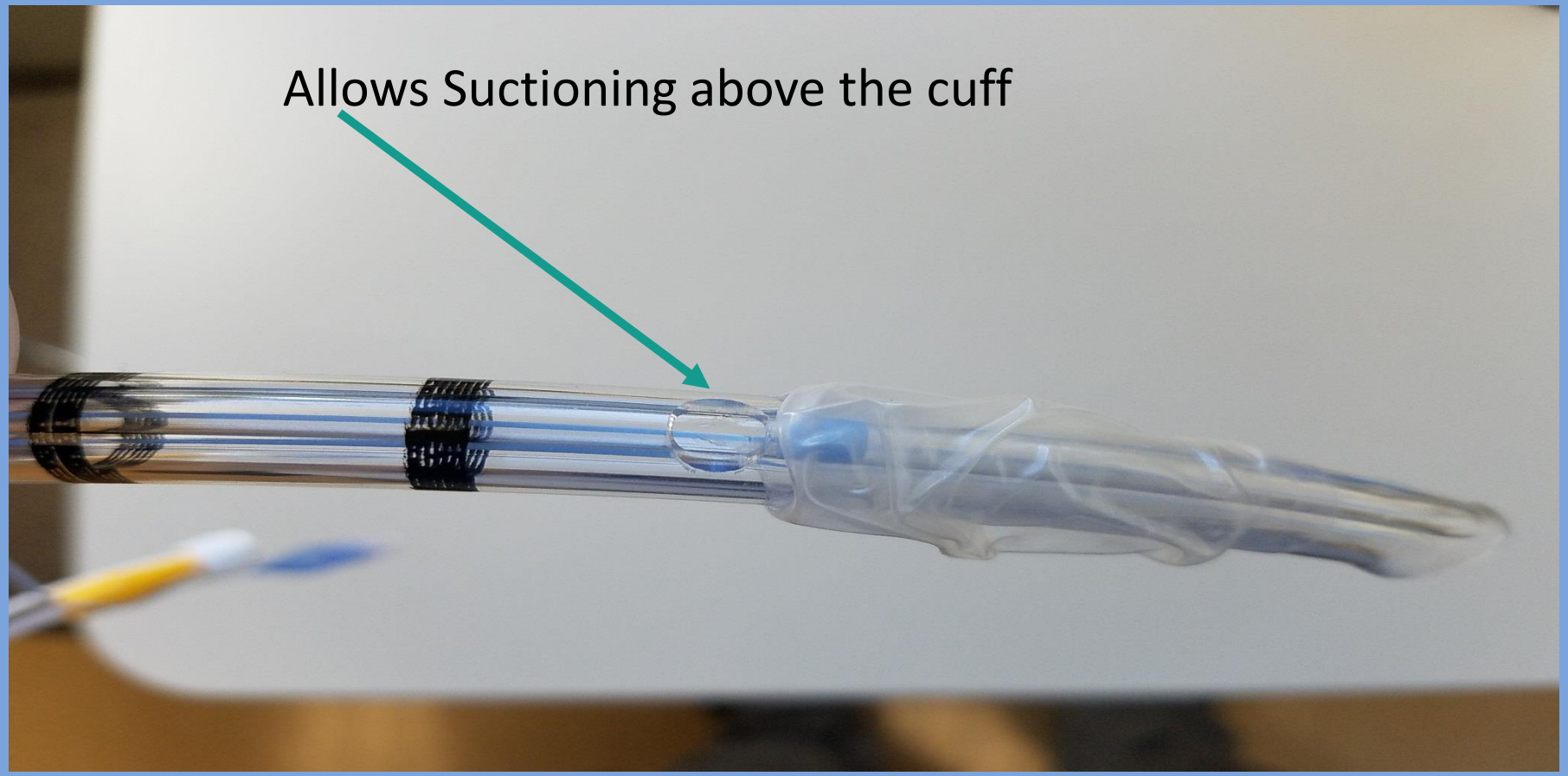
Change in Endotracheal Tube



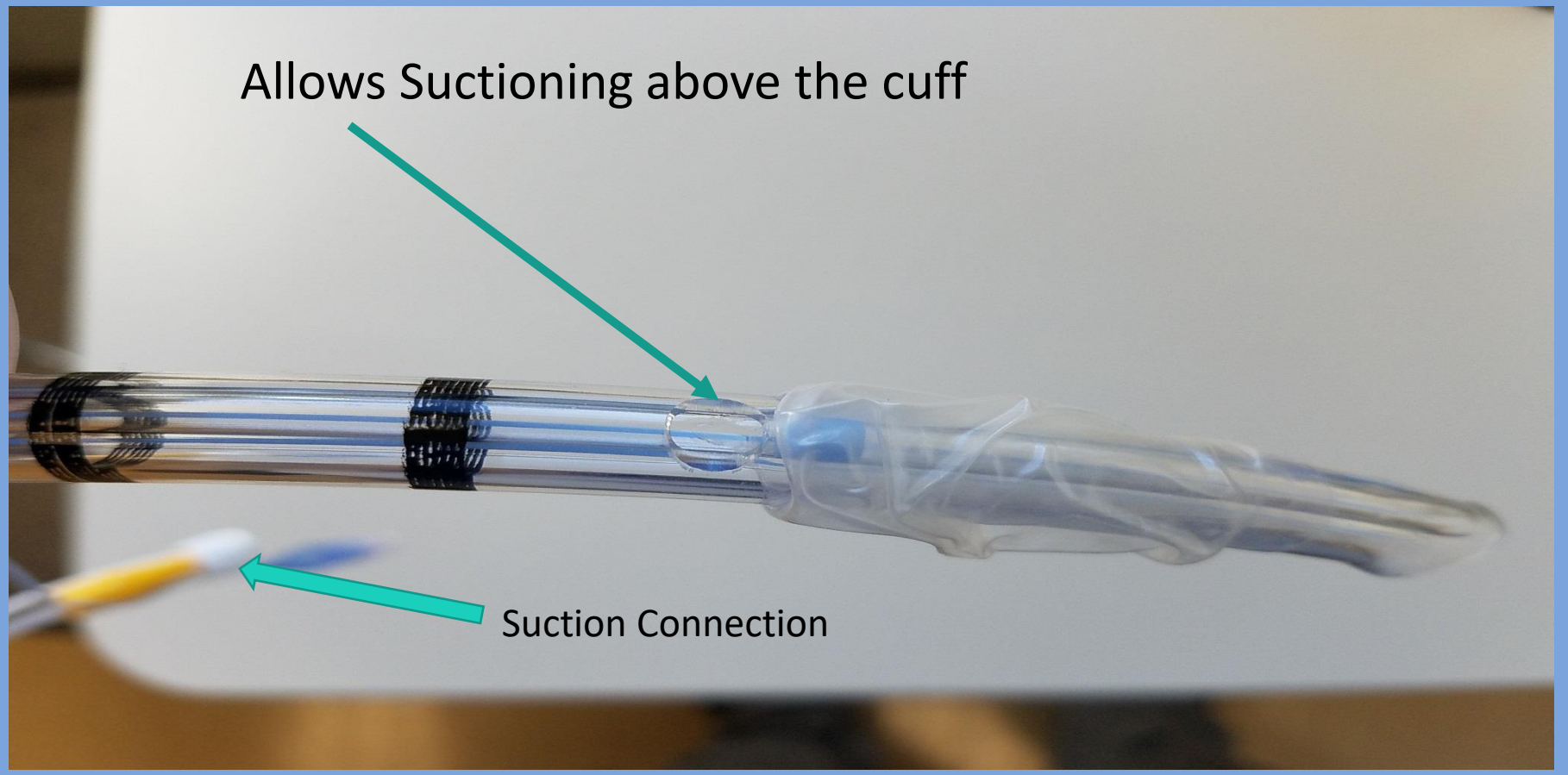
Subglottic Endotracheal Tube



Subglottic Endotracheal Tube



Subglottic Endotracheal Tube



New nebulizer for every treatment

Standardized Infection Ratio

National Healthcare Safety Network
SIR for Ventilator-Associated Event Data for Acute Care Hospitals (2015 Baseline)

infCount	numPred	numventdays	SIR	SIR_pval	SIR95CI	vaeCategory
1	1.065	234	0.939	1.0000	0.047, 4.629	Total VAE

Standardized Utilization Ratio

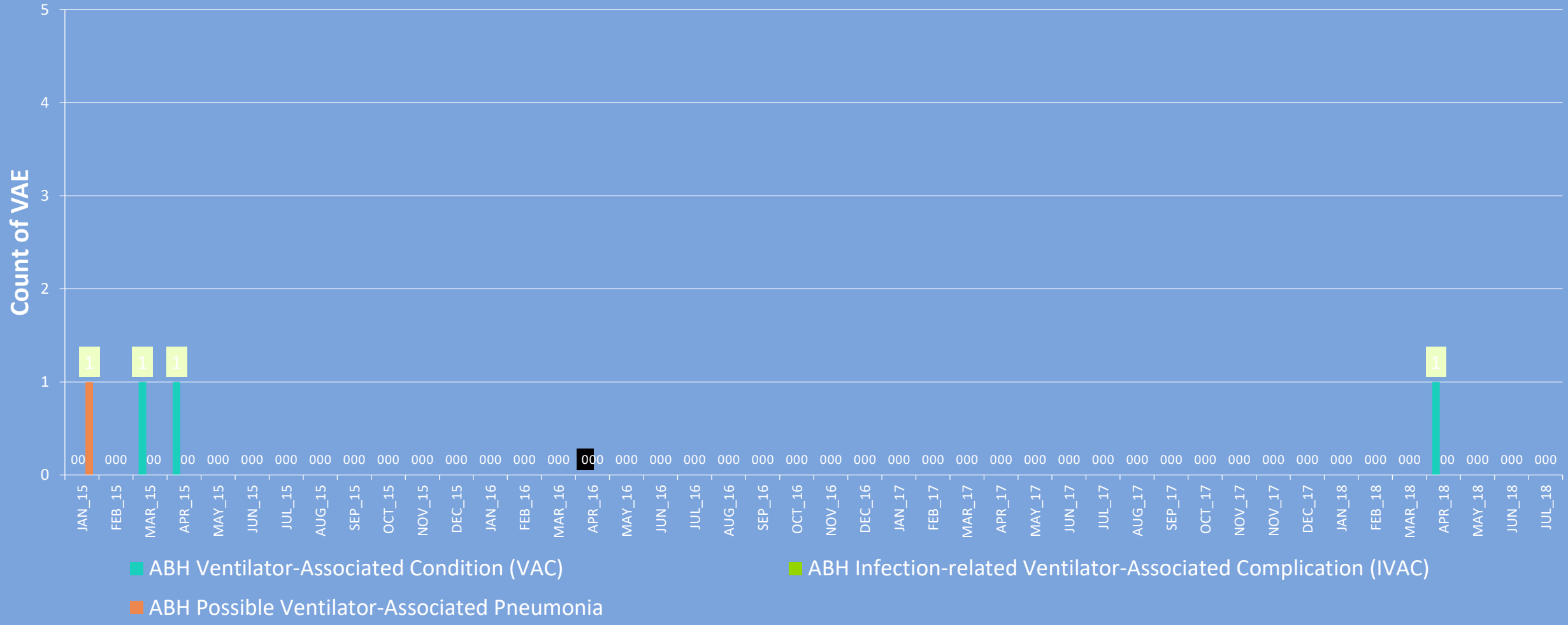
National Healthcare Safety Network
SUR for Ventilator Device Use for Acute Care Hospitals (2015 Baseline) - By OrgID

Ventilator Days	Number Predicted Device Days	SUR	SUR p-value	95% Confidence Interval
1372	2,118.279	0.648	0.0000	0.614, 0.683

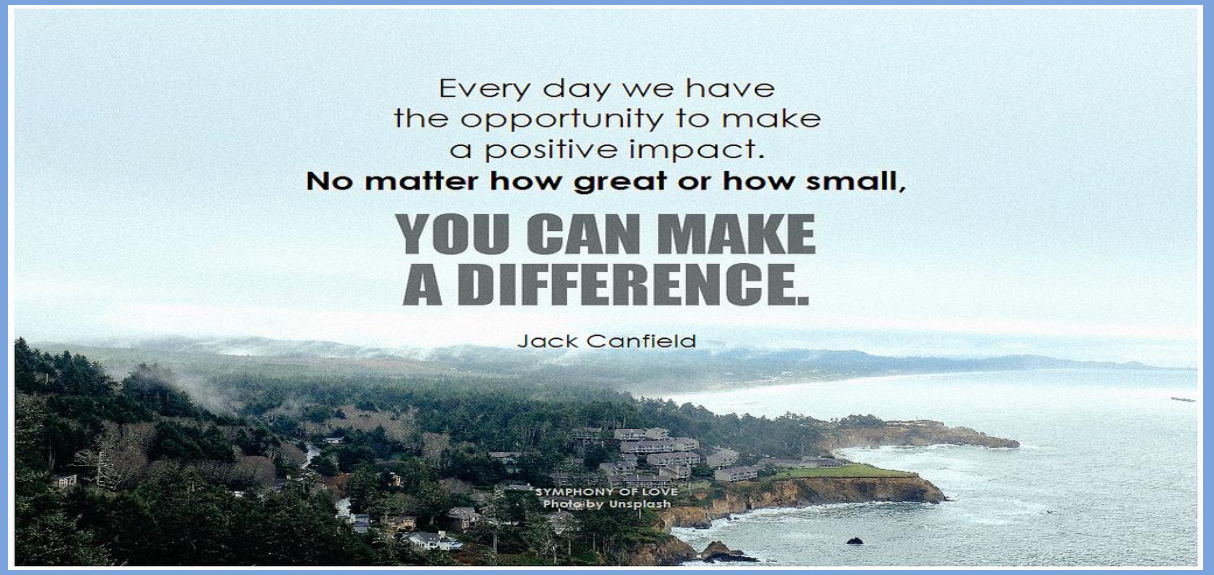
Barriers

- Change in leadership for the ICU and the Respiratory Therapy Departments 2012-2014 time period
- Monitoring the data for 1:1 opportunities to do coaching
- Change in mouth care kits
- New organization had shift in products
- Back order on mouth care kits due to product recalls
- Cost containment for low volume of ventilated patients

AMITA Health Bolingbrook Ventilator Associated Events



Summary



Oral Care every 2 hours
with designated oral care kits

Cuff pressure Checks every 4 hours
Tube position change consistently done daily & tracked at patient care rounds
Daily monitoring of positive end- expiratory pressure valve
Product change to subglottic endotracheal tube
New nebulizer kit for every treatment
Dedicated ICU Nurses and Respiratory Therapist working together

Using IHA estimated cost of HAI- it is a savings of $294K with $15K investment since 2015 initiatives

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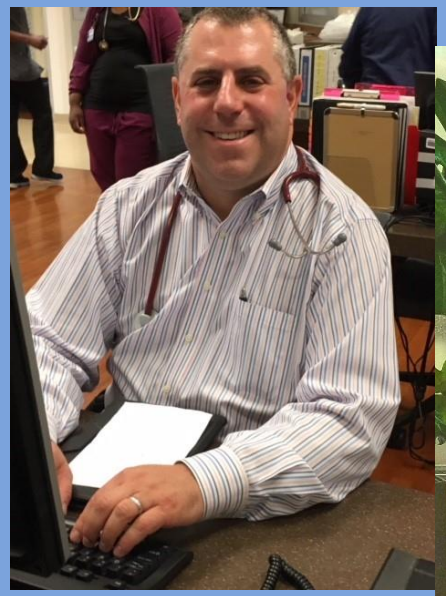
Thank You to the TEAM:
Intensivists, ICU RNs & Respiratory Therapists

ICU nurses

Dr. N. Hansra



Dr. A Rubin

Respiratory Therapists

Without <u>them</u> this would not have happened!

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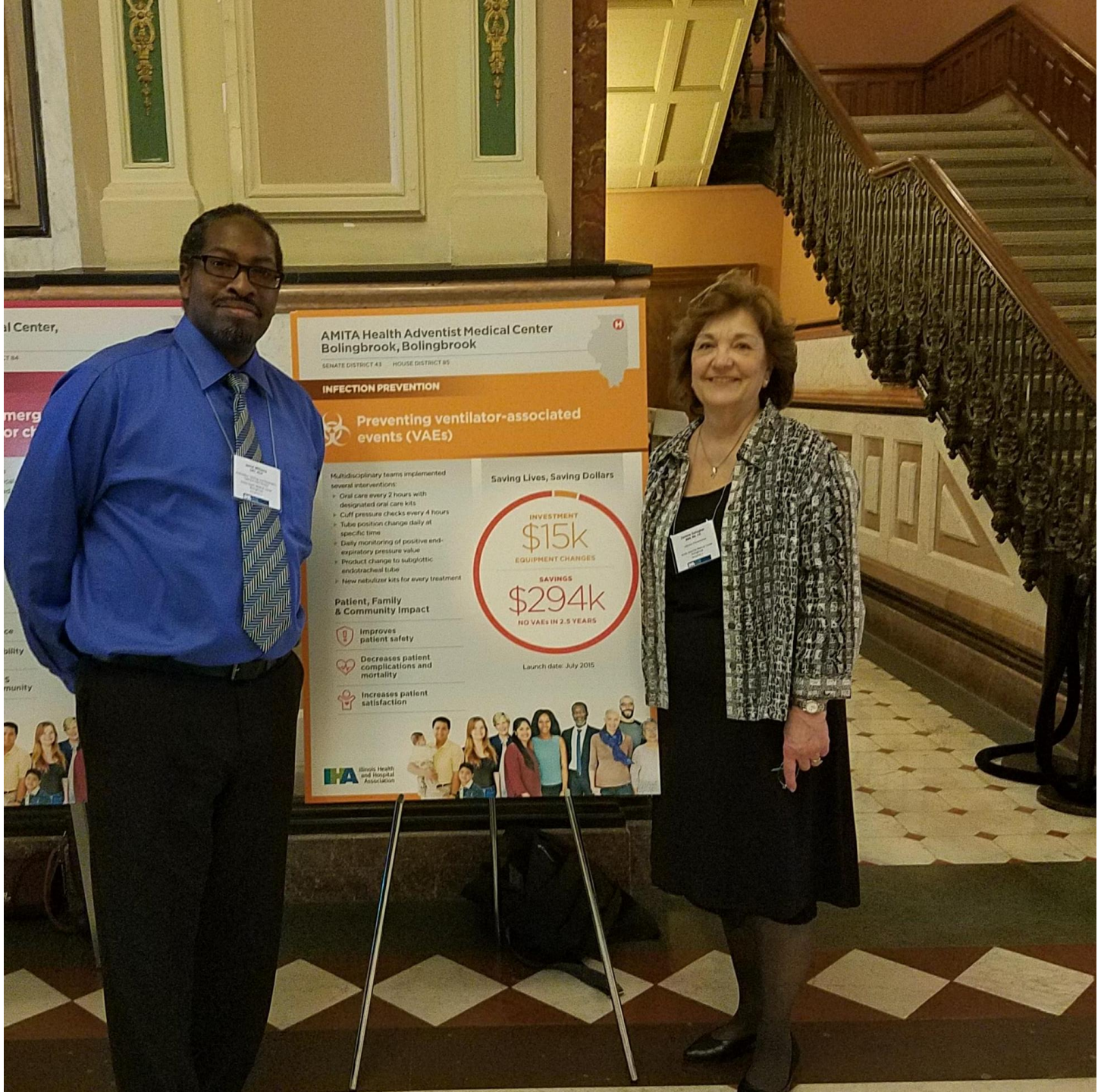

Thank You

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Questions