Role of the C-Suite in High Reliability Antimicrobial Stewardship

1st Annual Texas Medical Center Antimicrobial Resistance and Stewardship Conference
January 19, 2018

M. Michael Shabot, MD, FACS, FCCM, FACMI
Executive Vice President / Chief Clinical Officer
Memorial Hermann Health System

MEMORIAL HERMANN

High Reliability Organizations

Commercial Aviation

Nuclear Aircraft Carriers

Air Traffic Control

Hospital Patient Harm

Question: How many avoidable deaths occur in U.S. hospitals each year?

BMJ **2016**

ANALYSIS

Medical error—the third leading cause of death in the US

Medical error is not included on death certificates or in rankings of cause of death. **Martin Makary** and **Michael Daniel** assess its contribution to mortality and call for better reporting

Martin A Makary *professor*, Michael Daniel *research fellow*

251,454

Department of Surgery, Johns Hopkins University School of Medicine, Baltimore, MD 21287, USA

Source: James JT. A New, Evidence-based Estimate of Patient Harms Associated with Hospital Care. *Jol Patient Safety* 2013;9:122-128.

737 crash every 5.5 hours

Hospital Patient Harm

THE LEAPFROG GROUP

Hospital Choices and why they matter

Hospital Ratings and reports

1000 people will die today due to preventable hospital errors

The hospital you choose matters.

You deserve to know about the quality of care your hospital provides, both good and bad.

Compare Hospitals Now

Source: James JT. A New, Evidence-based Estimate of Patient Harms Associated with Hospital Care. *Jol Patient Safety* 2013;9:122-128.

737 crash every 5.5 hours

MEMORIAL HERMANN

Memorial Hermann's Goal

0 (Zero)

How Can Memorial Hermann Get to Zero?

New Doctors?

New Nursing Staff?

Hospital Administrators Week:
May 13th - 19th, 2015

All New Execs?

How Can Memorial Hermann Get to Zero?

Changing Processes of Care

The Path to Quality Outcomes

Robust Process Improvement:
Path to Quality Outcomes

MEMORIAL HERMANN

Lean

Six Sigma

Change Management

Joint Commission Center for Transforming Healthcare

Board Commitment

Safety as the Core Value

Moving the Memorial Hermann Healthcare System from Safety as a Priority to

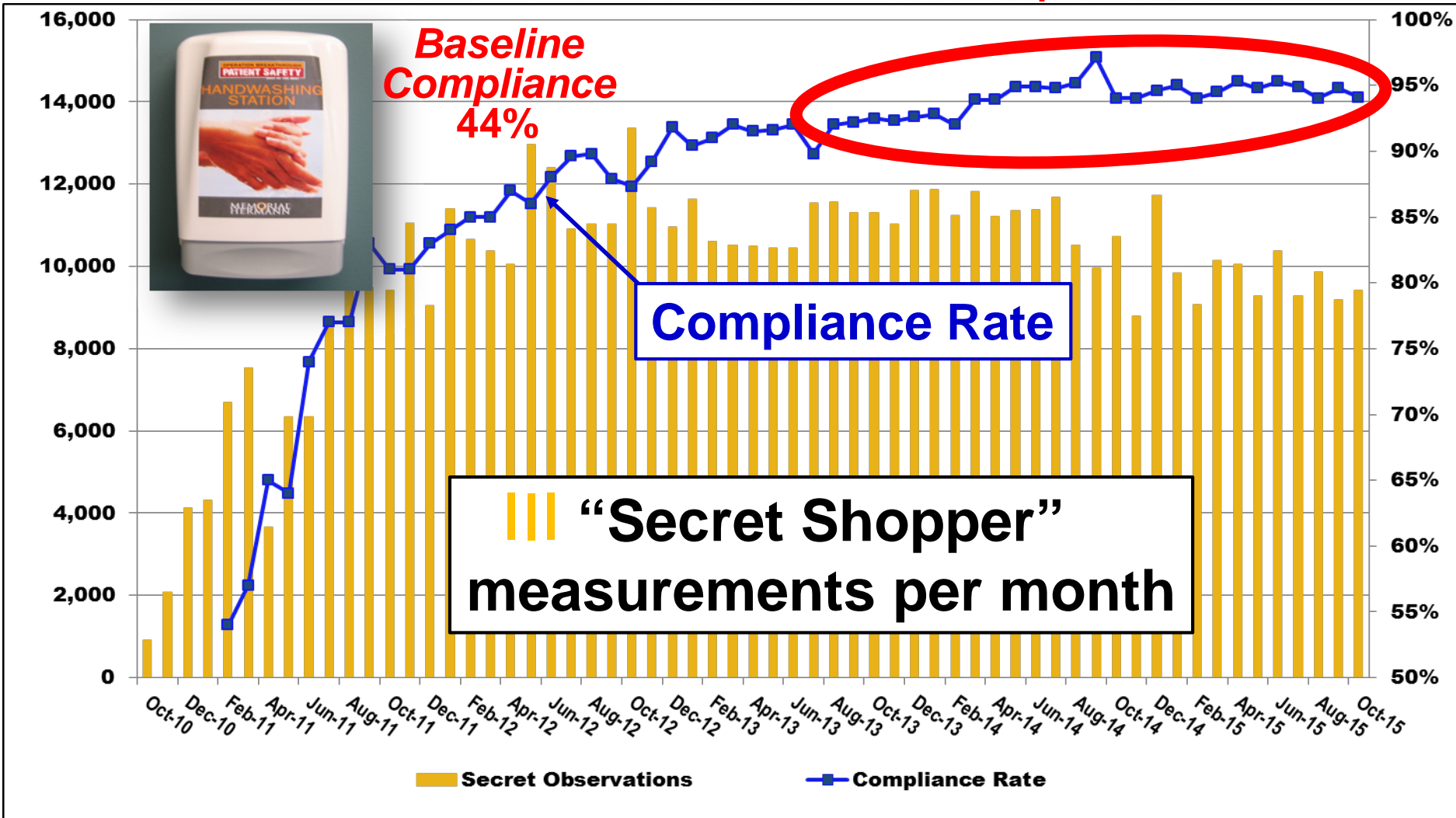# Safety is our Core Value

….

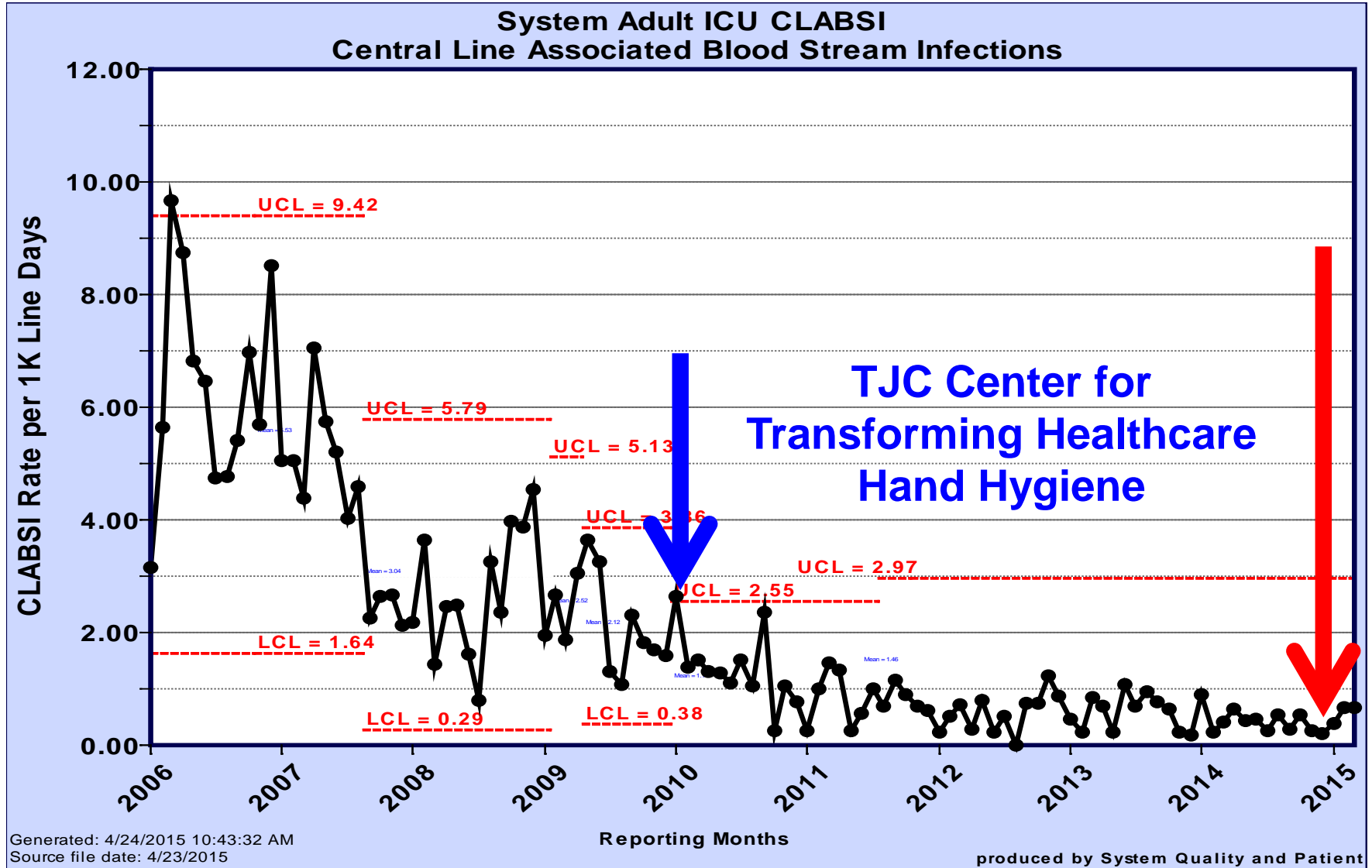*Leadership behavioral expectations change when safety is the core value*

Robust Process Improvement System-Wide Hand Hygiene

Adult ICU Central Line Associated Blood Stream Infections (CLABSI)

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System Adult ICU CLABSI
Central Line Associated Blood Stream Infections

UCL = 9.42
UCL = 5.79
UCL = 5.13
UCL = 3.36
UCL = 2.97
UCL = 2.55
LCL = 1.64
LCL = 0.29
LCL = 0.38

Mean = 6.53
Mean = 3.04
Mean = 2.52
Mean = 2.12
Mean = 1
Mean = 1.46

TJC Center for Transforming Healthcare Hand Hygiene

CLABSI Rate per 1K Line Days

Reporting Months

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Source file date: 4/23/2015

produced by System Quality and Patient

12

Ventilator Associated Pneumonias: All Adult ICUs

System Adult VAP
Ventilator Associated Pneumonia

TJC Center for Transforming Healthcare Hand Hygiene

UCL = 4.30
UCL = 3.12
UCL = 2.47
Mean = 2.19
Mean = 1.37
Mean = 0.73
LCL = 0.07

VAPs Rate per 1K Vent Days

2006 2007 2008 2009 2010 2011 2012 2013

Reporting Months
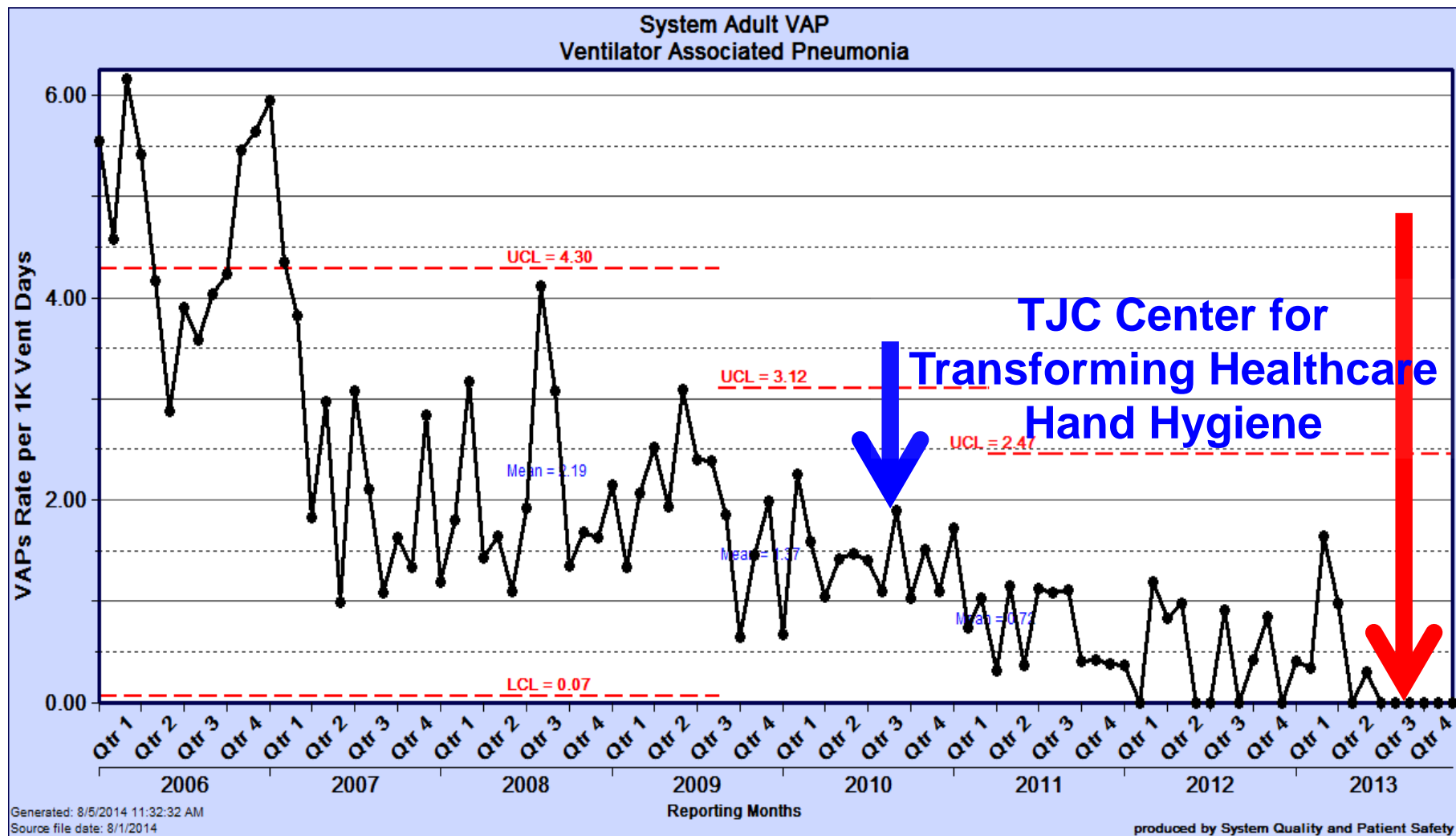
Achieving High Reliability ASP

Changing the processes of care

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ASP High Reliability Core Elements

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●	**Leadership Commitment**	• Dedicate necessary human, financial, and information technology resources.
●	**Accountability**	• Appoint a single leader responsible for program outcomes who is accountable to an executive-level or patient quality-focused hospital committee.
●	**Drug Expertise**	• Appoint a single pharmacist leader responsible for working to improve antibiotic use.
●	**Action**	• Implement at least one recommended action, such as systemic evaluation of ongoing treatment need after a set period of initial treatment.
●	**Tracking**	• Monitor process measures, impact on patients, antibiotic use, and resistance.
●	**Reporting**	• Report the above information regularly to doctors, nurses, and relevant staff.
●	**Education**	• Educate clinicians about disease state management, resistance, and optimal prescribing.

ASP Leadership

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Ensuring ASP Leadership

- System C-Suite support

- Hospital C-Suite support

- Ensuring the appointment of one or more lead clinicians in each hospital

- Ensuring appointment of a lead pharmacist partner in each hospital

Medical Informatics & IT Support

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Physician Alert

48 – 72 Hour De-escalation Alert

- Targeted agents
  - Cefepime, Meropenem, Piperacillin/Tazobactam
  - Vancomycin, Daptomycin, Linezolid

- Reviewed by Acute Care Medical Information Committee CPC (Clinical Programs Committee)

- Currently in Informatics design phase

MHMD Clinical Programs Committee & Subcommittees

MHMD — Memorial Hermann Physician Network

MHMD Board of Directors

Clinical Programs Governance Council

H&V   Neu...   ...ntract   Primary Care

2016 SUMMARY OF ACTIONS

519 Evidence-Based Practice Recommendations made by CPCs in 2016

Inform...   ...er Review

Acute S...

Safety & Quality Guideline MEC Approval

"Up and Over"

Clinical Operations Leadership Group

Hospital MECs (12)

Clinical Programs Governance Council

CPC Subcommittee(s): Critical Care → Surgery → Medicine

ICU Safe Practice Guideline: To prevent injury to adjacent organs when central lines are inserted, the following practice guideline is recommended:

- Real-time ultrasound guidance will be used for placement of all central venous catheters, whenever possible.

- Physicians and other individuals placing central lines under real-time ultrasound guidance will receive appropriate training in the use of ultrasound for this purpose.

Orders-Phased Approach

- **Phase 1**
  - 90% of most utilized antibiotics COMPLETE

- **Phase 2**
  - All remaining antibiotics available thru an <u>MPP</u> (Cerner order set).
    - Antifungal, antiviral, and antimalarial NOT included.

- **Phase 3**
  - All remaining antibiotics in the order catalog not included in Phase 1 or Phase 2
  - Include identified antifungal, antiviral, and antimalarial.

Microbiology Support

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Real-Time PCR Organism Identification

- Identification of genus, species, and genetic resistance determinants for a broad panel of Gram-positive and Gram negative bacteria

- Performed directly from positive blood culture bottles

- Requires approximately 3 hours for completion
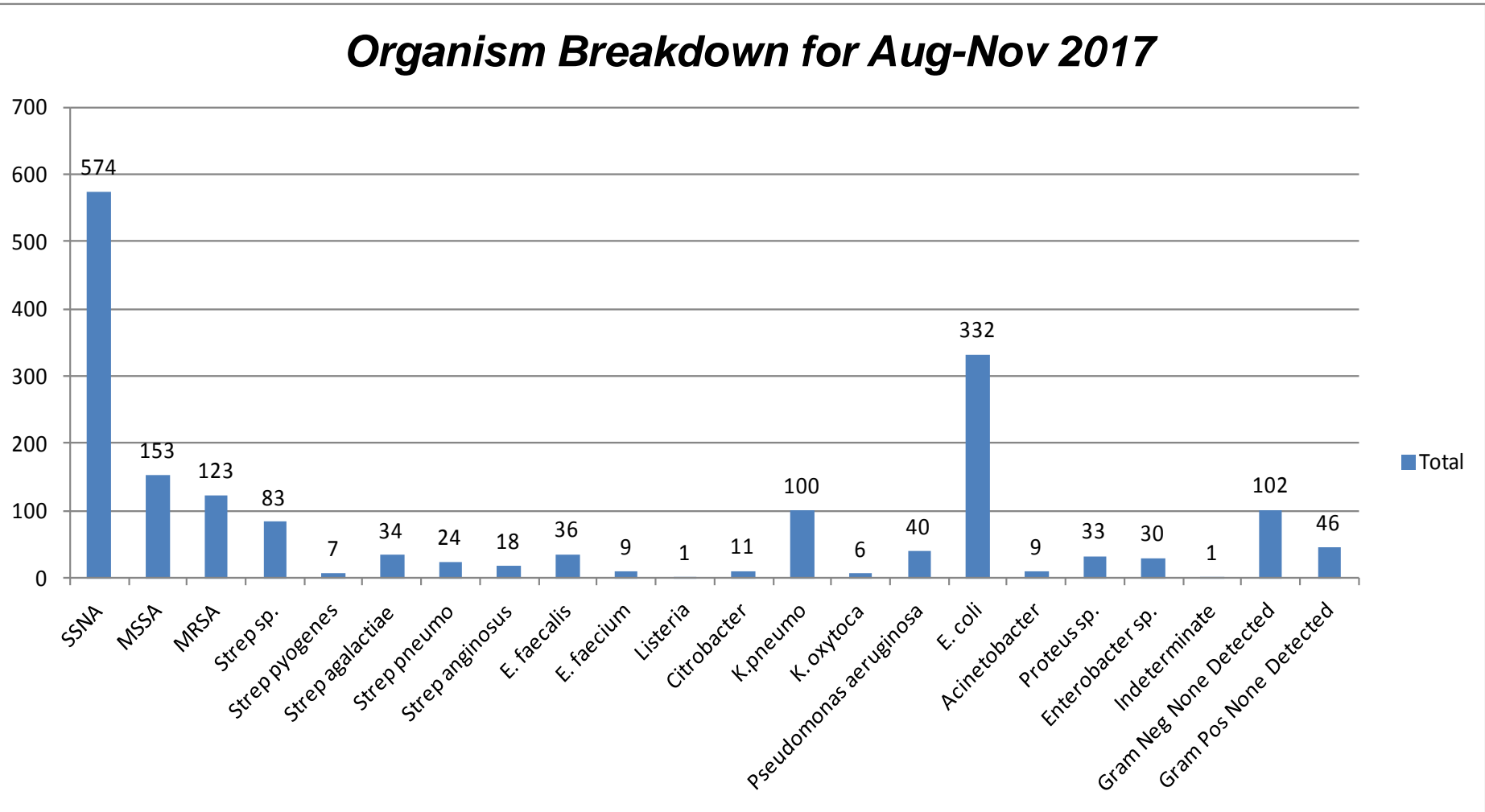
Real-Time PCR Interventions (October)

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Campus	Number of Real-Time PCR alerts	Number of actual interventions	Pharmacist Intervention			MD Interventions		
			Number of Escalation	Number of De-escalation	Number of D/C Abx	MD Escalate	MD De-escalate	MD Discontinue
NE	23	4	0	0	1	2	0	1
MC	53	3	3	0	0	0	0	0
GH	36	6	0	2	4	0	0	0
TW	38	3	2	0	0	1	0	0
KT	25	6	2	4	0			
PL	10	0	0	0	0			
TIRR		0						
KT-Rehab	0	0						
SE	45	16	7	8	1	0	0	0
SW		10	1	2	3	0	0	.
TMC		0						
SL	19	7	0	0	4	0	1	2
Totals	249	55	15	16	13	3	1	3

Overall Intervention Rate: 22.09%

Pharmacist Intervention Rate: 17.67%

Real Time PCR Organisms

Organism Breakdown for Aug-Nov 2017

Organism	Total
SSNA	574
MSSA	153
MRSA	123
Strep sp.	83
Strep pyogenes	7
Strep agalactiae	34
Strep pneumo	24
Strep anginosus	18
E. faecalis	36
E. faecium	9
Listeria	1
Citrobacter	11
K.pneumo	100
K. oxytoca	6
Pseudomonas aeruginosa	40
E. coli	332
Acinetobacter	9
Proteus sp.	33
Enterobacter sp.	30
Indeterminate	1
Gram Neg None Detected	102
Gram Pos None Detected	46

PCR Turnaround Time

- From In-Lab to Complete is 3 hours and 34 minutes

August	August	Sept	Sept	Oct	Oct	Nov	Nov
Average TAT	Total #	Average TAT	Total #	Average TAT	Total #	Average TAT	Total #
3:49	144	3:23	541	3:19	542	3:44	520

Who You Gonna' Call?

"Inside every problem there's a another problem struggling to get out."

Anon

Escalation of PCR Results

- Gram stain results called to inpatient locations and physicians at MH-TMC

- From 7:00 am – 7:00 pm, alerts are sent to Clinical Pharmacists, who evaluate and adjust antibiotic therapy

- After 7:00 pm, go to queue, where they are reviewed the next day.

- Currently a subgroup is working to change the 7:00 pm after hours service.

ICU Clinical Support

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Universal Decolonization

- ## <u>Current State - Intensive Care Units</u>
  - Universal Decolonization Pilot
    - Greater Heights, Southeast, Texas Medical Center
    - Mupirocin + Chlorhexidine Bath x 5 days
  - MRSA PCR Screening
    - Katy, Memorial City, Northeast, Southwest, Sugar Land, The Woodlands
    - Automatic PCR and isolation orders for some campuses

- Variations in practices across the system

Next Steps?

- Universal Decolonization vs. Automatic MRSA PCR Screen
  - Universal Decolonization MPP (order set)?

- Clinical Utility of MRSA PCR Testing

FY17 ASP Goal

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FY17 ASP Goal

Reduction in Antimicrobial Expenditure by 5% (FY17 vs FY16)

Results

Antimicrobial Utilization Cost

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Total Spend:

System	FY16	FY17	$ Change	% Change
SYSTEM	$15,549,684	$14,021,389	($1,528,295)	-10%

Per Adjusted Patient Day:

Hospital	FY16 $ / adj. pt day	FY17 $ / adj. pt day	$ Change	% Change
SYSTEM	$13.74	$11.50	($2.23)	-16%

Summary

Summary

MEMORIAL HERMANN

Leadership Commitment	• Dedicate necessary human, financial, and information technology resources.
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Hospital Patient Harm

Memorial Hermann's Goal

0 (Zero)

High Reliability
Certified Zero Award

1. **Zero Events**

2. **12 Consecutive Months**

3. **Certified Zero Category**

MH Katy: Zero Central Line Blood Stream Infections Hospital-Wide

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Katy Adult Hospital CLABSI
Do No Harm
Central Line Associated Blood Stream Infections

Blood Stream Infection Prevention Bundle	15-Jan	14-Dec	14-Nov	14-Oct	14-Sep	14-Aug	14-Jul	14-Jun	14-May	14-Apr	14-Mar	14-Feb
Central Line Insertion												
MD Hand Hygiene	97.83%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Chlorhexadine	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
MD gown, gloves, hat & mask	100.00%	97.37%	100.00%	100.00%	100.00%	100.00%	100.00%	97.14%	100.00%	95.24%	100.00%	100.00%
Drape patient head to toe	100.00%	97.37%	100.00%	100.00%	96.43%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Sterile field maintained during procedure	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Assistant Hand Hygiene	100.00%	100.00%	100.00%	97.50%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Assistant gown, gloves, hat & mask	97.83%	100.00%	96.88%	97.50%	100.00%	100.00%	96.00%	100.00%	100.00%	100.00%	95.24%	96.88%
Insertion Bundle Compliance	95.65%	94.74%	96.88%	97.50%	96.43%	100.00%	96.00%	97.14%	100.00%	95.24%	95.24%	96.88%
% Femoral Lines	8.70%	0.00%	0.00%	2.50%	0.00%	0.00%	0.00%	2.86%	2.78%	0.00%	0.00%	0.00%
% Femoral Lines justified by careful site selection	100.00%			100.00%				100.00%	100.00%			
Ultrasound Guidance												
% Ultrasound Guided CVC Insertions	100.00%	100.00%	92.31%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

2012

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High Reliability
Certified Zero Award

To: Memorial Hermann Katy Hospital

Zero Central Line Associated Bloodstream Infections

Hospital-wide for 12 months

July 2011 to June 2012

Dan Wolterman
President & Chief Executive Officer

M. Michael Shabot, M.D.
System Chief Medical Officer

Robert G. Croyle
Chair, Health System Board

BREAKTHROUGHS IN PATIENT SAFETY

Central Line Bundle Compliance

Zero CLABSIs Hospital-Wide x 17 Months

CLABSI Rate per 1K Line Days — 14.00, 12.00, 10.00, 8.00, 6.00, 4.00, 2.00, 0.00

Mar / Apr / May / Jun / Jul / Aug / Sep / Oct / Nov / Dec / Jan / Feb / Mar / Apr / May / Jun / Jul

2011   **2012**

Reporting Months

MH Northeast: Zero Catheter Associated Urinary Tract Infections Hospital-Wide

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2017

MEMORIAL®
HERMANN

High Reliability
Certified Zero Award

To: Memorial Hermann Northeast Hospital

Zero Catheter-Associated Urinary Tract Infections

Hospital-wide for 12 months

February 2016 to January 2017

Benjamin K. Chu, M.D.
President & Chief Executive Officer

M. Michael Shabot, M.D.
System Chief Clinical Officer

Deborah M. Cannon
Chair, Health System Board

BREAKTHROUGHS IN
PATIENT SAFETY
BEST OF THE BEST

High Reliability 2011-2017
Certified Zero Awards

MEMORIAL HERMANN

263

ICU Central Line Associated Bloodstream Infections (18)

ICU Catheter Associated Urinary Tract Infections (16)

Hospital-Wide Central Line Associated Bloodstream Infections (7)

Hospital-Wide Catheter Associated Urinary Tract Infections (5)

Ventilator Associated Pneumonias (23)

Surgical Site Infections

Retained Foreign Bodies (46)

Iatrogenic Pneumothorax (24)

Accidental Punctures and Lacerations (3)

Pressure Ulcers Stages III & IV (37)

Hospital Associated Injuries (7)

Deep Vein Thrombosis and/or Pulmonary Embolism (2)

Deaths Among Surgical Inpatients with Serious Treatable Complications (1)

Birth Traumas (16)

Obstetric Trauma in Natural Deliveries with Instrumentation (4)

Serious Safety Events 1&2 (21)

Serious Safety Events 1 & 2 for 1000 Days (2)

All Serious Safety Events (1)

Early Elective Deliveries (9)

Manifestations of Poor Glycemic Control (21)

2014
MEMORIAL HERMANN
High Reliability
Certified Zero Award
To: Memorial Hermann Northeast Hospital
Zero Early Elective Deliveries for 12 months
January 2013 to December 2013

High Reliability Organizations

Commercial Aviation

Nuclear Aircraft Carriers

Air Traffic Control

High Reliability Organizations

Memorial Hermann Health System

Nuclear Aircraft Carriers
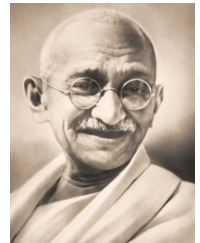

Commercial Aviation

Air Traffic Control

OPERATION BREAKTHROUGH
PATIENT SAFETY
BEST OF THE BEST

Thank you!

"You must be the change you want to see in the world"

Mahatma Gandhi (1869-1948)