NATIONAL QUALITY FORUM

Measuring and Preventing CLABSI

Featuring:

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Surveillance Branch Chief, Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention

Peter Pronovost, MD, PhD
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Moderated by:

Camille Espinoza, MSPH, MSW
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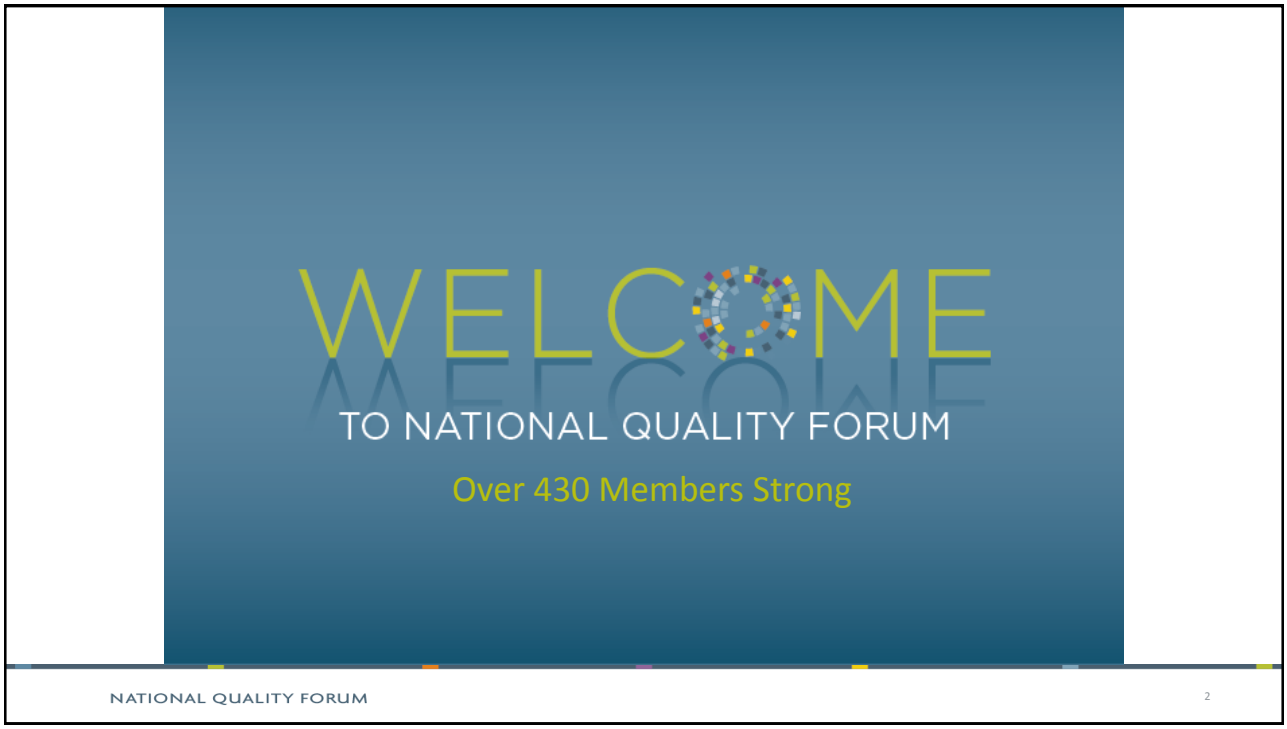
February 23, 2017



Today's Speakers

Daniel Pollock, MD
Surveillance Branch Chief, Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention

Peter Pronovost, MD, PhD
Senior Vice President, Patient Safety and Quality
Johns Hopkins Medicine

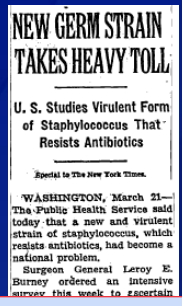
What Difference Does A Measure Make?

Measuring CLABSI: The Role of CDC's National Healthcare Safety Network (NHSN)

Daniel A. Pollock, M.D.
Surveillance Branch Chief
Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious Diseases

NQF Webinar "Measuring and Reducing CLABSI"
February 23, 2017

CDC's Response to Hospital Infections Began in the Late 1950s with Investigations of Antibiotic Resistant Staphylococcus



NEW GERM STRAIN TAKES HEAVY TOLL

U. S. Studies Virulent Form of Staphylococcus That Resists Antibiotics

Special to The New York Times.

WASHINGTON, March 21— The Public Health Service said today that a new and virulent strain of staphylococcus, which resists antibiotics, had become a national problem.

Surgeon General Leroy E. Burney ordered an intensive survey this week to ascertain

"Dr. Alexander Langmuir, chief of the epidemiological branch of the Atlanta center . . . said the center had made intensive investigations of at least a dozen of these outbreaks" *New York Times,* March 22, 1958

DEATH FROM THE HOSPITAL NURSERY

A new, virulent organism, breeding in nurseries for the newborn, is rocking the medical world

"A new, virulent organism, breeding in nurseries for the newborn, is rocking the medical world" *Ladies' Home Journal,* February 1959

CDC's Role in Healthcare-Associated Infection (HAI) Surveillance and Clinical Quality Measurement - Major Milestones

1957-58	Epidemic Intelligence Service (EIS) Committee on Hospital Infection Reporting issues CDC's first HAI surveillance recommendations
1965-66	HAI surveillance pilot projects at six hospitals
1970	National Nosocomial Infection Surveillance (NNIS) system launched with 62 participating hospitals
1974-83	Nationwide Study of the Efficacy of Nosocomial Infection Control (SENIC) project
1992	Healthcare Infection Control Practices Advisory Committee (HICPAC) established
2003	CLABSI and catheter-associated urinary tract infection (CAUTI) included in National Quality Forum's (NQF's) first hospital performance measures
2005	National Healthcare Safety Network (NHSN) succeeds the NNIS system
2011	Centers for Medicare and Medicaid Services (CMS) adds NHSN CLABSI measure to the CMS hospital inpatient quality reporting program

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NHSN CLABSI Measure – NQF #0139 – Single Metric, Multiple Purposes

Measure Uses:

- ☑ Public health/disease surveillance
- ☑ Quality improvement (internal to the specific organization)
- ☑ Quality improvement (external benchmarking involving multiple organizations)
- ☑ Public reporting
- ☑ Payment program
- ☐ Regulatory and accreditation programs
- ☐ Professional certification or recognition program

CMS and States Require Hospitals to Report CLABSI Data to CDC's NHSN for a Variety of Programmatic Purposes

CMS Program	Effective Date
Hospital Inpatient Prospective Payment System	2011 Acute Care Hospital ICUs 2015 Acute Care Hospital Wards
Long Term Care Hospital Prospective Payment System	2012
Cancer Hospital (Prospective Payment System Exempt)	2013
Hospital-Acquired Condition (HAC) Reduction	2015
Hospital Value Based Purchasing (HVBP)	2015

States (34)	Effective Date
AK, AL, AR, CA, CO, CT, DE, GA, HI, IL, IN, KY, MA, MD, ME, MS, NC, NE, NH, NJ, NM, NV, NY, OK, OR, PA, SC, TN,TX, UT, VA, VT, WA, WV	2006 (VT, NY) to 2017 (NE) with other states' requirements starting between those dates

NHSN CLABSI Criteria – NQF #0139

Microbiologic confirmation – A bloodstream infection that is laboratory confirmed (i.e., positive blood culture results)

Timing – Infection occurs on or after the 3rd calendar day of admission to a hospital inpatient location

Other infection source ruled out – Not secondary to an infection at another site, such as a urinary tract infection or pneumonia

Associated with central line use – A central line or umbilical catheter was in place for more than 2 calendar days and on the date of the infection event or the day before

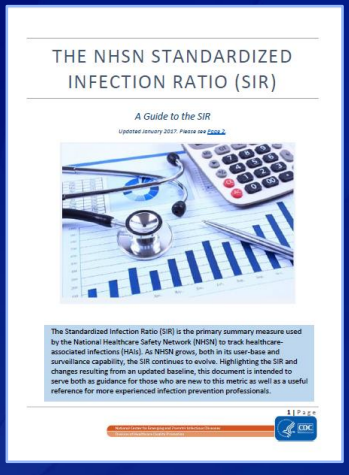
NHSN CLABSI Measure Data – NQF #0139

Numerator data – Total number of observed healthcare-associated CLABSIs among patients in inpatient care locations during the data period

Denominator data – Total number of central line days for each patient care location brought under surveillance during the data period

Data analyses – The CLABSI standardized infection ratio (SIR) is the quantitative centerpiece of NQF #0139. The SIR is calculated by dividing the number of observed CLABSIs by the number of predicted CLABSIs, producing a ratio of observed to predicted infections. The number of predicted CLABSIs is calculated using probabilities estimated from risk models that adjust for differences in patient and hospital characteristics known to contribute to CLABSI risk.

Standardized Infection Ratio (SIR) – The Basics


THE NHSN STANDARDIZED INFECTION RATIO (SIR)

A Guide to the SIR

Updated January 2017. Please see Page 2.

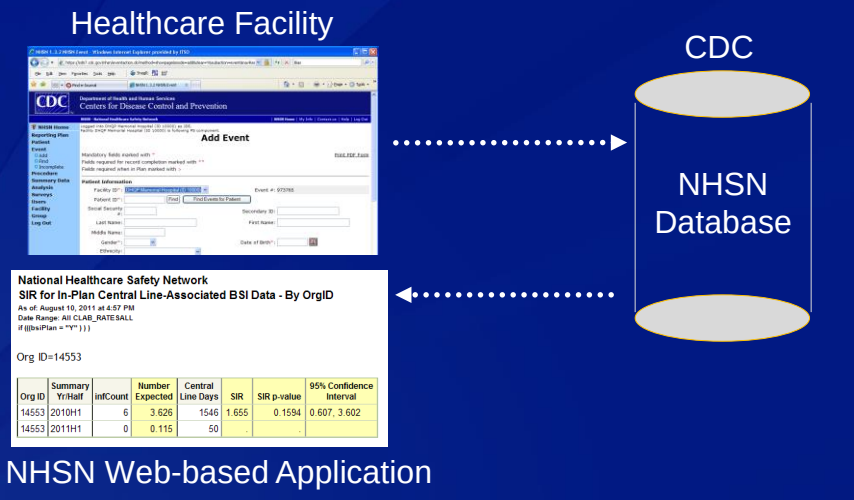
The Standardized Infection Ratio (SIR) is the primary summary measure used by the National Healthcare Safety Network (NHSN) to track healthcare-associated infections (HAIs). As NHSN grows, both in its user-base and surveillance capability, the SIR continues to evolve. Highlighting the SIR and changes resulting from an updated baseline, this document is intended to serve both as guidance for those who are new to this metric as well as a useful reference for more experienced infection prevention professionals.

1 | Page

- A summary statistic used to track HAIs at the healthcare facility, state, and national levels
- A single SIR can provide a composite quality measure by combining HAI data across multiple strata, e.g., patient care locations, into one summary statistic, e.g., a hospital's CLABSI SIR
- A SIR value greater than 1.0 indicates more HAIs were observed than predicted
- A SIR less than 1.0 is better than a SIR above 1.0

https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf

CLABSI Measure Data Submitted to NHSN are Entered into a CDC Database and Are Available for Immediate Analysis by NHSN Users



Org ID	Summary Yr/Half	infCount	Number Expected	Central Line Days	SIR	SIR p-value	95% Confidence Interval
14553	2010H1	6	3.626	1546	1.655	0.1594	0.607, 3.602
14553	2011H1	0	0.115	50	.	.	

NHSN User-Generated Standardized Infection Ratio (SIR) Table

National Healthcare Safety Network

SIR for In-Plan Central Line-Associated BSI Data - By OrgID

As of: August 10, 2011 at 4:57 PM
Date Range: All CLAB_RATESALL
if (((bsiPlan = "Y")))

Org ID=14553

Observed CLABSIs

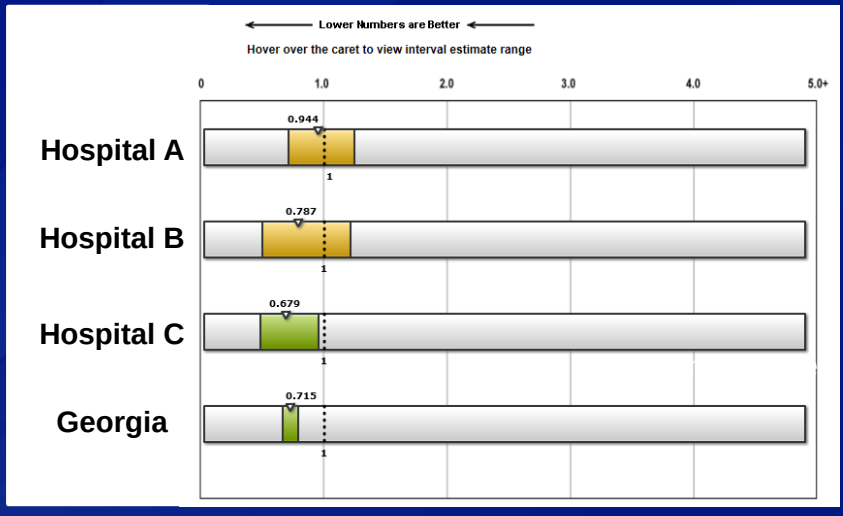
Predicted CLABSIs

CLABSI denominator data

Standardized Infection Ratio

Org ID	Summary Yr/Half	infCount	Number Expected	Central Line Days	SIR	SIR p-value	95% Confidence Interval
14553	2010H1	6	3.626	1546	1.655	0.1594	0.607, 3.602
14553	2011H1	0	0.115	50	.	.	

CLABSI Data Publicly Reported as SIRs at CMS Hospital Compare Web Site



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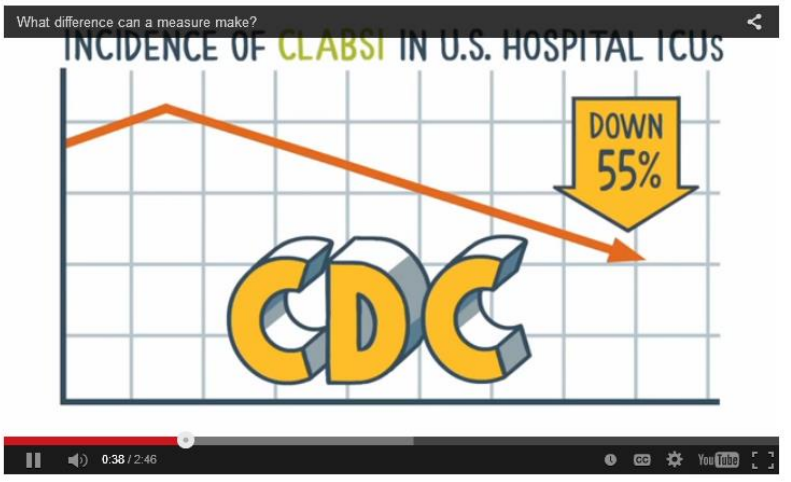
What difference does a measure make?



http://www.qualityforum.org/membership/measure_difference/

HAI Measurement via NHSN in the Current Policy Environment

NHSN at Launch - 2005
~ 300 hospitals

1. Purely voluntary and confidential system
2. Healthcare facilities initially enrolled had all participated in legacy CDC system(s)
3. Primary motivation for facilities is internal quality of care improvement
4. Expectation that facilities are motivated to submit data to CDC that are high quality and complete

Current Environment

- **Public reporting**
- **Pay for reporting**
- **Pay for performance**

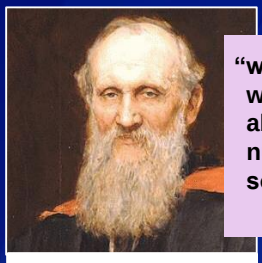
Impact

- **Changes in NHSN's purposes, infrastructure, and operations**
- **Intense scrutiny of HAI case criteria, surveillance practices, and analytic methods**
- **Pressure to simplify HAI definitions and move to electronic HAI detection and reporting**

NHSN at Age 12 - 2017
~ 21,000 facilities

1. Predominantly mandatory and public reporting system
2. Vast majority of healthcare facilities enrolled had not participated in legacy CDC system(s)
3. Primary motivation for facilities is compliance with reporting requirements
4. External data validation has heightened importance

What Difference Can Measurement Make?



Lord Kelvin

"when you can measure what you are speaking about, and express it in numbers, you know something about it . . . "

"In the pursuit of health care quality improvement, measurement is necessary but is no more sufficient than measuring a golf score makes for better golf."

Donald Berwick

https://archive.org/stream/popularlecturesa01kelvuoft#page/72/mode/2up
http://www.jstor.org/stable/3767726

Thank You!

Please contact me at dap1@cdc.gov

For more information about NHSN:
http://www.cdc.gov/nhsn

Division of Healthcare Quality Promotion
National Center for Emerging and Zoonotic Infectious Diseases

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Toward eliminating all harm; the need for new narratives

Peter Pronovost, MD, PhD, FCCM
The Johns Hopkins University

February 16, 2017

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Three narratives that hinder progress

- Harm is inevitable rather than preventable
- Safety is a local project rather than an integrated operating management system
- Safety is based on the heroism of clinicians rather than the design of safe systems

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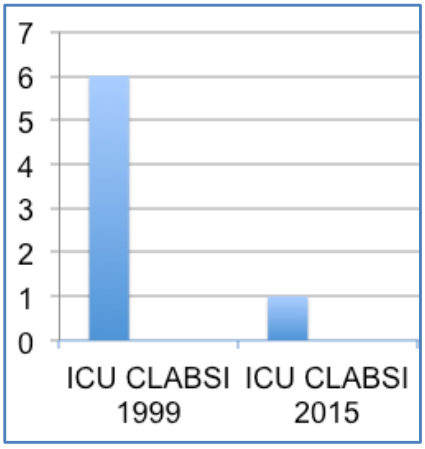
New Narrative: Harm is preventable

Change in US CLABSI Rates

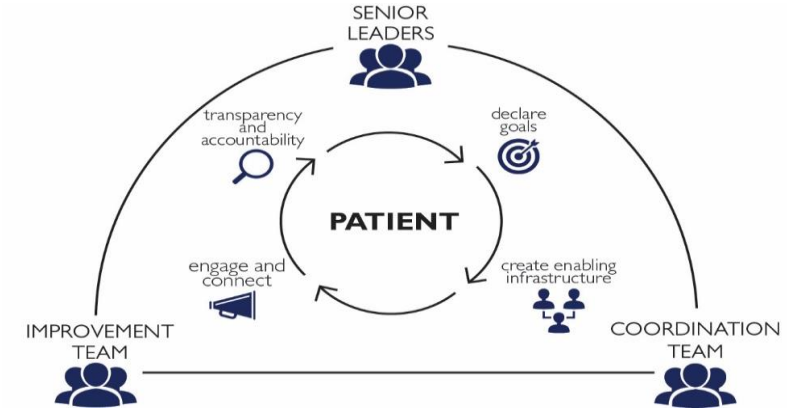


Source: Pronovost; 5 years after to err is human: a success story to learn from; BMJQS 2015
*Dixon-Woods, what is improvement science the Health foundation 2013
Marshall, Promotion of improvement as a science; Lancet 2013

Why did CLABSI Work at Policy Level?

- Reliable and valid measurement system
- Evidence-based practices from clinical and basic research
- Investment in implementation (improvement) science*
- Local ownership (CUSP team) and peer learning communities
- Align and synergize efforts of many around a common goal and measure

What did this work at organizational level



Pronovost J Health Organization and Management 2017

What did this work at a team and individual level

Dixon-Woods; Explaining Michigan Milbank Quarterly

Toward Eliminating all Harms High Reliability Organizations

Photo credit: U.S. Navy

Pursuit of excellent performance under complex and dynamic conditions

Weick & Sutcliffe 2015

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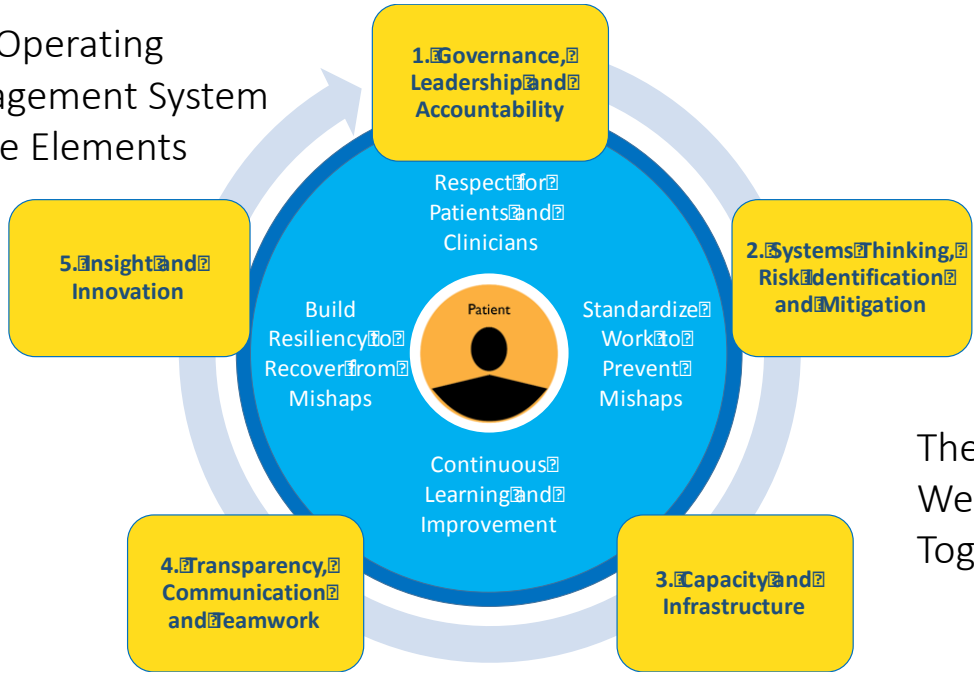
JHM Operating Management System 5 Core Elements



The Way We Work Together

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New Narrative: Harm is preventable

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[5]Lipitz-Snyderman et al. Impact of a statewide intensive care unit quality improvement initiative on hospital mortality and length of stay: retrospective comparative analysis. BMJ 2011;342:d219.
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Safety is based on design of safe systems

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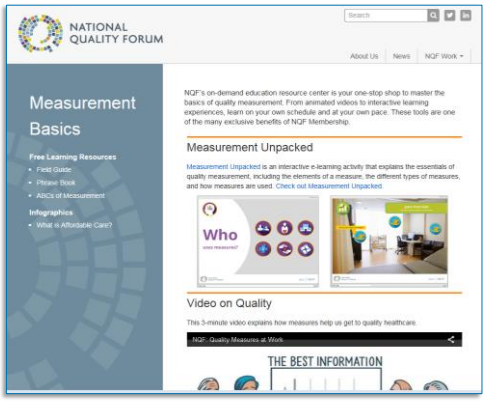
Your Feedback

Comments? Questions?

Please type into the chat box anytime

Additional Resources: Member Education



Access learning tools on-demand, such as webinar recordings, videos, and infographics:

www.qualityforum.org/membership/eduondemand

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