

# Welcome

Office for State, Tribal, Local and Territorial Support  
*presents . . .*

## **CDC Vital Signs** **How Three States Tackled Sepsis**

**August 30, 2016**  
**2:00–3:00 pm (EDT)**



Centers for Disease Control and Prevention  
Office for State, Tribal, Local and Territorial Support

# Agenda

- |                |                                   |   |
|----------------|-----------------------------------|---|
| <b>2:00 pm</b> | <b>Welcome &amp; Introduction</b> | <b>Matthew Penn, JD, MLIS</b><br>Director, Public Health Law Program, Office for State, Tribal, Local and Territorial Support, CDC  |
| <b>2:04 pm</b> | <b>Overview</b>                   | <b>Tony Fiore, MD, MPH</b><br>Chief, Epidemiology Research and Innovations Branch, Division of Healthcare Quality Promotion, National Center for Emerging & Zoonotic Infectious Diseases, CDC   |
| <b>2:08 pm</b> | <b>Presentations</b>              | <b>Jim O'Brien, MD</b><br>Vice President, Quality and Patient Safety, Riverside Methodist Hospital, OhioHealth<br><br><b>Marcus Friedrich, MD, MBA</b><br>Medical Director, Office of Quality and Patient Safety, New York State Department of Health<br><br><b>Kelly Court, MBA</b><br>Chief Quality Officer, Wisconsin Hospital Association |
| <b>2:38 pm</b> | <b>Q&amp;A and Discussion</b>     | <b>Matthew Penn, JD, MLIS</b>   |
| <b>2:55 pm</b> | <b>Wrap-up</b>                    |   |
| <b>3:00 pm</b> | <b>End of Call</b>                |   |



**CDC**  
**Vital**signs™ Teleconference  
to support STLT efforts and build  
momentum around the monthly  
release of CDC *Vital Signs*



# **CDC *Vital Signs* Town Hall Making Health Care Safer Think Sepsis. Time Matters.**

**Anthony Fiore, MD MPH**

**Chief, Epidemiology Research And Innovations Branch  
Division of Healthcare Quality Promotion**

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

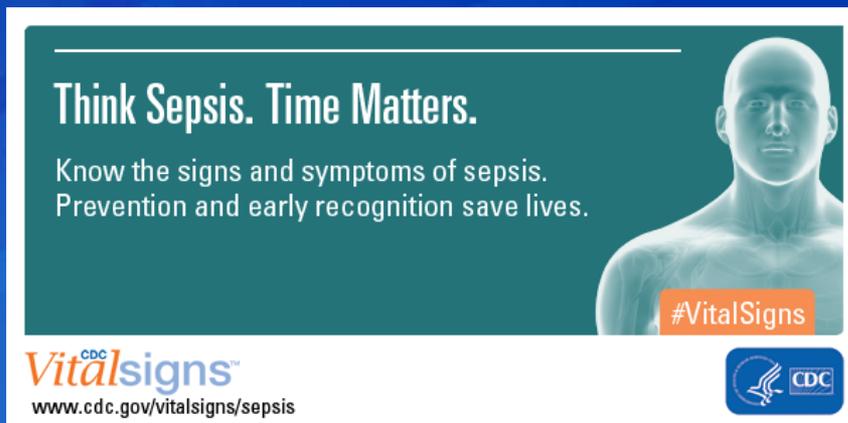
U.S. Department of Health and Human Services

Centers for Disease Control and Prevention



# What is Sepsis?

- ❑ Sepsis is a complication caused by the body's overwhelming and often life-threatening response to an infection. It can lead to organ failure, tissue damage, and death.
- ❑ Sepsis is a medical emergency.
- ❑ An infection that is getting worse and not treated can lead to sepsis, so urgent treatment matters.



Think Sepsis. Time Matters.

Know the signs and symptoms of sepsis.  
Prevention and early recognition save lives.

#VitalSigns

**Vital**<sup>CDC</sup>signs™  
[www.cdc.gov/vitalsigns/sepsis](http://www.cdc.gov/vitalsigns/sepsis)



The graphic features a human torso with glowing internal organs, set against a dark green background. The text is white and orange. The CDC logo is in the bottom right corner.

# Epidemiology of Sepsis

- ❑ Sepsis **most often occurs** in people:
  - Over the age of 65, or infants less than one year of age.
  - With chronic diseases (such as diabetes) or weakened immune systems.
  
- ❑ Sepsis is most often associated with **infections of the lung, urinary tract, skin, or gut.**
  
- ❑ Common germs that cause sepsis are ***Staphylococcus aureus*, *E. coli*, and some types of *Streptococcus*.**
  
- ❑ Even **healthy people can develop sepsis** from an infection, especially if it is not treated properly.

# CDC *Vital Signs* Report

## ❑ ***Vital Signs* report found that:**

- Sepsis begins outside of the hospital for nearly 80% of patients.
- 7 in 10 patients with sepsis had recently interacted with healthcare providers or had chronic diseases requiring frequent medical care.

## ❑ **This presents a prime opportunity for both preventing infections and recognizing sepsis early to save lives.**

- Providers should talk to their patients about infections and sepsis: how infections that can lead to sepsis can be prevented or recognized early, and what to do when an infection is not getting better.

# What You Can Do

## □ To help stop sepsis and save lives, you can:

- Prioritize infection control and prevention, sepsis early recognition, and appropriate antibiotic use.
- Train healthcare providers and front-line staff to quickly recognize and treat sepsis.
- Promote smoking cessation, vaccination and chronic disease management.
- Learn how other states and organizations have worked to improve sepsis early recognition and treatment.

**State Policy Approaches to Sepsis Prevention and Early Recognition**

There are several approaches that state health departments, state hospital associations and other policymakers have taken to improve sepsis prevention and early recognition. Formal evaluation or peer-review of the successes of these policies or initiatives may not be complete at this time. However, the list below is intended to be illustrative of some possible approaches that states may consider. The list is not an exhaustive inventory of all sepsis laws, regulations, or initiatives.

**Gabby's Law – Illinois Senate Bill 2403 (SB2403)**  
Law named in honor of a 5-year-old girl who developed an infection from an undetected tick bite that led to sepsis. This law requires hospitals to:

- Implement an evidence-based process for quickly recognizing and treating adults and children with sepsis.
- Train staff to identify and treat patients with possible sepsis.
- Collect sepsis data to improve the quality of care and provide to the state (e.g. sepsis data to the Centers for Medicare & Medicaid Services (CMS) Hospital Inpatient Quality Reporting program).

**Rory's Regulations – NYCRR Title 10 Sections 405.2, 405.4, and 405.7**  
Law named in honor of a 12-year old boy who died when he developed an infection from a cut after falling in a school gym that led to sepsis. This law requires hospitals to:

- Implement an evidence-based process, which should include suitable training, resources, and equipment for healthcare providers, for quickly recognizing and treating sepsis in adults and children.
- Collect sepsis data to improve the quality of care and provide this data to the state annually.
- Allow parents or guardians to stay with pediatric patients at all times.
- Review medical tests with the patient or the patient's parent or guardian before discharging a child patient.

**Reducing Sepsis Mortality in Ohio – Ohio Hospital Association's Sepsis Initiative**  
A two-year sepsis prevention and early recognition program funded from CMS's Leading Edge Advanced Practice Topics (LEAPT) program that focuses on reducing sepsis mortality in Ohio by 30%. The program encourages hospitals to:

- Conduct a survey to identify gaps in sepsis knowledge and treatment.
- Identify, track, and report sepsis data.
- Provide healthcare provider training for sepsis prevention and early recognition.

**"Think Katie First" – Wisconsin Hospital Association's Partners for Patients Initiative**  
Initiative named in honor of Katie, a 26-year-old healthcare worker who died from sepsis after being hospitalized with flu-like symptoms, that brings Wisconsin hospitals together to:

- Reduce sepsis mortality through early detection and rapid treatment of sepsis.
- Share sepsis prevention and early recognition best practices.

Collaboration efforts have led to a 16% decrease in mortality-associated sepsis since 2013.

**References:**

- IL • <http://www.iles.gov/legislation/Detail.aspx?DocNum=24028&QID=186&DocType=Bill&Level=SB&LegID=93876&Session=12>
- NY • [https://www.health.ny.gov/facilities/public\\_health\\_and\\_health\\_planning\\_council/meetings/2013-02-07/docs/13-01.pdf](https://www.health.ny.gov/facilities/public_health_and_health_planning_council/meetings/2013-02-07/docs/13-01.pdf)
- NY • <https://www.health.ny.gov/facilities/centers/1470.pdf>
- OH • <http://ohiohospo.org/3643sepsis>
- WI • <http://www.wisconsinhospitalassociation.org/PartnersforPatients/3643sepsis.aspx>
- WI • <http://www.wisconsinhospitalassociation.org/PartnersforPatients/3643sepsis.aspx>

To see how other states are working to stop sepsis, visit: <http://go.usa.gov/xjxnz>.

# Thank You

## Contact Information

### **Anthony Fiore, MD**

Branch Chief, Epidemiology Research and Innovations Branch  
Division of Healthcare Quality Promotion

Email: [abf4@cdc.gov](mailto:abf4@cdc.gov)

**For more information, please contact Centers for Disease Control and Prevention**

1600 Clifton Road NE, Atlanta, GA 30333

Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

Visit: [www.cdc.gov](http://www.cdc.gov) | Contact CDC at: 1-800-CDC-INFO or [www.cdc.gov/info](http://www.cdc.gov/info)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



# OHIO HOSPITAL ASSOCIATION STATEWIDE SEPSIS INITIATIVE

Jim O'Brien, MD, Vice President,  
Quality and Patient Safety, Riverside Methodist Hospital, OhioHealth

August 30, 2016



# OHIO HOSPITAL ASSOCIATION

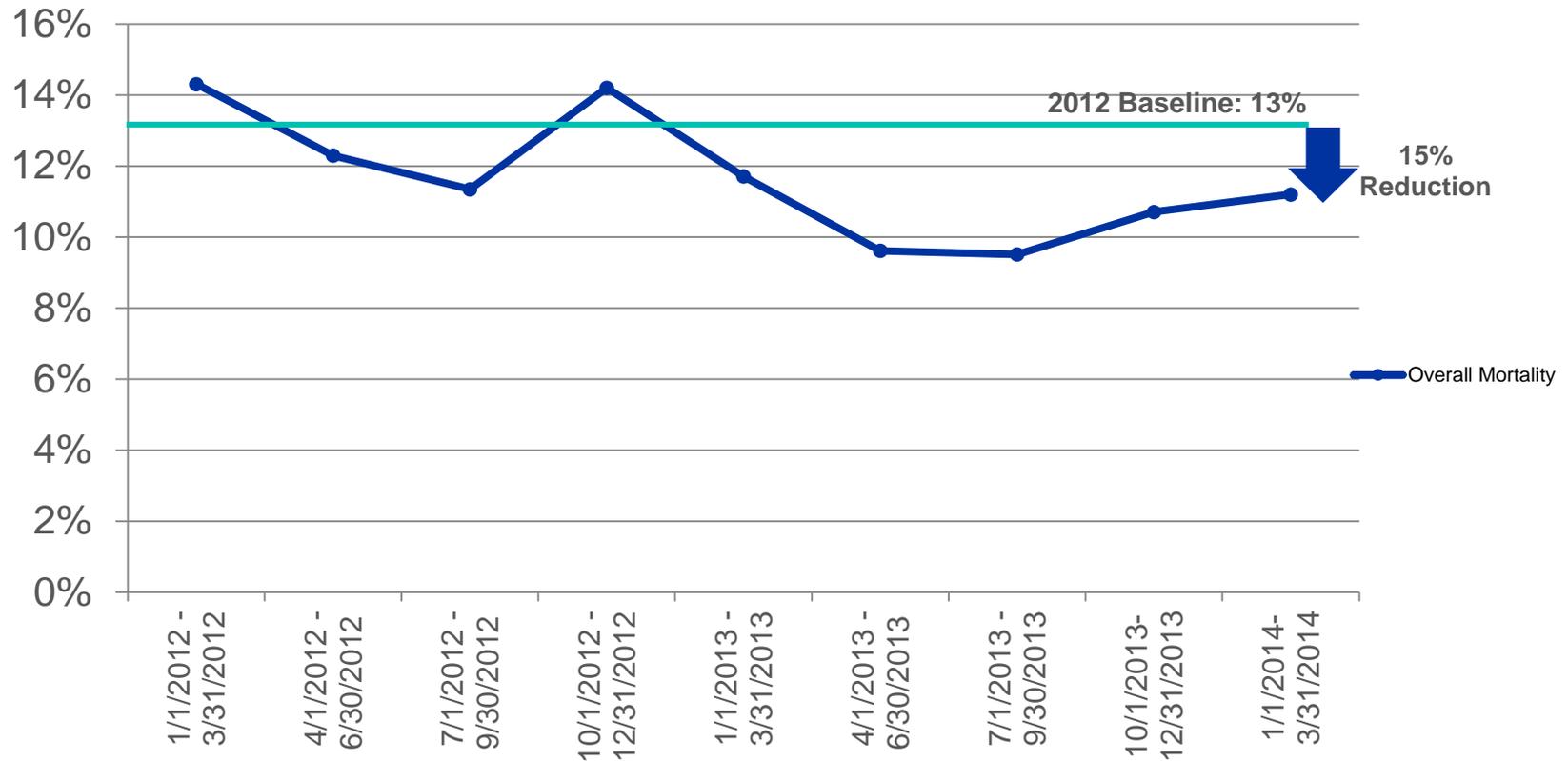
## Country's First State Association for Hospitals

- Founded in 1915 in Sandusky, Ohio
- 220 hospitals and 13 health systems
- Mission is to collaborate with member hospitals and health systems to ensure a healthy Ohio
- Focused on advocacy, patient safety and healthcare quality, and economic sustainability
- Nationally recognized for patient safety and quality (2016) and energy sustainability programs (2014)
- 65 associates, seven membership societies.
- Founded OHA's Institute for Health Innovation, Ohio Health Information Partnership
- Co-Founded Ohio Patient Safety Institute



# PROGRESS TO DATE

## Leading Edge Advanced Practice Topics (LEAPT) Sepsis Mortality





# OHA STRATEGIC PLAN

## Board-Directed Goal

- **Goal:** Lead the nation in quality improvement on key issues as identified by OHA members
  - **Objective:** Reduce severe sepsis and septic shock incidence and mortality by 30 percent by Q4 2018
    - **Tactic:** Lead a statewide sepsis reduction hospital collaboration to improve implementation of best practices, specifically early identification, and treatment



# ENGAGEMENT

- Annual membership meeting (June 2015)
- Board direction
- Physician advisor



# METHODOLOGIES

- Minimal data burden  
(numerator/denominator)
- Leverage of administrative data
- Regional quality collaborative focus areas
- Monthly education/coaching calls
  - <http://ohiohospitals.org/Patient-Safety-Quality/Institute/sepsis/Education.aspx>



# CHALLENGES

- “Incidence” target
- CMS SEP-1 bundle (October 2015)
- ICD-10 implementation (October 2015)
- 3<sup>rd</sup> International Consensus Definitions publication (February 2016)
- Ongoing EMR challenges
- Continuum of care focus



# LEADERSHIP SUPPORT

- Board action on gaining hospital leadership commitment
- OHA CEO visibility on sepsis
- Co-chairs of regional quality collaboratives



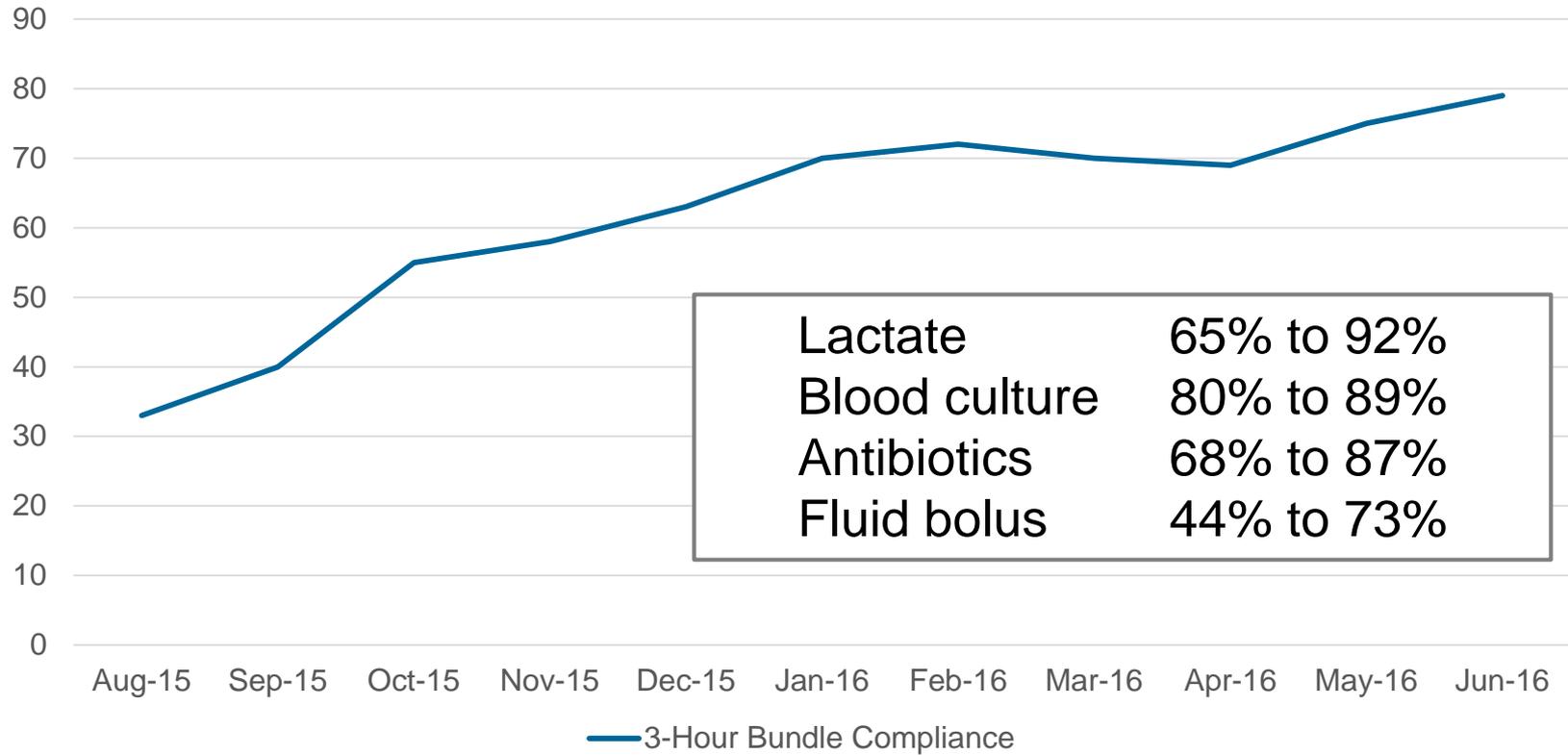
# COLLABORATION

- Hospital Engagement Network (HEN)
- Sepsis Alliance (sepsis.org)
- Professional societies
- Providers throughout the continuum of care (EMS, long-term care)
- Collaborative with Ohio's Quality Innovation Network-Quality Improvement Organization (QIN-QIO), Ohio Department of Health (ODH), and Ohio Department of Aging



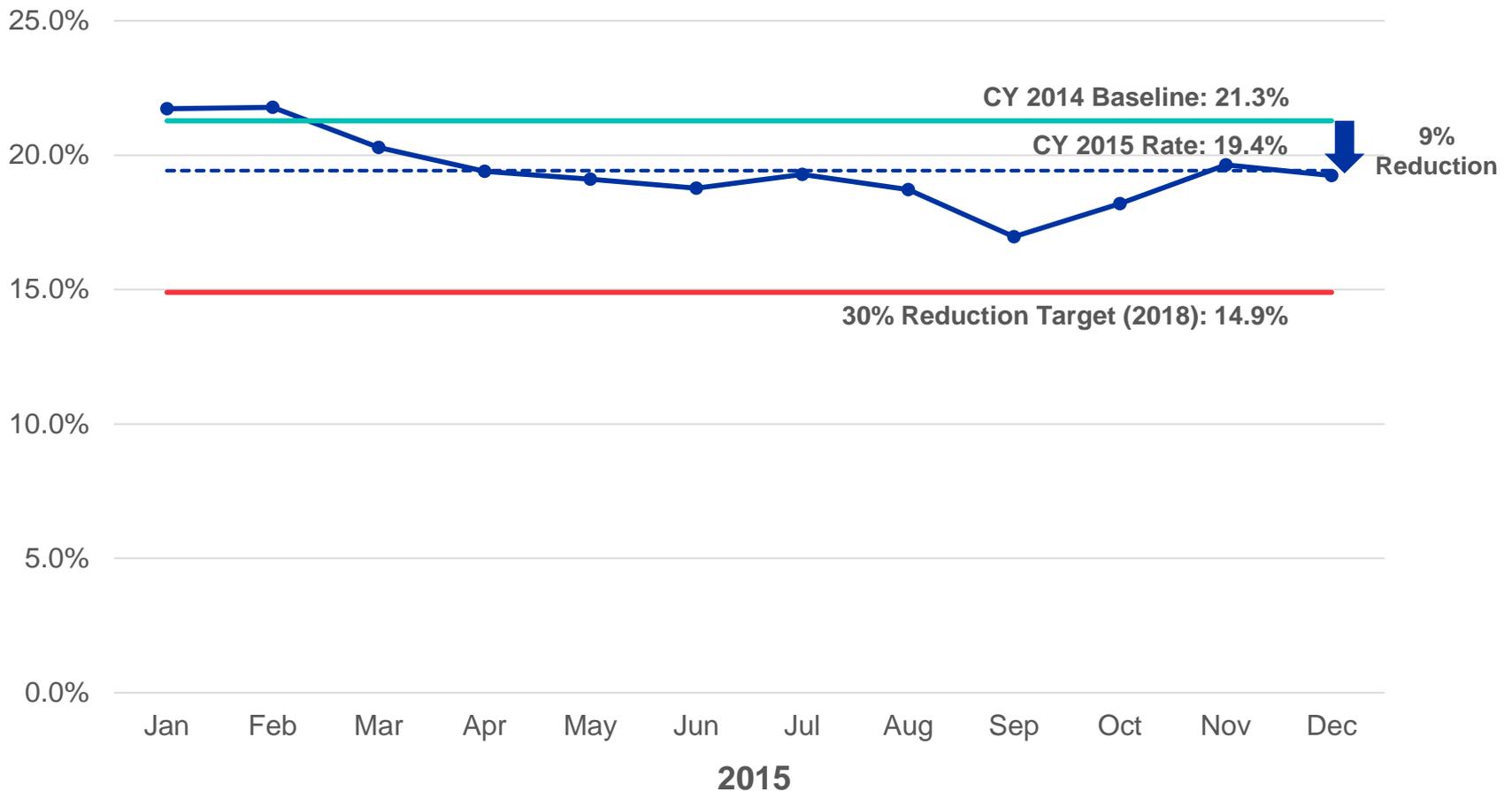
# PROGRESS TO DATE

## 3-Hour Bundle Compliance



# PROGRESS TO DATE

## Severe Sepsis and Septic Shock Mortality by Month Ohio Hospitals, 2015





## OHA collaborates with member hospitals and health systems to ensure a healthy Ohio

James O'Brien, MD, MS

Vice President, Quality and Patient Safety  
OhioHealth Riverside Methodist Hospital

Chair, Board of Directors  
Sepsis Alliance

---

### Ohio Hospital Association

155 E. Broad St., Suite 301  
Columbus, OH 43215-3640

T 614-221-7614  
[ohiohospitals.org](http://ohiohospitals.org)



HelpingOhioHospitals



@OhioHospitals



[www.youtube.com/user/OHA1915](http://www.youtube.com/user/OHA1915)



Department  
of Health

# CDC Division of Quality Healthcare Promotion – Sepsis Vital Signs: NY State Sepsis Initiative Update

Marcus Friedrich, MD, MBA, FACP  
Medical Director  
Office of Quality and Patient Safety  
NYSDOH  
[Marcus.Friedrich@health.ny.gov](mailto:Marcus.Friedrich@health.ny.gov)



# NY State Sepsis Initiative: Development and Implementation

# Development

- Built from national and state initiatives on sepsis care
  - Surviving Sepsis Campaign
  - IHI
  - Stop Sepsis (NYC)
- Significant (and increasing) prevalence and mortality/morbidity
  - Voluntary QI initiatives and observed variation suggested opportunity for impact if all hospitals participated

# Key Implementation Themes

- Humility
  - We did not have all the answers (still don't!)
- Collaboration
  - Patients/families/consumer groups
  - Clinicians
  - Hospitals and hospital associations
  - National organizations and initiatives
    - CDC
    - CMS
    - Surviving Sepsis Campaign
- Pilot Testing
  - Hospital Demonstration Waiver (1115) included sepsis as one of the projects

# Implementation

- Since 2014, NY State requires hospitals to have (and use) evidence informed protocols for recognition and treatment and report data to the department
- Data consist of 70 variables, including treatment, severity, and comorbidities,
  - Includes three hour and six hour bundle variables for adults
  - Includes one hour bundle for children
- Hospitals have the ability to correct data
- 98,795 adult cases of severe sepsis/septic shock from 2014 Q2 - 2016 Q1, 1,385 pediatric cases
- Raw mortality is 29%
- First audit of data 2014 Q2 – 2015 Q1

# Adult Measures and Bundles

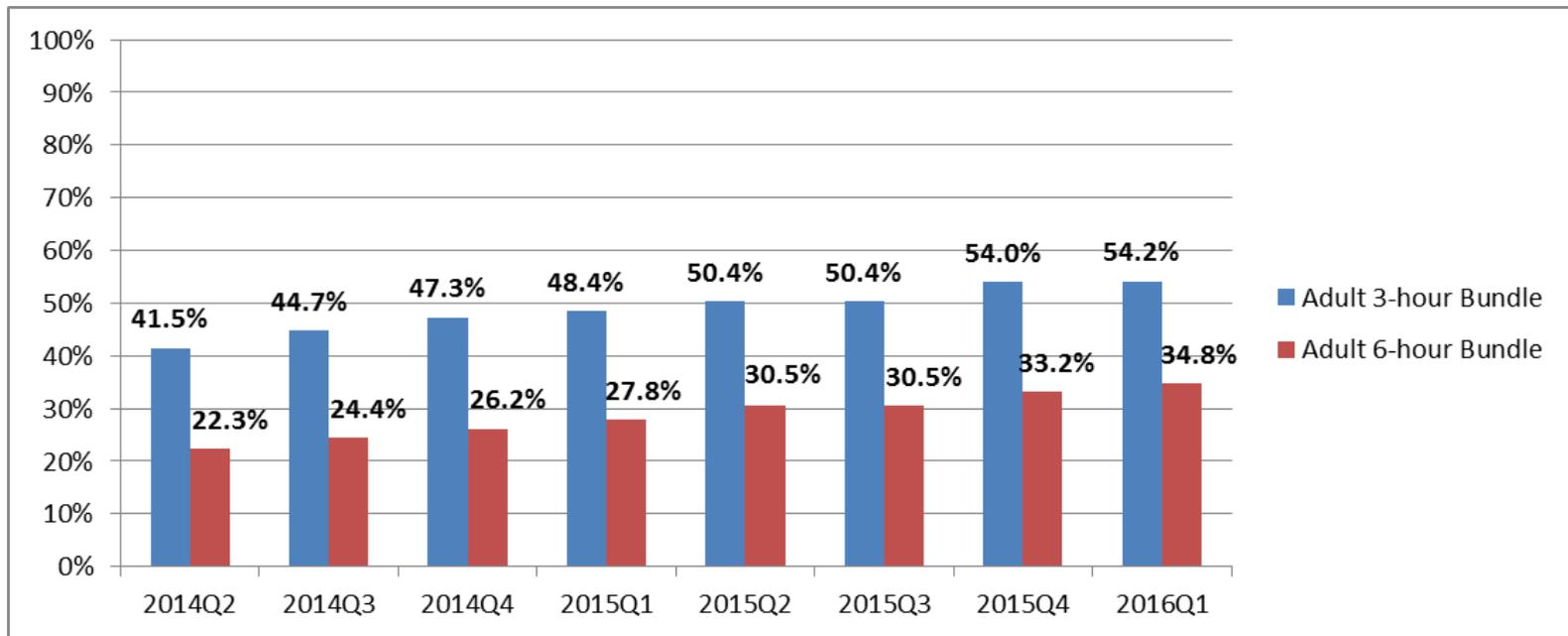
- 3-hour measures and bundle:
  - Antibiotics
  - Lactate
  - Culture before antibiotic
- 6-hour measures and bundle (for patients who don't respond to the 3-hour interventions):
  - Fluids
    - Elevated lactate ( $\geq 4$  mmol/L) or hypotension
  - Vasopressors
    - Hypotension not responsive to fluids
  - Reordered lactate
    - If elevated (or never measured)



# Pediatric Measures and Bundle

- 1-hour measures and bundle:
  - Blood culture before antibiotic
  - Antibiotics
  - Fluids

# Adult 3-hour & 6-hour Bundle Completion - All Cases





# Reporting

# Quarterly Data Reports from/to Hospitals

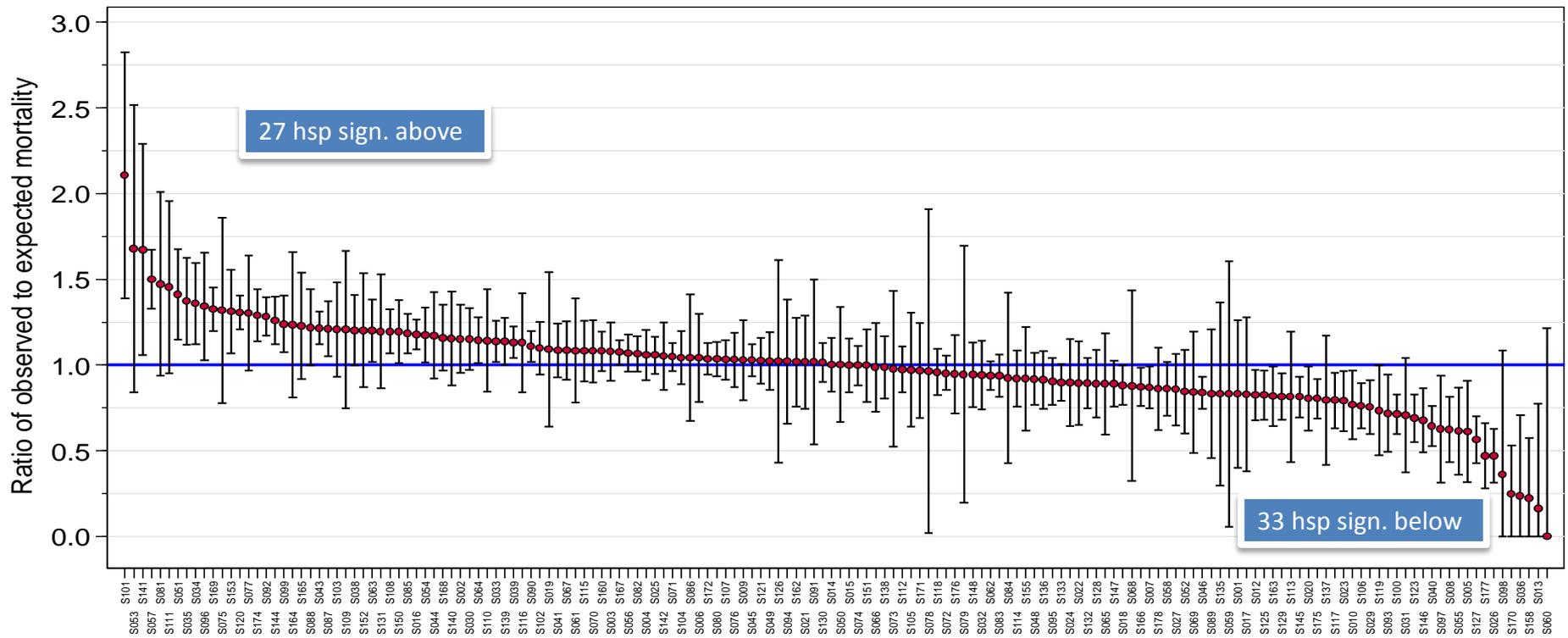
- Hospitals to DOH
  - Quarterly reported severe sepsis and septic shock cases, up to 2 months after closure of quarter
  - Including all transfer cases
  - Pediatric reporting separate
- DOH to Hospitals
  - Quarterly performance report includes
  - Demographics
  - Protocol exclusions
  - Protocol implementation
  - Treatment variables
  - Treatment bundles (25<sup>th</sup>/75<sup>th</sup> percentile benchmark, all hospitals)
  - Time Zero, transfers

# Risk Adjusted Mortality – Adults

- Model uses most recent 4 quarters of data (2015)
- Each patient was represented once in the dataset
  - For repeat or multiple admissions, the final admission remained in the dataset
- Objective: predict hospital mortality in septic patients based on demographics, comorbidities, and admission characteristics without the use of treatment variables
- Collaborators: risk adjustment experts (Ohio State University) developed the model in consultation with Levy (Brown), Hannan (SUNY Albany), DOH staff, and input from the Sepsis Clinical Advisory Group
- 26 potential variables- 15 variables ultimately used in the model
- Standardized mortality ratio is calculated by dividing the observed mortality by the expected mortality



## Version 1.0 - Distribution of risk adjusted ratio of observed to expected mortality



Comparison was restricted to hospitals with  $\geq 10$  sepsis discharges in 2014 4<sup>th</sup> quarter to 2015 3<sup>rd</sup> quarter (N = 162). Overall state ratio is 1.0 (blue line)

# Lessons Learned

- Involvement of stakeholders is key: Patient/Family advocacy organizations (Rory Staunton Foundation), NY State Sepsis Advisory group, clinical content experts, IPRO, risk adjustment experts, 'partnership for patients' initiative
- Improvement is possible



## Next Steps:

- Public Reporting on adult risk adjusted mortality per hospital
- Development of relevant outcome measures for children
- Analysis to evaluate relationship between protocol adherence measures, specific interventions, patient/care characteristics and outcomes
- Research on broader national vs. statewide trends in sepsis mortality
- Update the data dictionary
- Alignment with CMS Core Measure (SEP-1), Surviving Sepsis Guidelines, new definitions



# Questions/Comments?

# Think Katie First: Wisconsin Hospital Sepsis Mortality Improvement Initiative



**August 30, 2016**



**Kelly Court**

**Wisconsin Hospital Association  
Chief Quality Officer**

# Wisconsin Hospital Association

- 136 hospitals
- Advocacy
  - Legislative and regulatory issues
  - Quality measurement and improvement
  - Education

# Hospital Engagement Network (HEN)

- Statewide 20% reduction in readmissions and a 40% reduction in hospital acquired harm
- 85 hospitals
- Combining:
  - Evidence based best practice
  - Science of improvement
- Open sharing between hospitals
- Patient and Family Advisory Committee

# What is Our Aim?

Reduce Sepsis Mortality by 40%



# “Putting a Face on Sepsis”



# How will we get there?



Thinking  
Sepsis  
First: Think  
Katie First

1

Immediate and consistent risk awareness assessment and escalation

2

Immediate Testing and Treatment

3

Rapid test evaluation and specific treatment

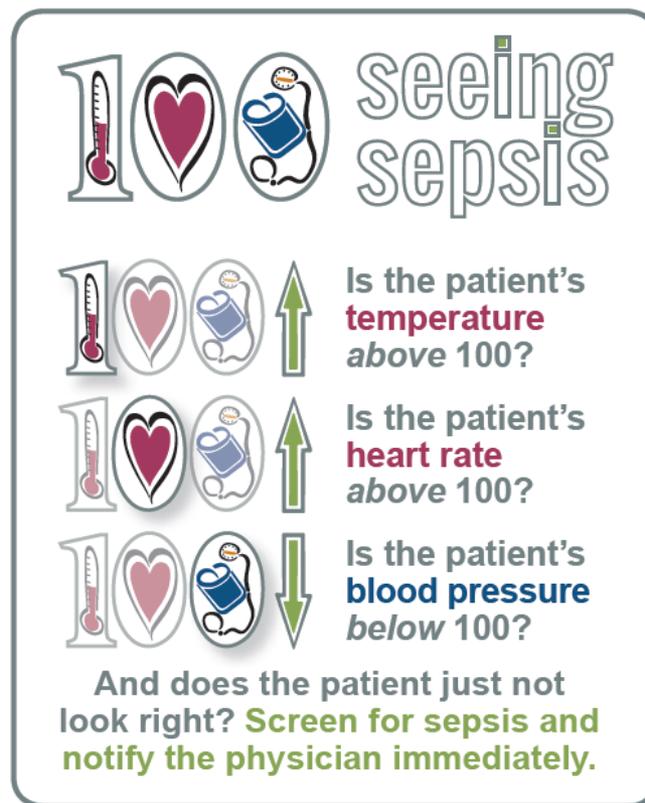
# The “What to Do”

Early recognition (ED and “on the floor”)

3-hour bundle

- Measure lactate level
- Obtain blood cultures
- Broad spectrum antibiotics
- Fluid resuscitation in hypotension or lactate level  $\geq 4$ mmo/L

## Visual Cues for Staff Recognition



The graphic is enclosed in a rounded rectangle. At the top, it features three icons: a thermometer, a heart, and a stethoscope, each inside a circle. To the right of these icons, the words "seeing sepsis" are written in a large, outlined font. Below this, there are three rows, each starting with the same three icons. The first row has a green upward-pointing arrow to its right, followed by the text "Is the patient's temperature above 100?". The second row has a green upward-pointing arrow to its right, followed by the text "Is the patient's heart rate above 100?". The third row has a green downward-pointing arrow to its right, followed by the text "Is the patient's blood pressure below 100?". At the bottom of the graphic, the text reads: "And does the patient just not look right? Screen for sepsis and notify the physician immediately."

100 seeing sepsis

100 ↑ Is the patient's temperature above 100?

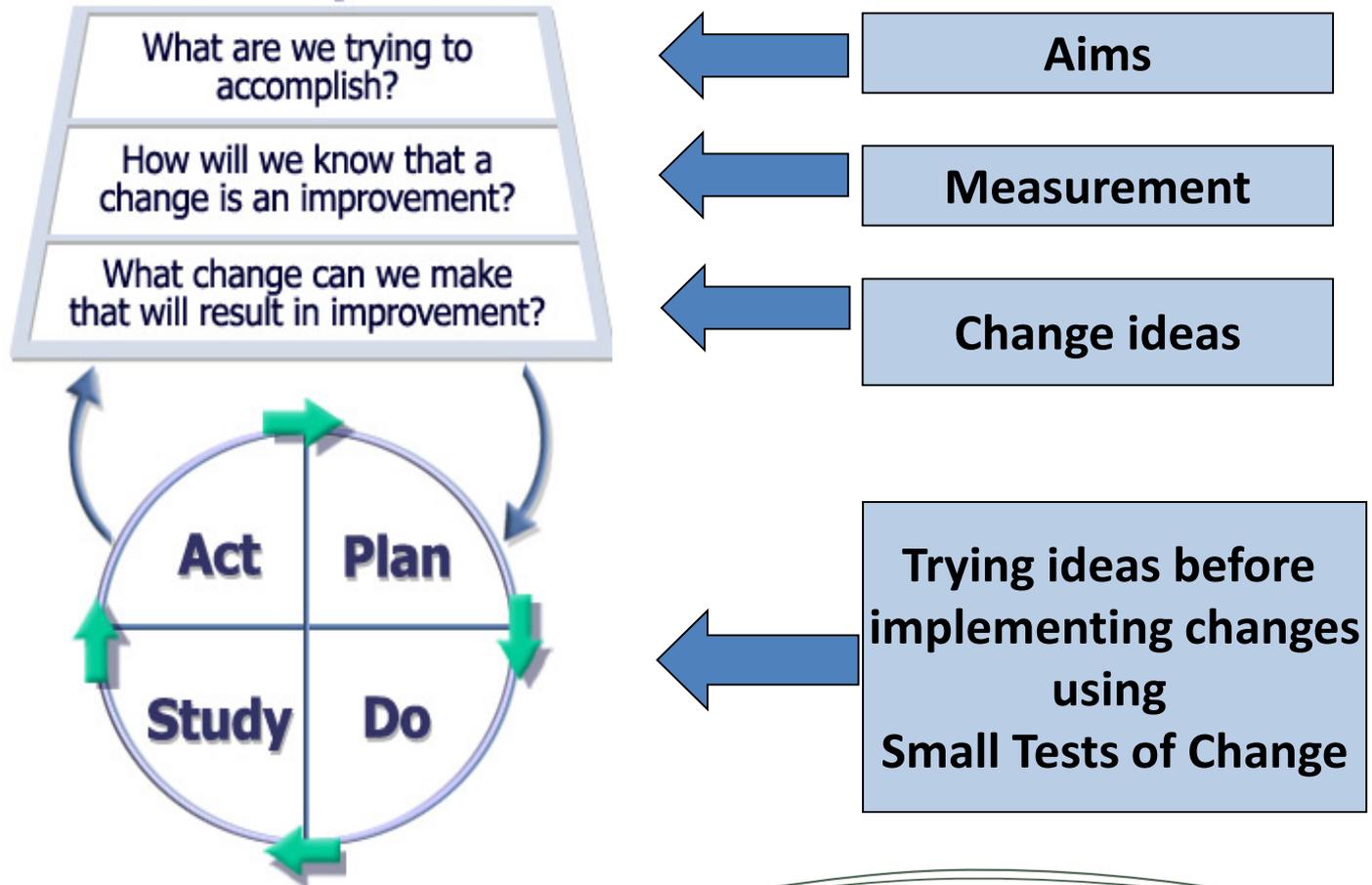
100 ↑ Is the patient's heart rate above 100?

100 ↓ Is the patient's blood pressure below 100?

And does the patient just not look right? Screen for sepsis and notify the physician immediately.

# The “How We Get it Done”

## Model for Improvement



## Challenges

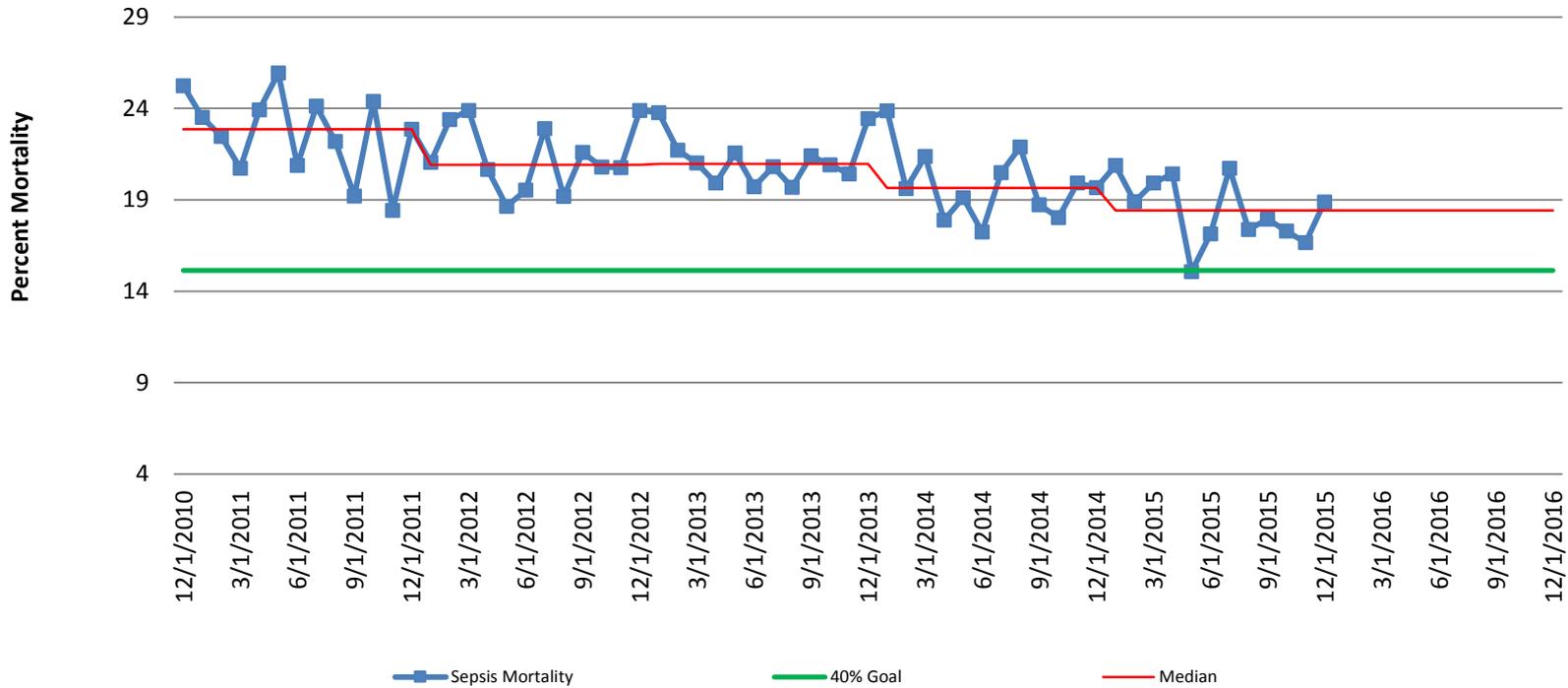
- Clinical education
  - Emergency departments
  - Inpatient and Post-operative teams
- Managing clinician hesitation
  - Serialized lactate levels
  - Fluid resuscitation

## Meeting the Challenges

- Using data to identify gaps
- PDSA and action planning
  - Accountability and championing
- Physician education
- Patient and family engagement

# Wisconsin Results

## Sepsis Mortality



# Thank You

Kelly Court

Wisconsin Hospital Association

Chief Quality Officer

# CDC *Vital Signs* Electronic Media Resources

Become a fan on Facebook

[www.facebook.com/cdc](http://www.facebook.com/cdc)

Follow us on Twitter

[twitter.com/CDCgov/](http://twitter.com/CDCgov/)

Syndicate *Vital Signs* on your website

<http://tools.cdc.gov/syndication/search.aspx?searchURL=www.cdc.gov%2fvitalsigns>

*Vital Signs* interactive buttons and banners

<http://www.cdc.gov/socialmedia/tools/buttons/vitalsigns/index.html>

# Prevention Status Reports

- The Prevention Status Reports (PSRs) highlight—for all 50 states and the District of Columbia—the status of public health policies and practices designed to address 10 important public health problems and concerns.

 Alcohol-Related Harms	 Food Safety	 Healthcare-Associated Infections
 Heart Disease and Stroke	 HIV	 Motor Vehicle Injuries
 Nutrition, Physical Activity, and Obesity	 Prescription Drug Overdose	 Teen Pregnancy
 Tobacco Use		

[www.cdc.gov/psr/](http://www.cdc.gov/psr/)

Provide feedback on this teleconference:

[OSTLTSFeedback@cdc.gov](mailto:OSTLTSFeedback@cdc.gov)



Please mark your calendars for the next  
***Vital Signs Town Hall Teleconference***

**September 20, 2016**

**2:00–3:00 pm (EDT)**

**For more information, please contact Centers for Disease Control and Prevention.**

1600 Clifton Road NE, Atlanta, GA 30333

Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

Email: [cdcinfo@cdc.gov](mailto:cdcinfo@cdc.gov) Web: [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



Centers for Disease Control and Prevention

Office for State, Tribal, Local and Territorial Support