

Sepsis - Automate and Streamline the CMS Early Measure Bundle

A Conversation with Clinicians About Best Practices to Effectively Meet the
Measure

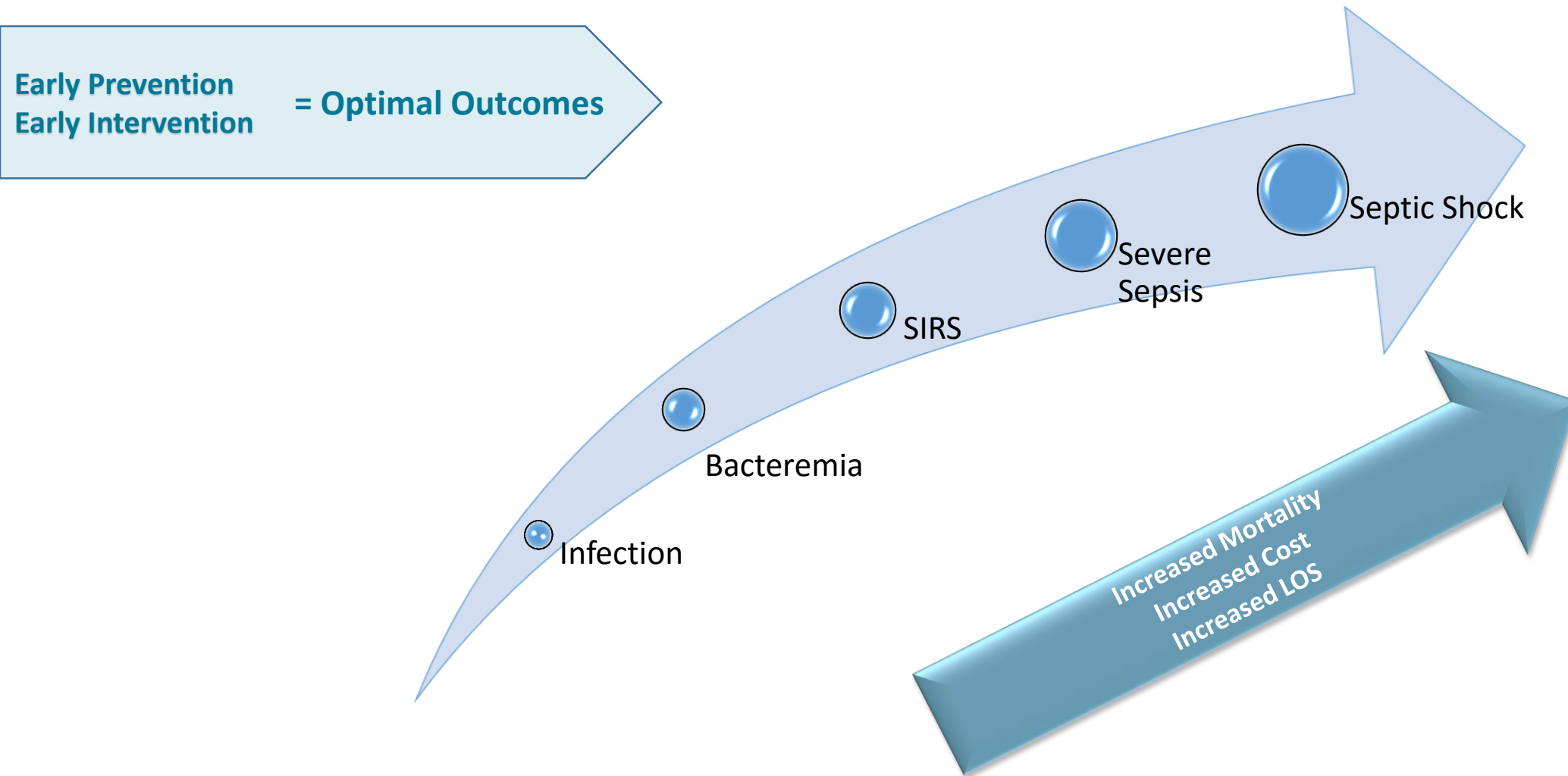
Presenters

- Stacy Pur Moderator
Vice President Clinical Intelligence, VigiLanz
- Edward O. Blews III, MD
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- Michael Cheatham, MD, FACS, FCCM
Chief Surgical Quality Officer, Orlando Regional Medical Center

Objectives

- Describe how to apply real-time intelligence technology for more effective, efficient Sepsis surveillance
- Learn the latest techniques to automated monitoring and reporting of the new bundle measures
- Identify operational efficiency best practices within your hospital, health system as well as from experts working as part of the VigiLanz community of more than 5,000 clinicians

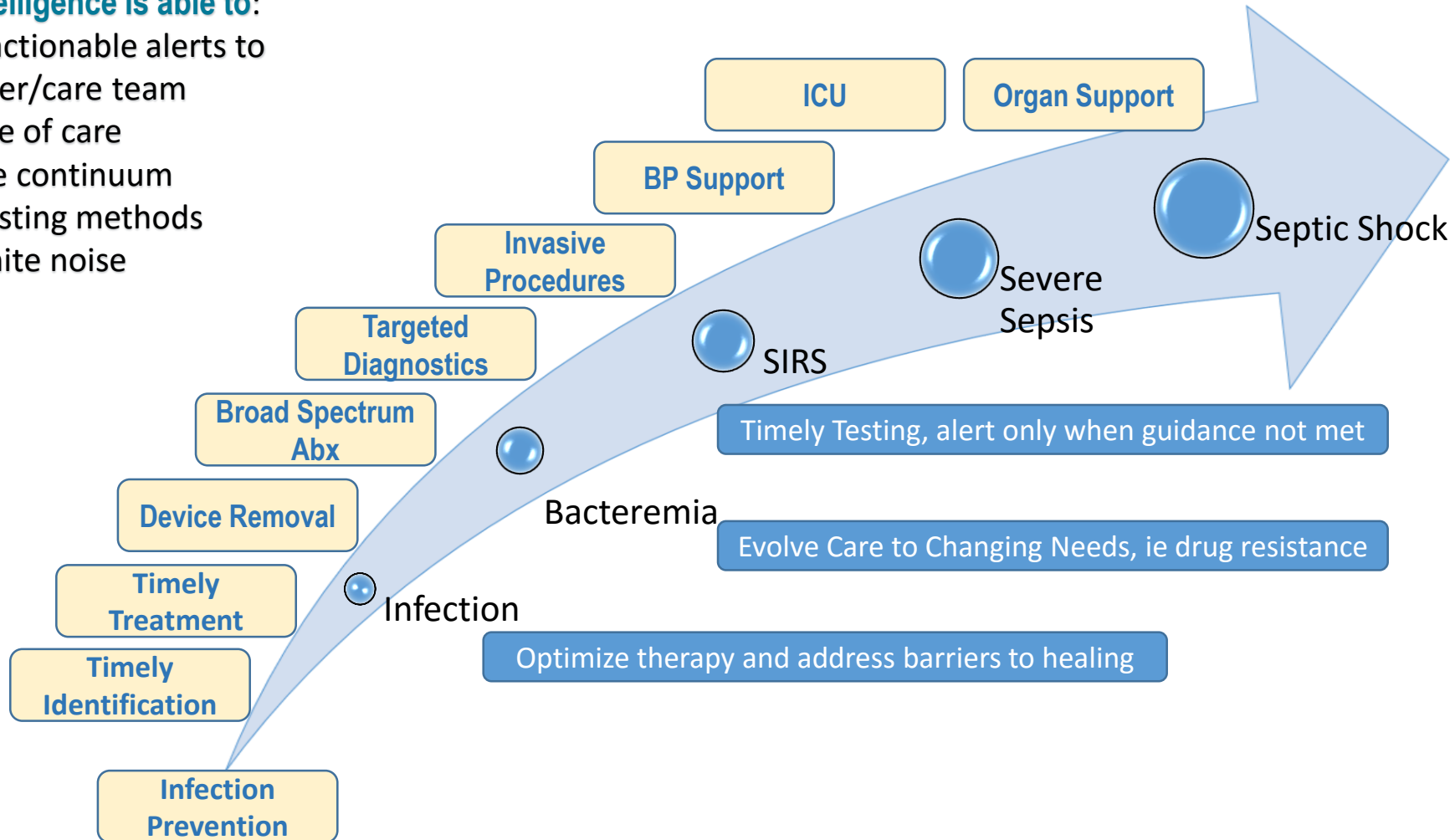
Sepsis



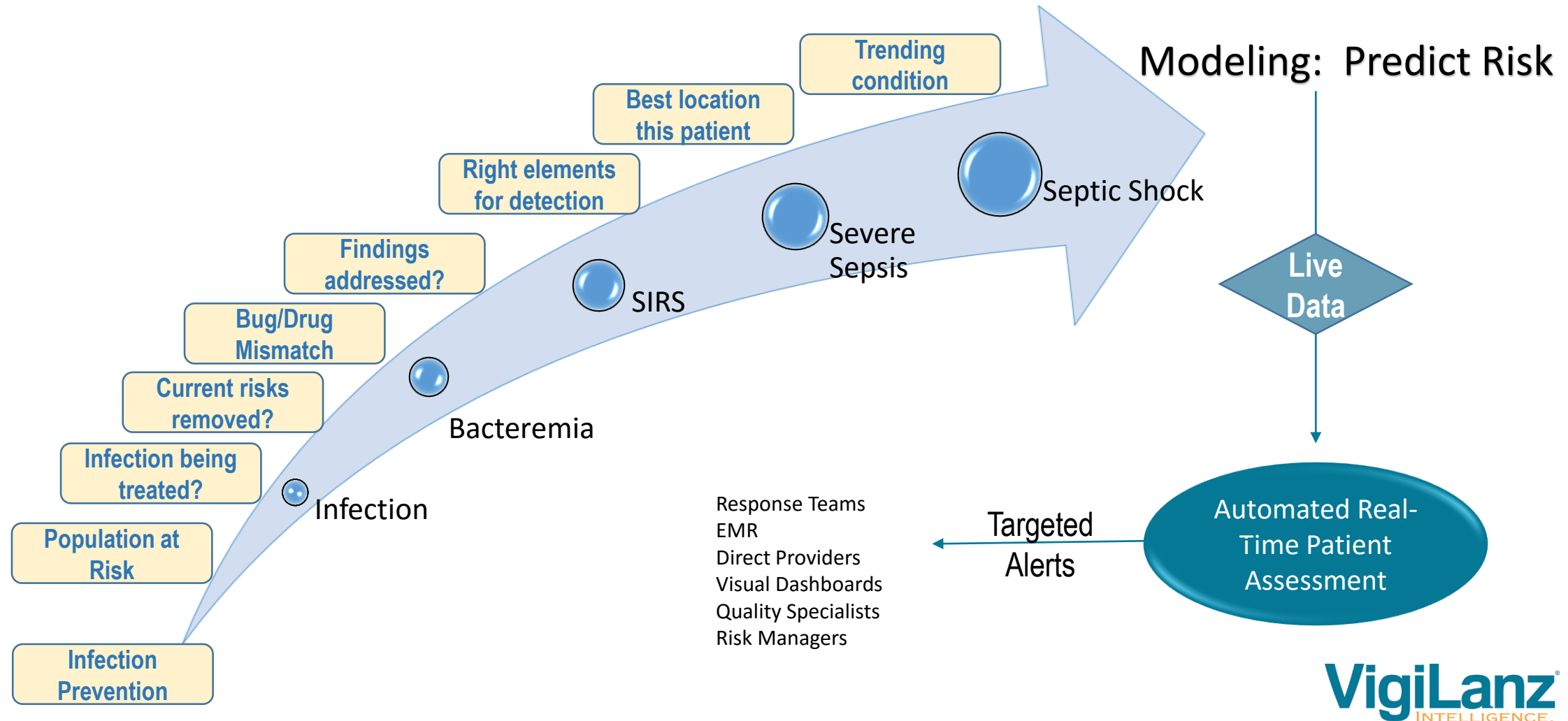
Prospective Intervention Opportunities

Modern Real-time Intelligence is able to:

Provide intelligent, actionable alerts to
any care provider/care team
at any stage of care
across the care continuum
using modern testing methods
without white noise



Retrospective Analytics Feed Real-time Intervention



Sepsis Concurrent Review: Leverage Advanced Technology

- Automated Alerts directed to Care-givers.
Intervene early, before the measure is failed.
- Include options for Prospective or Retrospective Review and Intervention
- Leverage auto-population of elements beyond demographics
- Guide clinicians to the proper element parameters
- Current with today's guidelines and tomorrow's science
- Deploy technology to find buried EMR data elements.
- Provide expert clinical support and report features

The screenshot displays a web-based interface for Sepsis Concurrent Review. It is divided into two main sections: 'Severe Sepsis' and '3 Hour Bundle - Severe Sepsis'.

Severe Sepsis Section:

- Presence:** Includes a dropdown for 'Is Present' (set to 'Yes'), a date field (10/24/2015 20:00), and checkboxes for 'Unable To determine', 'Criteria 1: Infection Documentation seen' (Yes), 'Criteria 2: SIRS' (Yes), and 'Criteria 3: Organ Failure Information' (Yes). It also lists vital signs: Temperature (98.7 degrees F), Heart Rate (95 bpm), Respiration Rate (26 breaths/minute), and WBC (23.5 K/uL).
- Directive For Comfort Care:** A dropdown menu set to 'No'.

3 Hour Bundle - Severe Sepsis Section:

- Initial Lactate Level:** Includes a date field and a dropdown for 'Result' (set to 'Unable To determine').
- Blood Culture Collection:** Includes a date field (10/24/2015 01:02) and a dropdown for 'Result' (set to 'Yes').
- Broad Spectrum/Other Antibiotic Administration:** Includes a date field (10/24/2015 00:34), a dropdown for 'Administration' (set to 'Yes'), and a dropdown for 'Administration Selection'.

VigiLanz Sepsis
Concurrent
Review

CMS Sepsis Core Measure

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CMS Sepsis Core Measure

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Disclosures

» No financial conflicts of interest

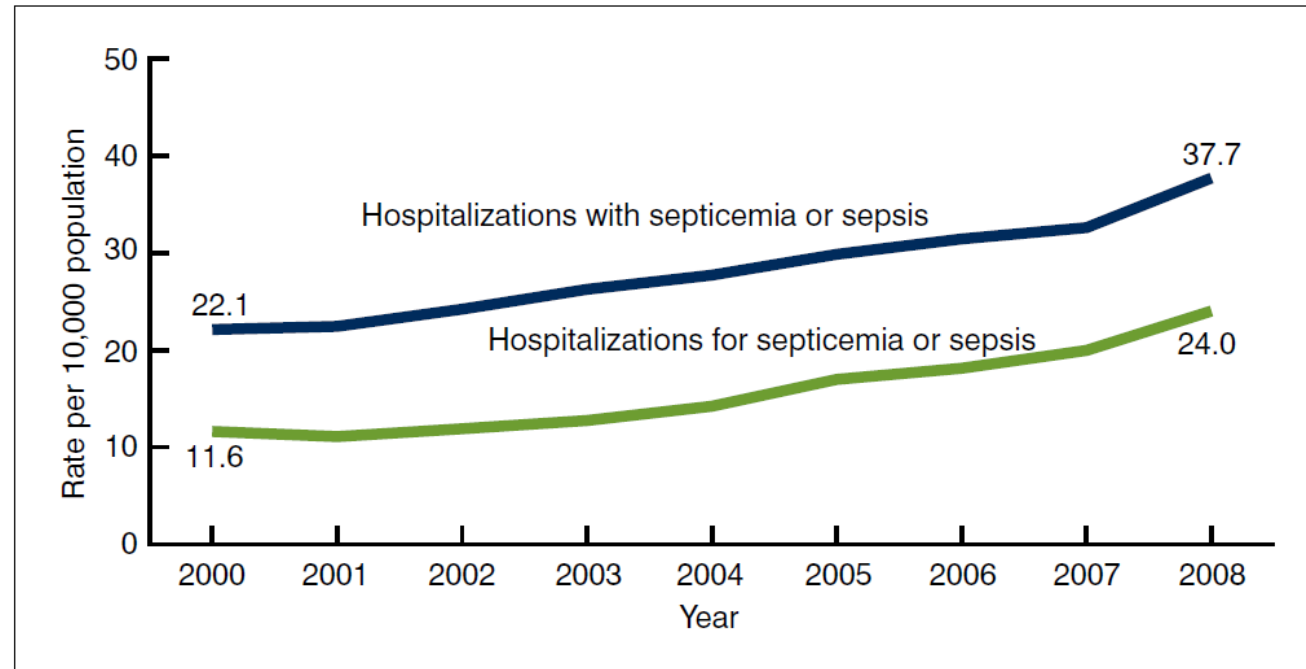


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Background

Hospitalization rates for septicemia or sepsis more than doubled from 2000 through 2008.

Figure 1. Hospitalizations for and with septicemia or sepsis



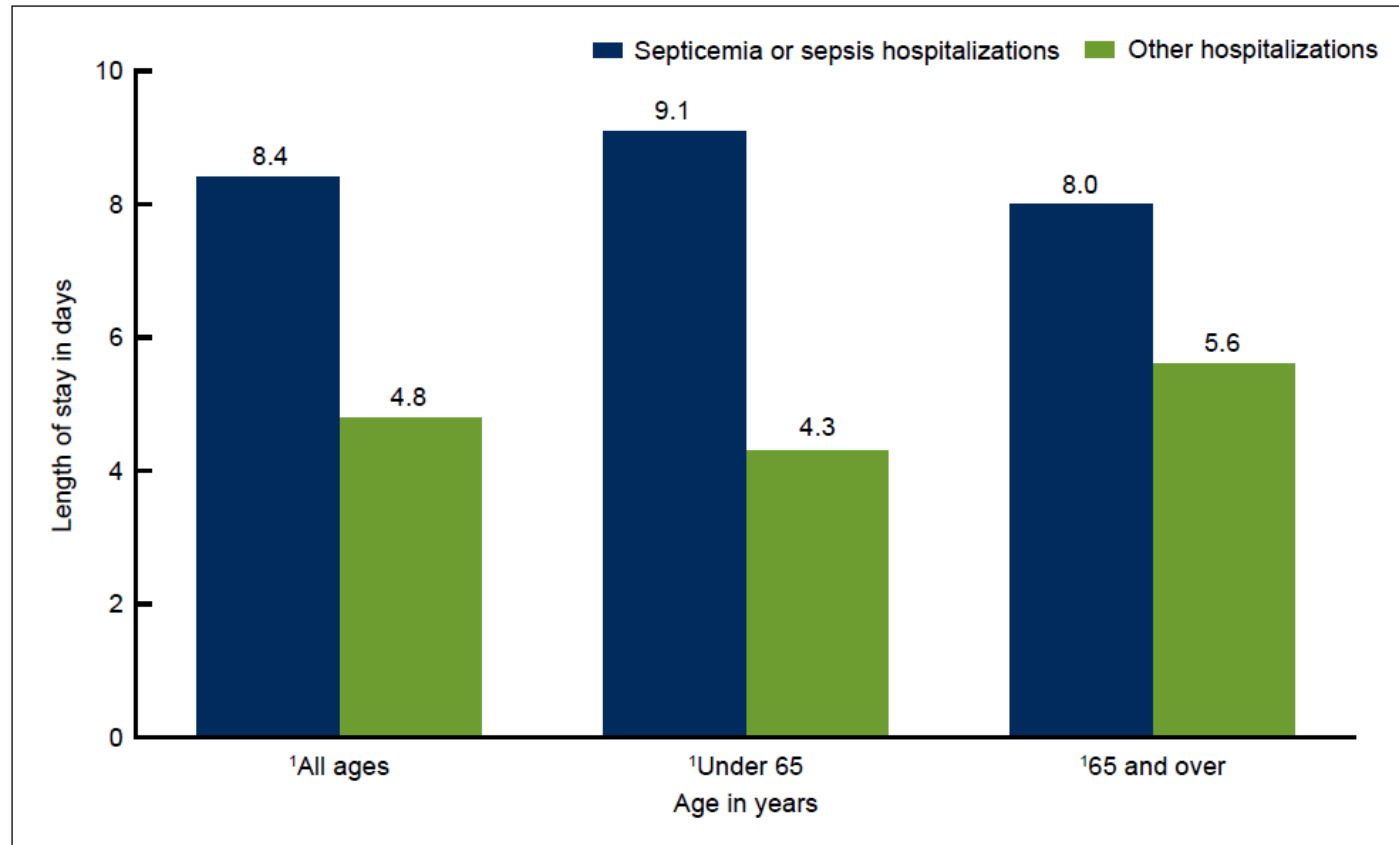
NOTE: Significant linear trend from 2000 through 2008 for both categories.
SOURCE: CDC/NCHS, National Hospital Discharge Survey, 2000–2008.



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Background

Figure 4. Average length of stay for those hospitalized for septicemia or sepsis compared with those hospitalized for other conditions, 2008



¹Difference is statistically significant at the 0.05 level.
SOURCE: CDC/NCHS, National Hospital Discharge Survey, 2008.



Background

Table. Hospitalizations for septicemia or sepsis compared with hospitalizations for other diagnoses, by discharge disposition, 2008

Characteristic	Septicemia or sepsis	Other diagnoses
Disposition	Percent	
Routine ¹	39	79
Transfer to other short-term care facility ¹	6	3
Transfer to long-term care institution ¹	30	10
Died during the hospitalization ¹	17	2
Other or not stated	8	6
Total	100	100

¹Difference is statistically significant at the 0.05 level.

SOURCE: CDC/NCHS, National Hospital Discharge Survey, 2008.



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Browser address bar: <http://www.survivingsepsis.org/Pages/default.aspx>

File Edit View Favorites Tools Help

Search this site...

Surviving Sepsis Campaign

Log In

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Society of Critical Care Medicine
The Intensive Care Professionals

ESICM
The Intensive Care Professionals

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Educational Videos

GUIDELINES

BUNDLES

Join The Campaign on Facebook

New Self-Directed Sepsis Performance Improvement Course Is Now Available
Improve your strategies for the recognition and treatment of sepsis with the Self-Directed Sepsis Performance Improvement course.

Watch Educational Tutorials from the Surviving Sepsis Campaign
An informative series, Spreading Quality Just in Time, offers short tutorials on the science and methods behind applying sepsis interventions at the right time in the right way.

SSC Six-Hour Bundle Revised
The Surviving Sepsis Campaign has released modifications to the six-hour bundle.

SSC Listserv
The Campaign's listserv provides an active forum for professionals to share experiences and ask questions. [Join SSC Listserv](#)

Patients and Families
[MyICUCare.org](#) and the [THRIVE Initiative](#) offer resources, including information on [post-intensive care syndrome](#).



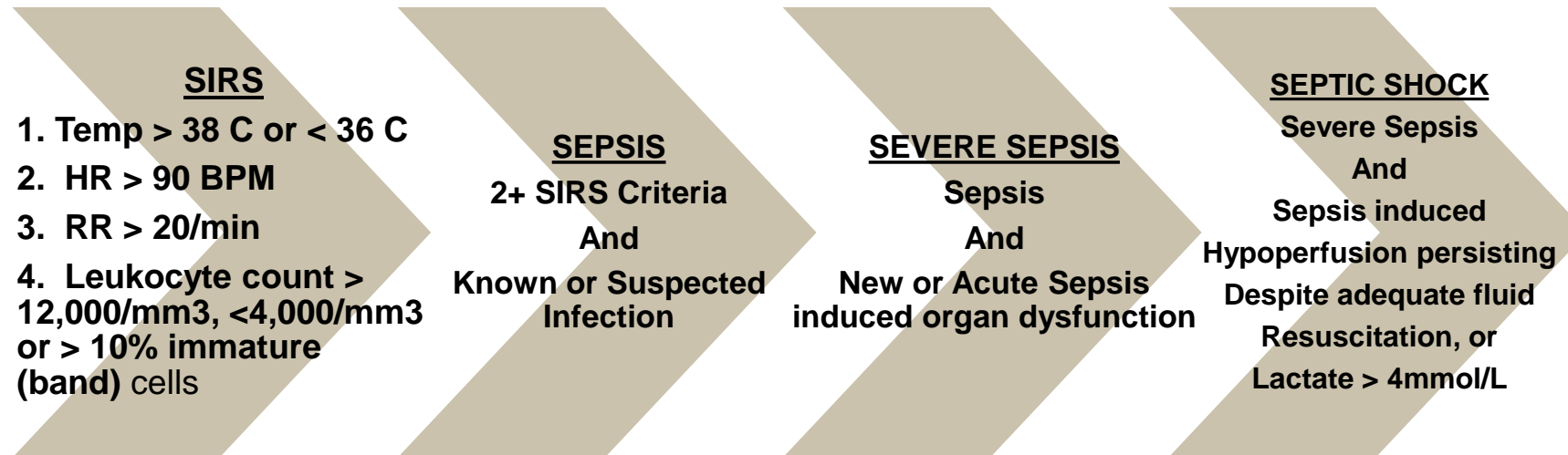
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CMS Rationale

- » Absolute reductions in mortality of 4-6% associated with sepsis bundle compliance rates of <30%
- » Absolute reductions in mortality of 20% associated with sepsis bundle compliance rates of 52%
- » Multicenter efforts to promote bundles of care for severe sepsis and septic shock were associated with improved guideline compliance and lower hospital mortality
- » “[...] there is a direct association between bundle compliance and improved mortality. Without a continuous quality initiative (CQI), even these compliance rates will not improve and will decrease over time” (Ferrer, 2008)



Sepsis Definitions



CMS Core Measures

- » The following pertains ONLY to adults aged 18 years or older
- » Within 3 hours of severe sepsis presentation, patients shall receive ALL of the following
 - ~ Initial lactate level measurement
 - ~ Blood cultures prior to antibiotics
 - ~ Broad spectrum or other antibiotics administered
- » Within 6 hours of severe sepsis presentation, patients shall receive ALL of the following
 - ~ Repeat lactate level measurement only if the initial lactate was elevated



CMS Core Measures

- » Within 3 hours of presentation of septic shock, ALL patients shall receive the following
 - ~ Severe sepsis interventions
 - Initial lactate level measurement
 - Blood cultures prior to antibiotics
 - Broad spectrum or other antibiotics administered
 - ~ Resuscitation with 30mL/kg crystalloid fluids
- » Within 6 hours ONLY IF hypotension persists after fluid administration,
 - ~ Vasopressors are administered
- » Within 6 hours ONLY IF hypotension persists after fluid administration or initial lactate ≥ 4 mmol/L:
 - ~ Repeat lactate measurement
 - ~ A focused exam (details on next slide) OR
 - ~ Two of the following four interventions (detail on next slide)



CMS Core Measures

- » Within 6 hours ONLY IF hypotension persists after fluid administration or initial lactate ≥ 4 mmol/L:
 - ~ A focused exam
 - Vital signs AND
 - Cardiopulmonary exam AND
 - Capillary refill evaluation AND
 - Peripheral pulse evaluation AND
 - Skin examination
 - ~ OR
 - ~ Two of the following four interventions
 - Central venous pressure measurement
 - Central venous oxygen measurement
 - Bedside Cardiovascular ultrasound
 - Passive leg raise or fluid challenge



Early Antibiotic Administration

Time to ABX ¹ , hrs	OR ²	95% CI		p-value	Probability of mortality ³	95% CI	
0 (ref)	1.00	---	---	---	18.7	17.5	19.9
1	1.05	1.02	1.07	< 0.001	19.3	18.3	20.4
2	1.09	1.04	1.15	< 0.001	20.0	19.1	21.0
3	1.14	1.06	1.23	< 0.001	20.8	19.7	21.8
4	1.19	1.08	1.32	< 0.001	21.5	20.3	22.8
5	1.25	1.11	1.41	< 0.001	22.3	20.7	23.9
6	1.31	1.13	1.51	< 0.001	23.1	21.2	25.1

¹Time to ABX is based on 15,948 observations that are greater than or equal to zero

²Hospital mortality odds ratio referent group is 0 hours for the time to ABX and is adjusted by the number of baseline organ failures, infection type (community vs. nosocomial), and geographic region (Europe, North America, and South America)



Sepsis Clock Start Times

» Time Zero

- ~ Occurs when all elements of the diagnosis (severe sepsis or septic shock) are present
 - If all elements are in place at time of ER triage, clock starts at time of triage
 - Elements include anything that has a time stamp (vital signs, lab results, physician documentation, nursing documentation, etc.)
- ~ Potential for two clocks to run simultaneously
 - Severe sepsis that progresses to septic shock



Challenges

- » May over-diagnose severe sepsis
- » No mention of other infectious workup
 - ~ Urinalysis / Urine Cultures?
 - ~ CSF examination?
 - ~ Sputum cultures?
- » Lab workflow
- » Pharmacy Workflow
- » Antibiotic stewardship



Loma Linda University Medical Center's Response

- » When any elements of SIRS criteria are noted in the chart, the following occurs
 - ~ Best Practice Alert notifies bedside nurse of possible sepsis
 - ~ Standing order for lactate and blood cultures
 - ~ Lactate drawn
 - ~ Physician immediately paged to assess patient. If no response in 30 minutes:
 - Standing order for antibiotics
- » Problems with our initial response
 - ~ 1500+ activations in the first month
 - ~ Currently, the above plan is being refined to improve the specificity





Implementing a Sepsis Initiative

Michael L. Cheatham, MD, FACS, FCCM
Chief Surgical Quality Officer
Orlando Regional Medical Center

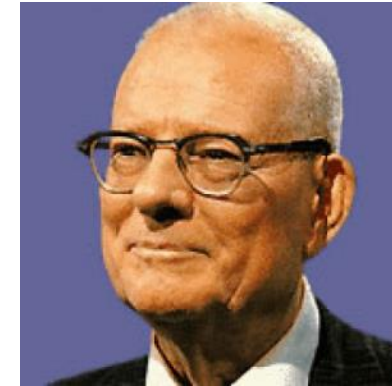


Quality Improvement at Orlando Health

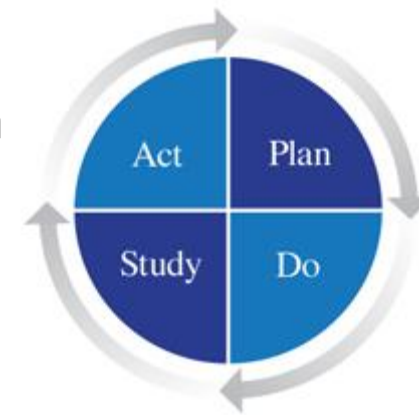
- **Corporate-wide structure for quality improvement**
 - Institute for Healthcare Improvement
 - www.IHI.org
- **Focus on effective quality improvement processes**
 - LEAN
 - Six Sigma
- **Team member engagement is essential!**

Improvement Requires Change

“If you cannot describe what you are doing as a process, you do not know what you are doing” - William Demming

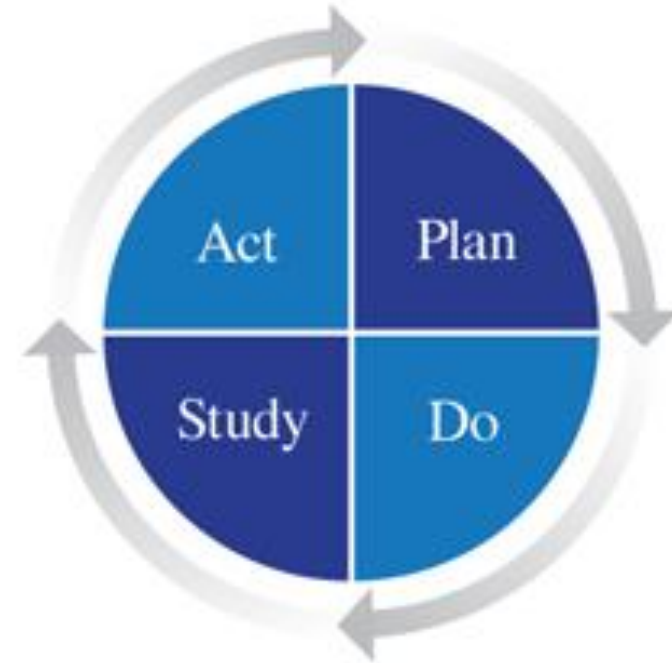


- We all want to improve sepsis care
- Simply telling physicians, nurses, and others to watch for sepsis is not enough
- We need a process and structure for implementing a sepsis initiative



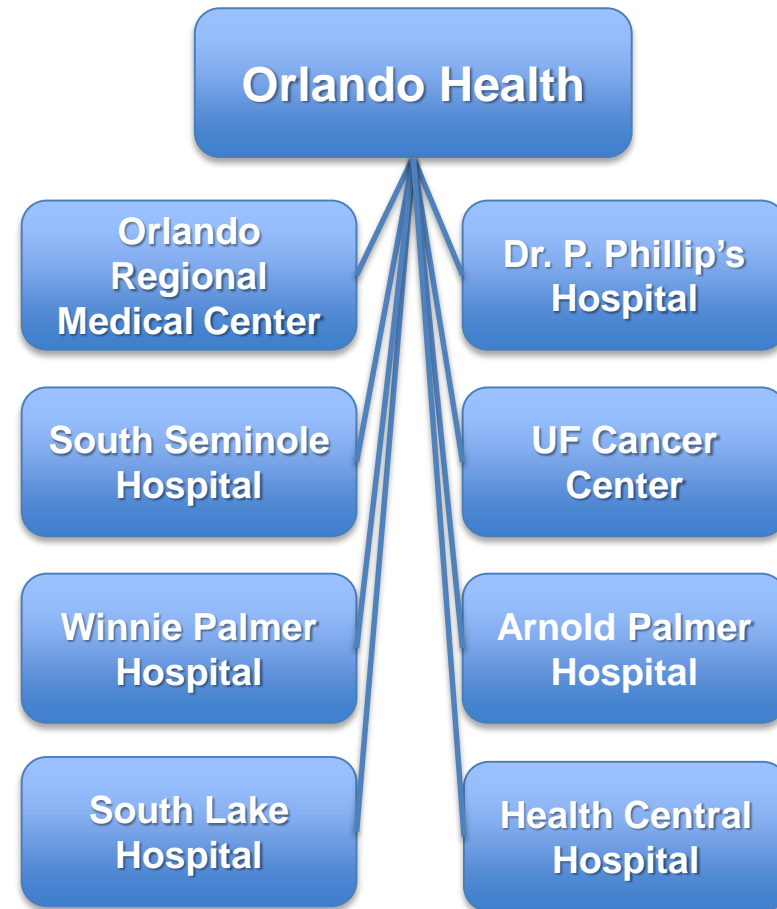
The “Plan-Do-Study-Act” Cycle

- Also known as “small tests of change”
 - Make a plan
 - Try it for a week or two
 - Study the outcome
 - Modify the plan
 - Test it again
 - What worked?
 - What didn’t work?
 - What should be done differently?



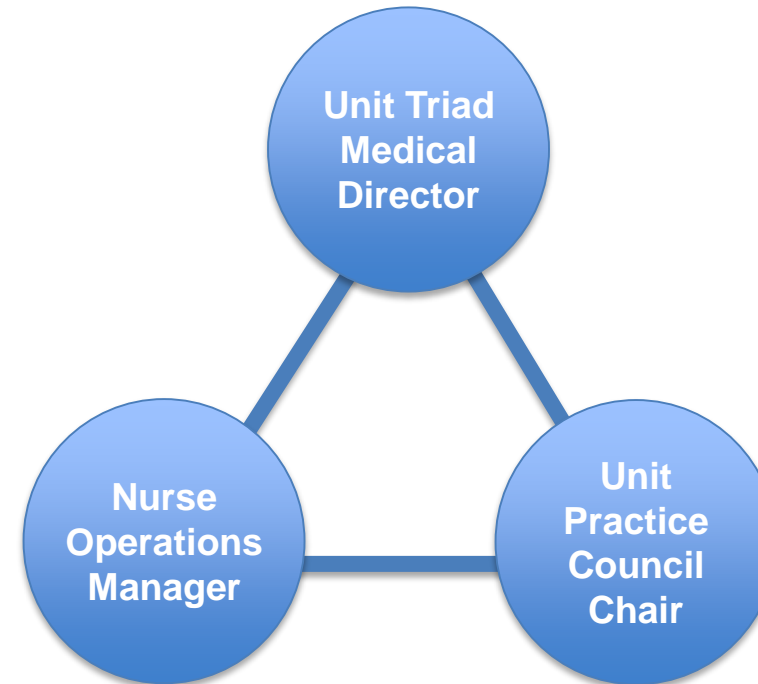
Sepsis Committees

- **Corporate Sepsis Committee defines strategy**
- **Hospital Sepsis Committees implement processes**
 - **CNO, CQO, physicians and nurses**
- **Units provide patient care**
- **Bi-weekly sepsis rounds**

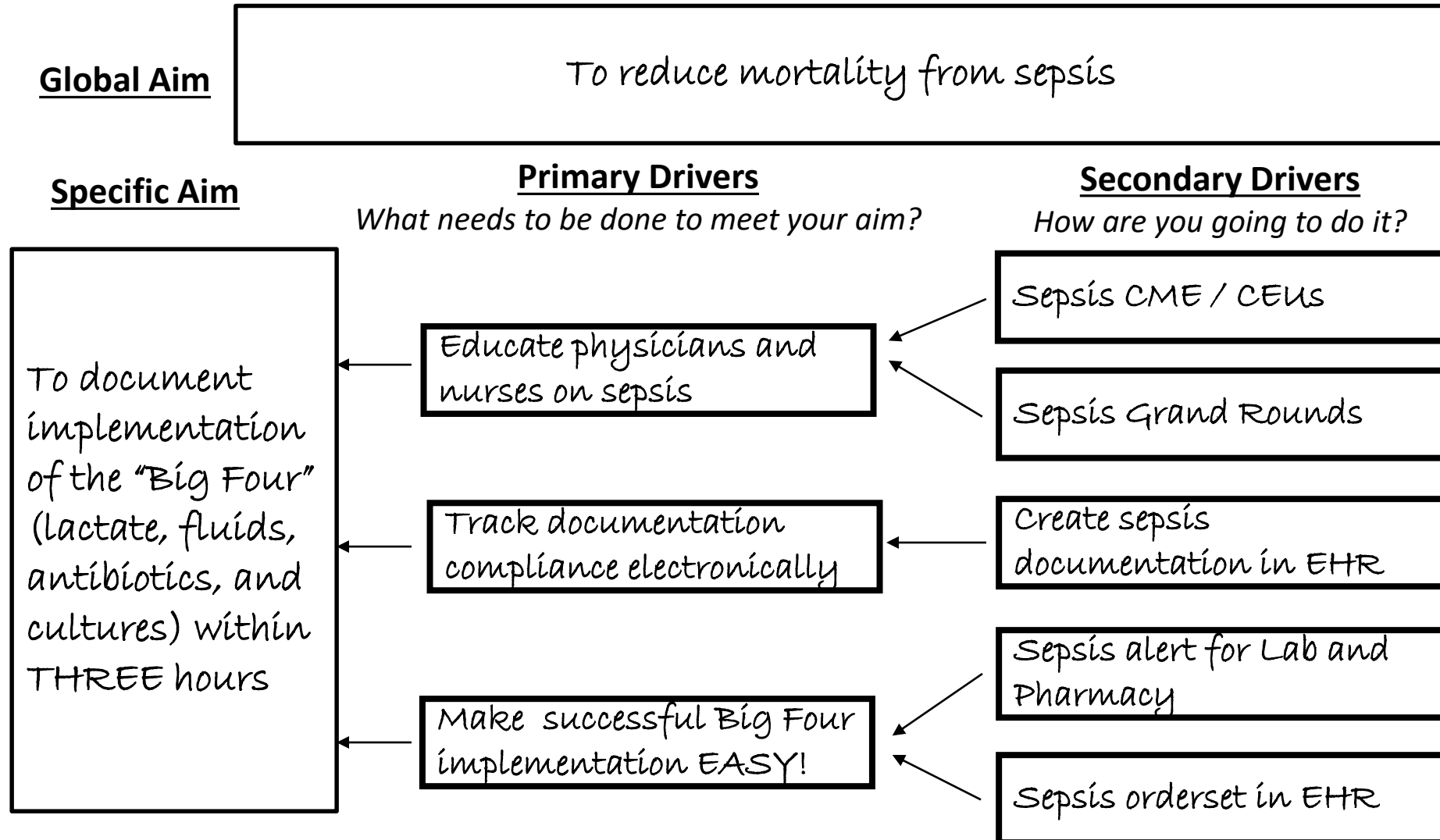


The Unit Triad Concept

- Each unit has a quality Triad
- Triads meet weekly to review unit metrics
- Weekly meetings at the GEMBA board inform staff of the unit's progress
- Sepsis initiative will be monitored by the Triad



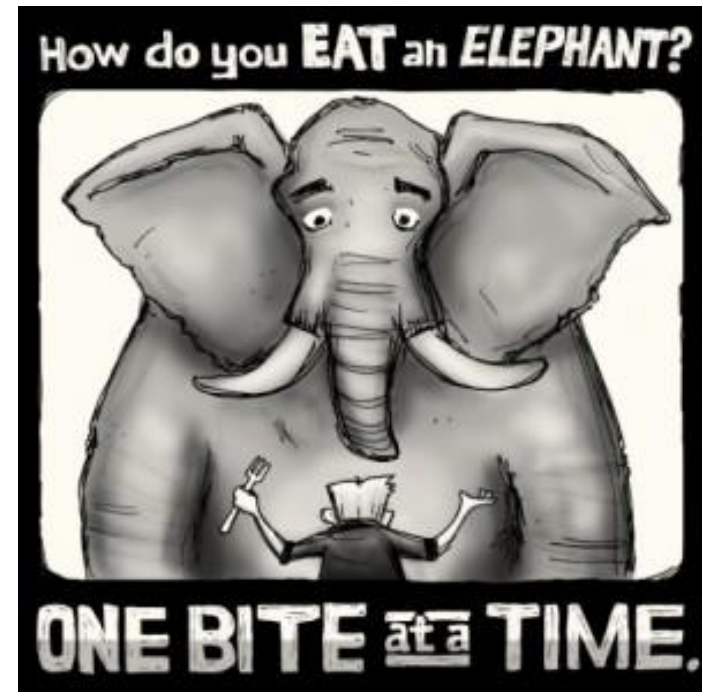
Driver Diagram



“If you fail to plan, you plan to fail”

- Benjamin Franklin

- **Structure your sepsis implementation to ensure success**
- **Start small and build your processes from there**
 - **Don't be afraid to fail**
 - **Just get started!**



Questions?