Working Together to Achieve Results
director of quality and performance improvement, patient safety
Phone: (206) 577-1810
Email: sueb@wsha.org

director of quality and performance improvement, patient safety
Phone: (206) 577-1821
Email: ryanh@wsha.org
Sepsis remains a leading cause of mortality and morbidity worldwide. While the WSHA HIIN has surpassed our initial goal of 20% reduction in sepsis mortality from baseline, many hospitals continue to identify challenges and opportunities for improvement.

Objectives:
- Review sepsis measure and regional data related to mortality
- Highlight challenges and opportunities
- Consider root causes and contributing factors
- Highlight best practices

Sepsis and Septic Shock

**Numerator**
Number of in-hospital deaths due to severe sepsis or septic shock 18 years and older

**Denominator**
Number of in-patients with severe sepsis or septic shock

**Inclusion ICD-10 Codes (ICD-9 Codes 785.52 and 995.92)**
- Severe sepsis WITHOUT septic shock: R65.20
- Severe sepsis WITH septic shock: R65.21

**Other Associated Codes** AHRQ Patient Safety Indicators #13
Sepsis and Septic Shock

Exclusions
Patients with advanced directives for comfort care and who refuse treatment

Exclusion ICD-10 Codes
• **Z53.0** Refuse treatment
• **Z51.5** Comfort care
• **Z53.21** Left against medical advice (AMA)

Agency for Healthcare Research and Quality (AHRQ) issued Patient Safety Indicators #13 (PSI #13) related to Postoperative Sepsis. Pages 4 and 5 highlight the ICD-10 codes for sepsis in general.

Baseline: A baseline of 2014 was chosen based on CMS contract and submission rates from hospitals.

Reporting Rate: Compliance with sepsis mortality reporting is high with 95% of hospitals reporting in September of 2017 via the Comprehensive Hospital Abstract Reporting System (CHARS) for WA and OR and direct AK reporting.
Root Causes:

• **Lack of Early Identification**: Hardwiring the routine screening for sepsis of every patient, every shift at every hospital remains a challenge. While early identification of patients in the Emergency Department appears to be more successful, patients who are admitted to in-patient units are not as reliably screened for clinical sepsis criteria.

• **Non-compliance with Evidence-Based Practices**: Hospitals struggle to consistently comply with the 3- and 6-hour bundles of care, though greater compliance with the 3-hour bundle has been noted.

Contributing Factors:

• **Failure to Rescue**: WSHA aligns with national agencies in supporting the development and implementation of Rapid Response Team processes that can be activated by patients, families and staff.

• **Critical Mass of Evidence for Innovation**: Caution may exceed risks related to innovations considered safe with appropriate screening and clinical judgment.
Best Practices

- **Coordinate**: Convene local and regional multi-disciplinary teams to review data on mortality and morbidity.

- **Champion**: Identify leaders who will champion awareness and best practices related to sepsis care.

- **Early Identification**: Hardwiring the routine screening for sepsis of every patient, every shift at every hospital.

- **Evidence-Based Practice**: Consistently utilize the 3- and 6-hour bundles of care.

- **Innovation**: Consider innovations such as intravenous vitamin therapies, non-invasive hemodynamic monitoring and filtration systems.

- **Rescue**: Develop, implement and maintain Rapid Response Team processes that can be activated by patients and family members, as well as staff, to assist in early detection.

- **Standardize**: Provide the highest quality care for every patient.
Transitions of Care

CO → ED → IP → TX → DC → CO

- Community Awareness
- Inpatient Unit Protocols and Resources
- Discharge and Follow up

- Emergency Department Protocols and Resources
- Transfer Options
- Community Awareness
CHI-FH Sepsis Initiatives
WSHA Sepsis Webinar Presentation
October 2017
CHI-FH Sepsis Teams Structure

Regional Sepsis Leadership Team

- System ED Code Sepsis Workgroup
- Site-based Process Improvement Teams
- High Intensity Education Steering Committee
- ED Code Sepsis Workgroups
Regional Sepsis Leadership Team Initiatives

- Epic Tool Kit launch in 2016
  - Severe Sepsis and Septic Shock BPAs for providers
  - New Sepsis Order Sets
  - Sepsis Checklists for RNs and providers
  - Smart phrases for fluid status evaluation for septic shock patients
Regional Sepsis Leadership Team Initiatives

• Order set revisions
  – Decreased from 3 order sets to 2. 1 ED order set, 1 for ICU and non/ICU
  – Revisions to lab orders to stat draws for blood cultures
  – Incorporating Palliative consult into order set for consideration for appropriate patients

• BPA revisions
  – Current BPAs: Provider Sepsis Screening BPA for severe sepsis, Compliance BPAs: Repeat Lactate, Vasopressors, Tissue Reperfusion
  – Reviewed fired BPAs with site based representation
  – Added recommendation for a lock out period to address the BPA
  – Ongoing assessment of BPA effectiveness
  – RN Sepsis Screening BPA in development

• Added smartphrase for failed attempted blood cultures
Regional Sepsis Leadership Team Initiatives

- Process improvement in ensuring second lactate
  - Work with interdisciplinary teams regionally including lab and nursing
- Education created for providers and nursing for review
- ED Code Sepsis implementation system wide

- Barriers – changes to EMR takes time, multidisciplinary process involvement needed for changes at a regional level
St. Joseph Medical Center Sepsis Committee

Who are we
• Multidisciplinary team with Physicians (ED, Intensivists, Hospitalists), Nurse Manager and Educators, Pharmacists, Quality Reps, Operational Excellence

What we do
• Review and monitor current performance metrics
• Identify areas for improvement in sepsis care
• Implement improvement strategies

Meeting structure
• Initially twice monthly for 4-5 months; then moved to once/month 90 minute meetings
Root Cause Analysis

Materials
- Lack of eMAR during downtime
- Problems with access to antibiotics
- Equipment
  - High volume of patients
  - Inappropriate patient location assignment

Method
- No system to detect sepsis
- No monitoring system/feedback on compliance
- Inconsistent use of order set
- Lack of means to assess fluid overload
- Failure to recognize sepsis
- Lack of staff engagement
- No accountability
- Poor handoff
- Lack of knowledge

People

Environment

Sepsis Bundle Fallout
Root Cause Analysis

Materials
Lack of eMAR during downtime

Method
No system to detect sepsis
Inconsistent use of order set

Lack of means to assess fluid overload

Sepsis Bundle Fallout

Equipment
Problems with access to antibiotics

High volume of patients
Inappropriate patient location assignment

People
Failure to recognize sepsis
Lack of staff engagement
No accountability

Poor handoff
Lack of knowledge

Environment
Process Mapping – From ABX Order to Administration

Provider suspects or confirms infection → Provider orders antibiotic in Epic or consults Pharmacy if needed → ED Order is verified by Pharmacy → RN Acknowledges Order → Blood Culture(s) Drawn → RN Determines When/How to Administer Antibiotic (such as need IV access)

Is ABX in Pyxis?

- YES: Administer Antibiotic
- NO:
  - If supposed to be in Pyxis, Call Pharmacy
  - Label printed in Pharmacy, medication mixed and tubed to ED

Delays:
1. No one notifies provider that test results back.
2. Provider gets busy with other tasks.
3. Waiting for test results
4. Provider distracted and forgets to check lab results
5. ABX order is not STAT and doesn’t get priority.
6. RN not available to acknowledge order
7. Unable to obtain blood culture (difficult draw)
8. If lab called, lab delay
9. No IV access or difficult to obtain access
10. ABX placed in yellow bucket after arriving in tube system and nurse busy
11. Waiting for tubed ABX
12. Stock not available in Pyxis
13. Tube system down or no tubes available
14. Pt gone from ED for testing such as radiology
15. Pt transferred out before ABX arrives

Parking Lot Items:
- IV Therapy – how do they or could they prioritize
- How to communicate urgency of ABX for Sepsis
Strategy for Process Improvement

- QI Tools
- Collaborative Partnerships
- Operational Strategies
- Engagement
- Education
Strategy for Process Improvement

- QI Tools
- Collaborative Partnerships
- Operational Strategies
- Engagement
- Education
Strategy for Process Improvement

Operational Strategies

QI Tools

Collaborative Partnerships

Engagement

Education
# Outcome Metrics

<table>
<thead>
<tr>
<th></th>
<th>Passed/Compliant</th>
<th>Failed/Non-compliant</th>
<th>Change</th>
<th>P-value</th>
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<tbody>
<tr>
<td><strong>Mortality</strong>*</td>
<td>6.60% (14/212)</td>
<td>12.81% (62/484)</td>
<td>94.1%</td>
<td>0.0078</td>
</tr>
<tr>
<td><strong>Average LOS</strong>*</td>
<td>6 days</td>
<td>8 days</td>
<td>33.33%</td>
<td>0.0022</td>
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<tr>
<td><strong>Readmission rate</strong>*</td>
<td>6.70%</td>
<td>19%</td>
<td>12.30%</td>
<td>0.04</td>
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*Based on charts abstracted for SEP-1 from all CHI-FH sites in the PNW Jan. 2016-Oct. 2016*
Take-away Points

• Completion of SEP-1 bundle is associated with **better outcomes and lower cost**

  • Engage key **individuals and departments**

    • Education is not enough; **system and process changes** are necessary

      • Ask the right questions to **define the problem**
March 2017: Regional CHI-Franciscan ED Workgroup
• Reviewed SEP-1 Sepsis Core Measure, Sepsis process improvement literature, and local King/Pierce county protocols
• Developed Sepsis Screening tool
• Developed Code Sepsis Protocol

Goals:
• Decrease time to appropriate broad spectrum antibiotic
• Decrease mortality via:
  o Code response to potentially Septic patients
  o Increased compliance with Sepsis Order Sets
CHI-FH System-wide ED Code Sepsis Team Project Charter

**Problem Statement:**
There is opportunity to improve sepsis management in the Emergency Departments (EDs). Our current process lacks tools to assist with early identification and/or a protocol to coordinate timely efforts in treating severe sepsis or septic shock.

**Criteria for Success:**

**Leading Metrics:**
- Increase ED Sepsis Management Bundle Compliance, Target Goals:
  - September 2017: 65% Bundle Compliance
  - October 2017: 70% Bundle Compliance
  - November 2017: 75% Bundle Compliance
  - December 2017: 80% Bundle Compliance
- ED Provider Order Set Utilization: 25% increase above baseline
- Decrease the number of ED missed opportunities (variances) for the following Sepsis Management Bundle Elements: Initial lactate, Blood Cultures, IV Antibiotics, Repeat Lactate, IVF Resuscitation

**Lagging Metrics:**
- Overall reduction in CHI-FH Sepsis Mortality Observed/Expected (O/E)

**Scope - Specific Focus**

**START:** Any adult patient 18 years or older who arrives to a CHI-FH ED with a known or suspected infection.

**STOP:** ED to Inpatient admission hand-off.

**Work to Complete:**
- Identify a screening tool that will be used within all CHI-FH EDs to assist staff with rapid identification of Severe Sepsis or Septic Shock.
- Develop a ED Code Sepsis Protocol that will be used within all CHI-FH EDs to assist staff with timely management of Severe Sepsis or Septic Shock patients
- ED Code Sepsis “go-live” — June 19, 2017

**Team Leadership**
- Sponsor: Dr. Kim Moore and Dr. John Krugger
- Phys. Champion: Dr. Stone, Dr. Aviles, Dr. Morris
- Team Leader: Monica Mcgee
- Process Owner: ED Nursing Directors
- Perf. Excellence Coaches: Laurie Johnson and John Elshaw
- Metrics Owner: Marina Zhukov and Carol Franco

**Team Members:**
- Subject Matter Resource: Dr. Salvador
- Regional ED Medical Directors
- Site Specific ED Physician Champions
- Site Specific ED Nursing Champions
- Lab Resource
- Pharmacy Resource
- Regional Hospitalist Resource
- Regional Intensivist Resource

**Anticipated Impact:**

<table>
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<tr>
<th>Impact</th>
<th>High</th>
<th>Mod</th>
<th>Low</th>
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<tbody>
<tr>
<td>CMIS Sepsis Core Measure Compliance</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Anticipated Impact: Mortality Reduction</td>
<td>X</td>
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<td></td>
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<tr>
<td>Anticipated Impact: Hospital Length of Stay</td>
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<td></td>
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<tr>
<td>Anticipated Impact: Complication Reduction</td>
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**Risk (Leadership Perspective):**
- Patient Mortality
- Patient Morbidity
- Loss of Revenue
- Organizational Reputation
March to June 2017 – ED Team Education & Prepare for Rollout

June 19, 2017 Go Live in all 7 EDs for Code Sepsis Protocol
   Biweekly touch base for Check & Adjust
   Data collection on core measure and protocol timeline goals
   Review of under- and over-activation
Regional Sepsis Workgroup identified consistent data points for collection:
• protocol compliance
• Physician order set compliance
• core measure compliance
• over- and under-activation of Code Sepsis

Each site submitted data, identified site-specific areas for improvement, and discussed strategies with the Regional team.
September 11, 2017 – adjustment to current Sepsis Protocol Algorithm
**ED Code Sepsis Initiative**

**Outcome Measures - Bundle compliance**

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**CHI-FH Key Performance Metrics**

**Trend:**
- **GREEN** Improved
- **RED** Lowered Performance

<table>
<thead>
<tr>
<th>Metric</th>
<th>Baseline</th>
<th>Current</th>
<th>Trend</th>
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<tbody>
<tr>
<td><strong>ED SAMPLE Population</strong></td>
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<td><strong>PASSED ED SAMPLE Population</strong></td>
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<tr>
<td><strong>FAILED ED SAMPLE Population</strong></td>
<td></td>
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<tr>
<td><strong>PASSED ED Sample Rate (passed/ed sample)</strong></td>
<td>39%</td>
<td>58%</td>
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<tr>
<td><strong>Order Set Utilization</strong></td>
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<tr>
<td><strong># of FAILED Initial Lactate</strong></td>
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<tr>
<td><strong># of FAILED IV Antibiotics</strong></td>
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<td></td>
</tr>
<tr>
<td><strong># of FAILED Blood Cultures</strong></td>
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<td></td>
<td></td>
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<tr>
<td><strong># of FAILED Repeat Lactate</strong></td>
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<td></td>
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</tr>
<tr>
<td><strong># of FAILED IVF Resuscitation (30ml/kg)</strong></td>
<td>4</td>
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**Data**

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<tr>
<th>Date</th>
<th>PASSED (ED Sample)</th>
<th>PASSED (ED Sample)</th>
<th>PASSED (ED Sample)</th>
<th>PASSED (ED Sample)</th>
<th>PASSED (ED Sample)</th>
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<td>64</td>
<td>67</td>
<td>07</td>
<td>00</td>
</tr>
<tr>
<td>Oct-16</td>
<td>30.7%</td>
<td>37.7%</td>
<td>38.7%</td>
<td>49.3%</td>
<td>52.4%</td>
<td>50.2%</td>
<td>42.8%</td>
<td>45.0%</td>
<td>58.3%</td>
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</table>
CHI-FH Mortality Observed/Expected (O/E)

Definition: Sepsis (Primary Dx), Severe Sepsis or Septic Shock POA= Y (Secondary Dx)

Sepsis Mortality Reviews began for Coding and Documentation Opportunities
The Regional team identified consistent areas for improvement:

- Use of Sepsis Order Sets
- Antibiotics administered within 60 minutes
- Fluid bolus initiated and completed promptly
- Post-resuscitation reassessment documentation completed
ED Code Sepsis Initiative
Gaps in Sepsis Care - Actions

Order Sets:
• Physician feedback about variances and Code Sepsis initiative

Antibiotics:
• Increased antibiotics availability in Pyxis
• Education to RN’s to have all broad spectrum antibiotic’s in for ALL patients in 30 min from order time
Fluids:
- Implemented fluid worksheet
- Tracking IV Fluid Bags

Post-resuscitation re-assessment
- Quick Vital sign on Epic Tool Bar
- Education to RN’s- Vital Signs and MAP
- RN education about required 2 sets of vital signs after fluid bolus
- Physician education about Sepsis Checklist in EPIC
All facilities were provided badge-buddies, computer signage and posters.
St. Anthony / Highline – Code Sepsis packets
  - Antibiotic priority & compatibility guide
  - Sepsis Nursing Checklist
  - Fluid Worksheet

Harrison – Sepsis Nursing Checklist

St. Francis – Code sign-in sheet
ED Code Sepsis Initiative
PI Methodology- A3 Tool
ED Code Sepsis Initiative

Timeline

- Pre-planning
- **System** planning
- Implementation
- Tracking our performance
- PDCA as a system
- PDCA per site- A3 driven
- Fine tuning our data capturing methodology
- **System** Barriers- Focus on two largest System ED Code Sepsis Opportunities
- Track performance, continue PDCA
- Pre- Planning to embark on **System-wide** In-Patient Code Sepsis
- **System-wide** In-Patient Code Sepsis Go-Live- TBD
A3 TITLE: Sepsis and Septic Shock  
Owner: Ryan Hosken  
Sponsor/Manager: Jennifer Graves  
VERSION #: 5  
DATE: /10/13/2017

Problem Statement (Describe the Problem)

• Sepsis remains a leading cause of mortality and morbidity worldwide.
• While the WSHA HiIN has reached the initial goal of 20% reduction in sepsis mortality from baseline, many hospitals continue to identify opportunities for improvement.

Historical Trend/Background (Current State of the Situation)

• WSHA 2014 baseline = 12.8%
• Goal of 20% reduction = 10.2%
• Recent performance = 10.1% for Q1 2017
• Current performance = 8.9% for Q2 2017

Root Cause Analysis

• Early Identification: Hardwiring the routine screening for sepsis of every patient, every shift at every hospital remains a challenge. While early identification of patients in the Emergency Department appears to be more successful, patients who are admitted to in-patient units are not as reliably screened for clinical sepsis criteria.
• Evidence-Based Practice: Hospitals struggle to consistently comply with the 3- and 6-hour bundles of care, though greater compliance with the 3-hour bundle has been noted.
• Critical Mass of Evidence: Periodic updates to the bundles and identification criteria have caused confusion. Caution may also exceed risks related to innovations that are considered safe with appropriate precautions such as intravenous vitamin C for patients with sepsis.
• Reporting Rate: Compliance with sepsis mortality reporting is high with 98% of hospitals reporting in July of 2017 via the Comprehensive Hospital Abstract Reporting System (CHARS) for WA and OR and direct AK reporting.

Target/Goal(s)

• Target of 20% reduction has been met
• Supporting hospitals in developing ways to hardwire reliable sepsis screening tools for early detection and more consistent use of the 3- and 6-hour bundles of care

Implementation Plan/Countermeasures/Outcome

<table>
<thead>
<tr>
<th>WHAT will be done</th>
<th>By WHOM</th>
<th>By WHEN</th>
<th>What was the OUTCOME</th>
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</thead>
<tbody>
<tr>
<td>Hospital site visits for hospitals with lowest and highest rates of sepsis mortality</td>
<td>Ryan Hosken</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>Data review calls and discussions of interventions and small test of change focusing on one or more: 1. Reliable early detection 2. Standardizing EBPs through use of bundles 3. Supporting innovation 4. Engaging leadership 5. Engaging patients and families in care</td>
<td>Ryan Hosken</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>Circulation of resources for utilization by hospitals in performance improvement</td>
<td>Ryan Hosken</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>Safe Table webcasts and in person events</td>
<td>Ryan Hosken</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td>Supporting patient and family member initiated and staff initiated Rapid Response Teams as one element of early detection</td>
<td>Ryan Hosken</td>
<td>Ongoing</td>
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</table>

Summary/Wrap-Up/Next Steps

• Continuing to focus on early detection, evidence-based practices and innovation
• Continuing to provide enhanced support, outreach, site visits and circulate available resources to hospitals for ongoing improvement
Sepsis and Disparities

**Sepsis Mortality Rate**
Q1 2017 - Q2 2017

- **White**: 9.6%
- **African-American**: 9.1%
- **Asian**: 11.7%
- **Native American**: 10.1%
- **Other**: 10.9%

**Definition:** Hospital deaths related to Severe Sepsis and Septic Shock (All Ages) from the number of patients diagnosed with Severe Sepsis and Septic Shock (Excludes Comfort Care Patients, with ICD-9 or ICD-10 codes)

**Data Source:** Washington State Department of Health Comprehensive Hospital Abstract Reporting System (CHARS)
Sepsis and Readmissions

Working Together to Achieve Results

We have achieved a 31.2% reduction in severe sepsis and septic shock mortality rate. This represents 660 fewer patients expiring from severe sepsis or septic shock.

Thank You!