The Davies Award Is:

• Since 1994, the Nicholas E. Davies Award of Excellence is HIMSS highest global recognition of hospitals, ambulatory practices and clinics, community health organizations, and public health organizations that utilize electronic health records and information technology to improve clinical and financial outcomes.

• The Davies Award is international and open to all healthcare delivery systems that meet the prerequisites.

• The Davies Award is vendor-agnostic.
Speaker Bio(s)

Taylor Hargrave, BSN, RN, CIC, Infection Prevention Supervisor

Amanda Logue, M.D., Chief Medical Information Officer

The HIMSS Nicholas E. Davies Award of Excellence
Awarding IT. Improving Healthcare.
Sepsis

Lafayette General Health

2017 Nicholas E. Davies Enterprise Award of Excellence

Taylor Hargrave, BSN, RN, CIC, Infection Prevention Supervisor
Amanda Logue, M.D., Chief Medical Information Officer
Lafayette General Health

Who we are

- 7 Inpatient facilities (incl. Academic)
- 43 Ambulatory sites: 18 specialties
- 1 Ambulatory surgery center
- 4,043 FTEs
- 68 Employed Physicians
- 1,700 Non-Employed Medical Staff
- Acute HIMSS Level 6 (LGMC & UHC)

Our patients

- 29,000 Admissions
- 180,000 ED visits
- 23,000 Surgical cases
- 335,000 Outpatient visits

Top Service lines:
- Cardiology
- Neurology
- Orthopedics

Fiscal Year 2016 (Sept. 2015 - Sept. 2016)
Information Systems automation journey

2003
- CPOE, Documentation, ED, Pharmacy, Revenue Cycle

2006
- Radiology, PACS, Laboratory

2012
- System re-install, Surgery, Cerner Patient Accounting, Quality Alignment

2013
- Ambulatory ASP, Oncology

2014
- Remote Hosting

2015
- Integrated Ambulatory, Sepsis, PSI-15 process, New CDI software

2016
- Women’s Health, Care Management, Registries, CommonWell, EPCS, HealthyLink clinics

2017
- EDW, HealthyLink hospital system, Palm Scanning, Patient Observer

Hospitals acquired:
Local Problem
33.13% of overall mortality rates attributed to Sepsis

- Previous workflow:
  - Reviewed current symptoms vs. early detection
  - Identification only considered Temperature, HR, and Systolic BP (Rules of 100s)
  - When patient's vital signs met criteria a sheet was automatically printed on the ICU printer
  - The Rapid Response Team nurse went patient's unit and spoke with the primary nurse, assisted with patient assessment if appropriate

- Contributing factors:
  - Unemployment rates increasing, patients losing health benefits\(^1\)
  - Patients tend to wait to seek treatment, sicker when in hospital

\(^1\)Reference the appendix for Lafayette vs National unemployment rates
## Sepsis Mortality Rate and Incident Count

<table>
<thead>
<tr>
<th>Diagnosis group*</th>
<th>Mortality Rate Monthly Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGMC Mortality</td>
<td>2.13%</td>
</tr>
<tr>
<td>Overall Sepsis†</td>
<td>16.54%</td>
</tr>
<tr>
<td>Sepsis</td>
<td>7.28%</td>
</tr>
<tr>
<td>Severe Sepsis</td>
<td>18.92%</td>
</tr>
<tr>
<td>Septic Shock</td>
<td>33.33%</td>
</tr>
<tr>
<td>% of mortality attributed to sepsis</td>
<td>33.13%</td>
</tr>
</tbody>
</table>

Time period: Nov. 2014 – Nov. 2015

*ICD-10 diagnoses included in each category listed in Appendix

Data Source: LGMC Cerner EHR database
# Sepsis Incident Count by Diagnosis Group

<table>
<thead>
<tr>
<th>Diagnosis group*</th>
<th>Incident Count Monthly Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Sepsis†</td>
<td>77</td>
</tr>
<tr>
<td><em>Sepsis</em></td>
<td>38.08</td>
</tr>
<tr>
<td><em>Severe Sepsis</em></td>
<td>9.83</td>
</tr>
<tr>
<td><em>Septic Shock</em></td>
<td>23.67</td>
</tr>
</tbody>
</table>

†Overall Sepsis includes Sepsis, Severe Sepsis, and Septic Shock cases

Data Source: LGMC Cerner EHR database

Time period: Nov. 2014 – Nov. 2015
## Sepsis Incident Count by DRG

<table>
<thead>
<tr>
<th>DRG</th>
<th>Monthly Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>870¹ “Sickest”</td>
<td>3.36</td>
</tr>
<tr>
<td>871² “Sicker”</td>
<td>26</td>
</tr>
<tr>
<td>872³ “Sick”</td>
<td>7.73</td>
</tr>
</tbody>
</table>

Time period: June 2014 – May 2015

¹ SEPTICEMIA OR SEVERE SEPSIS W MV 96+ HOURS  
² SEPTICEMIA OR SEVERE SEPSIS W/O MV 96+ HOURS W MCC  
³ SEPTICEMIA OR SEVERE SEPSIS W/O MV 96+ HOURS W/O MCC

Data Source: LGMC Cerner EHR database
# Sepsis Length of Stay

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>LOS: Days Monthly Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Wide</td>
<td>4.5</td>
</tr>
<tr>
<td>Overall Sepsis</td>
<td>9.35</td>
</tr>
<tr>
<td>Sepsis</td>
<td>8.61</td>
</tr>
<tr>
<td>Severe Sepsis</td>
<td>7.25</td>
</tr>
<tr>
<td>Septic Shock</td>
<td>12.21</td>
</tr>
</tbody>
</table>

Time period: Nov. 2014 – Nov. 2015

Data Source: LGMC Cerner EHR database
Sepsis Core Measure\textsuperscript{1}

**Early Management Bundle, Severe Sepsis/Septic Shock**

**Description:** This measure focuses on adults 18 years and older with a diagnosis of severe sepsis or septic shock. Consistent with Surviving Sepsis Campaign guidelines, it assesses measurement of lactate, obtaining blood cultures, administering broad spectrum antibiotics, fluid resuscitation, vasopressor administration, reassessment of volume status and tissue perfusion, and repeat lactate measurement. As reflected in the data elements and their definitions, the first three interventions should occur within 3 hours of presentation of severe sepsis, while the remaining interventions are expected to occur within 6 hours of presentation of septic shock.

**Rationale:** The evidence cited for all components of this measure is directly related to decreases in organ failure, overall reductions in hospital mortality, length of stay, and costs of care.

\textsuperscript{1}**Measure Set:** Sepsis **Set Measure ID #:** SEP-1 **Performance Measure Name:** Early Management Bundle, Severe Sepsis/Septic Shock

\textsuperscript{2}**Data Source:** LGMC Cerner eQualityCheck


\textsuperscript{3}The Joint Commission. (2016) Specifications Manual for National Hospital Inpatient Quality Measures v.5.2a (applicable 1/1/2017 - 12/31/2017).
## LGMC baseline cost per case by DRG

<table>
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<th>DRG</th>
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<td>$27,669.24</td>
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<td>$11,902.18</td>
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Data Source: Premier Quality Advisor
Design
Implementation
Governance
Governance

- Governance:
  - Executive Sponsor: CMIO
  - Clinical Transformation Committee
  - Medical Executive Committee

- Project team:
  - Quality department
  - IT analysts
  - Nursing subject matter experts (ICU, Med-Surg, RRT, ED)
  - Clinical pharmacists
  - Cerner Quality Reporting

- Goals/Anticipated outcome:
  - Increase early detection and prevention of Sepsis
  - Decrease mortality associated with Sepsis
Design and Build

- **Project Timeline:**
  - 14 months

- **Algorithm monitoring and modification:**
  - Alert initially built in “silent mode”
  - Project team audited and validated alert population and frequency
  - Excluded:
    - CV surgery for the initial 24 hours post-op
    - Active laboring population for 24 hours
    - Comfort measures only patients for duration of stay
    - NICU, Nursery, Pediatrics
Design and Build, cont.

• Decisions:
  • Who to alert
  • Frequency of alert
    • Every patient will only alert once Q24 hours.
    • Alerts are suppressed for extended time (72 hours) if a sepsis order set is active or if a sepsis diagnosis is in place
  • When to call physician
  • Additional FTE added to Rapid Response Team (LGMC)

• Repeat lactate orders:
  • If any lactate result is > 2.0, then an automatic timed lactate is ordered for 5 hours after the original lab was ordered
Review of alerts prior to go-live

May 2015 Total Alerts SIRS and Sepsis
N = 172 alerts

- **Infectious Etiology***: 47%
- **Non-infectious Etiology****: 53%

*Infectious Etiology = Infection documented or developing at the time of alert
**Non-Infectious Etiology = No infection documented or developing at time of alert
Review of alerts prior to go-live

SIRS or Sepsis Alerts by Infectious Etiology
May 2015

- Respiratory: 30 alerts, 26.1% of total
- UTI: 28 alerts, 50.4% of total
- Sepsis: 26 alerts, 73.0% of total
- GI: 20 alerts, 90.4% of total
- Abscess/cellulitis - other: 8 alerts, 97.4% of total
- Osteomyelitis: 2 alerts, 99.1% of total
- Viral illness: 1 alert, 100.0% of total

Percent of Total

Count of Alerts

Cumulative %

Infectious Etiology

- Count of Alerts
- Cumulative %
Review of alerts prior to go-live

SIRS or Sepsis Alerts by Non-Infectious Etiology
May 2015

Non-Infectious Etiology

- Anemia/SSC: 16 (17.8%)
- GI: 15 (34.4%)
- Surgery: 10 (45.6%)
- Cardiac: 8 (54.4%)
- Pulmonary: 62.2%
- Trauma: 6 (68.9%)
- End of life: 6 (75.6%)
- Steroids: 5 (81.1%)
- Drug use: 5 (86.7%)
- Maternity: 5 (92.2%)
- Chemo/CA: 4 (96.7%)
- Seizures: 1 (97.8%)
- <5 year old: 1 (98.9%)
- Allergic reaction: 1 (100.0%)

Count of Alerts

Percent of Total

Cumulative %
Training

- 1 month prior to go-live: all nurses assigned module via Elsivier training on alert workflow
- Infection Prevention (IP) attended hospitalist meetings to explain the core measure
  - Quick reference laminated pocket cards were provided to physicians
- Education provided to physician residents via LSU education platform
- IP attended Women's Services staff meetings to discuss core measures; information included in department newsletter

See Sepsis Appendix for sample training materials
Support and Measure

- Infection Prevention quarterly review of all Sepsis patients
  - Synopsis of all core measure passes and misses sent to those involved in care of patient at the time of event
  - Thank you card sent to physicians responsible for passes
  - Opportunity letter sent to physicians responsible for misses
  - Synopsis of passes and misses sent to each leader monthly

<table>
<thead>
<tr>
<th>Passes:</th>
<th>Financial Number</th>
<th>Person Name</th>
<th>Discharge Facility</th>
<th>Discharge Date</th>
<th>Location Attribution</th>
<th>Personnel 1</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LGMC</td>
<td>2/14/2017</td>
<td>ED</td>
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<td>2/17/2017</td>
<td>ED</td>
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<td></td>
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<td></td>
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</table>

<table>
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<tr>
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<th>Person Name</th>
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<th>Discharge Date</th>
<th>Discharge Disposition</th>
<th>Category Reason</th>
<th>Investigation</th>
<th>Personnel 1</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>LGMC</td>
<td>2/27/2017</td>
<td>Home</td>
<td>Initial Lactate Level Collection - 2</td>
<td>Pt meets severe s...</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>LGMC</td>
<td>2/25/2017</td>
<td>Expired</td>
<td>Broad Spectrum or Other Antibiotic Administration - 2</td>
<td>Septic shock criteria met in ED...</td>
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<tr>
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<td></td>
<td></td>
<td>LGMC</td>
<td>2/28/2017</td>
<td>Expired</td>
<td>Repeat Lactate Level Collection - 2</td>
<td>Pt met septic shock criteria in ED...</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>LGMC</td>
<td>2/22/2017</td>
<td>Other Health Care Facility</td>
<td>Crystallloid Fluid</td>
<td>Septic shock criteria met in ED...</td>
<td></td>
</tr>
</tbody>
</table>
Opportunity and Thank You letters

Physician Core Measure Opportunity Notification

Dear Dr.,

Lafayette General is required to submit process of care (Core Measure) data to CMS per the Quality Reporting Program. In an effort to improve our performance, we are notifying you of a case that was found to fall outside of the accepted guidelines. Please review this notification and notify the Quality Department of documentation supportive of the published guidelines in regard. Your questions are welcomed.

Synopsis: Sepsis Core Measures

Standards – Severe Sepsis:
- Initial lactate level drawn between 6 hr prior to and 3 hr following presentation of severe sepsis.
- Broad spectrum or other antibiotic administration 24 hr prior to or 3 hr following severe sepsis.
- Blood culture collected between 48 hr prior to and 3 hr following severe sepsis and prior to a repeat lactate level drawn beginning at severe sepsis and ending 6 hr thereafter, if initial lactate level drawn.
- 30 mL/kg crystalloid fluids administration following hypotension 6 hr prior to and 6 hr following presentation of severe sepsis.

Standards – Septic Shock:
- If hypotension persists in the hour after fluid administration, then begin intravenous vasopressor.
- Vital signs record documented by physician between fluid administration and 6 hr after septic shock.
- Cardiopulmonary evaluation performed between fluid administration and 6 hr after septic shock.
- Capillary refill exam performed by physician between fluid administration and 6 hr after septic shock.
- Peripheral pulse evaluation performed by physician between fluid administration and 6 hr after septic shock.
- Skin examination performed by physician between fluid administration and 6 hr after septic shock.

OR

- Central Venous Pressure measurement obtained within 6 hr after septic shock.
- Central Venous Oxygen measurement obtained after the presentation of septic shock.
- Bedside CV ultrasound performed between fluid administration and 6 hr after septic shock.
- Passive Leg Raise exam performed by physician between fluid administration and 6 hr after septic shock.

Thank you
How Health IT was Utilized
How Health IT was Utilized

- Cerner St. John Sepsis Agent:
  - Gathers and combines patient information and vital signs from EHR
  - Fires alert in EHR when signs for SIRS or organ dysfunction are detected
- Electronic alerts based on algorithm
- Orders/tasks to drive action
- Evidence-based electronic order sets
  - Sepsis quality measure compliant
  - Improve antibiotic use identification
- Core measure reporting
St. John Sepsis Agent Algorithm

Copyright Cerner Corp. 2014
Sepsis Inpatient Workflow

Green boxes = Health IT utilization
Sepsis ED Workflow

SIRS or sepsis criteria met

SIRS alert generated on ED tracking board

ED resource nurse follows-up on all sepsis alerts to ensure primary nurse has discussed with physician

Primary nurse speaks with physician about possibility of sepsis

Infection prevention receives folder documentation monthly and compares to sepsis core measure population for performance improvement

Secondary nurse generates ED SIRS protocol order set if instructed by physician

Primary nurse orders ED sepsis protocol

Primary nurse starts sepsis folder to document intervention times

Items in folder are scanned in patient’s medical record before the patient leaves ED

Green boxes = Health IT utilization
SIRS Alert

- At least 3 SIRS criteria met
- Date and Time appear prior to the clinical event in the alert
- Includes a link to the patient’s chart in the message
Sepsis Alert

- At least 2 SIRS criteria and 1 organ dysfunction criteria
- Alert for the patient who meets criteria for the Sepsis Security Rule should display as shown
- Date and Time appear prior to the clinical event in the alert
- Includes a link to the patient’s chart in the message

[Screenshot from Cerner EHR]
Rapid Response Team Beeper

- Every Sepsis Alert sent to Rapid Response Team Beeper
Alert order placed on patient’s chart with nursing task

Patient Order Profile

Nurse Task List

Screenshot from Cerner EHR
ICU Decision Tree

- Used to determine if physician notification needed

1. Response Nurse receives page regarding sepsis alert and location of patient.
2. Evaluate reason sepsis alert was triggered in Powerchart.
3. Evaluate the patient with the primary nurse and determine the patient’s working diagnosis.

- Is the patient already being treated for an active or presumed infection with antibiotics?
  - no
    - Does the workup indicate a new source of infection?
      - yes
        - Call physician on call to discuss the patient’s new results/sepsis alert and hemodynamic stability. Utilize the sepsis powerplan for orders.
      - no
        - Is there a significant change in the patient’s vital signs, mental status, or decreased urinary output?
          - yes
            - Call physician on call to discuss the patient’s changes and decide if sepsis powerplan is to be initiated.
          - no
            - Discuss with primary nurse to watch for additional signs of sepsis and encourage call back if needed.
  - yes
    - Is there a significant change in the patient’s vital signs, mental status, or decreased urinary output?
      - yes
        - Discuss with primary nurse to watch for additional signs of sepsis and encourage call back if needed.
      - no
        - Call the physician on call to discuss the patient’s condition.
Provider Notification Form

If deemed clinically necessary, nurse will contact provider and document communication in EHR.
ED Tracking Board icon

<table>
<thead>
<tr>
<th>Bed</th>
<th>Bed Name</th>
<th>Age</th>
<th>Sep CC</th>
<th>LOS</th>
<th>LOS/RN</th>
<th>Event</th>
<th>PINED Comments</th>
<th>T</th>
<th>HR</th>
<th>SBI</th>
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<td>E.04</td>
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<td></td>
</tr>
</tbody>
</table>

- **Sepsis Column**
- **Possible SIRS Event**
- **Possible Sepsis Event**

Screenshot from Cerner EHR
# Sepsis Order Sets

**ED Sepsis Treatment Protocol (Initiated Pending)**

- **Admit**
  - General
  - Vital Signs
  - Lab
  - Nutritional Services

- **Vital Signs**
  - Telemetry with Monitor

- **Lab**
  - Resuscitation Status (Code Status)

- **Nutritional Services**
  - Elevate Head of Bed
  - Head of bed elevated equal to or greater than 30 degrees unless contraindicated

- **Vasoactive Agents**
  - NPO
  - Regular Diet

- **Patient Care**
  - Fluids and Electrolytes
  - Urinary Catheter Discontinue
  - Gastric/Enteral Tube Insertion (NG/OG Tube Insertion)

- **Continuous Infusions**
  - Sodium Chloride 0.9% IVF Normal Saline NS Inf...
  - Lactated Ringers Injection (IVF Lactated Ringers ...)

- **Medications**
  - Heparin (heparin 5000 units/mL, injectable solution...
Key Orders in Sepsis Order Sets

• Sepsis Quality Measure Order
• Sepsis Severity Identification Order
Sepsis Severity Identification Order

- Completed by physician to identify the type of sepsis being treated and suspected source of infection
- Drives electronic documentation for the Sepsis core measure and helps with the establishment of time zero
Early Warning Alerts Flowsheet

One-stop-shop for discrete sepsis information

Screenshot from Cerner EHR
Value Derived
Decreased Sepsis Mortality Rate

LGMC Mortality Rate Data

- Hospital Mortality Rate: 2.13% (Baseline) 1.89% (Outcome)
- Overall Mortality Sepsis Rate: 16.54% (Baseline) 12.69% (Outcome)
- Sepsis Mortality Rate: 7.28% (Baseline) 6.29% (Outcome)
- Severe Mortality Sepsis Rate: 18.92% (Baseline) 9.41% (Outcome)
- Septic Shock Mortality Rate: 33.33% (Baseline) 28.77% (Outcome)

Data Source: LGMC Cerner EHR database
## Decreased Sepsis Mortality Rate

<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
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<td>33.13%</td>
<td>31.2%</td>
<td>-5.83%</td>
</tr>
</tbody>
</table>

Data Source: LGMC Cerner EHR database
Improved Sepsis Core Measure Compliance by 949.48%

LGMC Sepsis Core Measure Compliance

Pre-go live compliance (Oct. 2015 - Feb. 2016): 2.46%
Post-go live compliance (March. 2016 - Feb. 2017): 25.86%

Data Source: LGMC Cerner eQualityCheck
Increased Incident Count/Coding

Change in Incident Coding by Diagnosis Group

- SIRS: Baseline 5.42, Outcome 12.25
- Sepsis: Baseline 38.08, Outcome 50.08
- Severe Sepsis: Baseline 9.83, Outcome 12.42
- Septic Shock: Baseline 23.67, Outcome 22.83

Data Source: LGMC Cerner EHR database
Increased Incident Count/Coding

Change in Incident Coding by DRG

Baseline Monthly Average (Jun. 2014 – May 2015)

1SEPTICEMIA OR SEVERE SEPSIS W MV 96+ HOURS
2SEPTICEMIA OR SEVERE SEPSIS W/O MV 96+ HOURS W MCC
3SEPTICEMIA OR SEVERE SEPSIS W/O MV 96+ HOURS W/O MCC

Data Source: LGMC Cerner EHR database
Change in LOS by Diagnosis Group

- **Hospital Wide**: 4.5 – 4.65
- **Overall Sepsis**: 9.35 – 9.48
- **Sepsis**: 8.61 – 8.48
- **Severe Sepsis**: 7.25 – 7.58
- **Septic Shock**: 12.21 – 13

**Legend**
- **LOS – days Monthly Average (Nov. 2014 – Nov. 2015)**

Data Source: LGMC Cerner EHR database
## Decreased Cost Per Case

<table>
<thead>
<tr>
<th></th>
<th></th>
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<td>871 “Sicker”</td>
<td>$11,902.18</td>
<td>$11,413.57</td>
<td>424</td>
<td>$207,170.64</td>
</tr>
<tr>
<td>872 “Sick”</td>
<td>$7,434.45</td>
<td>$6,618.30</td>
<td>116</td>
<td>$135,480.90</td>
</tr>
<tr>
<td><strong>Total cost savings</strong></td>
<td><strong>$343,682.78</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **How decreased cost:**
  - Diagnosing sooner impacts progression of disease
  - Coded more patients with sepsis diagnosis codes
  - Decreased mortality and improved outcomes
  - Improved efficiencies to care for patient – lowered cost to provider, patient, and payer

Data Source: Premier Quality Advisor
## Overall Sepsis Lives Impacted/Saved Analysis

<table>
<thead>
<tr>
<th>Month</th>
<th>Sepsis Mortality Count</th>
<th>Total Sepsis Encounters</th>
<th>Sepsis Mortality Rate</th>
<th>Lives Impacted/Saved*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>12.54</td>
<td>75.15</td>
<td>16.54%</td>
<td>--</td>
</tr>
<tr>
<td>Mar-16</td>
<td>8</td>
<td>74</td>
<td>10.81%</td>
<td>4.24</td>
</tr>
<tr>
<td>Apr-16</td>
<td>9</td>
<td>96</td>
<td>9.38%</td>
<td>6.87</td>
</tr>
<tr>
<td>May-16</td>
<td>12</td>
<td>77</td>
<td>15.58%</td>
<td>0.74</td>
</tr>
<tr>
<td>Jun-16</td>
<td>8</td>
<td>84</td>
<td>9.52%</td>
<td>5.90</td>
</tr>
<tr>
<td>Jul-16</td>
<td>13</td>
<td>85</td>
<td>15.29%</td>
<td>1.06</td>
</tr>
<tr>
<td>Aug-16</td>
<td>11</td>
<td>74</td>
<td>14.86%</td>
<td>1.24</td>
</tr>
<tr>
<td>Sep-16</td>
<td>9</td>
<td>87</td>
<td>10.34%</td>
<td>5.39</td>
</tr>
<tr>
<td>Oct-16</td>
<td>10</td>
<td>75</td>
<td>13.33%</td>
<td>2.41</td>
</tr>
<tr>
<td>Nov-16</td>
<td>14</td>
<td>97</td>
<td>14.43%</td>
<td>2.04</td>
</tr>
<tr>
<td>Dec-16</td>
<td>7</td>
<td>85</td>
<td>8.24%</td>
<td>7.06</td>
</tr>
<tr>
<td>Jan-17</td>
<td>13</td>
<td>96</td>
<td>13.54%</td>
<td>2.88</td>
</tr>
<tr>
<td>Feb-17</td>
<td>17</td>
<td>100</td>
<td>17.00%</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td>39.84</td>
<td></td>
</tr>
</tbody>
</table>

*Monthly Average: **3.32**

*Lives impacted/saved calculated by multiplying the change in mortality rate from baseline and the number of sepsis encounters per month*
Future considerations

• ED physician note often started without a sepsis diagnosis
  • When sepsis enters the differential, an addendum is made and treatment orders are entered
  • If the addendum does not have a time stamp, then time zero becomes when the note was first opened
• Create nursing documentation identifying sepsis onset that physician can pull into note
• Evaluate SOFA criteria vs. old CMS SIRS criteria
  • Will the CMS specs change as the Surviving Sepsis campaign adopts new criteria?
• SIRS and sepsis ED icons are difficult to differentiate for color blind employees
• Include CMO with physician opportunity letters for misses
• Work with Intensivists to stay up to date on sepsis recommendations
Thank you
Appendix
LGH Patient Population

Lafayette Metro vs. U.S. National Average Unemployment Rate

Sepsis Diagnosis Group Data Criteria

• **Encounter Types**
  - Hospice
  - Inpatient
  - LBHU Inpatient
  - LTAC Long Term Care
  - Rehab
  - Swingbed

• **SIRS Diagnosis List (ICD-10)**
  - R65.10
  - R65.11

• **Sepsis Diagnosis List (ICD-10)**
  - 771.81
  - 995.91
  - A02.1
  - A22.7
  - A26.7
  - A32.7
  - A40.0
  - A40.1
  - A40.3
  - A40.8
  - A40.90
  - A40.9
  - A41.01
  - A41.02
  - A41.1
  - A41.2
  - A41.20
  - A41.3
  - A41.4
  - A41.50
  - A41.51
  - A41.52
  - A41.53
  - A4.59
  - A41.81
  - A41.89
  - A41.9
  - A42.7
  - A54.86
  - B37.7

• **Severe Sepsis Diagnosis List (ICD-10)**
  - 995.92
  - R65.20

• **Septic Shock Diagnosis List (ICD-10)**
  - 785.52
  - R65.21
Sepsis Training Materials

Sepsis Alerts

- LGH will replace the Rules of 100s with an alerting system based upon a combination of symptoms that may indicate sepsis.

- When the patient meets sepsis alert criteria the alert will be sent to an ICU response nurse, primary nurse, resident, quality and infection prevention.

Sepsis Alert Example

Alert criteria is based upon CMS definitions which may include HR, temperature, BP, labs, respirations, etc.

Severe Sepsis – 3 hour bundle

- **Initial lactate**
  - Must be collected before 3 hours after time zero

- **Blood culture prior to antibiotic**
  - Must be collected before 3 hours after time zero and before IV antimicrobial is administered

- **Broad spectrum or other IV antibiotic**
  - Administer immediately after blood culture collection and before 3 hours after time zero

- **Repeat lactate**
  - Only if initial lactate is >2
  - Must be collected before 6 hours after time zero
Sepsis Training Materials, cont.

Septic Shock – 6 hour bundle

- **30 mL/kg crystalloid fluids**
  - Must be either NS or LR at a rate of at least 125 mL/hr

- **Vasopressors**
  - Only if hypotension persists after fluid bolus

- **Tissue perfusion assessment**
  - Must be documented by MD/APN/PA within 6 hours of septic shock time zero

Pocket Cards for Providers

**Front**

- 3 Hours
- Lactate level
- Blood cultures prior to antimicrobial
- Administer antimicrobial
- 30mL/kg crystalloid bolus for hypotension or lactate > 4.0

**Back**

- 6 Hours
- Vasopressor for hypotension not responsive to fluid bolus
- Repeat lactate if initial result is > 4.0
- Tissue perfusion assessment
  - VS acknowledgement
  - CP exam
  - Cap refill
  - Peripheral pulse
  - Skin exam referencing color
# Sepsis ICU Documentation

## Date: Time notified: Time Response arrived: End Time:

### Initial Vital Signs
- **Temp**: 
- **BP**: 
- **HR**: 
- **RR**: 
- **SpO2**: 
- **FiO2**: 

### Severe Sepsis Criteria:
- **Documentation** of suspected source of infection
- **PLUS**
  - Two or More SIRS Criteria:
    - Temperature > 38.3 or < 36.0
    - Pulse > 90
    - Respirations > 20 per minute
    - WBC > 12,000 or < 4,000 or > 10% bands
  - **AND**
    - One manifestation of organ dysfunction:
      - SBP < 90 or MAP < 65 or SBP ↓ by 40mmHg from normal
      - Creatinine > 2.0 or UO < 0.5mL/kg/hr for 2 hours
      - Bil > 2
      - PaO2 < 100,000
      - INR > 1.5 or aPTT > 60sec
      - Lactate > 2 mmol/L
  - **OR**
    - **Documentation** of severe sepsis

### Septic Shock Criteria:
- **Documentation** of severe sepsis
- **PLUS**
  - Tissue Hypoperfusion persist > one hour following crystalloid fluid administration:
    - SBP < 90
    - MAP < 65
    - SBP ↓ by 40mmHg from last recorded normal
  - Lactate > 4
  - **OR**
    - **Documentation** of septic shock

### Background / Assessment:
- Admission Diagnosis:
- Date of Admit:
- Code Status:
- Brief History:
- Assessment:

### Interventions (specify):

### Outcome / Plan (select all that apply):
- Sepsis Power Plan Initiated
- RRT Initiated (transfer documentation to RRT form)
- Code Blue Initiated
- No Intervention

### Patient Disposition:
- Transferred to ICU

### Attending physicians notified:
- Time:
- Hospitalist (if applicable):
- Time:

### Signatures:
- RESPONSE NURSE
- Time:

---

**Form Title:** Sepsis Alert Response Form  
**Chart Tab Order:** Nurses Notes  
**Revision Date:**
# Sepsis ED Timing Chart

<table>
<thead>
<tr>
<th>Timing</th>
<th>Severe Sepsis</th>
<th>Septic Shock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure Lactate</td>
<td>3 hour</td>
<td>3 hour</td>
</tr>
<tr>
<td>Blood Culture</td>
<td>3 hour</td>
<td>3 hour</td>
</tr>
<tr>
<td>Start Antibiotics</td>
<td>3 hour</td>
<td>3 hour</td>
</tr>
<tr>
<td>IV fluids (30ml/kg)</td>
<td>N/A</td>
<td>3 hour</td>
</tr>
<tr>
<td>Repeat Lactate (if initial &gt;2)</td>
<td>6 hour</td>
<td>6 hour</td>
</tr>
<tr>
<td>Initiate pressor if MAP low despite fluids (norepinephrine)</td>
<td>N/A</td>
<td>6 hour</td>
</tr>
<tr>
<td>Assess volume status/perfusion</td>
<td>N/A</td>
<td>6 hour</td>
</tr>
</tbody>
</table>
Sepsis ED Timed Worksheet

**SEPSIS TIMED WORK SHEET**

If Screen Positive for Severe Sepsis and/or Septic Shock, **SEPSIS GOALS** -

- Lactate Drawn: 36 min.
- Sepsis Alert to Cultures: 36 min.
- Sepsis Alert to Antibiotic: 3 hr ED Patient

<table>
<thead>
<tr>
<th>Symptom Onset Date:</th>
<th>Time:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of Sepsis Alert:</td>
<td></td>
</tr>
<tr>
<td>Antibiotic Goal Time:</td>
<td>Actual time given:</td>
</tr>
</tbody>
</table>

Mark appropriate screen:
- Severe Sepsis
- Septic Shock

**TIME SEPSIS PROTOCOL ORDERS INITIATED:**

- Blood Cultures prior to Antibiotics: yes or no
- If yes, draw time: If no, reason: 
- If done within 48 hours do not repeat

- Lactate Drawn: yes or no
- If yes, draw time: Result:
- If already done result: **repeat Lactate within 6 hrs if initial >2.0**

- Antibiotic Time Initiated:
- Goal: 3 hr ED Patient:

- Weight: Target IV volume [ml]:
- Time Fluid Bolus: (NS/LR @ 30ml/kg)
- Amount of Fluid Bolus:

- SEPTIC SHOCK (Hypotension persisting after fluid resuscitation)
- Date/Time Pressors initiated:
- Transferred to:
- Staff Signature:

Reviewer to complete section below:

<table>
<thead>
<tr>
<th>Sepsis Alert</th>
<th>Time:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactate Drawn</td>
<td>Time:</td>
</tr>
<tr>
<td>3x onset to Antibiotic</td>
<td>Order Time:</td>
</tr>
<tr>
<td>3x onset to Cultures</td>
<td>Start Time:</td>
</tr>
<tr>
<td>3x onset to Fluid Resuscitation</td>
<td>Time:</td>
</tr>
</tbody>
</table>
ED Flowsheet for Time Zero

≥ 2 SIRS criteria
- Temp >38 or <36
- HR >90
- RR >20
- WBC >12 or <4

NO → monitor

YES

> 1 Organ Dysfunction Criteria
- SBP <90 or MAP <65
- Creatinine > 2.0
- Bili > 2.0
- Platelet < 100,000
- INR >1.5 or PTT > 60
- Acute respiratory failure requiring intubation
- Lactate > 2.0

NO → monitor

YES

Suspected Source of Infection

YES

Severe Sepsis criteria has been met

Obtain lab work: routing labs, lactic acid, blood cultures x2
Administer Antibiotics – must be started within 1 hour from TIME ZERO
Lactic Acid – repeat in <6 hours from TIME ZERO

Lactate >4

or

Hypotensive: SBP <90 or MAP <65

YES

Septic Shock criteria has been meet

NS or LR bolus = ≥ 30 ml/kg over 30-60 minutes

Pt remains hypotensive: SBP <90 or MAP <65

YES
Thank You for joining us for this Davies Webinar

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