Trinity Health System
About Trinity Health System

- Located in Steubenville, along Ohio River
- Member Catholic Health Initiatives
- Community Hospital with 340 licensed beds
- 7600 admissions per year
- 44,000 ED visits per year
- Services include: Pediatrics, OB, Cath Lab & Open Heart, Behavioral Medicine, Skilled Care, Inpatient Rehab Unit
Presenters

- Dr. John Columbus, Medical Director ED & Chief of Staff
- Dr. Ken Woods, Medical Director Infectious Disease
- Dr. Himanshu Doshi, Medical Director Pathology & Clinical Laboratory
- Dr. John Figel, Chief Medical Officer
- Amy Lindsay, RN - Clinical Coordinator, Emergency Dept.
Our Sepsis Journey

- Identified opportunity to decrease overall mortality

- Sepsis -- highest driver of mortality

- Multidisciplinary team formed in early 2014
  - Emergency Department – physician & nursing
  - Infectious Disease
  - Inpatient nursing
  - Laboratory
  - Information Systems
Putting all the Pieces Together

1. Awareness & Identification
2. Researching best practice
3. Developing order sets
4. Sepsis bundle compliance
5. BioFire Technology
6. Continual Education
### Awareness & Identification

#### Rapid Response Team Record

<table>
<thead>
<tr>
<th>Sepsis Screening Tool: (\text{If Yes to 2 or more criteria and suspected/known infection, alert Rapid Response physician of findings.})</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(YES or NO)</td>
<td></td>
</tr>
<tr>
<td>Temperature &gt; 38°C (100.9°F) or &lt; 36°C (96.8°F)?</td>
<td></td>
</tr>
<tr>
<td>Heart Rate &gt; 90?</td>
<td></td>
</tr>
<tr>
<td>Respiratory rate &gt; 20 or PaCO2 &lt; 32?</td>
<td></td>
</tr>
<tr>
<td>WBC &gt; 12,000 or &lt; 4,000 or &gt; 10% Bands?</td>
<td></td>
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</table>
Sepsis Treatment

1. **Source of Infection suspected or known**
   - **Yes**: STOP
   - **No**:
     - **SIRS score 2 or more**
       - **Yes**: STOP
       - **No**:
         - **Obtain initial lactate level**
           - **Any one of the following:**
             1. organ dysfunction
                2. lactate > 2
                3. hypotension
           - **Yes**:
             - **Initiate all:**
               1. repeat lactate if initial > 2
               2. blood cultures
               3. broad spectrum antibiotics
           - **Assess Patient**
         - **No**:
           - **Hypotension &/or lactate level 4 or >**
             - **No**: STOP
             - **Yes**:
               - **Administer adequate fluid resuscitation**
                 - **30ml/kg of crystalloid fluids**
               - **AND**
                 - If appropriate: (adequate amount of fluids given or fluids infusing and condition worsening) administer vasopressors
               - **Re-assess/document vital signs w/in 1 hour of completion of fluids**

Severe Sepsis
The FilmArray BCID Panel Provides Faster Results

- Can use on blood culture bottles that are:
  - Flagged as positive by a continuously monitoring blood culture instrument
  - Positive by Gram stain examination

BCID=blood culture identification; ID=identification.
The FilmArray BCID Panel

- The FilmArray instrument integrates sample preparation, amplification, detection, and analysis into one simple system.

Fast¹:
- 2 minutes of hands-on time
- Run time of about 1 hour

Accurate²:
- Overall sensitivity of 97.5%
- Overall specificity of 99.8%

Comprehensive¹:
- Identifies pathogens in 9 out of 10 positive blood cultures
- Simultaneously tests for 27 targets

¹ As observed in the prospective arm of the FilmArray BCID clinical study. Please see Instruction Booklet for complete performance data.
² BCID=blood culture identification.

What Does the FilmArray BCID Panel Test for?

The FilmArray BCID Panel identifies pathogens in 9 out of 10 positive blood cultures.

### Gram-Positive Bacteria
- Enterococcus
- Listeria monocytogenes
- *Staphylococcus*
  - *Staphylococcus aureus*
- *Streptococcus*
  - *Streptococcus agalactiae*
  - *Streptococcus pneumoniae*
  - *Streptococcus pyogenes*

### Gram-Negative Bacteria
- Acinetobacter baumannii
- Haemophilus influenzae
- Neisseria meningitidis
- Pseudomonas aeruginosa
- *Enterobacteriaceae*
  - Enterobacter cloacae complex
  - *Escherichia coli*
  - Klebsiella oxytoca
  - Klebsiella pneumoniae
  - Proteus
  - Serratia marcescens

### Yeast
- *Candida albicans*
- *Candida glabrata*
- *Candida krusei*
- *Candida parapsilosis*
- *Candida tropicalis*

### Antibiotic resistance genes
- *mecA* – methicillin resistance
- *vanA/B* – vancomycin resistance
- KPC – carbapenem resistance

BCID = blood culture identification.

## Sensitive and Specific

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Prospective and Seeded Blood Cultures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sensitivity</td>
</tr>
<tr>
<td><strong>Antimicrobial Resistance Genes</strong></td>
<td></td>
</tr>
<tr>
<td>mecA</td>
<td>98.4%</td>
</tr>
<tr>
<td>vanA/B</td>
<td>100%</td>
</tr>
<tr>
<td>KPC</td>
<td>100%</td>
</tr>
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</table>
Continual Education

❖ Lunch & Learn - all employees invited – lunch provided
   - half hour education
   - Sepsis topic twice a year

❖ Storyboard unit to unit education

❖ September – Sepsis Awareness Month activities
❖ Sepsis education in RN orientation & yearly competencies
❖ Sepsis orders sets reviewed in physician orientation
SIGNIFICANT REDUCTIONS

Non-POA Mortality Improvement – 17 Top Hospitals

A 45%
B 37%
C 27%
D 20%
E 20%
F 18%
G 17%
H 17%
I 14%
J 13%
K 13%
L 12%
M 12%
N 11%
O 11%
P 10%
Q 10%
Sepsis Mortality Rates

Percent

2013 2014 2015 2016 2017
20.28 16.64 11.43 9.36 6.35
Lives saved to date....

668
Questions?