Sepsis Awareness Month: 
Back & to the Future: 
Maternal Sepsis

Brittany Waggoner, RN, MSN 
IHA Maternal and Infant Quality Improvement Advisor

Sept. 22, 2022
Our Mission

Advancing Health in Indiana
• Engage and inspire health care providers
• Create safe cultures
• Create reliable systems of care
• Prevent patient harm in Indiana

PREVENT PATIENT HARM
To create high reliability organizations who collaborate and engage in continuous improvement to achieve best in class outcomes

IMPROVE COMMUNITY HEALTH
To partner with communities and stakeholders to develop, plan, and coordinate initiatives that span the prevention and care continuum

INCREASE PATIENT AND FAMILY ENGAGEMENT
To engage patients and families in all aspects of their care and seek their input and inclusion in advisory capacities throughout organizations

LEAD A CULTURE OF SAFETY
To create an environment of mutual trust, respect, and transparency among organizations, patients, and families

IHAconnect.org/Quality-Patient-Safety
# Sepsis: Back and to the Future

## IHA 2022 Sepsis Awareness Month Webinars

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Sept.</td>
<td>3 p.m. ET</td>
<td><strong>Indiana Sepsis State of the State</strong></td>
</tr>
<tr>
<td>8-Sept.</td>
<td>3 p.m. ET</td>
<td><strong>Sepsis Pathophysiology &amp; Bundle Compliance</strong></td>
</tr>
<tr>
<td>15-Sept.</td>
<td>3 p.m. ET</td>
<td><strong>Sepsis Diagnostic Advances</strong></td>
</tr>
<tr>
<td>22-Sept.</td>
<td>3 p.m. ET</td>
<td><strong>Maternal Sepsis</strong></td>
</tr>
<tr>
<td>29-Sept.</td>
<td>3 p.m. ET</td>
<td><strong>Sepsis Fluid Management Advances</strong></td>
</tr>
<tr>
<td>6-Oct.</td>
<td>3 p.m. ET</td>
<td><strong>Personal Hygiene and Sepsis Prevention</strong></td>
</tr>
</tbody>
</table>

*Click on link to register for each webinar*

[Click here to register for each webinar](#)
Sepsis Webinar Details

2022 IHA Clinical Webinar Series - 3 - 4 p.m. ET

Sepsis: Back & to the Future (Click link to register)

Sept. 1: Indiana Sepsis 2022: Current State of the State and New Resources,
   Rebecca Hancock PhD, RN, CNS, Patient Quality & Safety Advisor, IHA
   Chris Newkirk, BSN, RN, CCM, Clinical Quality Advisor, Columbus Regional Health

Sept. 8: Sepsis Back to Basics: Pathophysiology and Bundle Compliance,
   Tom Ahrens, PhD, RN, FAAN

Sept. 15: Sepsis Future: Advances in Sepsis Diagnostics,
   Dr. Sandy Estrada, Pharm.D., Clinical Consultant

Sept. 22: Sepsis Future: Focus on Maternal Sepsis,
   Brittany Waggoner, Patient Safety & Quality Advisor, RN, MSN, CNS, IHA

Sept. 29: Sepsis Future: Fluid Management
   Danielle Herr BSN, CCRN, Therapy Development Specialist
   Vince Holly, MSN, RN, CCNS, ACNS-BC, CCRN, FCNS, Indiana University Health-Bloomington

Oct. 6: Back to the Basics with Personal Hygiene for Infection Prevention
   Rebecca Hancock, Patient Quality & Safety Advisor, IHA
   Annette Handy, Clinical Director, Patient Safety Center, IHA
September is Sepsis Awareness Month—SET YOUR HOSPITAL GOALS!

- Updated 2022 Sepsis Toolkit coming August
  - Updated Social Media messages—connect with your marketing department & share IHA posts
  - Send photos of sepsis/COVID-19 infection prevention activities with caption to Casey Hutchens, chutchens@ihaconnect.org
  - Patient & Caregiver Education QR Codes on table tents, & posters
  - Consider local mayoral proclamation for Sept 13, World Sepsis Day
  - Share “I am a Sepsis Champion” selfies on Sept 13 via social media
  - Updated data-based state sepsis goals

- September Webinars, Thursdays 3-4pm
  - Back & to the Future with Sepsis

www.survivesepsis.com

IHAconnect.org/Quality-Patient-Safety
Sepsis Patient Discharge Education (Updated)

www.survivesepsis.com
Adams Memorial Hospital
Indiana University Health

Our super heroes are
Stomping out sepsis!

Indiana University Health

IHAconnect.org/Quality-Patient-Safety
St. Mary Medical Center
St. Mary’s Medical Center

Thank You Sepsis Heroes
December 2021

Thank you sepsis superheroes for acknowledgment of the sepsis BPA with notification to the provider for prompt attention.

Bradley Evans ED
Jessica Loya ICU
Layne Watts SW

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Objectives

1. Describe incidence of national and Indiana maternal sepsis and outcomes
2. Describe maternal sepsis identification & treatment recommendations
The IHA table can be found at [Regulatory and Reporting (ihaconnect.org)](https://ihaconnect.org).

### Current and Proposed CMS Quality Measures

**for Reporting in 2022 through 2028**

Revised 8/19/2022

<table>
<thead>
<tr>
<th></th>
<th>HIQR</th>
<th>VBP</th>
<th>HITECH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MEASURE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolded measures must be manually abstracted and submitted to HQR site quarterly.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STRUCTURAL MEASURE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Morbidity</td>
<td>Oct 2021</td>
<td>FY 2023</td>
<td></td>
</tr>
<tr>
<td>Hospital Commitment to Health Equity</td>
<td>CY 2023</td>
<td>CY 2025</td>
<td></td>
</tr>
</tbody>
</table>
Maternal Morbidity

2 parts for hospital with L & D:
1. Participation in a statewide and/or national Perinatal QI Collaborative
2. Implementation through participation in the collaborative(s), safety practices and/or bundles related to maternal morbidity
Guest Speaker

Brittany Waggoner, RN, MSN, XXX
Maternal & Infant Quality Improvement Advisor
Indiana Hospital Association
Sepsis is an important cause of maternal morbidity and mortality.

The Centers for Disease Control and Prevention notes that the proportion of U.S. maternal deaths from sepsis (12.7%) is similar to the proportion of deaths from obstetric hemorrhage (11.4%) and hypertensive disorders (7.4%).

It is estimated that 63 to 73% of maternal deaths from sepsis are preventable.

Furthermore, for each maternal death, there are 50 women who experience life threatening morbidity from sepsis.
National Sepsis Statistics
# Maternal Mortality Rates (MMR) in the United States, 2020

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live Births</td>
<td>3,791,712</td>
<td>3,747,540</td>
<td>2,613,647</td>
</tr>
<tr>
<td>Maternal Deaths</td>
<td>658</td>
<td>754</td>
<td>861</td>
</tr>
<tr>
<td>Maternal Mortality Rate</td>
<td>17.4</td>
<td>20.1</td>
<td>23.8</td>
</tr>
</tbody>
</table>
Non-Hispanic Black MMR in the United States, 2020

Non-Hispanic Black Maternal Mortality Rate
55.3

2.9 times the rate for non-Hispanic Whites (19.1)

The increases from 2019 to 2020 for non-Hispanic Black and Hispanic women were significant

The increases from 2019 to 2020 for non-Hispanic White women was not significant
Maternal Mortality due to Sepsis in the United States


*Per 100,000 live births

Pregnancy-related mortality ratio
Pregnancy-Related Deaths: Data from Maternal Mortality Review Committees in 36 US States, 2017-2019

### Table 4. Underlying causes of pregnancy-related deaths*, overall and by race or ethnicity, data from Maternal Mortality Review Committees in 36 US states, 2017–2019

<table>
<thead>
<tr>
<th>Cause</th>
<th>Total</th>
<th>Hispanic</th>
<th>AIAN</th>
<th>Asian</th>
<th>Black</th>
<th>NHOP/</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health conditions</td>
<td>224</td>
<td>22.7</td>
<td>34</td>
<td>24.1</td>
<td>2</td>
<td>3.1</td>
<td>21</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>135</td>
<td>13.7</td>
<td>30</td>
<td>21.3</td>
<td>2</td>
<td>10</td>
<td>31.3</td>
</tr>
<tr>
<td>Cardiac and coronary conditions</td>
<td>126</td>
<td>12.8</td>
<td>15</td>
<td>10.6</td>
<td>1</td>
<td>7</td>
<td>21.9</td>
</tr>
<tr>
<td>Infection</td>
<td>91</td>
<td>9.2</td>
<td>15</td>
<td>10.6</td>
<td>1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Embolism-thrombotic</td>
<td>86</td>
<td>8.7</td>
<td>9</td>
<td>6.4</td>
<td>0</td>
<td>2</td>
<td>6.3</td>
</tr>
<tr>
<td>Cardiomyopathy</td>
<td>84</td>
<td>8.5</td>
<td>5</td>
<td>3.6</td>
<td>0</td>
<td>2</td>
<td>6.3</td>
</tr>
<tr>
<td>Hypertensive disorders of pregnancy</td>
<td>64</td>
<td>6.5</td>
<td>7</td>
<td>5.0</td>
<td>0</td>
<td>1</td>
<td>3.1</td>
</tr>
<tr>
<td>Amniotic fluid embolism</td>
<td>37</td>
<td>3.8</td>
<td>6</td>
<td>4.3</td>
<td>1</td>
<td>7</td>
<td>21.9</td>
</tr>
<tr>
<td>Injury</td>
<td>35</td>
<td>3.6</td>
<td>6</td>
<td>3.6</td>
<td>1</td>
<td>1</td>
<td>3.1</td>
</tr>
<tr>
<td>Cerebrovascular accident</td>
<td>25</td>
<td>2.5</td>
<td>2</td>
<td>1.4</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Cancer</td>
<td>19</td>
<td>1.9</td>
<td>3</td>
<td>2.1</td>
<td>0</td>
<td>1</td>
<td>3.1</td>
</tr>
<tr>
<td>Metabolic/endocrine conditions</td>
<td>17</td>
<td>1.7</td>
<td>2</td>
<td>1.4</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Statewide Sepsis Statistics
• **2020 Key Findings**
  - 92 pregnancy-associated deaths occurred during pregnancy or within one year of the end of pregnancy.
  - 79% of reviewed pregnancy-associated deaths in 2020 were preventable.
Causes for all 2018-2020 Pregnancy Related Deaths

Indiana Maternal Mortality Review Committee
2022 Annual Report
Indiana Maternal Sepsis Incidence

![Graph showing delivery volumes and maternal sepsis incidence from 2018 to 2022. Delivery volumes decreased from 78,459 in 2018 to 75,094 in 2022. Maternal sepsis incidence decreased from 595 in 2018 to 336 in 2022.]

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Indiana Maternal Sepsis Rate

0.76% 0.62% 0.57% 0.56% Estimated 0.48%
Maternal Sepsis Readmission Rate

Maternal Sepsis Readmissions = 23
Delivery Volumes = 74,916

Maternal Sepsis Readmission Rate = 3.07%
It’s Not Just About Mortality....
Pathophysiology of Sepsis
## Leading Causes of Maternal Sepsis

<table>
<thead>
<tr>
<th>Antepartum</th>
<th>Intrapartum/Immed. Postpartum</th>
<th>Post-discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Septic abortion</td>
<td>Chorioamnionitis/ intraamniotic infection</td>
<td>Pneumonia/influenza</td>
</tr>
<tr>
<td>Chorioamnionitis/ intraamniotic infection</td>
<td>Endometritis</td>
<td>Pyelonephritis</td>
</tr>
<tr>
<td>Pneumonia/ influenza</td>
<td>Pneumonia/influenza</td>
<td>Wound Infection/ Necrotizing Fasciitis</td>
</tr>
<tr>
<td>Pyelonephritis</td>
<td>Pyelonephritis</td>
<td>Mastitis</td>
</tr>
<tr>
<td>Appendicitis</td>
<td>Wound Infection/ Necrotizing Fasciitis</td>
<td>Cholecystitis</td>
</tr>
</tbody>
</table>
Pathophysiology

Pregnancy

Cardiovascular:
- ↓ Systemic vascular resistance (25–30%)
- ↓ Blood pressure
- ↓ Blood volume (40–45%)
- ↑ Heart rate (10–20 bpm)
- ↑ Cardiac output (40%)
- Aorto-caval compression

Respiratory:
- ↓ Pulmonary vascular resistance and plasma colloid pressure
- ↓ Residual volume
- ↓ Functional residual capacity
- ↓ Tidal volume
- ↓ Minute ventilation
- Compensated respiratory alkalosis

Renal:
- ↑ Renal plasma flow
- ↑ Glomerular filtration rate
- Renal collecting system dilatation

Coagulation:
- ↑ Factors I, II, VII, VIII, IX, XII
- (x5) plasminogen activator inhibitors (PAI) I & II
- ↓ Protein S
- ↓ Anti-thrombin and Protein C

Sepsis

Cardiovascular:
- ↓ Systemic vascular resistance
- ↓ Blood pressure
- ↑ Heart rate
- Vasodilatation
- Myocardial depression

Respiratory:
- ↑ Pulmonary microvascular pressure and permeability
- Acute lung injury

Renal:
- Ischaemia
- Vasoconstriction
- Cytokine-mediated renal cell injury

Coagulation:
- ↑ Procoagulant effects
- ↑ Thrombin production
- Activated Protein C
- Fibrinolysis (increased PAI I)

2019 Royal College of Obstetricians and Gynaecologists
Greer et al.
Pathogens

- Bacterial
- Fungal
- Viral
- No Causative Organism Identified
Non-OB

- > 35 years of age
- Tobacco use
- Low socioeconomic status
- Minorities
- Presence of comorbidities
- Transfusion
Pregnancy & Postpartum

**Antepartum**
- PROM
- Multiple Gestation
- Reproductive Technologies
- Preeclampsia
- Preterm Labor

**Intrapartum**
- PROM
- Multiple Vaginal Exams
- Prolonged 2nd Stage Labor

**Postpartum**
- Retained Products
- Hemorrhage
- Operative Vaginal or Cesarean Birth
- Multips
Screening & Diagnoses

CMQCC’s Two-Step Screening & Diagnosis Method
## Comparing Normal Pregnancy Physiology and SIRS Criteria

<table>
<thead>
<tr>
<th>Pregnancy Physiology</th>
<th>SIRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>↑ or ↓ Temperature</td>
<td>Temperature &gt;38°C or &lt;36°C (&lt;100.4°F or &lt;96.8°F)</td>
</tr>
<tr>
<td>HR ↑ 17%</td>
<td>HR &gt;90 bpm</td>
</tr>
<tr>
<td>RR ↑ in labor</td>
<td>RR &gt;20 breaths/min</td>
</tr>
<tr>
<td>PaCO₂ 28-32 mmHg</td>
<td>PaCO₂ &lt;32 mmHg</td>
</tr>
<tr>
<td>WBCs ↑ 8% to 5,000-12,000/mm³ (up to 15,000/mm³ seen) during pregnancy; during intrapartum may ↑ to 25,000-30,000/mm³</td>
<td>WBC &gt;12,000/mm³ or &lt;4,000/mm³</td>
</tr>
</tbody>
</table>
# SEP-1 Criteria Measure Update

<table>
<thead>
<tr>
<th>Non-Pregnant Criteria</th>
<th>Pregnant 20 weeks through Day 3 Post-delivery Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature &gt;38.3 °C or &lt;36.0 °C (&gt;100.9 °F or &lt;96.8 °F)</td>
<td>Temperature ≥38 °C or &lt;36.0 °C (≥100.4 °F or &lt;96.8 °F)</td>
</tr>
<tr>
<td>Heart rate (pulse) &gt;90</td>
<td>Heart rate (pulse) &gt;110</td>
</tr>
<tr>
<td>Respiration &gt;20 per minute</td>
<td>Respiration &gt;24 per minute</td>
</tr>
<tr>
<td>White blood cell count &gt;12,000 or 10% bands</td>
<td>White blood cell count &gt;15,000 or 10% bands</td>
</tr>
</tbody>
</table>

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Screening & Diagnosing Step # 1

**Step 1: Initial Sepsis Screen**
- Oral temp < 36°C (96.8°F) or > 38°C (100.4°F)
- Heart rate > 110 beats per minute
- Respiratory rate > 24 breaths per min
- WBCs > 15,000/mm³ or < 4,000/mm³ or > 10% bands

**Positive if any 2 of 4 criteria met**

**Action:** If suspected infection, start source-directed antibiotics and 1-2 L of IV fluids; increase monitoring and surveillance. Move to confirmation evaluation.

**Suspected Infection**

**Routine Vital Signs / WBC Screening**

**NOTE:** A MAP < 65 mm Hg (persistent after 30ml/kg fluid load) in setting of infection directly defines SEPTIC SHOCK.

IHAnetconnect.org/Quality-Patient-Safety
### Confirmation of Sepsis Step #2

#### Tests to Evaluate End Organ Injury

<table>
<thead>
<tr>
<th><strong>Laboratory values</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>CBC (including % immature neutrophils [bands], Platelets)</td>
</tr>
<tr>
<td>Coagulation status (PT, INR, PTT)</td>
</tr>
<tr>
<td>Comprehensive Metabolic Panel (specifically include bilirubin, creatinine)</td>
</tr>
<tr>
<td>Venous Lactic Acid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Bedside assessment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine output (place Foley catheter with urometer)</td>
</tr>
<tr>
<td>Pulse oximetry</td>
</tr>
<tr>
<td>Mental status assessment</td>
</tr>
</tbody>
</table>
# Confirmation of Sepsis Step #2

<table>
<thead>
<tr>
<th>Measure of End Organ Injury</th>
<th>Criteria</th>
</tr>
</thead>
</table>
| **Respiratory function**<sup>*</sup> | • Acute respiratory failure as evidenced by acute need for invasive or non-invasive mechanical ventilation, OR  
  • $\text{PaO}_2/\text{FiO}_2 < 300$ |
| **Coagulation status**              | • Platelets $< 100 \times 10^9$/L, OR  
  • International Normalized Ratio (INR) $> 1.5$, OR  
  • Partial Thromboplastin Time (PTT) $> 60$ seconds |
| **Liver function**                  | • Bilirubin $> 2$ mg/dL                                                  |
| **Cardiovascular function**         | • Persistent hypotension after fluid administration:  
  • SBP $< 85$ mm Hg, OR  
  • MAP $< 65$ mm Hg, OR  
  • $> 40$ mm Hg decrease in SBP |
| **Renal function**                  | • Creatinine $> 1.2$ mg/dL, OR  
  • Doubling of serum creatinine, OR  
  • Urine output less 0.5 mL/kg/hour (for 2 hours) |
| **Mental status assessment**        | • Agitation, confusion, or unresponsiveness                              |
| **Lactic acid**                     | • $> 2$ mmol/L in absence of labor  
  (Lactic acid not used for diagnosis in labor, but remains important for treatment.) |
Assessment & Treatment
Assessment & Treatment

Step 2: Confirmation of Sepsis Evaluation
- Respiratory: New need for mechanical ventilation or PaO2/FiO2 < 300
- Coagulation: Platelets < 100 x 10^9/L or INR > 1.5 or PT > 60 secs
- Liver: Bilirubin > 2 mg/dL
- Cardiovascular: SBP < 85 mm Hg or MAP < 65 mm Hg or > 40 mm Hg decrease in SBP (after fluids)
- Renal: Creatinine ≥ 1.2 mg/dL or doubling of creatinine or urine output < 0.5 ml/kg/hr x 2 hrs
- Mental Status: Agitated, confused, or unresponsive
- Lactic Acid: > 2 mmol/L in absence of labor

Confirmed if 1 or more criteria met

- All Criteria NEGATIVE
- Elevated Isolate ONLY in Labor
- MAP < 65 mm Hg (with confirmation) defines SEPTIC SHOCK
- ≥ 1 Criterion POSITIVE defines SEPSIS

Action: This group remains at high risk for sepsis and requires close supervision and reevaluation.

Action: At a minimum, maintain close surveillance; consider additional fluids to reduce lactic acid level; repeat lactate. (See Discussion of the Role of Lactic Acid in the Peripartum Period in the toolkit for more detail.)

Action: Start source-directed antibiotics, broad spectrum antibiotics if source unclear; increase fluids to 30 ml/kg within 3 hours; collect blood cultures if not already obtained, maintain close surveillance, e.g. RRT, and repeat lactate. Escalate care as needed.

Action: As above for Sepsis, admit to ICU. If hypotension persists after 30 ml/kg fluid load, assess hemodynamic status and consider vasopressor use.
Sepsis Treatment

- Narrow spectrum antibiotics if not already started
- If source unclear, give broad spectrum antibiotics
- Increase fluids to 30 mL/kg within 3 hours if not already done
- Repeat lactate
- Blood cultures, if not already drawn
- Call for RRT to escalate care, as needed
Fluid Management

30ml/kg Crystalloid IV Fluid Bolus

Begin within 3 hours

- Each hour increases mortality rate by 7.6%

Large-bore IV

Considerations

- Pulmonary edema
- ARDS
- Preeclampsia

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Antibiotic Therapy

Broad spectrum

- Most cases are polymicrobial
- Ampicillin, Gentamycin, Clindamycin, Vancomycin, Metronidazole, Antivirals
- Reassess therapy daily
- Toxicity versus therapeutic
# Antibiotic Regimen by Condition

(See full recommendations in Toolkit)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Antibiotic Choices</th>
<th>Duration</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chorioamnionitis / intraamniotic infection (Plante, et al 2019, ACOG)</td>
<td>Ampicillin 2 g IV q6h</td>
<td>Generally limited to the peripartum period</td>
<td>For post-caesarean delivery: one additional dose of the chosen regimen is indicated. Add clindamycin 90 mg IV or Metronidazole 500 mg IV for at least one additional dose.</td>
</tr>
<tr>
<td></td>
<td><strong>PLUS</strong></td>
<td></td>
<td>For post-vaginal delivery: No additional antibiotic doses required, but if additional doses of antibiotics are given, clindamycin is not indicated.</td>
</tr>
<tr>
<td></td>
<td>Clindamycin 2 mg/kg IV load, then 5 mg/kg every 24h</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alternate regimens: (Based on local antibiotic resistance patterns)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ampicillin-sulbactam 3g IV q6h OR</td>
<td>Duration of therapy is unclear, but there are some recommendations to continue until afebrile for 24h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Piperacillin-tazobactam 3.375g IV q6h OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cefoxitin 2g IV q6H OR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Antibiotic Regiment Cont.

<table>
<thead>
<tr>
<th>Source infection</th>
<th>Recommended antibiotics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal infections</td>
<td>Ceftriaxone, cefotaxime, ceftazidime, or cefepime plus metronidazole;</td>
</tr>
<tr>
<td></td>
<td>Complicated cases may require monotherapy with a carbapenem or piperacillin-tazobactam</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>Ampicillin plus gentamicin. Add anaerobic coverage with clindamycin or metronidazole if cesarean delivery required</td>
</tr>
<tr>
<td>Community-acquired pneumonia</td>
<td>Cefotaxime, ceftriaxone, ertapenem, or ampicillin plus azithromycin, clarithromycin, or erythromycin</td>
</tr>
<tr>
<td>Endomyometritis</td>
<td>Ampicillin, gentamicin, and metronidazole (or clindamycin); Alternatively, may use cefotaxime or ceftriaxone plus metronidazole</td>
</tr>
<tr>
<td>Hospital-acquired pneumonia</td>
<td>Low risk patients: Piperacillin-tazobactam, meropenem, imipenem, or cefepime</td>
</tr>
<tr>
<td></td>
<td>High mortality risk patients: double coverage for pseudomonas (beta lactam plus an aminoglycoside or a quinolone) and MRSA coverage with vancomycin or linezolid</td>
</tr>
</tbody>
</table>
| Skin and soft tissues (necrotizing) | Vancomycin plus piperacillin-tazobactam  
If Streptococcus Group A or Clostridium perfringens are present, use penicillin G plus clindamycin |
| Urinary tract infections         | Gentamicin with ampicillin; Alternatively, may use monotherapy with a carbapenem or piperacillin-tazobactam |
Septic Shock

- Admit to ICU
- Hemodynamic Monitoring
- Vasopressors
Lactic Acid

Not used for diagnosis in labor, but remains important for treatment.

Trends can be used to evaluate the effectiveness of treatment.
Discharge

• Individualized

• Potential for
  – Depression
  – Anxiety Fatigue
  – Sleep disturbances
  – Post-traumatic stress syndrome
Faces of Sepsis

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