Sepsis Learning Collaborative:
Improving Inter-Hospital Transfers for Patients with Sepsis
How to Work With ICU to Improve Sepsis Care Transitions and Boarding
Presenters

Nicholas Mohr, MD, MS

John J. Kelly DO, FACEP, FAAEM, FCPP
Improving Inter-Hospital Transfers for Patients with Sepsis

Nicholas Mohr, MD, MS
Associate Professor
Department of Emergency Medicine
Division of Critical Care, Department of Anesthesia
Rural Telemedicine Research Center
University of Iowa Carver College of Medicine
nicholas-mohr@uiowa.edu
Conflicts of Interest

• This speaker has no relevant financial relationships to disclose

• Topics discussed in this lecture are components of the American College of Emergency Physicians Emergency Quality Network (E-QUAL)

• The content of this lecture was developed following an extensive literature search and contains up-to-date, evidence-based information
Objectives

• To describe current systems of care for patients with sepsis, including clinical outcomes

• To provide framework for thinking about sepsis systems of care

• To define strategies to build and improve regional sepsis networks
What is Sepsis?

Sepsis is the systemic response to infection.

Sepsis is sometimes adaptive, but in severe cases, it can be responsible for organ failure and death.

Image courtesy MIMS, Inc.
Severe sepsis is now responsible of 17% of all in-hospital deaths

Severe sepsis accounts for 40% of all ICU expenditures (almost $17 billion)

Early Sepsis Therapy

- Early Identification
- Early Antibiotics
- Early Goal-Directed Hemodynamic Resuscitation

Where does regionalization fit into existing sepsis treatment algorithms?

* Not SEP-1
Background: Volume Influences Outcomes

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Very Low</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall mortality rate, %</td>
<td>18.0 (17.8–18.2)</td>
<td>18.9 (18.6–19.1)</td>
<td>18.6 (18.4–18.9)</td>
<td>17.7 (17.4–17.9)</td>
<td>15.8 (15.6–16.0)</td>
</tr>
<tr>
<td>Unadjusted OR</td>
<td>Ref</td>
<td>1.02 (0.98–1.05)</td>
<td>0.98 (0.94–1.02)</td>
<td>0.89 (0.85–0.93)</td>
<td>0.74 (0.70–0.78)</td>
</tr>
<tr>
<td>Adjusted OR*</td>
<td>Ref</td>
<td>0.83 (0.79–0.87)</td>
<td>0.80 (0.76–0.85)</td>
<td>0.74 (0.69–0.78)</td>
<td>0.62 (0.58–0.67)</td>
</tr>
<tr>
<td>Early mortality rate, %</td>
<td>7.8 (7.6–8.0)</td>
<td>7.7 (7.5–7.9)</td>
<td>7.2 (7.0–7.3)</td>
<td>6.8 (6.6–6.9)</td>
<td>6.0 (5.8–6.1)</td>
</tr>
<tr>
<td>Unadjusted OR</td>
<td>Ref</td>
<td>0.96 (0.92–1.01)</td>
<td>0.89 (0.85–0.94)</td>
<td>0.84 (0.80–0.88)</td>
<td>0.69 (0.65–0.74)</td>
</tr>
<tr>
<td>Adjusted OR*</td>
<td>Ref</td>
<td>0.84 (0.80–0.89)</td>
<td>0.80 (0.76–0.86)</td>
<td>0.78 (0.72–0.83)</td>
<td>0.67 (0.62–0.73)</td>
</tr>
</tbody>
</table>

Transferred patients are excluded

Background

- 59% of Iowa severe sepsis patients are transferred
- 95% of rural sepsis patients seek care at their local hospital

Background: Rural Sepsis Outcomes

- Inter-hospital transfer is associated with 9.2% increased mortality (21% higher if transferred from inpatient status)
- Rural hospital bypass increases mortality by 5.6%
- Adherence with Surviving Sepsis Campaign targets in a sample of transferred sepsis patients was 11%
  - Appropriate antibiotics: 34%
  - Adequate fluid bolus by 3 h: 54%

Question

How can sepsis care be improved outside tertiary centers?

Is early inter-hospital transfer the solution?

Image courtesy Shutterstock (Lightspring)
Sepsis is Different from Trauma

- Most important aspects of care are simple
- Advanced resources not necessary early
- Guidance can be provided remotely (telemedicine)
Regional Sepsis Care

Transfer Timing Criteria

Provider Support

Regional Care Systems
Transfer Timing Criteria/Guidance

- Early risk stratification for transfer
- Prioritizing early care over early transfer
- Surveillance of admitted patients with infection
- Treatment pathways
Provider Support

• Access to high quality transport services
  – With ability to continue sepsis therapy
• Access to specialist guidance
  – Telemedicine
• Real-time performance feedback
Regional Care Systems

- Identification of hospital capabilities
- Patient risk stratification for transfer
- Formalizing transfer networks and developing common treatment pathways
- Standardizing transfer communication
- Incorporating EMS
Conclusions

• Transferred sepsis patients are at high risk of poor outcomes, perhaps because of the inter-hospital transfer process

• Developing regional systems of sepsis care can improve transitions of care, bundle adherence, and clinical outcomes

• Focusing on high quality early care pre-transfer may improve sepsis survival
Improving Inter-Hospital Transfers for Patients with Sepsis

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Associate Professor
Department of Emergency Medicine
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University of Iowa Carver College of Medicine
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How to Work With ICU to Improve Sepsis Care Transitions and Boarding

John J. Kelly DO, FACEP, FAAEM, FCPP
Interim Chair, Department of Emergency Medicine
Einstein Healthcare Network
Professor of Emergency Medicine
Jefferson Medical College
First Steps

- Get to know your ICU Physician and Nursing Leaders
- Create trust and develop the relationship
- Invite them to your ED Staff Meetings
- Keep all communication and emails positive, constructive, and professional
Create the ED-MICU Workgroup
Share the Evidence for Best Practice

- Multidisciplinary Group
- Meetings every 2 weeks
- Mission Statement
- Agenda
- Fix the easy stuff first!
- Nothing is important until you measure it!
Mission Statement

- “To improve the rapid ED Care Process and timely Disposition to MICU for all critical patients with Sepsis”
- “To significantly reduce the morbidity and mortality of our patients with Sepsis”
Process Mapping

- Create “Process Maps” for each segment of the Sepsis Patient
- Immediate ED Care for Suspected Sepsis and Septic Shock
- MICU Bed Order and Handoff and Orders
- MICU Bed ready and RN handoff and Transport
Thin Slice: First Hour

- Early Recognition
- Sepsis Bundle Completion
- Intubation and Vent Management
- Fluid Bolus and Resuscitation
- Broad Spectrum Antibiotics
- Repeat Lactate
- Special Imaging
- Pressors and stabilization
Second Hour

- MICU bed requested
- MICU Physician consulted and at Bedside
- MICU orders written
- Other Advanced Studies and Treatment needed
- MICU Bed Assigned
Third Hour

- ED RN Handoff and all Documentation completed
- ED RN “To-Do” list (what have we NOT done yet)
- Transport to MICU
- “The ABCs and the PDSA of the ICU Queue”: Gershengorn HB. AnnAmThoracSoc June 2015; V12,N6,pp791-793
Create the Measurement Tool

- Bedside measurement tool is best
- Paper vs EMR?
- Assign QA Staff to abstract each Sepsis Tool concurrently
- Concurrent Email Summary of each Sepsis Case to both ED and MICU staff
- Include each Milestone, and what went well!
- Benchmark
- Reflect upon struggles and meet to find new solutions and new Policy
**Finstein Emergency Medicine**

**Adult Sepsis Bedside Tool**

Date: ___________  
Patient Weight: ___________

**VITAL SIGNS:**  
T: ___________  
HR: ___________  
RR: ___________  
BP: ___________

**SIRS SIGNS:**  
T > 38 or < 36  
HR > 90  
RR > 20  
WBC > 12, < 4 or > 10% bands

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### EARLY RECOGNITION: SIRS SIGNS AND SUSPECTED INFECTION

<table>
<thead>
<tr>
<th>TIME (24 hr)</th>
<th>GOAL (cumulative time)</th>
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</thead>
<tbody>
<tr>
<td>Triage</td>
<td>&lt;10 minutes</td>
</tr>
<tr>
<td>Recognition of Sepsis</td>
<td>&lt;10 minutes</td>
</tr>
<tr>
<td>Severe Sepsis?</td>
<td>NO?</td>
</tr>
<tr>
<td>ED Provider to Bedside</td>
<td>&lt;10 minutes</td>
</tr>
</tbody>
</table>

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### IV ACCESS AND FLUID BOLUS

<table>
<thead>
<tr>
<th>IV Access</th>
<th>&lt;15 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVF BOLUS 30 ml/kg Start time</td>
<td>Use Pressure bag</td>
</tr>
<tr>
<td>Communication to full bolus?</td>
<td>___________________</td>
</tr>
<tr>
<td>IVF Finish</td>
<td>&lt;1 hour</td>
</tr>
</tbody>
</table>

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### CULTURES and LABS

<table>
<thead>
<tr>
<th>Labs drawn</th>
<th>Initial Lactate</th>
<th>SEVERE SEPSIS?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood culture</td>
<td>___________</td>
<td>___________________</td>
</tr>
<tr>
<td>Repeat lactate</td>
<td>___________</td>
<td>SEVERE SEPSIS?</td>
</tr>
</tbody>
</table>

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### EARLY ANTIBIOTICS AND SHOCK MANAGEMENT

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>&lt;3 hours</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>Need vasopressors?</th>
<th>YES/NO</th>
</tr>
</thead>
</table>

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### EARLY CRITICAL CARE CONSULT AND ED TIME

<table>
<thead>
<tr>
<th>MICU or Surgery Paged</th>
<th>___________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitting Consultant @ Bedside</td>
<td>___________________</td>
</tr>
</tbody>
</table>
Beyond the Basics: The ED

- Create a “Minimum Data Set” for the ED Workup
- “The patient is in Shock, and I just tubed them”
- “We have Critical Care Labs and Lactate resulted”
- “We have the EKG and the CXR”
- “The Sepsis Bundle has been started”
- The MICU really needs nothing else.
Beyond the Basics: The Call

- Innovate the MICU call process to include all key personnel all at once
- MICU Attending and Fellow at bedside <30minutes
- MICU Charge RN (to ready MICU bed and workforce)
- SDU Charge RN (to take a stable pt to free up MICU bed)
- BedBoard and RN Supervisor
Beyond the Basics: At Bedside

- Create a culture of collaboration and cross-check
- Meet your MICU team at the bedside
- MICU Team should confirm ED Bundle completion
- 6 hr MICU Bundle metrics should also be cross-checked
- 24hr Outcome as well as “Pt Discharged from MICU” should be communicated to both Departments
Complexities for Consideration

- Codify your Criteria for MICU vs CCU admissions
- Include your Surgeons in Sepsis Discussions
- Create a safe “MICU Downgrade” protocol
- Create a “Persistent Lactemia Rule” to reduce dangerous downgrades
- Include SDU Attendings in the Sepsis Workgroup
- Create Surge Capacity Protocol for when MICU is full
ADVANCED IDEAS: PDSA of the MICU Queue

- ICUs operate at or beyond full capacity
- We must all help to improve MICU throughput
- Decrease “time to transfer out” of MICU (within 1hr)
- MICU bed cleaning/servicing
- SDU Bed Availability
- Flexible staffing model with ICU on-call RNs
- Use Queuing Theory and Simulation
ADVANCED IDEAS:
Implementation of a STAT Acuity RN

- Carries the RRT Beeper and is highly specialized RN
- Responds to all Critical cases
- Assists in immediate management concerns
- Confirms that all Bundle elements are met
- Transports the patient to the ICU
- Provides continuity of care
- Improves system-wide patient flow and safety
ADVANCED IDEAS: Hospitalist Bed Management Can Help Throughput

- Twice-daily ICU Bed-Management Rounds
- Regular visits to the ED to access flow
- “Hospitalist bed management effecting throughput from the ED to the ICU”, Howell E, et.al. Journal of Critical Care 2010, V25, 184-189
Sepsis Webinar:
Wednesday, September 21st
12:00pm-1:00pm EST

ACEP E-QUAL Network Resources and More Information:
www.acep.org/equal

Contact Nalani Tarrant (Project Manager):
ntarrant@acep.org