IHI Expedition
Treating Sepsis in the Emergency Department and Beyond Session 4

Thursday, October 24, 2013
These presenters have nothing to disclose

Terry Clemmer MD
Sean Townsend MD
Diane Jacobsen MPH, CPHQ

Today’s Host

Max Cryns, Project Assistant, Institute for Healthcare Improvement (IHI), assists programming activities for hospital settings including Expeditions (2-4 month web-based educational programs), Passport memberships, and mentor hospital relations. He also supports IHI’s networking and knowledge efforts. Max is currently in the Co-Operative Education Program at Northeastern University in Boston, MA, where he majors in Business Administration with concentrations in Entrepreneurship and Marketing. He enjoys professional and collegiate sports, playing basketball, music, the beach, and trivia.
WebEx Quick Reference

- Welcome to today’s session!
- Please use chat to “All Participants” for questions
- For technology issues only, please chat to “Host”
- WebEx Technical Support: 866-569-3239
- Dial-in Info: Communicate / Join Teleconference (in menu)

When Chatting…

Please send your message to All Participants
Expedition Director

Diane Jacobsen, MPH, CPHQ, Director, Institute for Healthcare Improvement (IHI) is currently directing the CDC/IHI Antibiotic Stewardship Initiative, NSLIJ/IHI Reducing Sepsis Mortality Collaborative. Ms Jacobsen served as IHI content lead and improvement advisor for the California Healthcare-Associated Infection Prevention Initiative (CHAIP) and directed Expenditions on Antibiotic Stewardship, Preventing CA-UTIs, Reducing C. difficile Infections, Sepsis, Stroke Care and Patient Flow. She served as faculty for IHI’s 100,000 Lives and 5 Million Lives Campaign and directed improvement collaboratives on Sepsis Mortality, Patient Flow, Surgical Complications, Reducing Hospital Mortality Rates (HSMR) and co-directed IHI’s Spread Initiative She is an epidemiologist with experience in quality improvement, risk management, and infection control in specialty, academic, and community hospitals. A graduate of the University of Wisconsin, she earned her master's degree in Public Health-Epidemiology.

Today’s Agenda

- Introductions
- Debrief: Action Period Assignment
- Ensuring Reliable Care from the Patient Perspective
- Action Period Assignment
Expedition Objectives

By the end of the Expedition participants will be able to:

- Describe the latest evidence based care for patients with severe sepsis and septic shock
- Design reliable processes to ensure that each patient receives all elements of the best possible care at each opportunity
- Identify key opportunities and test changes on medical/surgical units to improve early recognition of sepsis in a care context which has been challenging for providers

Schedule of Calls

Session 1 – Clinical Updates to the Surviving Sepsis Campaign Guidelines: The 3 Hour Resuscitation Bundle
Date: Thursday, September 12, 1:00-2:30 PM ET

Session 2 – Key Considerations for Enhancing Reliability with Antibiotic Therapy in the Emergency Department and in Inpatient Floor
Date: Thursday, September 26, 1:00-2:00 PM ET

Session 3 – Lactate and Blood Culture Collection: Getting to Results Within One Hour
Date: Thursday, October 10, 1:00-2:00 PM ET

Session 4 – Ensuring Reliable Care from the Patient Perspective
Date: Thursday, October 24, 1:00-2:00 PM ET

Session 5 – Early Recognition and Monitoring of the Sepsis Patient on the Inpatient Floor
Date: Thursday, November 7, 1:00-2:00 PM ET

Session 6 – Considerations and Challenges with Fluid Resuscitation
Date: Thursday, November 21, 1:00-2:00 PM ET
Faculty

Terry P. Clemmer, MD, Director of Critical Care Medicine, LDS Hospital, Intermountain Healthcare (IHC), is also Professor of Medicine and Adjunct Professor of Biomedical Informatics at the University of Utah School of Medicine. He is the Medical Lead over the Intermountain Medicine Clinical Program’s Critical Care Team. Dr. Clemmer is Faculty Chair for the Institute for Healthcare Improvement (IHI) Reducing Sepsis Mortality Collaborative and has previously coached several IHI Adult ICU Breakthrough Series Collaboratives, the Idealized Design of the ICU project, and the Improving Outcomes for High-Risk and Critically Ill Patients Learning and Innovation Community. He has been active with the Surviving Sepsis Campaign and in the formulation of the Sepsis Bundles. An active researcher with numerous publications, he is a recognized speaker on critical care, medical informatics, telemedicine, standardization of care, and quality improvement.

Faculty

Sean R. Townsend, MD, Vice President of Quality and Safety, California Pacific Medical Center (CPMC), is also a practicing intensivist in the Division of Pulmonary and Critical Care at CPMC. Previously, he was Assistant Professor of Medicine at the University of Massachusetts and at Brown University Medical School. Dr. Townsend has been faculty advisor to IHI’s 100,000 Lives and 5 Million Lives Campaigns for the ventilator-associated pneumonia and catheter-related bloodstream infections interventions. He led IHI’s work on sepsis as part of the Improving Outcomes for High-Risk and Critically Ill Patients Learning and Innovation Community, and he is current faculty for the Reducing Sepsis Mortality Collaborative. A member of the Surviving Sepsis Campaign (SSC) executive committee, he is an author of the 2008 SSC International Guidelines on the Management of Severe Sepsis and Septic Shock and 2010 SSC Results of an International Guideline-based Performance Improvement Program Targeting Severe Sepsis.
Debrief: Action Period Assignment

- Complete a PDSA to expedite lactate and blood culture **collection:**
  - Pre-bundle blood culture bottles and lactate tube with sepsis sticker label
  - Partner with laboratory to expedite collection & transport of specimens
  - Other PDSA based on your current process

- Complete a PDSA to expedite lactate **reporting:**
  - Alert lab to priority order for lactate (i.e., send a card/prompt identifying “code sepsis” with lab specimen)
  - Partner with laboratory to expedite results reporting to ED or inpatient unit via phone, text, etc.
  - Other PDSA based on your current process
Defining Healthcare Reliability

- The measurable capability of a health-related process, procedure or service
- To perform its intended function correctly
- In the required time
- Under commonly occurring conditions

Measuring Reliability

- Reliability = number of actions that achieve the intended result / total number of actions taken or intended
- From the patients perspective: This is an all or none measure
- Either they receive “all” of the elements of a process of care or the process is considered to be unreliable
Aviation – All or None Reliability

Catastrophic Failures
1. Failure to put fuel in the airplane
2. Failure to communicate with air traffic control
3. Failure of altimeter to work

Non-catastrophic Failures
1. Failure to do complete preflight check
2. Failure of pilot to get sufficient sleep
3. Failure to plot course accurately

Healthcare – All or None Reliability

Catastrophic Failures
1. Failure to identify correct kidney for removal
2. Failure to connect the ventilator to oxygen
3. Failure to recognize insulin drip is 10 time the appropriate dose

Non-catastrophic Failures
1. What step in the central line insertion is it okay to skip?
2. If I give antibiotics in 1 hour can I ignore the hypotension?
3. As long as I keep the mean blood pressure > 65 can I then ignore the lactate and ScvO2?
What Is Your Expectation of A Reliable Process?

Expectations

- How many of you would put up with your car not starting two out of ten attempts?

- How many of you would fly commercially if the airplane crashed or aborted the flight two out of ten trips?

- How many of you would frequent a restaurant that served contaminated food two times out of ten meals?

This is what 80% Reliability Looks Like
What Are Your Expectation of A Reliable Process In Healthcare?

<table>
<thead>
<tr>
<th>Preventive Services</th>
<th>Average Percent</th>
<th>High Income Zip Codes</th>
<th>Low Income Zip Codes</th>
<th>Expected in One Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetic Eye Exams</td>
<td>47.9</td>
<td>53.2</td>
<td>44.9</td>
<td>100.0</td>
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<tr>
<td>Hgb A1c Monitoring</td>
<td>55.9</td>
<td>59.5</td>
<td>50.9</td>
<td>100.0</td>
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<td>Mammography Screening</td>
<td>46.7</td>
<td>50.8</td>
<td>39.8</td>
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<td>Colon Cancer Screening</td>
<td>9.0</td>
<td>10.3</td>
<td>8.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Influenza Vaccine</td>
<td>46.5</td>
<td>50.8</td>
<td>41.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Pneumococcal Vaccine</td>
<td>8.0</td>
<td>8.7</td>
<td>7.3</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Two Years After Publishing the Evidence, ‘7’ of 10 Pts Are **Not** Receiving Best Care

Adhere to Best Practice?

Do you use lung protective strategy in ventilating acute lung injury patients?

Results of A Level 1 Reliability Processes.

Supportive and Adjunctive Therapies
Results of the German “Prevalence” Study

- Low Tidal Ventilation: 80% Interview, 2.6% Audit
- Glycemic Control: 67% Interview, 9% Audit
- ScVO2: 46% Interview, 18% Audit
- Hemodynamic Support: 79% Interview, 31% Audit


The difference: a defaulted automated computerized protocol

Intermountain Healthcare
Every system is perfectly designed to produce the results it gets

Paul B. Batalden, MD – Dartmouth University
Adverse events are usually a result of multiple systems factors.

Swiss Cheese Model

When many things line up just right a failure occurs.
Anatomy of an Adverse Events

- Most IV solution bags look similar
  (difference in heparin bag is it has **Heparin** written on the bag in RED letters)
- Central distribution stocks the IV solutions for ICUs
- The bins for NS and Heparin are near each other
- A heparin solution was put in the wrong bin
- Patient was hypotensive from massive hemorrhage
- Nurse grabbed a bag out of the NS bin and infused it rapidly;
  - it was a heparin bag!

The Number 1 Barrier To High Reliability

“… the inherent limitations of human memory, effects of stress and fatigue, the risks associated with distraction and interruptions and limited ability to multitask **ENSURE** that even skilled, experienced providers will make mistakes.”

Michael Leonard, MD

All Humans Err
Frequently

Solution
Build into the system mechanisms to prevent human tendencies to create errors when implementing the plan of care
Design for Reliability

**LEVEL 1:** Intent, Vigilance and Hard Work
- Guidelines
  - An inexplicit outline how we want it to be done
- Training
  - Give an in-service or CME about the guideline
- Personal Checklists
  - Create a mechanism to help me personally to do it
- Feedback
  - Let them see how they are doing compared to others

Design for Reliability

**LEVEL 2:** Human Factors Prevention – Decision Aids
- Reminders built into the system
  - Alerts
  - Defaulted order sets
  - Check lists for rounds (E-ICU Assignment)
- Evidence based defaults
  - Tidal volume defaulted
  - Glucose level to start insulin drip default
  - predetermined antibiotic selection
  - Specified Fluid Bolus
Design for Reliability

**LEVEL 2:** Human Factors Prevention – Decision Aids

- **Redundancy**
  - Medication double checks
  - Unit wide vent & pump alarm
  - E-ICU checklists

- **Scheduling activities**
  - Med. schedule
  - Coordination of patient activity time

- **Real time data collection & feedback**
  - Sepsis communication tool

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Design for Reliability

**LEVEL 2:** Human Factors Prevention – Decision Aids

- **Explicit Protocols & Standardize Processes**
  - Sepsis bundle
  - [Local explicit protocols for sepsis](#)
  - [Glucose management protocol](#)
  - [Ventilator management protocol](#)
  - [Antibiotic protocols](#)

- **Forced functions by design**
  - O2 and air outlets
Summary

- Doing the Right Thing at the Right Time and Every Time it is indicated
- Reliability is a key:
  - To best care delivery
  - Efficiency
  - Team performance and learning
  - Achieving remarkable outcomes
- You Can
  - Want to do it
  - Create a system to help get it done
  - Create a culture that insists on it happening

Questions?

Raise your hand

Use the Chat
**Action Period Assignment**

- Identify one (or more) elements of the 3 hour bundle with an opportunity to improve reliability:
  - Lactate collection
  - Blood cultures prior to antibiotics
  - Antibiotics
  - Fluids
- Design a PDSA within the process of care to improve the timeliness of one (or more) of the 3 hour bundle elements

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**Expedition Communications**

- Listserv for session communications: [TreatingSepsis@ls.ihi.org](mailto:TreatingSepsis@ls.ihi.org)
- To add colleagues, email us at [info@ihi.org](mailto:info@ihi.org)
- Pose questions, share resources, discuss barriers or successes
Next Session

Thursday, November 7, 1:00-2:00 PM ET
Session 4 - Early Recognition and Monitoring of the Sepsis Patient on the Inpatient Floor