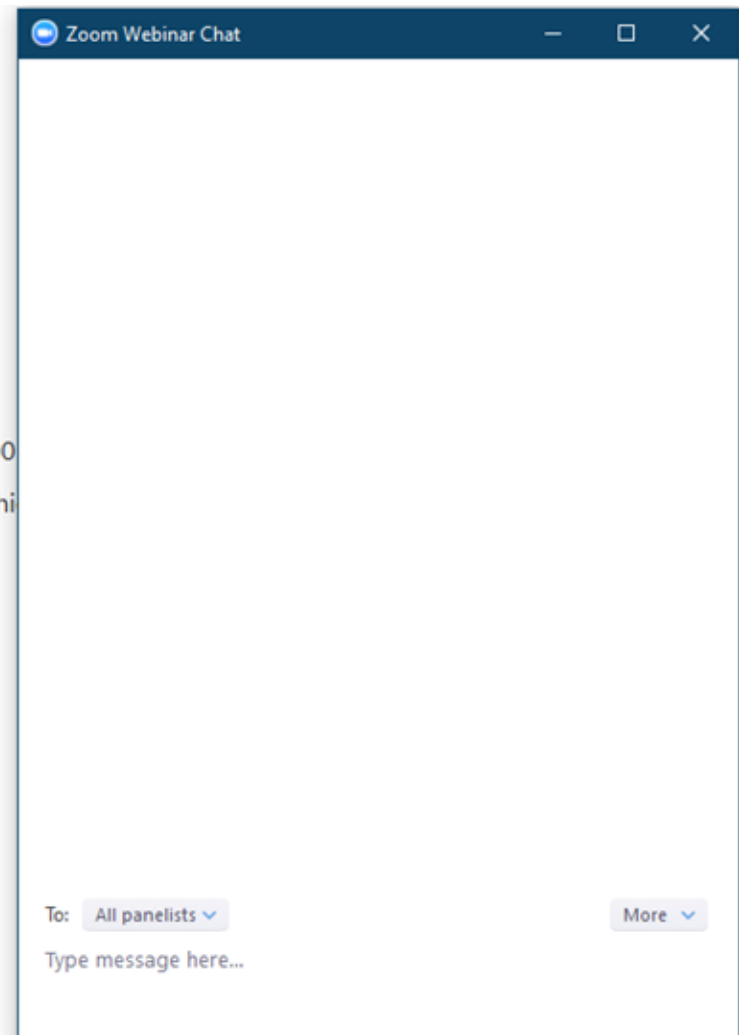
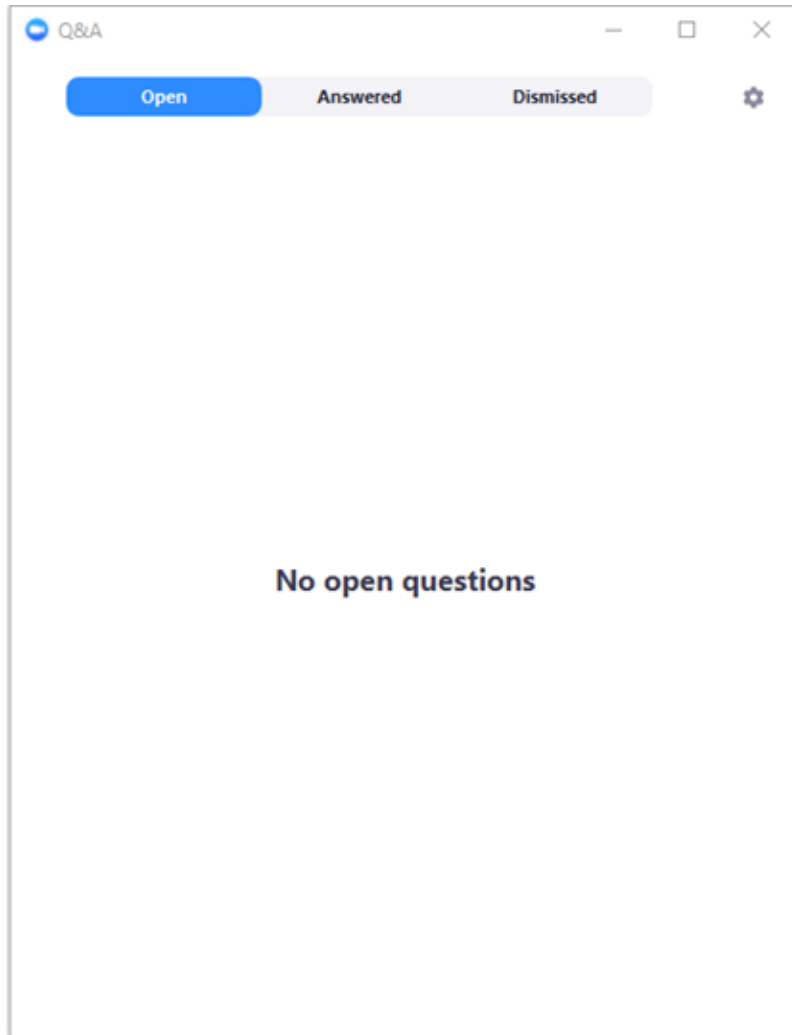




A CRITICAL CARE TRANSPORTER'S PERSPECTIVE ON HOSPITAL TRANSFERS OF SEPSIS PATIENTS

February 19, 2020

SUBMITTING QUESTIONS



SEPSIS WEBSITE

ohiohospitals.org/sepsis



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Sepsis

Reducing Sepsis Mortality in Ohio Through Early Recognition, Appropriate Intervention

The OHA Board of Trustees identified reducing sepsis mortality in Ohio as one of the key focus areas for OHA and Ohio hospitals. Sepsis is the body's overwhelming and life-threatening response to infection that can lead to tissue damage, organ failure and death. In other words, it's your body's over active and toxic response to an infection. Sepsis impacted an estimated 41,000 Ohioans in 2017. Early recognition and treatment can reduce the morbidity and mortality of sepsis.

CONTINUING EDUCATION

- The link for the evaluation of today's program is: <https://www.surveymonkey.com/r/Sepsis-2-19-2020>
- Please be sure to access the link, complete the evaluation form, and request your certificate. The evaluation process will remain open **two weeks** following the webcast. Your certificate will be emailed to you when the evaluation process closes after the 2 week process.
- If you have any questions please contact Dorothy Aldridge (Dorothy.Aldridge@ohiohospitals.org)

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Sepsis

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Hannah Eichelberger
E-learning Specialist
The Sepsis Institute



Sepsis Alliance

Sepsis Coordinator Network

The Sepsis Institute

About Sepsis Alliance



Carl Flatley, DDS, MSD,
Sepsis Alliance founder, with
daughter Erin, a victim of
sepsis

- Nation's first and leading sepsis organization
- Leader in sepsis awareness – 19% to 65%
- Leader in training – 30,000+ medical professionals
- Leader in advocacy – working in all 50 states
- GuideStar Platinum Rated
- 83% of funds go towards programs
- Focus on Education

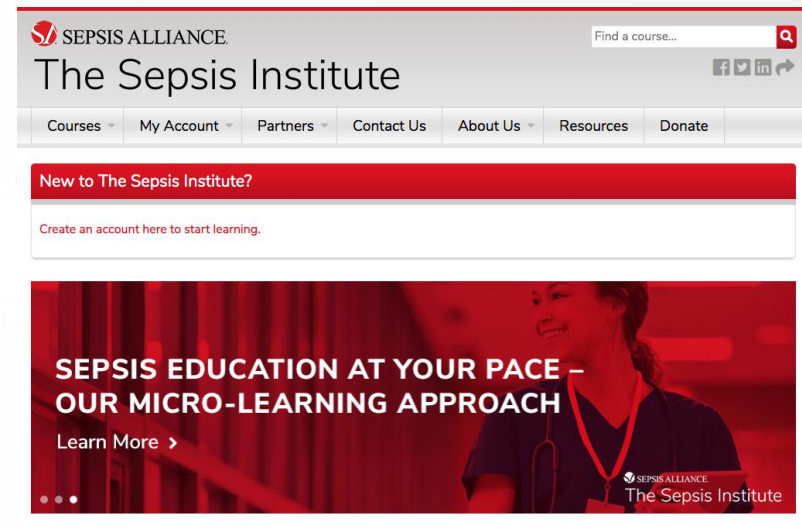


The Sepsis Institute from Sepsis Alliance



The Sepsis Institute

The Sepsis Institute (TSI) is an online learning platform that provides healthcare professionals across the continuum of care with **high quality, evidence-based sepsis education** and training to improve diagnosis and outcomes.



SepsisInstitute.org

CE credits available at **no cost!**

The Sepsis Institute



The Sepsis Institute

Mission:

- To create and deliver expert content for the healthcare community on the prevention, recognition, diagnosis, and treatment of sepsis across the continuum of care and through the continuum of career.
- Established to drive systemic change in the recognition, diagnosis, and treatment of sepsis.
- Initial funding provided by a contract with BARDA (Biomedical Advanced Research and Development Authority)

The first centralized hub for
evidence-based sepsis education

Our Partners*



Memorial Sloan Kettering
Cancer Center



*Partial list

Health Professional Webinars



The Sepsis Institute

- Topics across the continuum of care
- Leading medical experts from:
 - CDC
 - MD Anderson
 - Memorial Sloan Kettering Cancer
 - CHOP
 - University of Michigan
 - Sutter Health
- New content added weekly



Training Modules

Available Now:

- Sepsis: Home Healthcare
- Sepsis: Pediatric First Response

Upcoming:

- Sepsis and Oncology
- Sepsis: Skilled Nursing and Long-Term Care
- Maternal Sepsis
- Sepsis and Dermatology
- Disaster Medicine and Sepsis
- Sepsis: Emergency Preparedness



Led By Subject-Matter Experts



The Sepsis Institute

Wide network of subject matter experts who provide **evidence-based sepsis training** for healthcare providers

Some Featured Subject Matter Experts:



Hallie Prescott, MD, MSc

Assistant Professor in Internal Medicine, Division of Pulmonary & Critical Care Medicine, University of Michigan



Rom Duckworth, LP

Award-Winning EMS Educator, Career Fire Captain and EMS Coordinator

Our Micro-Learning Format



The Sepsis Institute

- Gives the learner flexibility to complete courses on their own timeline
- Short segments of educational content at the learner's convenience
- More control over learning experience



Walkthrough



The Sepsis Institute

Courses

Refine by:

Credit types

- Participation (20)
- RN CE Contact Hours (20)
- No Credit Offered (4)
- AMA PRA Category 1 Credit™ (1)

Category

- Prerecorded Webinar (22)
- CE Offered (18)
- Sponsored Webinar (No CE) (6)
- Live Webinar (3)
- Training Module (2)

Format

SORT BY

Relevance

SEARCH

GE Sponsored Webinar - Can We Help 'Solve' Sepsis Together? Medical-Surgical Nurses as "Sepsis Solvers"

Webinar Description: As the first line of defense, nurses are key players in diagnosing sepsis - in particular, Medical-Surgical nurses. They provide care to those patients who are acutely ill and susceptible to sepsis. Yet they face multiple challenges in their day-to-day work.

Category	Format	Credits
Prerecorded... +		No Credit Offered

Sepsis Champions: How Hospital-wide Involvement Changes Sepsis Care

Webinar Description: Sepsis Champions help to optimize sepsis management and emphasize the importance of early recognition and timely treatment. This webinar session provides an overview of what a sepsis champion is and what they do.

Category	Format	Credits
CE Offered +		RN CE Cont... +

Sepsis Coordinator Network



Resources:

- **Educational webinars** that highlight sepsis best practices
- **Active discussion** and **peer support** via online forum
- **Resource drive** with information on topics including core measures, clinical practice guidelines, patient screening, identification tools, education resources, and more

All active healthcare providers are welcome to join, including physicians, nurses, first responders, pharmacists, lab staff, etc.

Sponsors:



Sepsis Coordinator Network



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Sponsors:





Dr. Howard Werman
Medical Director
MedFlight

Challenges in the Interhospital Transport of Sepsis

Howard A. Werman, MD

February 19, 2020

Interhospital Transport of Sepsis

definition

- physiologic, biologic, and biochemical abnormalities caused by a dysregulated host response to infection
- lead to multiple organ dysfunction syndrome and death

Interhospital Transport of Sepsis

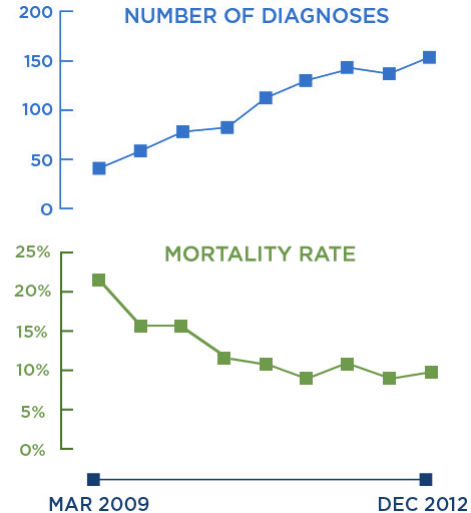
epidemiology

- 2.56 million cases between 2010-2016
- 8-9% increase in the incidence over the past 2 decades
- patients > 65 years account for 60-85% of sepsis cases
 - impact of an aging society
- overall mortality = 12.5%
 - sepsis (5.6%), severe sepsis (14.9%), septic shock (34.2%)
- US health care costs: > \$50 billion over 7 year period

Interhospital Transport of Sepsis

goals of therapy

- mortality has been declining over time
 - early recognition
 - early therapeutic intervention
 - success of sepsis bundle is controversial



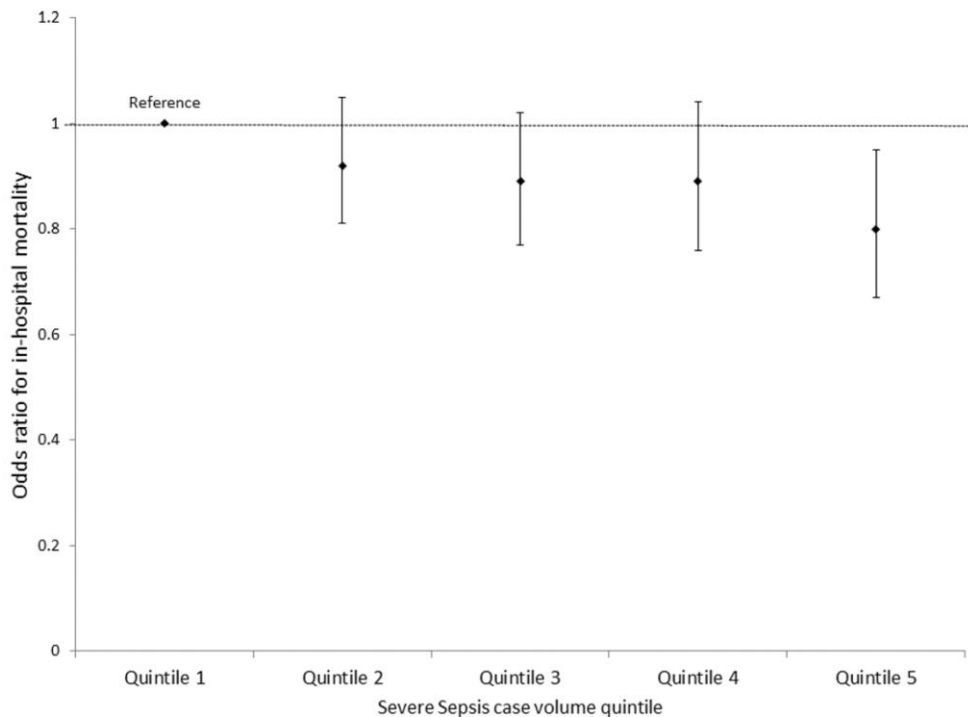
Interhospital Transport of Sepsis

complexity of care

- patients with severe sepsis and septic shock are ***labor-intensive***
 - complex ventilatory management
 - fluid management in patients with cardiac or renal disease
 - management of various pressor agents
 - complex monitoring devices – central lines, arterial lines
 - management of co-morbidities
 - DM, obesity, cancer, immunosuppression, transplant

Interhospital Transport of Sepsis

complexity of care



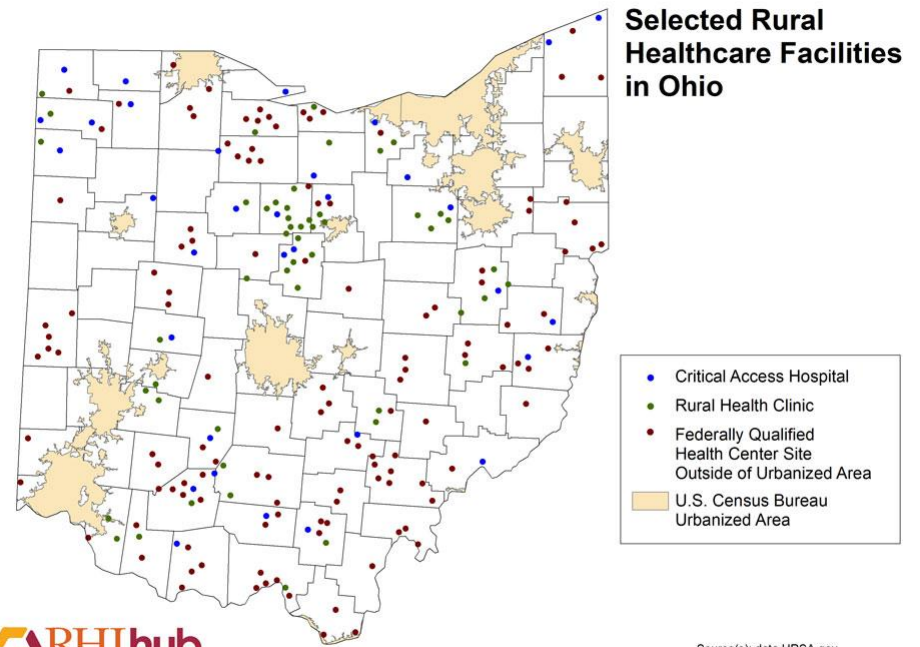
high volume centers have a lower odds of mortality from severe sepsis

Figure 2. Odds Ratio and 95% Confidence Intervals for In-hospital Mortality by Quintiles of Severe Sepsis Case Volume

Interhospital Transport of Sepsis

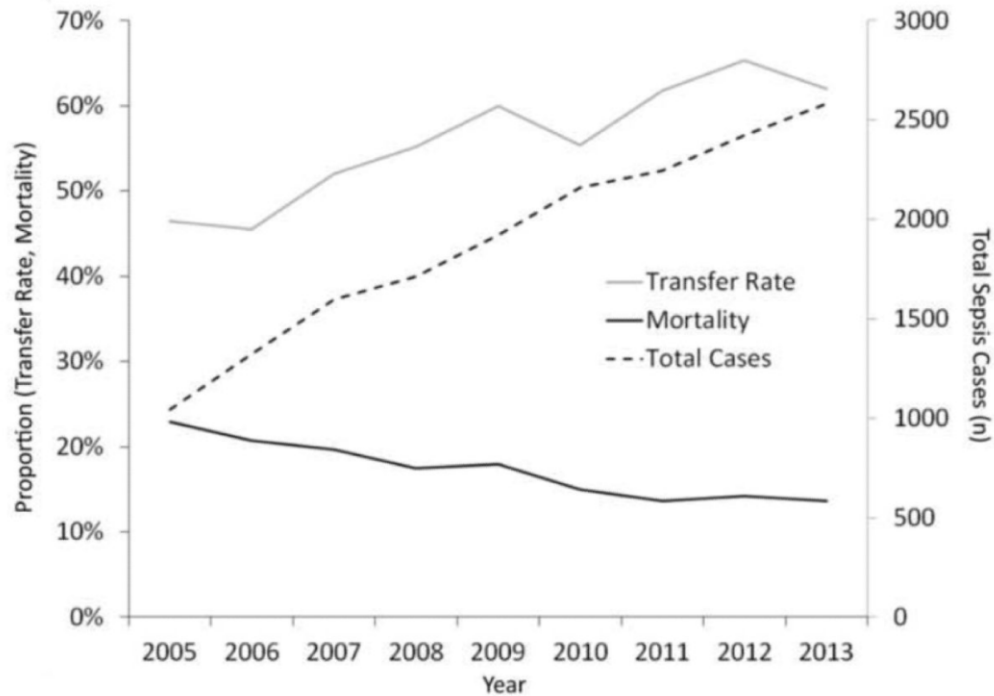
complexity of care

- patients with severe sepsis and septic shock ***do not always present to a tertiary center***
- 11,689,442 people in Ohio – 2,352,916 living in rural areas



Interhospital Transport of Sepsis

complexity of care



Interhospital Transport of Sepsis

complexity of care

- many of these transfers are best served by critical care transport



Interhospital Transport of Sepsis

transport decisions

- ALS/BLS – widespread availability
 - no complex ventilatory needs
 - hemodynamic stability
 - no need to titrate drips frequently
 - no advanced equipment needs
 - vent, a-line, central line, ECMO



Interhospital Transport of Sepsis

transport decisions

- mobile ICU – limited availability, usually in tertiary centers
 - complex ventilatory needs
 - hemodynamic stability
 - need to titrate drips frequently
 - advanced equipment needs
 - vent, a-line, central line, ECMO



Interhospital Transport of Sepsis

transport decisions

- helicopter – less limited availability, closer to rural centers
 - complex ventilatory needs
 - hemodynamic stability
 - need to titrate drips frequently
 - advanced equipment needs
 - vent, a-line, central line



Interhospital Transport of Sepsis

air versus mobile ICU decision

- need to undergo an emergent procedure
 - trauma, stroke, STEMI
 - difficult airway, ECMO, central access, arterial line
- need to minimize out-of-hospital time
- costs
 - air medical transport charges are a minimum of 4-5 times as more expensive as mobile ICU
- internal space and physiologic considerations

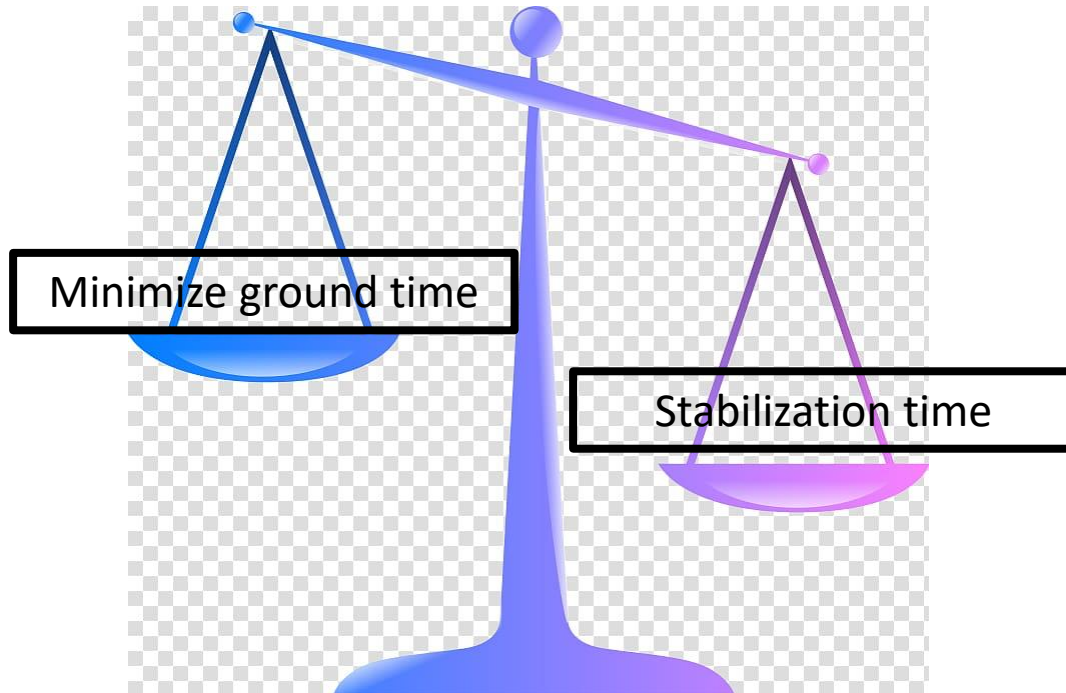






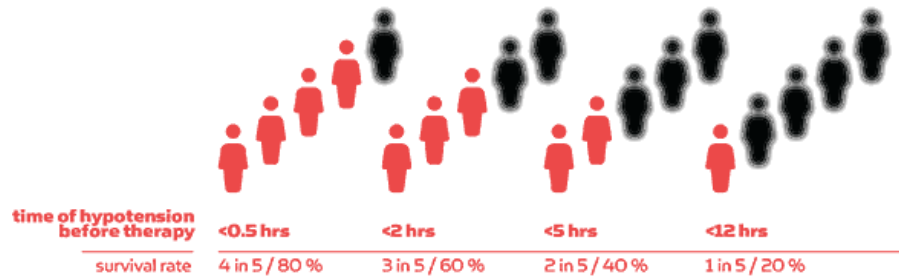
Interhospital Transport of Sepsis

ground stabilization vs. transport decision



Interhospital Transport of Sepsis

early therapy



Interhospital Transport of Sepsis

metrics

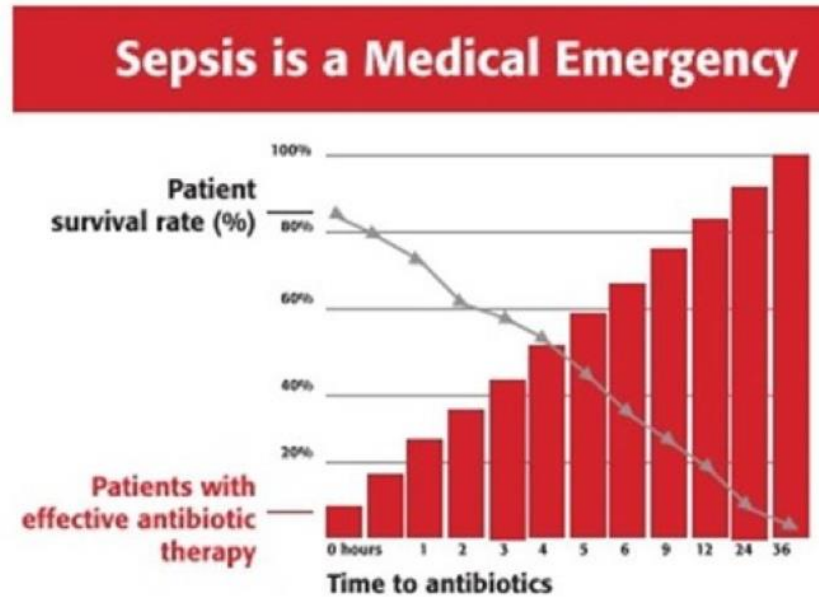
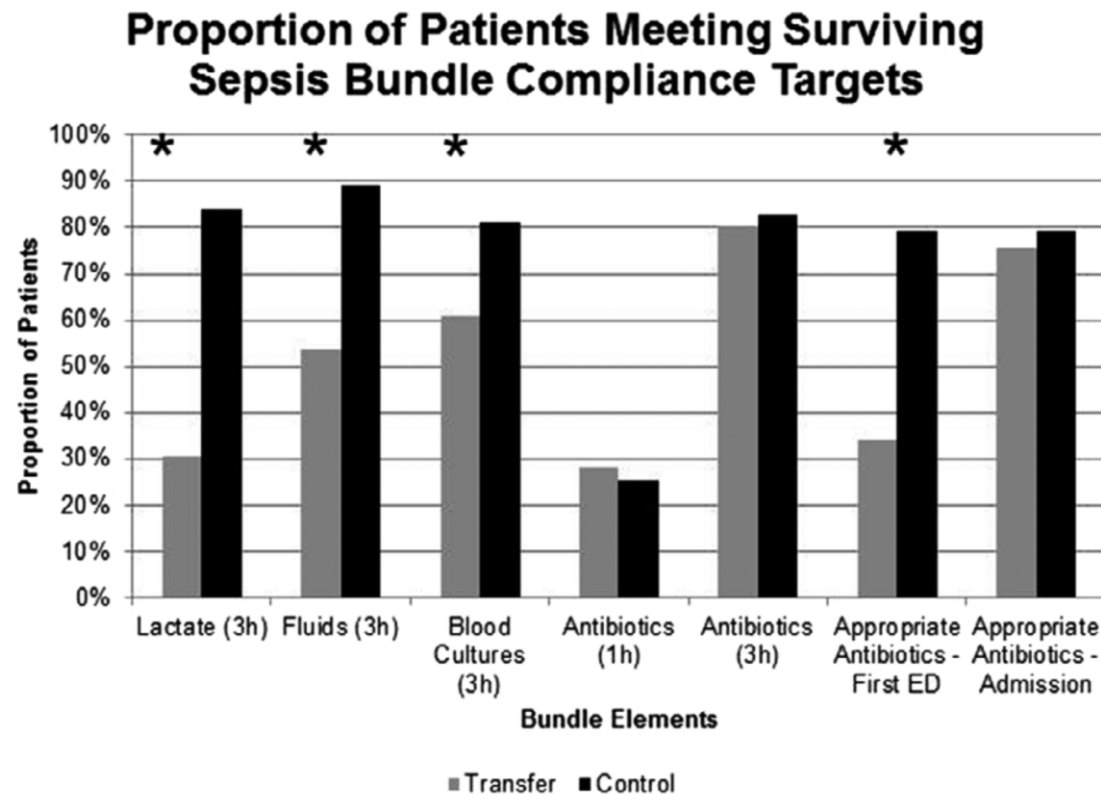


Figure 2.

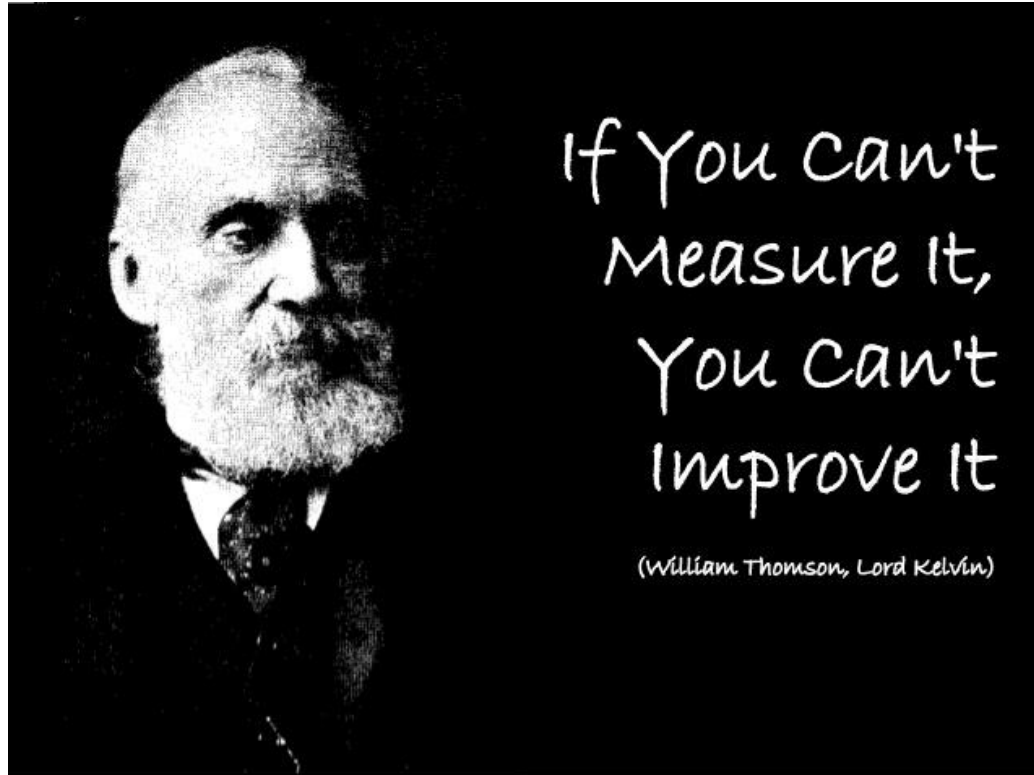
Interhospital Transport of Sepsis

early therapy



Interhospital Transport of Sepsis

metrics



Interhospital Transport of Sepsis

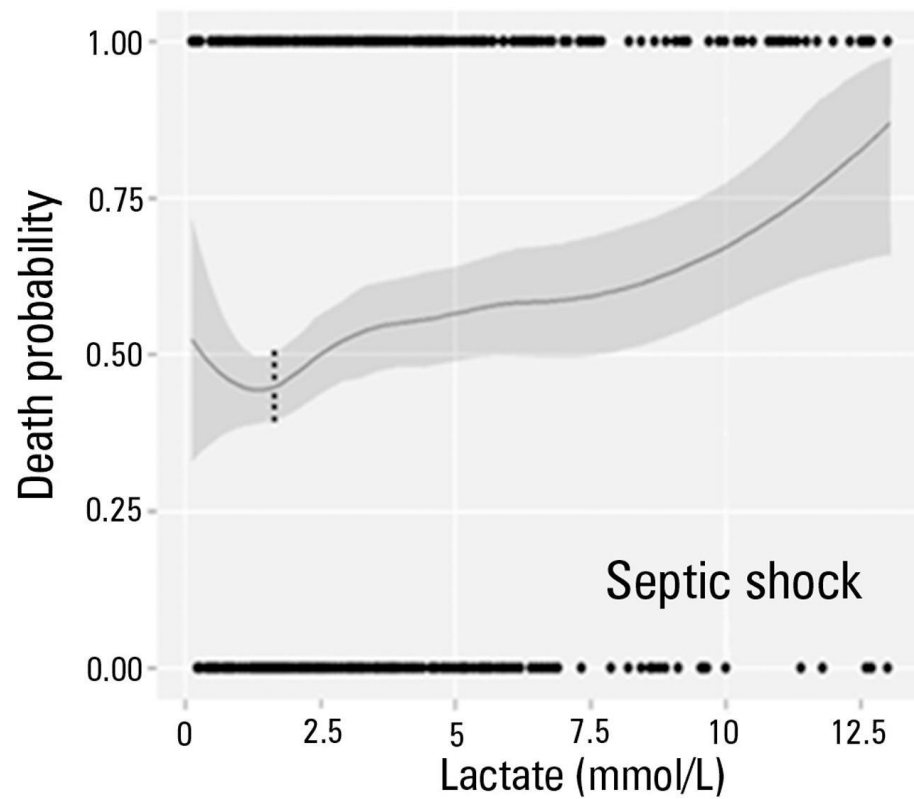
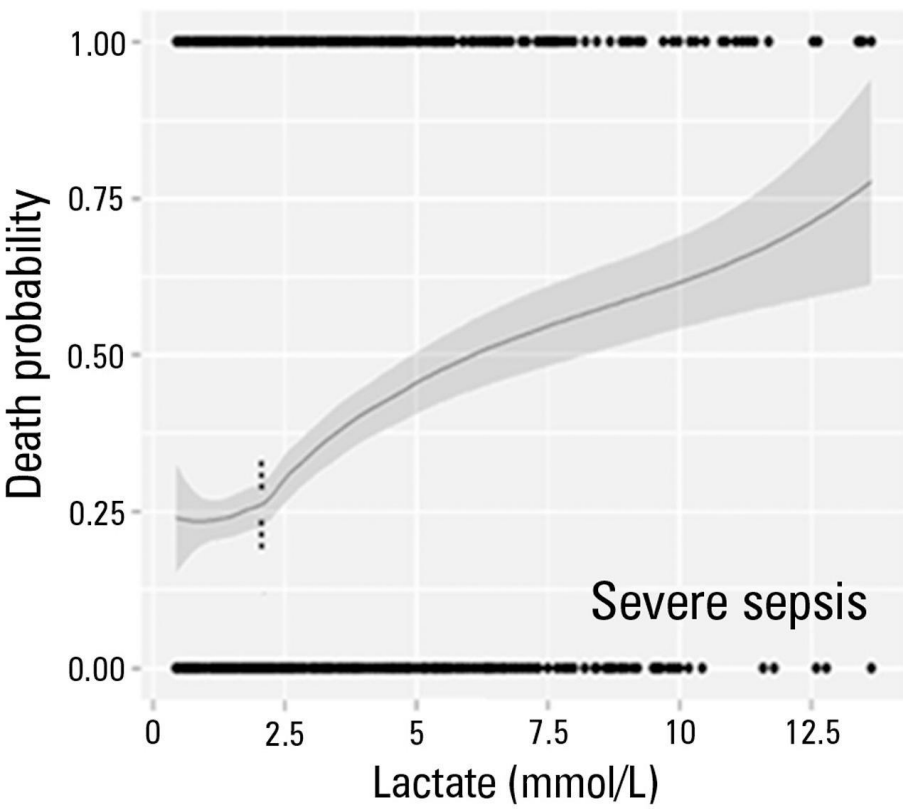
metrics

- **FLAP**

- **fluids:** has a fluid bolus of 30 ml/kg been administered
- **lactate:** is there a recorded lactate
- **antibiotics:** have early antibiotics been administered
- **pressors:** have pressors been initiated early

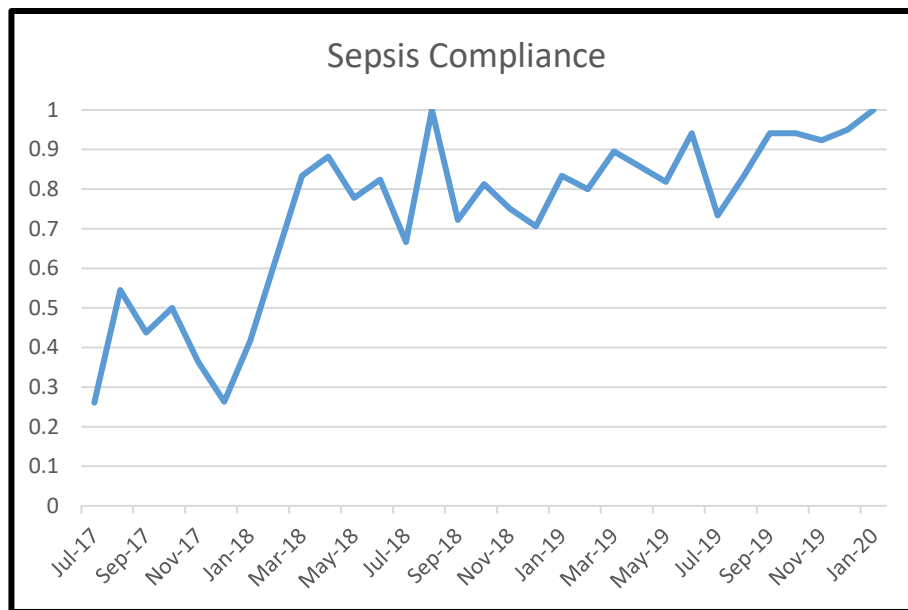
Interhospital Transport of Sepsis

metrics



Interhospital Transport of Sepsis

metrics



Interhospital Transport of Sepsis

barriers/challenges

- communication issues in the care of the septic patients
 - sending facility, dispatch center, transport crew, medical control physician, ICU or ED physician, etc.
- documentation challenges
- uniform reporting tool regarding the care of septic patient
- effects of altitude: noise, vibration, turbulence

Interhospital Transport of Sepsis

barriers/challenges

- when you see 'Sepsis' or 'Septic Shock' your pager, what four things should you immediately consider:

PTA Sepsis

By: Other Healthcare Provider

Qualifiers:

Lactate = **1.50**

Amount of Fluid Infused = **2500ML**

Antibiotics Started = **Yes**

Fluid Resuscitation 30 ml/kg S = **Yes**

Vasopressor Started = **NA**

Time Antibiotic Started = **0800 TODAY**

Time Fluid Started = **YESTERDY**

Time Vasopressor Started = **NA**

Interhospital Transport of Sepsis

barriers/challenges

Table 4

Suggested elements of rural sepsis protocols in patients who are being transferred between hospitals

J Crit Care 2016; 36: 187–194

Interhospital Transport of Sepsis

barriers/challenges

Factor	Not Transferred (n = 7,445)	Transferred (n = 10,801)	p
Critical Access Hospital, n (%)	5256 (71)	6267 (58)	< 0.001
Outcomes			
Hospital Length-of-Stay, median (IQR)	4 (3 – 7)	9 (5 – 16)	< 0.001
Cost of Care			
ED Cost, \$USD2010 (median, IQR)	\$2,204 (1,331 – 3,504)	\$2,492 (1,409 – 3,955)	< 0.001
Ambulance Transfer Cost, \$USD2010 (median, IQR)	\$0	\$763 (612 – 940)	< 0.001
Inpatient Care Cost, \$USD2010 (median, IQR)	\$6,041 (3,470 – 11,400)	\$20,928 (10,891 – 41,691)	< 0.001
Family Costs, \$USD2010 (median, IQR)	\$0	\$205 (90 – 441)	< 0.001
Total Cost of Care, \$USD2010 (median, IQR)	\$7,709 (4,970 – 13,113)	\$23,344 (12,993 – 44,462)	< 0.001
Died	894 (12.0)	2188 (20.2)	< 0.001

y, years; SD, standard deviation; IQR, interquartile range; \$USD2010, US Dollars with inflation indexed to 2010

J Crit Care 2016; 36:
187–194

Interhospital Transport of Sepsis

future directions

- have we leveraged technologies such as the eICU and telemedicine to their fullest extent?
- can we bring sepsis stabilization teams to the primary/secondary hospitals rather than transferring patients to tertiary centers?
- should we regionalize 'sepsis systems of care' like we have with trauma, STEMI and stroke?

OHA collaborates with member hospitals and health systems to ensure a healthy Ohio

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HelpingOhioHospitals



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www.youtube.com/user/OHA1915