

# Seeing Sepsis: Reducing Severe Sepsis Mortality in Rural Hospitals

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- Sherrie Muhs, RN, BSN, CEN,  
Avera Health
- Tammy Hale, TriCounty  
Wadena



# CMS Partnership for Patients Leading Edge Advanced Practice Topics (LEAPT)

- MHA is 1 of only 6 Partnership for Patients Hospital Engagement Networks (HEN) awarded the LEAPT contract
- MHA LEAPT topics:
  - Severe Sepsis and Septic Shock
  - Clostridium difficile (c-diff)
  - Iatrogenic delirium
  - Culture of safety that integrates patient safety with employee safety
  - Expanding falls, pressure ulcer and readmission prevention across community
- Began Sept. 30, 2013 and goes through Dec. 8, 2014
- Fast paced PDSA cycle to prepare for statewide roll-out
- MHA 1<sup>st</sup> LEAPT HEN to kick-off sepsis statewide
- Best practices, bundles and toolkits designed to be sustainable<sup>2</sup> beyond Dec. 2014

# Seeing Sepsis

- The Minnesota Hospital Association coordinated the development of a tool kit to facilitate the adoption of severe sepsis early detection tools and the Surviving Sepsis Campaign three- and six-hour care bundles by hospitals of all sizes.

*Surviving sepsis campaign bundles: 3-hour bundle and 6-hour bundle from: Dellinger RP, Levy MM, Rhodes MB et al: Surviving Sepsis Campaign: International Guidelines for management of severe sepsis and septic shock: 2012. Crit Care Med 2013; 41 (2) “Reproduced with permission of the publisher. Copyright 2012 Society of Critical Care Medicine and European Society of Intensive Care Medicine.”*

# LEAPT Seeing Sepsis Partners

- St. Cloud Hospital
- Ridgeview Medical Center, Waconia
- Tri-County Health Care, Wadena
- CentraCare Health – Melrose
- Avera, Sioux Falls, S.D.
- Avera Marshall Regional Medical Center
- Avera St. Mary's Hospital, Pier, S.D.

# Systemic Inflammatory Response Syndrome to Septic shock: A Continuum

**SIRS** → **Sepsis** → **Severe Sepsis**

A Clinical response arising from a nonspecific insult with 2 of the following

Temp > 100.9 or > 96.8F

HR > 90

RR > 20 or pCO<sub>2</sub> < 32

WBC > 12 K, < 4 K, > 10% Bands

SIRS with a presumed or confirmed infectious process

Sepsis induced tissue hypoperfusion or organ dysfunction

Respiratory

Renal, GI

CNS

Hematologic

Refractory hypotension

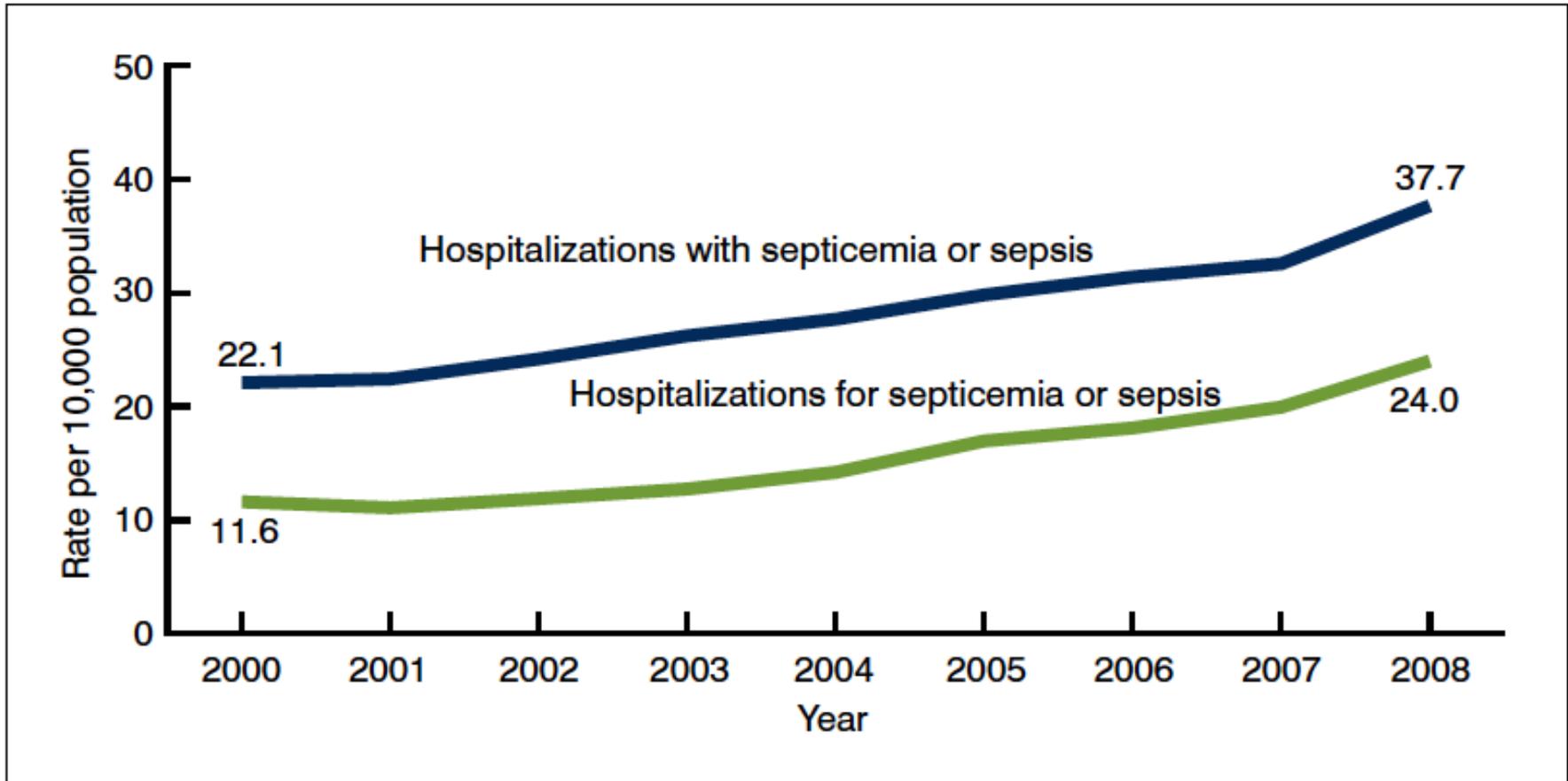
Septic Shock

- Sepsis is the leading cause of death in non-coronary care intensive care units, with a mortality rate between 30% and 50%
- From 2007 to 2009, over 2,047,038 patients were admitted with a sepsis-related illness
  - 52.4% are diagnosed in the ED
  - 34.8% on the hospital wards
  - 12.8% in the ICU

Hall, M.J, et al. NCHS data brief, 62. Hyattsville, MD: National Center for Health Statistics. 2011  
Reed K et al. Health Grades. June, 2010 2011;The First Annual Report(1):1-28.

# Hospitalization rates for septicemia or sepsis more than doubled from 2000 through 2008.

Figure 1. Hospitalizations for and with septicemia or sepsis



NOTE: Significant linear trend from 2000 through 2008 for both categories.

SOURCE: CDC/NCHS, National Hospital Discharge Survey, 2000–2008.

# Seeing Sepsis

- Severe sepsis can be associated with a mortality rate of up to 50% in hospitals that do not utilize an early detection and treatment bundle.
- The Minnesota Seeing Sepsis mentor hospitals have decreased mortality related to severe sepsis and septic shock 49% and 64% since 2008.

# Severe Sepsis is One of the Time Critical Emergencies

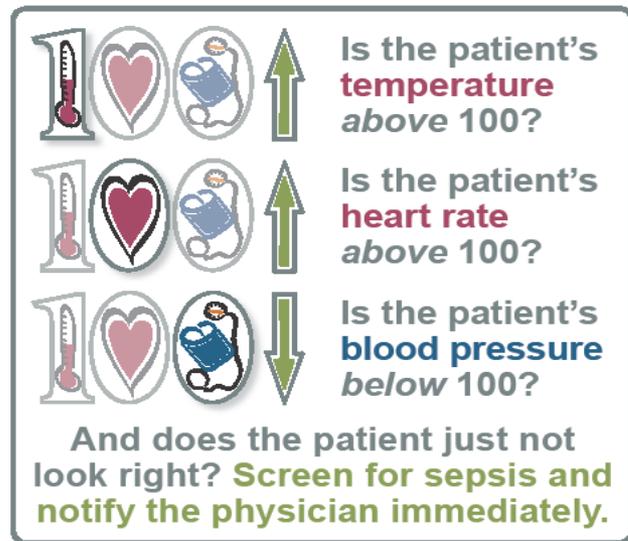


# Time Critical Emergencies

- Severe Sepsis/Septic Shock – Highest mortality (5x greater than)
- Trauma
- STEMI
- Stroke

# Seeing Sepsis Toolkit contents

## seeing sepsis



Is the patient's **temperature** above 100?

Is the patient's **heart rate** above 100?

Is the patient's **blood pressure** below 100?

And does the patient just not look right? **Screen for sepsis and notify the physician immediately.**



Minnesota Hospital Association

- Seeing sepsis early detection graphic tool
- Seeing sepsis “Act Fast” poster
- Seeing Sepsis ED triage poster
- Seeing Sepsis ED algorithm
- Sepsis screening tools - ED and inpatient
- Severe sepsis order bundles for hospitals with and without ICU
- Sepsis coding/documentation tool
- Sepsis performance improvement tool
- Sepsis simulation tools – ED and inpatient
- Seeing sepsis staff education video

# seeing sepsis



Is the patient's **temperature** above 100?



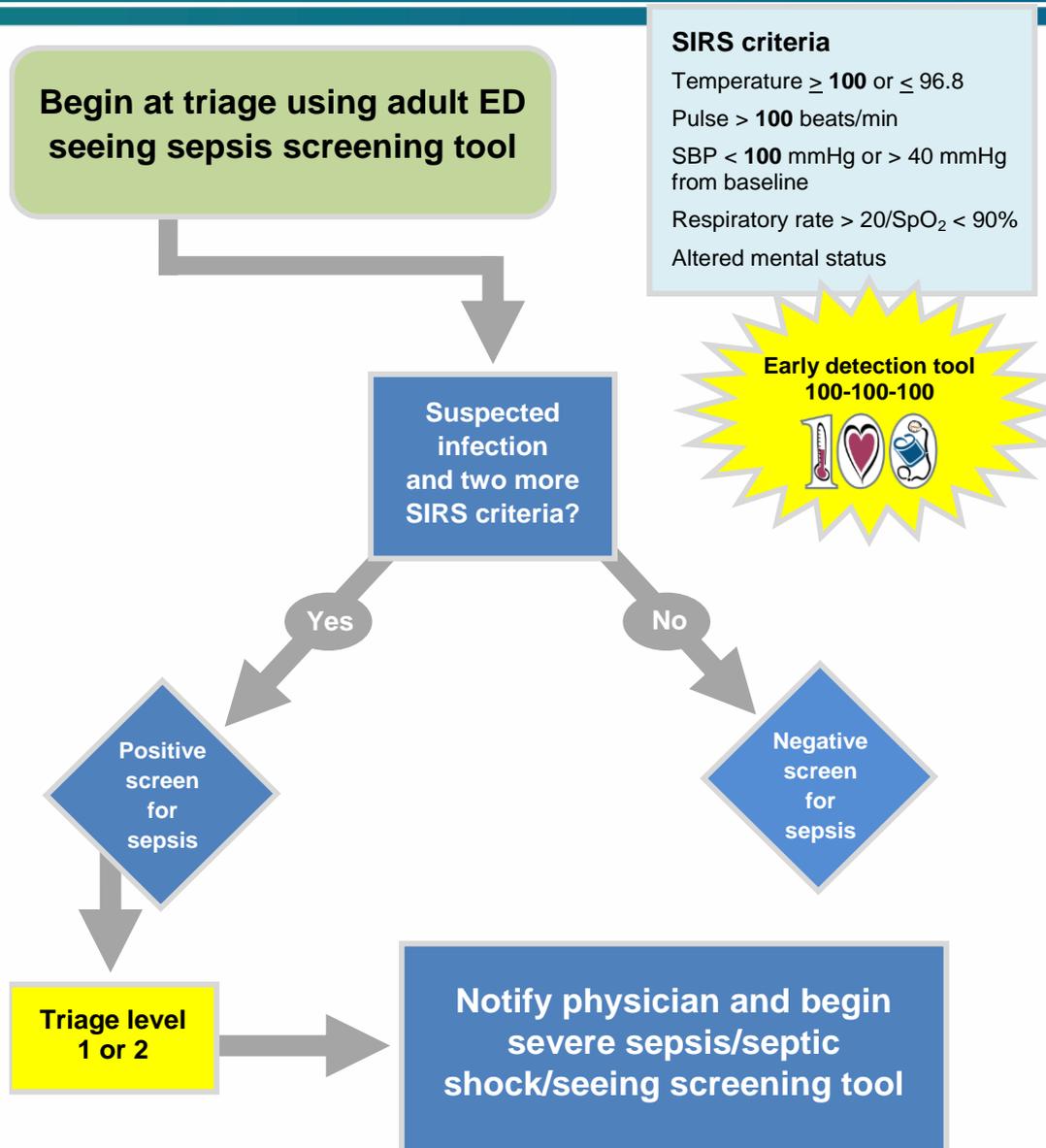
Is the patient's **heart rate** above 100?



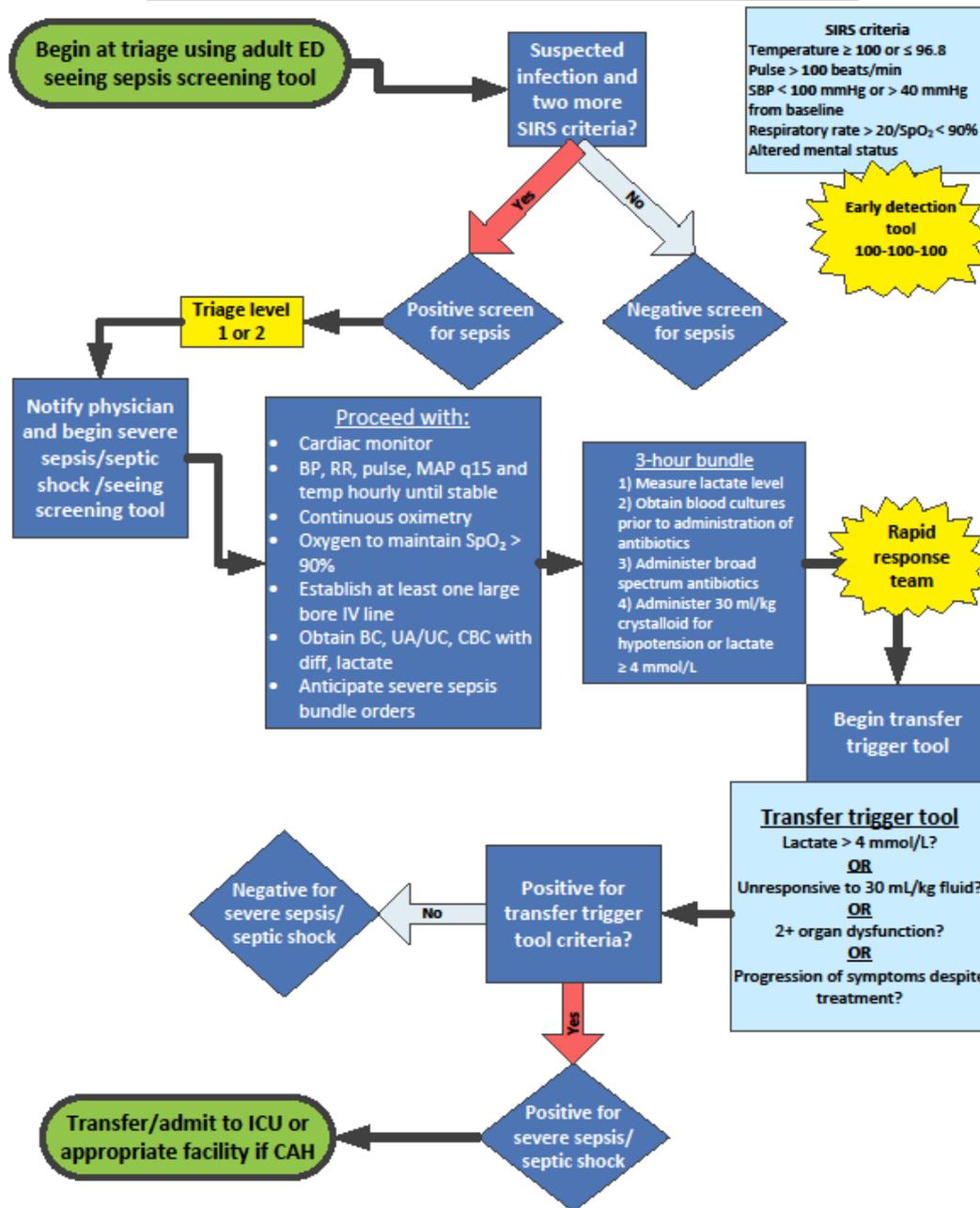
Is the patient's **blood pressure** below 100?

And does the patient just not look right? **Screen for sepsis and notify the physician immediately.**





## Emergency department & general floor sepsis algorithm



# Anticipate ICU admission or transfer if:

- Lactate > 4 mmol/mL or
- Unresponsive to 30 ml/kg fluid (no increase in UOP or BP) or
- Two or more signs or symptoms organ dysfunction:
  - Respiratory: SaO<sub>2</sub> < 90% OR increasing O<sub>2</sub> requirements
  - Cardiovascular: SBP < 90 mmHg OR 40 mmHg less than baseline or MAP < 65 mmHg
  - Renal: urine output < 30 ml/hr, creatinine increase > 0.5 mg/dl from baseline or ≥ 2.0 mg/dl
  - CNS: Altered mental status, GCS ≤ 12
  - Hematologic: platelets < 100,000, INR >1.5, PTT > 60 secs
  - Hepatic: Serum total bilirubin ≥ 4 mg/dl or plasma total bilirubin > 2.0 mg/dl or 35 mmol/L
  - Hypotension (SBP < 90 mm Hg, MAP < 70, or SBP decreases > 40 mm Hg)

or

- Progression of symptoms despite treatment

# ACT FAST!

Early detection of SEPSIS requires fast action —  
like a STEMI or Stroke

IF patient has suspected infection AND two or more:

- Temperature > 100° F or < 96.8° F
- Pulse > 100
- SBP < 100 mmHg or > 40 mmHg from baseline
- Respiratory rate > 20 / SpO2 < 90%
- Altered mental status

Plan for:

- Cardiac monitor
- BP, MAP, HR, resp rate q15 and temp hrlly until stable
- Continuous oximetry
- Oxygen to maintain SpO2 > 90
- Establish at least one large bore IV line
- Obtain BC, UA/UC, CBC w/diff, lactate

Anticipate ICU admission or transfer if:

- Lactate > 4 mmol/mL
- OR
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  - Hypotension (SBP < 90 mm Hg, MAP < 70, or SBP decreases > 40 mm Hg)
- OR
- Progression of symptoms despite treatment

**“Every hour a patient in septic shock doesn’t receive antibiotics, the risk of death increases 7.6%”**

**Activate Rapid Response Team!**

**100 seeing sepsis**

**100** ↑ Is the patient’s **temperature** above 100?

**100** ↑ Is the patient’s **heart rate** above 100?

**100** ↓ Is the patient’s **blood pressure** below 100?

And does the patient just not look right? **Screen for sepsis and notify the physician immediately.**

# Seeing Sepsis Transfer Trigger Tool

- Anticipate ICU admission or transfer if:
  - Lactate > 4 mmol/mL **OR**
  - Unresponsive to 30 ml/kg fluid (no increase in UOP or BP) **OR**
  - Two or more signs or symptoms organ dysfunction:
    - Respiratory: SaO<sub>2</sub> < 90% OR increasing O<sub>2</sub> requirements
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    - Hypotension (SBP < 90 mm Hg, MAP < 70, or SBP decreases > 40 mm Hg)**OR**
- Progression of symptoms despite treatment

# Sherrie Muhs, RN, BSN, CEN

## Avera eEmergency

As a nurse with Avera's eEmergency program, Sherrie Muhs has firsthand experience developing quality initiatives.

Sherrie is very active in the Emergency Nurse's Association and is a well respected colleague not only in her home facility of Avera McKennan, but also in the 85+ rural Critical Access Hospitals that we serve. Her commitment to rural health shines as she partners with rural teams, supporting them in their times of greatest need. She has a passion for quality excellence and is a true leader in her field.

# Tammy Hale MSN, RN

## Nurse Educator/Infection Preventionist

Tammy Hale earned her Bachelor of Science in Nursing degree from the University of North Dakota and her Master of Science in Nursing from Minnesota State University Moorhead. In addition to working in acute care, Tammy has taught nursing courses at Minnesota State Community and Technical College. She is the primary author of *Simulation Scenarios for Nursing Education*. Currently, Tammy is the Nurse Educator and Infection Preventionist at Tri-County Health Care in Wadena.

# Avera@CARE™

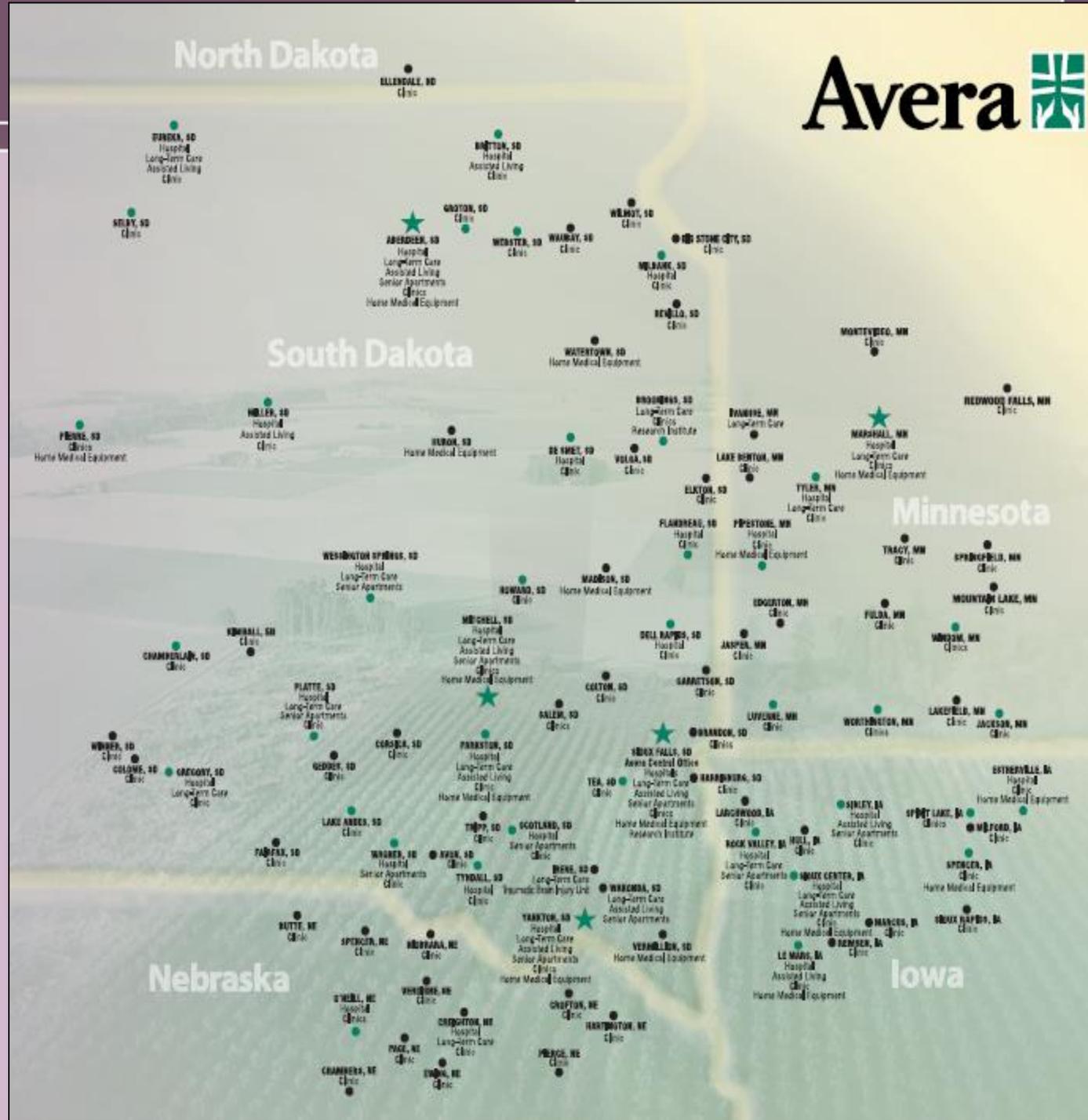


Sherrie Muhs, RN, BSN, CEN  
Avera e Care

Avera 

# Avera

Avera is a regional health care family with more than 300 facilities in 100+ communities in the five-state region of South Dakota, North Dakota, Iowa, Minnesota, and Nebraska.



## Mission

Avera is a health ministry rooted in the Gospel. Our mission is to make a positive impact in the lives and health of persons and communities by providing quality services guided by Christian values.

## History

Avera's roots stretch back to the frontier medicine of the Benedictine and Presentation Sisters, who began providing health care in Dakota Territory in 1897.

21 Nursing Homes



31 Hospitals



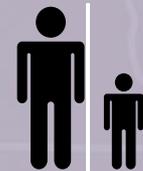
2.5 M Outpatient & Clinic Visits



110,000 Home Health Visits



1,000,000 People



\$2.8 Billion in Assets



Avera 

# History of Avera Telemedicine



November 1993  
**eConsult**



August 2004  
**eICU**



November 2008  
**ePharmacy**



January 2012  
**eAccess for  
Long Term Care**

October 2012  
**eHelm**



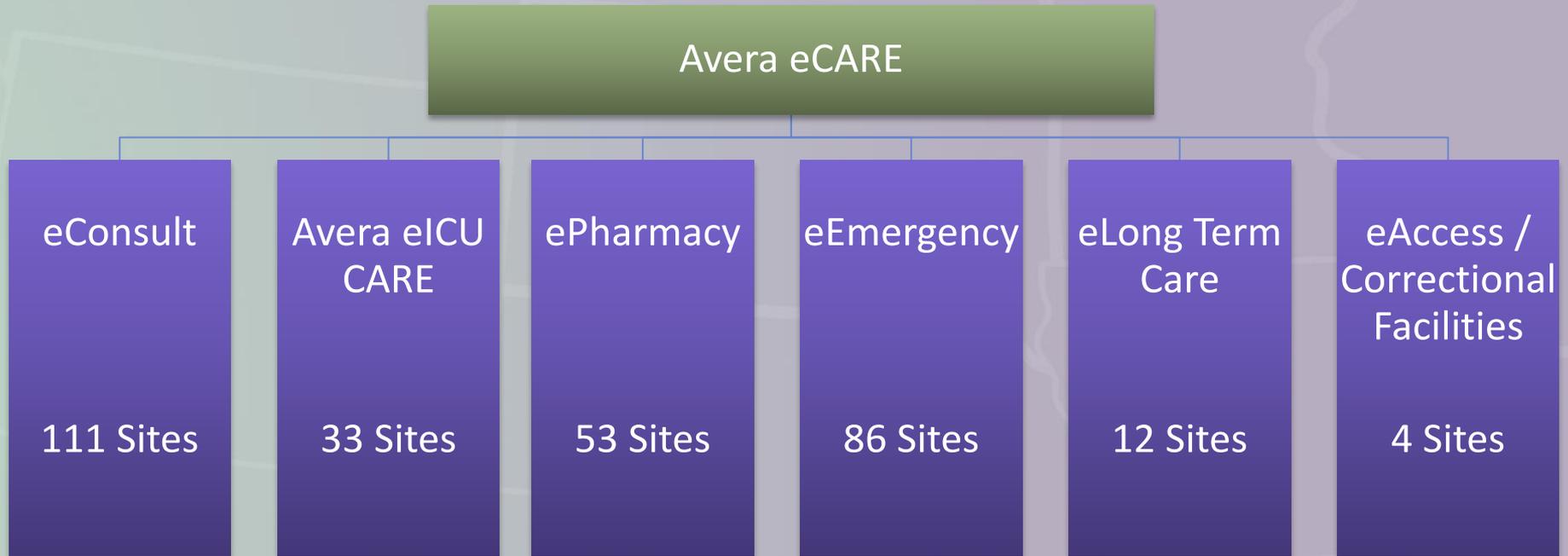
October 2009  
**eEmergency**

April 2012  
**eAccess for  
Correctional Facilities**

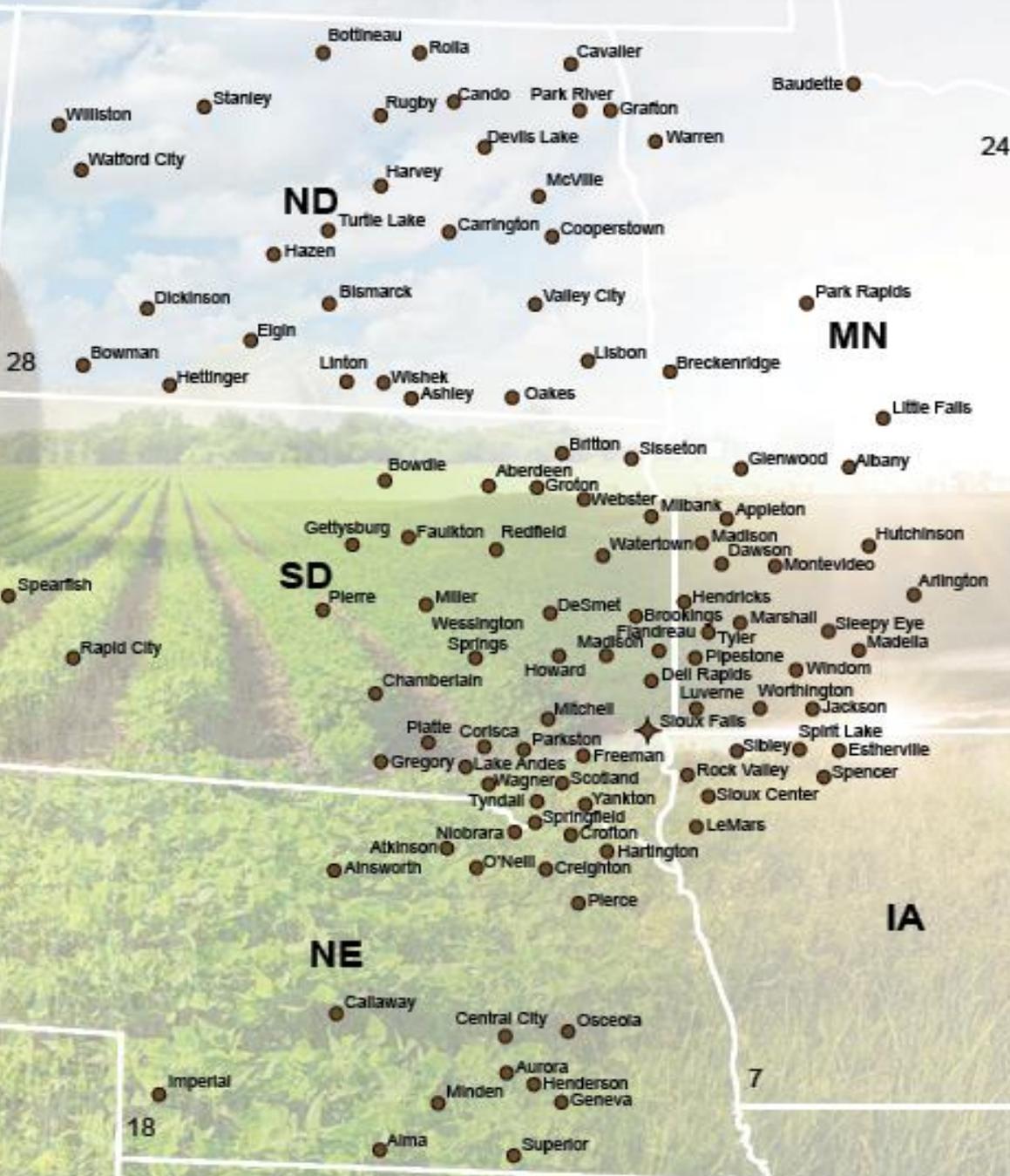
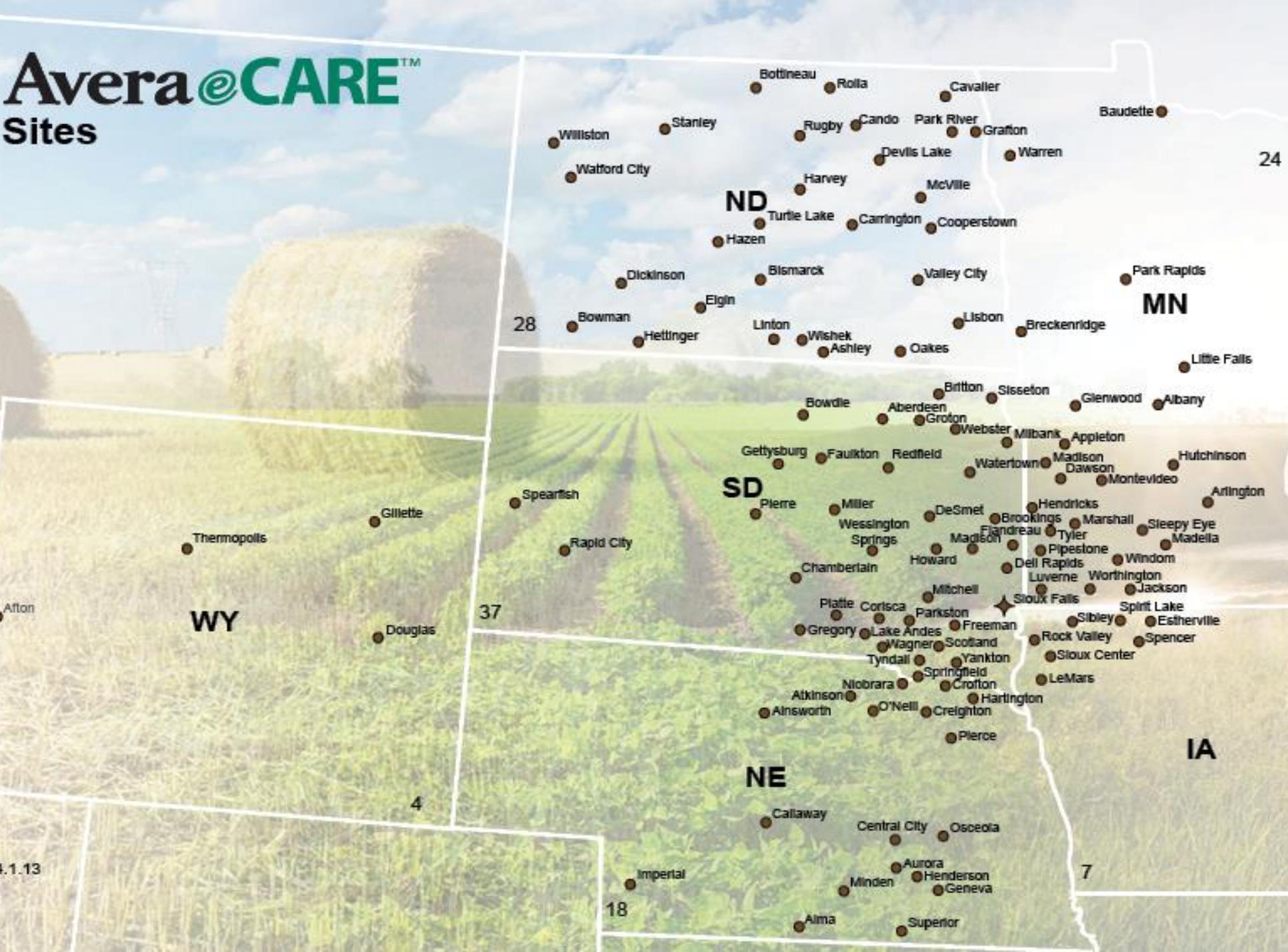


Introduced in 1993

# Avera eCARE Services Today



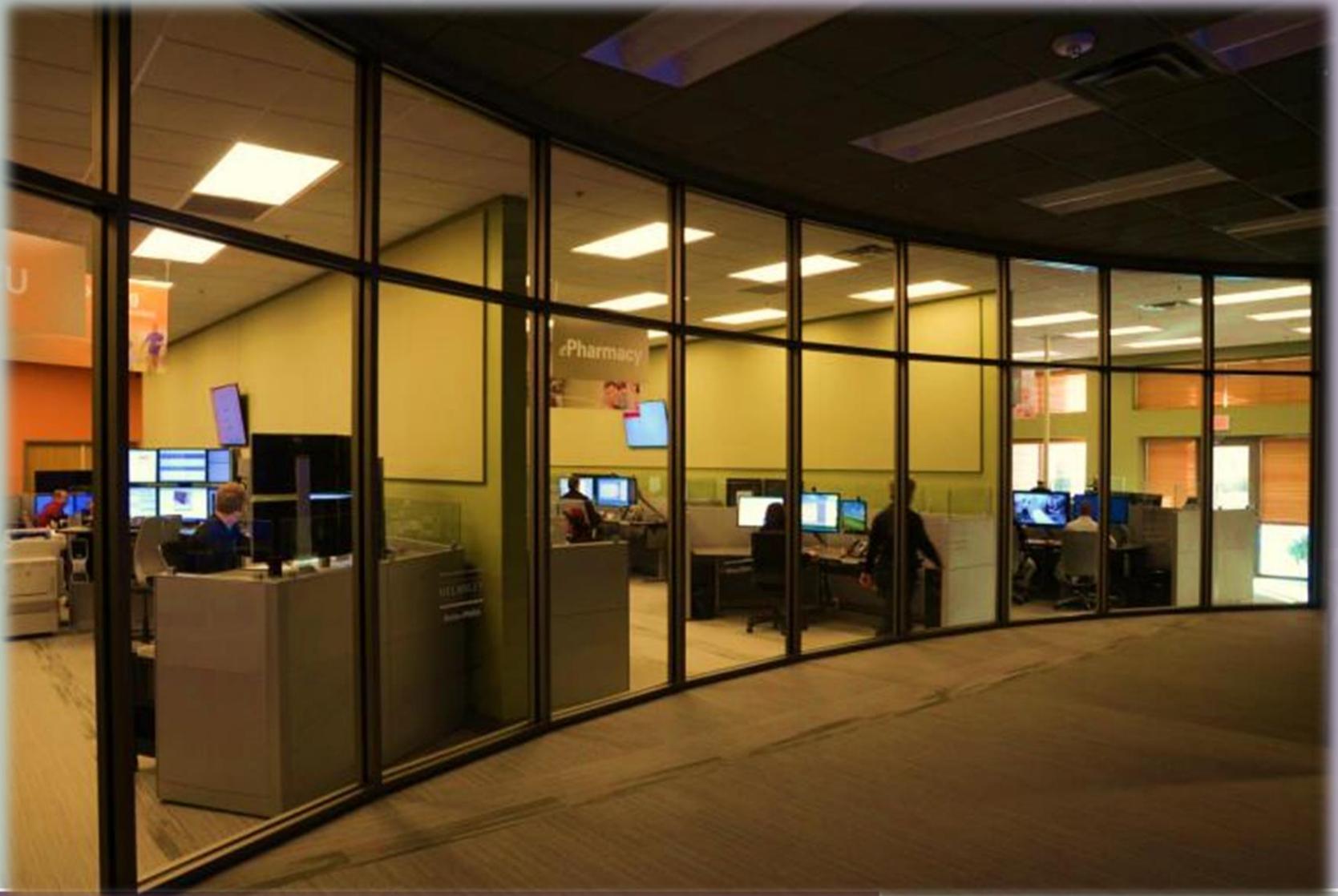
# Avera@CARE™ Sites



# Avera eHelm 2013

- **149,100** patients touched
- **162** hospitals and clinics served
- **700** providers impacted system wide
- **455,000** square miles covered  
(7 states)
- **\$58.6M** in health care costs saved





Avera 

# seeing sepsis



Is the patient's **temperature** above 100?



Is the patient's **heart rate** above 100?



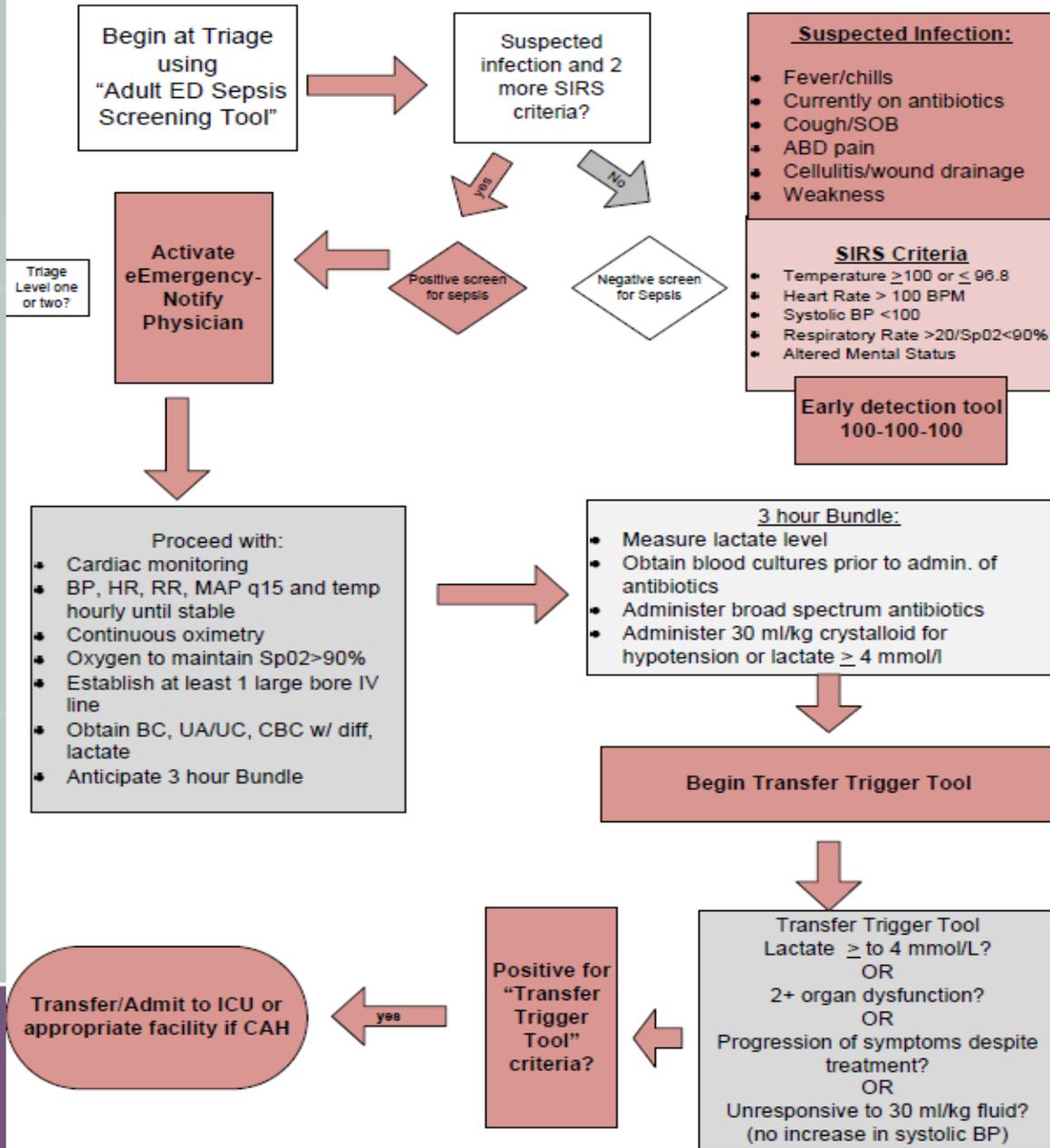
Is the patient's **blood pressure** below 100?

And does the patient just not look right? **Screen for sepsis and notify the physician immediately.**

# Keys to Success

- Consistent timely antibiotic administration
- Adequate fluid bolus
- Increasing use of Sepsis Power Plans (order sets)
- Reporting
  - Increasing transparency with clinical metrics
  - Critical data points
  - Outcomes to bedside staff
- Consistent communication

## Emergency Department Sepsis Algorithm





# Adult ED Severe Sepsis/Septic Shock

- **Proceed with:**
- Cardiac monitor
- BP, P, RR, MAP q15 and temperature hourly until stable
- Continuous oximetry
- Oxygen to maintain SpO2 >90
- Establish at least 1 large bore IV line
- Obtain BC, UA/UC, CBC w/diff, lactate
- **Anticipate Severe Sepsis Bundle Orders**



# ED Transfer Trigger

**Anticipate ICU or different level of care admission or transfer to another hospital (within 2 hours) if:**

- Lactate > 4mmol/mL

**OR**

- Unresponsive to 30ml/kg fluid (no increase in UOP or BP)

**OR**

- 2 or more signs or symptoms organ dysfunction:
- Respiratory SaO<sub>2</sub> <90% OR increasing O<sub>2</sub> requirements
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- Hypotension (SBP < 90 mm Hg, MAP < 70, or SBP decreases > 40mm Hg)

**OR**

- Progression of symptoms in spite of treatment



# Keys to Others Success

Engage the ED physician and nurses

Arrival is “Time Zero”

Nurses were Key to Assessment and Triage

Standardize Interventions

One order set that follows patients

Do Not Deviate

Stress

Early Recognition,  
Early Intervention and  
Immediate Treatment

Medical Emergency



# ED who to screen

- All Admissions except behavioral health, blood alcohol, overdose, and suture removal. Caution in above, VSS on all patients!!
- Current program does not include pediatrics, team will be developing in future.



# Inpatient Who to Screen

- Note adult patients who meet the 100, 100, 100 rule should be screened.

# Keys to Success

- Awareness of sepsis
- Early use of the word “sepsis” led to the highest likelihood of survival

# e CARE Case Study

- Pt arrives to critical access ED from BLS ambulance service.
- Report: agitated and restless, talking incoherently, Hx of BHS problems
- 43 Year old female well known to staff.
- BS 112

# e CARE Case Study

- The RN staff alerted e emergency 6 minutes before arrival.
- NP provider at site called and will arrive in 20 minutes
- Pt extremely agitated and restless.
- IV placed and e ED MD orders 1 mg Ativan
- Proceed with monitor, VSS, Fluids

# e CARE Case Study

- Pt has rectal temp of 101.2, hr 112
- Has been taking meds for BHS issues as directed per family
- Had c/o of headache for 3 days and not feeling well”
- Staff get Blood Culture and E care RN assist with sepsis screen
- Pt has 3 criteria: Headache,temp and tachycardia

# e CARE Case Study

- NP at site arrives.
- Discussing exam with e MD and they proceed with exam.
- NP notes pain on neck exam and crackles in lung bases
- Discuss Lumbar puncture due to clinical exam
- Transfer set up by helicopter due to 125 miles and no ALS ambulance

**Avera** 

# e CARE Case Study

- Discussed with pharmacy first antibiotic treatment
- WBC 24,000
- Blood Culture pending
- E pharmacy consulted: Rocephin 2 gm's IV started and recommend Vancomycin to start also.
- Flight team dispatched arrangements made for EICU coverage.

**Avera** 

# e CARE Case Study

- Outcome Pt in ICU for 3 days
- Discharged in 7 neurological intact
- The results of telemedicine can be shown in the positive results and utilizing a team approach to care.

**Avera** 

# the CARE Outcome Based Care

- Early recognition
- Adequate fluid resuscitation
- Appropriate antibiotics
- Early transfer if needed

Questions?

# Seeing Sepsis Simulation

Tri-County Health Care

Tammy Hale MSN, RN

Nurse Educator/Infection Preventionist

# Importance of Simulation

- Simulation compared to sports
- Practice is essential
- Can you practice independently?
  - No, the team must learn how to work together
- Simulation is being used on a regular basis
- It's game day..... Is your health care team ready?



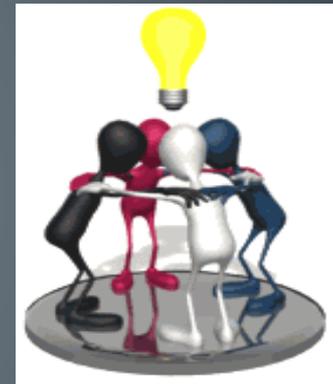
# Concepts of Simulation

- Engage ALL learners
- Replicate experiences
- Safe environments
- Reinforce concepts
  - New processes
  - Skills not performed on routine basis
- Promote effective communication
- Team work
- Provide for reflection
  - What areas went well... what areas need improvement



# The Process

- Each event 20-30 minutes (4-5 learners per group)
- Apply best-practices and updates
- Non-threatening
- Vary situation to each department
- Incorporate
  - All departments
  - Procedures/Protocols
- Change current main-stay of education to higher level
  - Problem solving/critical thinking
  - Goal is to learn



# The Process

- Key objectives
- Preparation by educator and manager
- Orientation group
- Environment
- Equipment
- Make it real
  - Go through all steps
  - Use Electronic Medical Record – Example Epic Playground
  - Omnicell



# Simulation Process

- Clearly communicate roles
  - Group leader (MD/supervisor)
  - Medication
  - Assessment
  - Family member
  - Documentation
  - Multidisciplinary



# Simulation in Progress

- Scenario presented to the group
- Talk to the “patient” or “family”
  - Communication can be difficult (i.e. “It will be ok”)
- Team may struggle at first
- Anxiety
- Perform roles
- Communicate and work as a team
  - SBAR
  - Transfer of care
- Re-evaluate progress



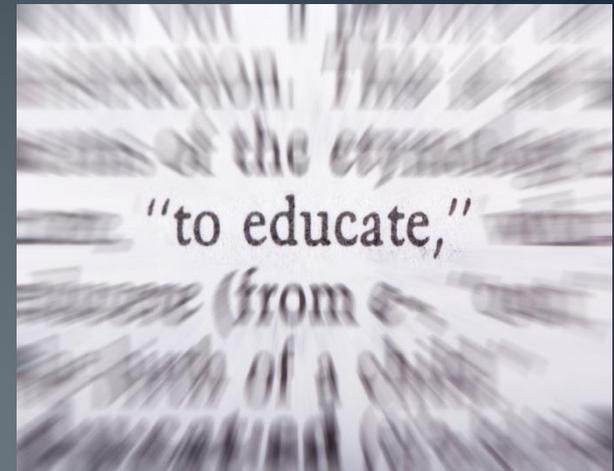
# Goals of Simulation

- Evaluate patient care
- Practice efficiency
  - Timeliness of care
  - Screening Tool
  - Order set
- Debrief
- Consider audiovisual review



# Debriefing is Important

- Further problem solving
- Reflective learning
- Timing
  - Immediately to ensure feeling/emotions are not diminished
- Allow to ask questions
- Review policies/guidelines
- Encourage participation by ALL team members
- Confidence
- Fun



# Benefits

- Enhanced Education
  - Learner Satisfaction
- Continuity of Care
- Practice as a Team
- Clarify roles
- Communication
- Process improvement
- Superior Patient Care
- It's game day..... Is your team ready?



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