

# HQIC Community of Practice Call

---

## Implementation and Improvement Tips of Sepsis Bundles

February 10, 2022

# Introduction

---



**Shaterra Smith**

Social Science Research Analyst - Division of  
Quality Improvement Innovation Models  
Testing  
iQuality Improvement and Innovations  
Group  
Center for Clinical Standards and Quality  
CMS

Welcome!

Who's in the Room?

# Agenda

---

- Introduction
- Today's Topic – **Implementation and Improvement Tips of Sepsis Bundles**
- Presentations by:
  - John Lawrence, Inova Mount Vernon Hospital, Alexandria, VA
  - Jodi Griffin, Mosaic Medical Center, Maryville, Missouri
- Open Discussion/Q&A
- Closing Remarks

## As You Listen, Ponder...

---

- What excites you the most about the information provided? What information can you leverage to help expand opportunities in your communities?
- What actions will you take as a result of the call?
- Where can you begin with your facility to continue to ensure safety, and a true patient-centered approach as you engage collaboratively with others?
- Which activities do you have underway that will allow for you to expand and push forward to build on action in the next 30 days? 90 days?

# Meet Your Speakers

---



**John Lawrence, RN, BSN,  
CPHQ, SCRN**  
Sepsis Coordinator  
Inova Mount Vernon Hospital



**Jodi Griffin, RN, BSN**  
Quality Improvement Coordinator,  
Mosaic Medical Center

# Implementation and Improvement Tips of Sepsis Bundles

February 10, 2022

# Agenda

**1**

**Bundle Basics**

**2**

**Raising Awareness**

**3**

**Addressing Barriers**

**4**

**Success Factors/Facilitators**

**5**

**Keeping Things in Perspective**

**6**

**Questions**

# Inova Mount Vernon Hospital

Founded in 1976, Inova Mount Vernon Hospital is a 237-bed community hospital in Alexandria, VA, offering patients convenience and state-of-the-art care in a unique healing environment.



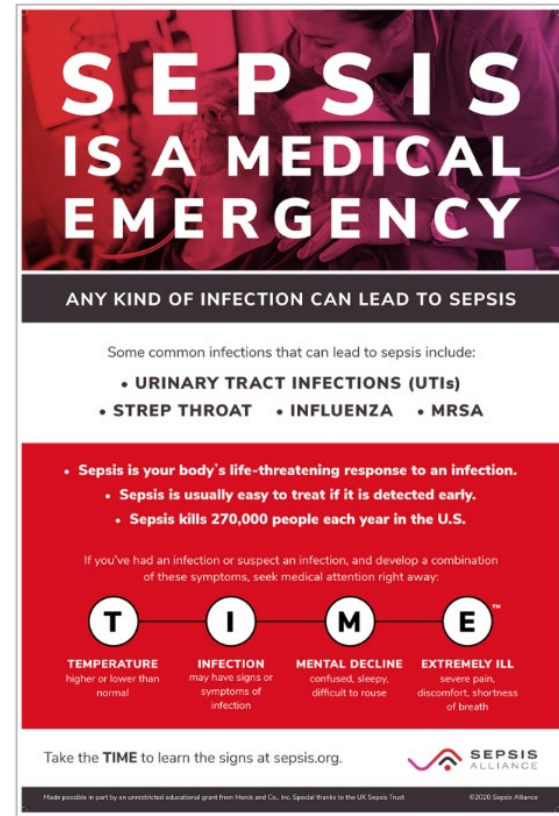


# Bundle Basics



# Problem

- Sepsis is a dysregulated host response to an infection and is considered a medical emergency.
- Time is of the essence. For patients with septic shock, mortality may increase by over 7% for every hour that antibiotics are delayed (Kumar et al., 2006)



# Summary of SEP-1

## Within 3 Hours of Presentation:

- Measure initial lactate level
- Obtain blood cultures prior to antibiotic administration
- Start broad-spectrum (or other) antibiotic(s)
- Start 30mL/kg fluid bolus for hypotension or lactate  $\geq 4$

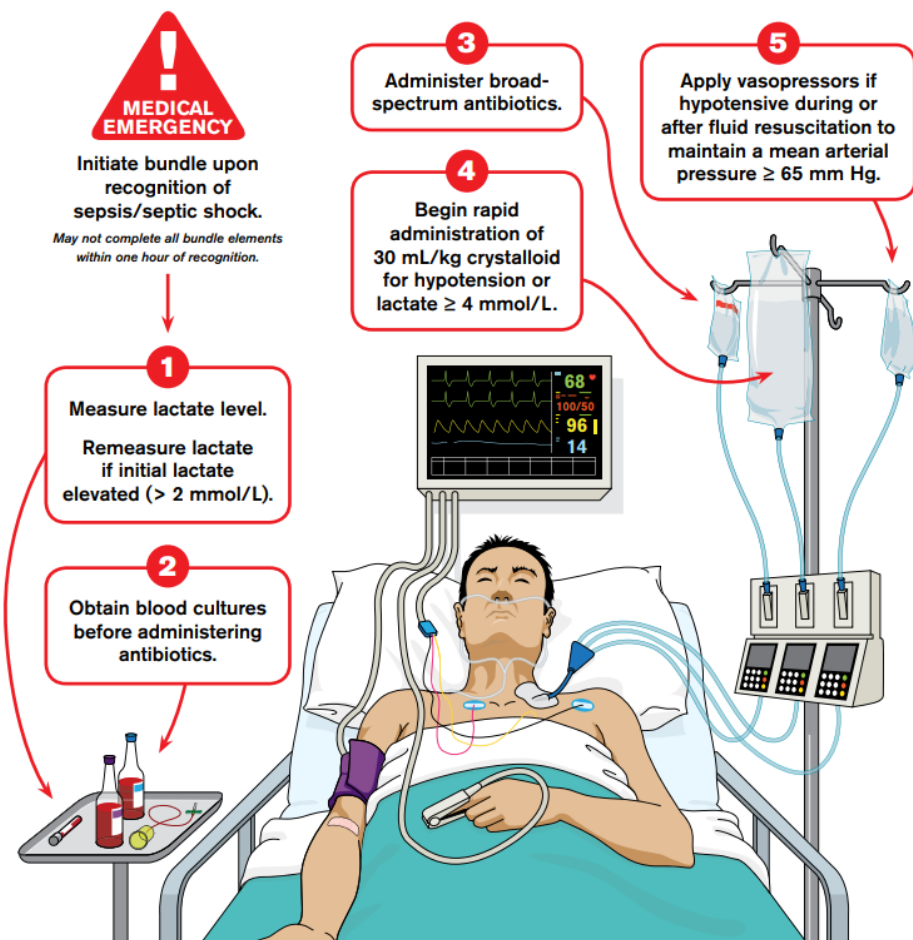
## Within 6 Hours of Presentation:

- Re-measure lactate if initial lactate  $> 2.0$
- Re-assess BP after fluids are complete
- Start vasopressors for hypotension unresponsive to fluid bolus = "septic shock"
- If persistent hypotension after fluids or lactate  $\geq 4$ , provider re-assesses and documents volume status and tissue perfusion assessment

# Hour-1 Bundle

## Initial Resuscitation for Sepsis and Septic Shock

Surviving Sepsis  
Campaign



Surviving Sepsis Campaign. (2019). *Hour-1 Bundle. Adult Patients.*  
<https://www.sccm.org/getattachment/SurvivingSepsisCampaign/Guidelines/Adult-Patients/Surviving-Sepsis-Campaign-Hour-1-Bundle.pdf?lang=en-US>

# Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021

**KEY WORDS:** adults; evidence-based medicine; guidelines; sepsis; septic shock

## INTRODUCTION

Sepsis is life-threatening organ dysfunction caused by a dysregulated host response to infection (1). Sepsis and septic shock are major healthcare problems, impacting millions of people around the world each year and killing between one in three and one in six of those it affects (2–4). Early identification and appropriate management in the initial hours after the development of sepsis improve outcomes.

The recommendations in this document are intended to provide guidance for the clinician caring for adult patients with sepsis or septic shock in the hospital setting. Recommendations from these guidelines cannot replace the clinician's decision-making capability when presented with a unique patient's clinical variables. These guidelines are intended to reflect best practice (Table 1).

(References 5–24 are referred to in the Methodology section which can be accessed at Supplemental Digital Content: Methodology.)

## SCREENING AND EARLY TREATMENT

### Recommendation

1. For hospitals and health systems, we **recommend** using a performance improvement program for sepsis, including sepsis screening for acutely ill, high-risk patients and standard operating procedures for treatment.

*Strong recommendation, moderate quality of evidence for screening.*

*Strong recommendation, very low-quality evidence for standard operating procedures.*

Laura Evans<sup>1</sup>  
 Andrew Rhodes<sup>2</sup>  
 Waleed Alhazzani<sup>3</sup>  
 Massimo Antonelli<sup>4</sup>  
 Craig M. Coopersmith<sup>5</sup>  
 Craig French<sup>6</sup>  
 Flávia R. Machado<sup>7</sup>  
 Lauralyn McIntyre<sup>8</sup>  
 Marlies Ostermann<sup>9</sup>  
 Hallie C. Prescott<sup>10</sup>  
 Christa Schorr<sup>11</sup>  
 Steven Simpson<sup>12</sup>  
 W. Joost Wiersinga<sup>13</sup>  
 Faye Alshamsi<sup>14</sup>  
 Derek C. Angus<sup>15</sup>  
 Yaseen Arabi<sup>16</sup>  
 Luciano Azevedo<sup>17</sup>  
 Richard Beale<sup>18</sup>  
 Gregory Beilman<sup>19</sup>  
 Emilie Belley-Cote<sup>20</sup>  
 Lisa Burry<sup>21</sup>  
 Maurizio Cecconi<sup>22</sup>  
 John Centofanti<sup>23</sup>  
 Angel Coz Yataco<sup>24</sup>  
 Jan De Waele<sup>25</sup>  
 R. Phillip Dellinger<sup>26</sup>

Screening for Patients With Sepsis and Septic Shock

This article is being simultaneously

Evans, L., Rhodes, A., Alhazzani, W., Antonelli, M., Coopersmith, C. M., French, C.,... & Levy, M. (2021). Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021. *Intensive Care Medicine*, 47(11), 1181-1247.

# COVID-19 Resources

## Summary of recommendations on the management of patients with COVID-19 and ARDS

### COVID-19 with mild ARDS

**DO:**  
Vt 4-8 ml/kg and  $P_{plat} < 30$  cm H<sub>2</sub>O

**DO:**  
Investigate for bacterial infection

**DO:**  
Target SpO<sub>2</sub> 92% - 96%

**CONSIDER:**  
Conservative fluid strategy

**CONSIDER:**  
Empiric antibiotics

### COVID-19 with mod to severe ARDS

**CONSIDER:**  
Higher PEEP  
PEEP should be tailored to individual response

**CONSIDER:**  
NMBA boluses to facilitate ventilation targets

**CONSIDER:**  
If PEEP responsive  
Traditional recruitment maneuvers

**CONSIDER:**  
Prone ventilation 12 -16 h

**CONSIDER:**  
If proning, high  $P_{plat}$ , asynchrony  
NMBA infusion for 24 h

**DON'T DO:**  
Staircase recruitment maneuvers

### Rescue/adjunctive therapy

**CONSIDER:**  
If proning, high  $P_{plat}$ , asynchrony  
NMBA infusion for 24 h

**CONSIDER:**  
Prone ventilation 12 -16 h

**CONSIDER:**  
A trial of inhaled nitric oxide  
STOP if no quick response

**CONSIDER:**  
V-V ECMO or referral to ECMO center  
follow local criteria for ECMO

Mod = moderate  
ARDS = adult respiratory distress syndrome  
 $P_{plat}$  = plateau pressure  
SpO<sub>2</sub> = peripheral capillary oxygen saturation  
PEEP = positive end-expiratory pressure  
NMBA = neuromuscular blocking agents  
ECMO = extracorporeal membrane oxygenation

Society of  
Critical Care Medicine  
The Intensive Care Professionals

Surviving Sepsis  
Campaign



© 2021 Society of Critical Care Medicine and European Society of Intensive Care Medicine.

Surviving Sepsis Campaign. (2021). *Summary of recommendations on the management of patients with COVID-19 and ARDS*. COVID-19 Guidelines.

<https://www.sccm.org/getattachm ent/SurvivingSepsisCampaign/Guidelines/COVID-19/SSC-COVID19-Infographic-Management-of-Patients-with-COVID-19-and-ARDS.pdf.aspx?lang=en-US>

Inova Mount Vernon Hospital

## Timely & effective care

 Print

These measures show how often or how quickly hospitals provide care that research shows gets the best results for patients with certain conditions, and how hospitals use outpatient medical imaging tests (like CT scans and MRIs). This information can help you compare which hospitals give recommended care most often as part of the overall care they provide to patients.

[Find out why these measures are important](#)

[Get more information about the data](#)

[Get current data collection period](#)

### Sepsis care

Sepsis is a complication that occurs when your body has an extreme response to an infection. It causes damage to organs in the body and can be life-threatening if not treated. Sepsis can sometimes turn into septic shock, which has a...

[Read more](#)

**Percentage of patients who received appropriate care for severe sepsis and septic shock**

↑ *Higher percentages are better*

**93%**

of 54 patients

National average: 57% <sup>26</sup>

Virginia average: 55% <sup>26</sup>

SEP-1 is publicly  
reported at  
Medicare.gov

# Raising Awareness





# Our Journey with Sepsis

**January 2013  
Formed ED  
Team**

**December  
2013  
Started  
Screening in  
ICU**

**March 2014  
Screening in  
IMCU**

**October 2015  
Housewide  
Screening  
SEP-1 Begins**

**January 2017  
New Escalation  
Plan with  
TeleICU  
Support**

**November  
2018  
MEWS Rollout**

**January 2021  
Sepsis Value  
Improvement  
Project (VIP)**

# CODE SEPSIS RN + PROVIDER HUDDLE CHECKLIST 1/10/2021

Time SIRS + Infection Documented

1-HOUR GOAL

3-HOUR GOAL

6-HOUR GOAL

Patient Sticker

FOR SEVERE SEPSIS AND SEPTIC SHOCK

SIRS + Suspected Infection + Acute (not chronic) Organ Dysfunction (Lactic > 2.0, SBP < 90 or MAP < 65, Cr > 2.0, INR > 1.5, PTT < 100, DO<sub>2</sub> Index > 2.0, Intubation/CPAP/BIPAP for acute respiratory failure)

DOCUMENT WEIGHT (ACTUAL) & HEIGHT

DRAW LACTIC ACID #1 (Goal: <1 hour) Result: \_\_\_\_\_

Is lactic 4.0 or more? ☐ Yes: Provider must chart, "Sepsis exam done after fluids started."

DRAW BLOOD CULTURES BEFORE ANTIBIOTICS

Collect cultures AND print label BEFORE scanning antibiotics. Do not delay antibiotics more than 45 minutes.

Chart any barriers to obtaining cultures.

START IV ANTIBIOTICS (Goal: <1 hour from arrival time or first recognition)

Sepsis is a medical emergency. You may start multiple antibiotics at once: Use compatibility chart at bottom.

NO vancomycin for suspected C. diff is acceptable.

DRAW LACTIC ACID #2 (Goal: <3 hours) Time Due: \_\_\_\_\_ if first lactic 2 or less, cancel repeat lactic.

Result: \_\_\_\_\_ if repeat higher than first, draw third lactic in 2 hours.

START FLUID BOLUS 30 mL/KG IF PATIENT MEETS TRIGGERS (<3 hours)

Fluid bolus triggers: SBP < 90 or MAP < 65 or Lactic Acid > 4. Normal saline, lactated Ringer's or PlasmaLyte acceptable.

Label each bag (ex. Bag 1 of 3, Bag 2 of 3, etc.). Monitor for fluid overload. May use ideal body weight if BMI > 30.

Patient is exempt ONLY if provider charts refusal by patient/family refusal or consults palliative care.

Patient Weight (kg): \_\_\_\_\_ x 30 mL = Bolus Total (mL): \_\_\_\_\_

Bolus Given (mL): \_\_\_\_\_

Bolus Remaining (mL): \_\_\_\_\_

BEGIN AUTO-CYCLING BP EVERY 15-30 MINUTES DURING BOLUS INFUSION AND FOR 1 HOUR AFTER BOLUS ENDS

CHART END TIME OF FLUID BOLUS + I/O'S End Time: \_\_\_\_\_

Chart all recorded BPs, including validating device data.

FOR SEPTIC SHOCK

Severe sepsis + persistent hypotension after 30 mL/kg fluid bolus ends. OR lactic > 4

START VASOPRESSOR (Goal: <6 hours)

Required if two consecutive readings of SBP < 90 or MAP < 65 during hour after 30 mL/kg amount is completely infused.

CHECK WITH MD THAT VOLUME STATUS/TISSUE PERFUSION ASSESSMENT CHARTED

Part of pressor order OR if initial lactic > 4. Provider must chart, "Sepsis exam done after fluids started."

FOR ALL PATIENTS

INFORM RECEIVING RN DURING REPORT OF ANY INCOMPLETE ITEMS AND WHEN THEY ARE DUE

BEFORE ADMISSION/TRANSFER, SCAN FORM TO IMVH SEPSIS COORDINATOR. PINK COPY STAYS WITH PATIENT.

Provider: \_\_\_\_\_

Receiving RN: \_\_\_\_\_

By signing, I acknowledge that I will continue the sepsis care outlined above.

Primary RN: \_\_\_\_\_

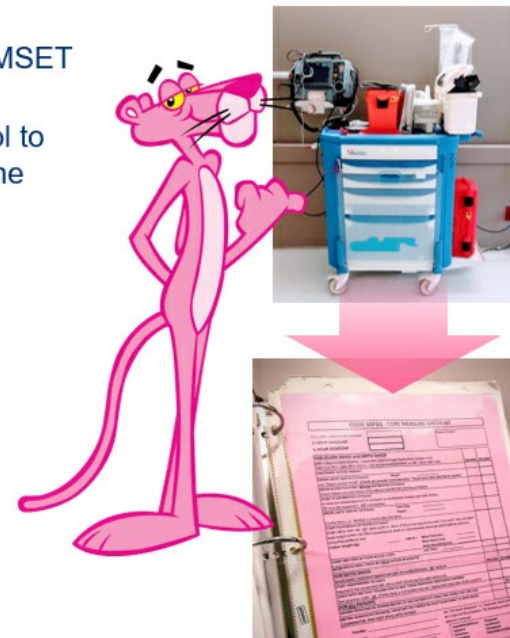
## ANTIBIOTIC COMPATIBILITY YES = Y-site compatibility. NO = NOT Y-site compatible. Start antibiotics in BOLD CAPS first.

	Azithromycin	Aztreonam	CEFTAZIDIME	CEFTIOXIME	Clindamycin	Gentamicin	LEVOFLOXACIN	MEROPENEM	Miconazole	PHTHAZO (2021N)	Vancomycin
Azithromycin	-	NO	YES	YES	NO	NO	NO	YES	YES	NO	YES
Aztreonam	NO	-	YES	YES	YES	YES	YES	NO	NO	YES	NO
CEFTAZIDIME	YES	YES	-	-	NO	NO	YES	NO	YES	NO	NO
CEFTIOXIME	NO	YES	NO	-	-	YES	YES	NO	YES	YES	YES
Clindamycin	NO	YES	NO	NO	-	YES	YES	YES	YES	NO	YES
Gentamicin	NO	YES	NO	YES	YES	-	-	NO	YES	NO	YES
LEVOFLOXACIN	NO	YES	YES	YES	YES	YES	-	NO	YES	NO	YES
MEROPENEM	YES	NO	YES	YES	YES	YES	YES	NO	-	YES	YES
Miconazole	YES	NO	YES	YES	YES	YES	YES	NO	-	YES	NO
PHTHAZO (2021N)	NO	YES	YES	YES	YES	YES	YES	YES	YES	NO	-
Vancomycin	YES	NO	NO	NO	YES	YES	YES	YES	YES	NO	-

## When It Comes to Sepsis: **THINK PINK!**



- Checklists are in the back of the MSET notebook on the crash cart.
- Use the checklist as an SBAR tool to talk to the physician about what the patient needs.



# Staff Education Examples

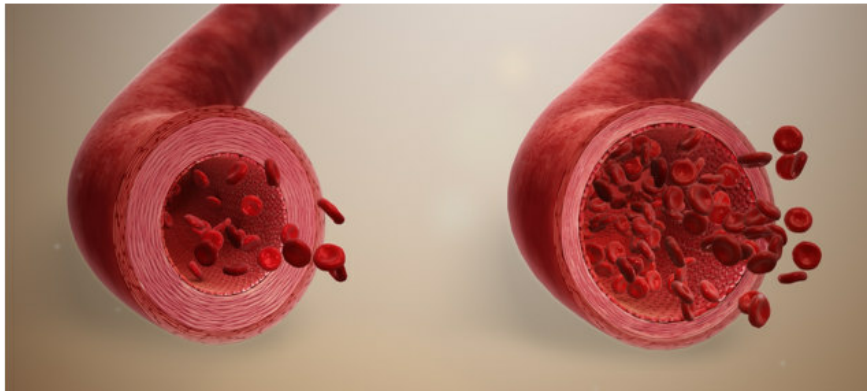
1. Education rollout in 2017 across the entire health system for both RNs and clinical technicians
2. Annual nursing and clin tech skills fair/competency
3. 30 minutes at new employee orientation for RNs and clin techs
4. 20-minute onboarding with all new ED and hospitalist providers
5. Ongoing coaching of front-line staff



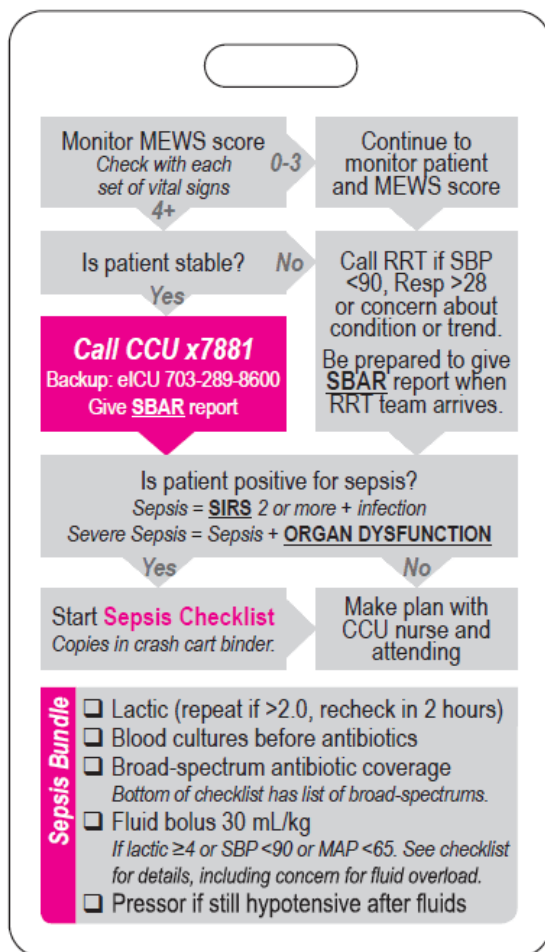
## What is sepsis?



- What if whole body experiences an inflammatory response at once?
  - This is a Systemic Inflammatory Response Syndrome or “SIRS”
  - This is abnormal and bad
  - Massive vasodilation → Drop in blood pressure → Tissues don’t get oxygen → Lactic begins to go up



Teach the “why”  
behind the bundle



### CHARGE NURSES

1. Monitor patient list for MEWS scores 4+.

### CLIN TECHS

1. If patient has one or more **SIRS** (see below) or SBP <90, notify RN or Charge RN.
2. Document in Epic who you notified.

### SIRS

*SIRS 2 or more + infection, start Sepsis Checklist.*

- Resp >20 • HR >90 • Temp >100.9 or <96.8
- WBC >12 or <4 or >10% bands

### ORGAN DYSFUNCTION

*SIRS 2 or more + infection + abnormal lab or condition listed below could be severe sepsis. Start Sepsis Checklist! Draw new lactic if none in past 6 hours and blood cultures if none in past 24 hours.*

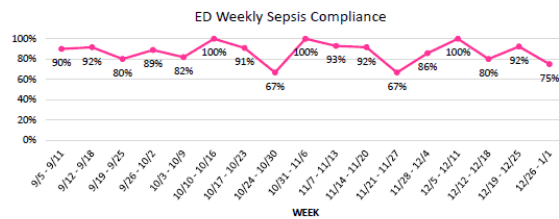
- Lactic >2 • SBP <90 or MAP <65 • Cr >2
- Plt <100 • INR >1.5 or PTT >60 • Bili >2
- New need for CPAP, BiPAP or ETT

### SBAR

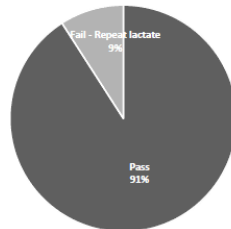
- *Situation* – Reasons MEWS is elevated.
- *Background* – Reason for admission, list tests/ treatments already completed.
- *Assessment* – For example, “I’m concerned that my patient has sepsis.”
- *Recommendation* – For example, “To pass the sepsis bundle, the patient still needs ... (list orders needed to pass Sepsis Checklist).”

Sepsis badge buddy  
given to all nurses  
and clin techs

## 2021 IMVH ED Sepsis Dashboard



### Last Week's Performance



### Recent Fallouts

MRN ----- - Two lactates ordered. First was normal and second was elevated. Third should have been ordered as the follow up.

MRN ----- - Patient boarding in ED with cellulitis developed low BP. Lactate had been drawn but was over 6 hours prior and was normal. With new onset organ dysfunction (low BP), need new lactate.

MRN ----- - Lactate of 2.3. Repeat lactate was ordered but not drawn in ED.

### Celebrations

Antibiotic time in less than 60 minutes! - Normajeane Duran (22 mins), Brian Gener (25 mins), Ansley Holly (28 mins), Micah Truex-Kisner and Ansley Holly (30 mins), Michelle De La Pena (40 mins)

Confidentiality Disclaimer: Prepared for Hospital Department functioning primarily to review adequacy or quality of professional services.  
Privileged under VA Code ANN.8.01-581.17

ED sepsis compliance dashboard shared each week





Staff and students at IMVH heard from a sepsis survivor at a 2018 Sepsis Lunch & Learn

## Sepsis: Keys to Success



### *Detecting and treating sepsis for our inpatients can be challenging.*

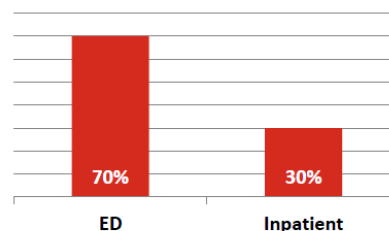
It's true – the ED and inpatient are two different worlds. But here are some elements of a successful sepsis team:

- Physician-nurse collaboration
- Careful clinical assessment (“sepsis until proven otherwise”)
- Consistent use of order sets

#### **In turn, what can we do?**

- Be responsive. Nurses are required to screen for sepsis and may call requesting orders to meet the sepsis bundles.\*
- For patients with infection or low-severity sepsis, be vigilant for organ dysfunction that could signal severe sepsis.
- For severe sepsis or septic shock, use one of these order sets: **SUSPECTED SEPSIS ORDERS** or **CRITICAL CARE ADMIT TO ICU**

Sepsis Bundle Compliance (May-July)



#### **\*3-HOUR BUNDLE**

- Initial lactic
- Blood cultures
- Broad spectrum antibiotic
- 30 mL/kg fluid bolus if lactic  $\geq 4$  or SBP  $< 90$  (or MAP  $< 65$ )

#### **6-HOUR BUNDLE**

- Repeat lactic (if initial  $> 2$ )
- Septic shock exam (.sepsiscms), if lactic  $\geq 4$  or vasopressors required
- Vasopressors, if refractory hypotension after fluid bolus

Example of focused sepsis bundle education given to providers in 2017



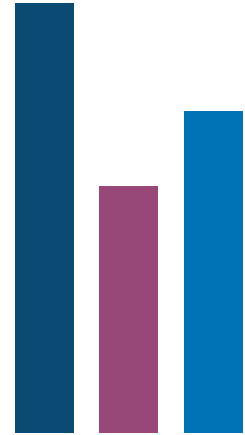
# Addressing Barriers



# Top Bundle Barriers

## Poll Results from August 2021:

1. Documentation of elements in the EHR
2. Fluids
3. Blood cultures before antibiotics
4. Physician buy-in



# Barriers

- Keep bundle tools simple
- Our success with tracking bundle elements has been done almost entirely on paper for last 5+ years
- Of course order sets in EHR have been key

**CODE SEPSIS RN + PROVIDER HUDDLE CHECKLIST** (REV 01)

Time SIRS + Infection Documented \_\_\_\_\_

1-HOUR GOAL \_\_\_\_\_

3-HOUR GOAL \_\_\_\_\_

6-HOUR GOAL \_\_\_\_\_

Patient Sticker \_\_\_\_\_

**FOR SEVERE SEPSIS AND SEPTIC SHOCK**  
 SIRS + Suspected Infection + Abnormal (test, exam) Organ Dysfunction (Lactic > 2.0, SBP < 90 or MAP < 65, Cr > 2.0, INR > 1.5, PTb < 100,000, Bilirubin > 2.0, Intubation/CNAP/BiPAP for acute respiratory failure)

**DOCUMENT WEIGHT (ACTUAL) & HEIGHT**

DRAW LACTIC ADD #1 (Goal: <3 hours) Time Due: \_\_\_\_\_

Result: \_\_\_\_\_ Is lactic 4.0 or more? ☐ Yes: Provider must chart, "Sepsis exam done after fluids started"

**DRAW BLOOD CULTURES BEFORE ANTIBIOTICS**  
 Collect cultures AND print label BEFORE scanning antibiotics. Do not delay antibiotics more than 45 minutes.  
 Chart any barriers to obtaining cultures.

**START IV ANTIBIOTICS (Goal: <3 hours from arrival time or first recognition)**  
 Sepsis is a medical emergency. You may start multiple antibiotics at once: Use compatibility chart at bottom.  
 PO vancomycin for suspected C. diff is acceptable.

DRAW LACTIC ADD #2 (Goal: <3 hours) Time Due: \_\_\_\_\_

Result: \_\_\_\_\_ If first lactic 2 or less, cancel repeat lactic.  
 If repeat higher than first, draw third lactic in 2 hours.

**START FLUID BOLUS 30 ML/KG IF PATIENT MEETS TRIGGERS (<3 hours)**  
 Fluid bolus triggers: SBP < 90 or MAP < 65 or Lactic Acid ≥ 4. Normal saline, lactated Ringer's or PlasmaLyte acceptable.  
 Label each bag (ex. Bag 1 of 3, Bag 2 of 3, etc.). Monitor for fluid overload. May use ideal body weight (if BMI > 30).  
 Patient is exempt ONLY if provider charts refusal by patient/family refusal or consults palliative care.

Patient Weight (kg): \_\_\_\_\_ x 30 mL = Bolus Total (mL): \_\_\_\_\_

Bolus Given (mL): \_\_\_\_\_

Bolus Remaining (mL): \_\_\_\_\_

**BEGIN AUTO-CYCLING BP EVERY 15-30 MINUTES DURING BOLUS INFUSION AND FOR 1 HOUR AFTER BOLUS ENDS**

**CHART END TIME OF FLUID BOLUS + I/O'S** End Time: \_\_\_\_\_

Chart all recorded BP's, including validating device data.

**FOR SEPTIC SHOCK**  
 Severe sepsis + persistent hypotension after 30 mL/kg fluid bolus ends OR lactic ≥ 4

**START VASOPRESSOR (Goal: <6 hours)**  
 Required if two consecutive readings of SBP < 90 or MAP < 65 during hour after 30 mL/kg amount is completely infused.

**CHECK WITH MD THAT VOLUME STATUS/TISSUE PERFUSION ASSESSMENT CHARTED**  
 Part of pressor order. Q8 if initial lactic ≥ 4. Provider must chart, "Sepsis exam done after fluids started."

**FOR ALL PATIENTS**  
 Inform receiving RN during report of any incomplete items and when they are due

BEFORE ADMISSION/TRANSFER, SCAN FORM TO IMVH SEPSIS COORDINATOR. PINK COPY STAYS WITH PATIENT.

Provider: \_\_\_\_\_ Recalling RN: \_\_\_\_\_  
 Primary RN: \_\_\_\_\_ By signing, I acknowledge that I will continue the sepsis care outlined above.

**ANTIBIOTIC COMPATIBILITY**  
 YES = Y-site compatibility. NO = NOT Y-site compatible. Start antibiotics in BOLD CAPS first.

	Aztreonam	Aztreonam	CEFEPIME	CEFTAZIDIME	Chloramphenicol	Clindamycin	Clindamycin	LEVOPROXACIN	MEROPENEM	Meropenem	PIPERACILLIN	Vancomycin
Aztreonam	NO	NO	YES	NO	NO	NO	NO	YES	YES	YES	YES	YES
Aztreonam	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
CEFEPIME	YES	YES	NO	NO	NO	NO	NO	YES	NO	YES	YES	NO
CEFTAZIDIME	NO	YES	NO	NO	NO	NO	NO	YES	NO	YES	YES	NO
Clindamycin	NO	YES	NO	NO	NO	YES	YES	YES	NO	YES	YES	NO
Clindamycin	NO	YES	NO	NO	NO	YES	YES	YES	NO	YES	YES	NO
LEVOPROXACIN	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
MEROPENEM	YES	NO	NO	NO	NO	YES	YES	NO	YES	YES	YES	YES
Meropenem	YES	NO	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
PIPACILLIN (BOLD)	NO	YES	YES	NO	YES	NO	YES	NO	NO	YES	YES	YES
Vancomycin	YES	NO	NO	NO	YES	YES	YES	YES	YES	YES	NO	NO

# Barriers, continued

- A proactive approach has helped us with blood cultures
  - We do not wait for patients to meet severe sepsis criteria to start the bundle
  - We order blood cultures on every ED patient receiving IV antibiotics who will be admitted
- Patients receiving the 30 mL/kg fluid bolus has been more challenging
  - We encourage providers to order the full amount from the beginning or to clarify in documentation why another approach was taken
  - Ultimate goal is to achieve organ perfusion by maintaining MAP

Smartphrases allow  
the provider to  
clarify diagnoses  
and plan of care

Summary:



#### Initial Sepsis Documentation:

At 1836 on 08/16/21, I suspect the patient to meet severe sepsis criteria due to a lactate >2. This timestamp also applies to every infectious and/or SEP-1-related diagnosis in Clinical Impression or MDM sections of this note.

#### Fluid Management

An initial bolus <30 mL/kg was given because a 30 mL/kg bolus of crystalloid fluids would be detrimental or harmful for the patient despite hypotension. The patient has stage V or GFR < 15 mL/min or ESRD. I performed a sepsis focused physical examination and reassessment on 07/28/21 at 2053.

Summary:



#### Initial Sepsis Documentation:

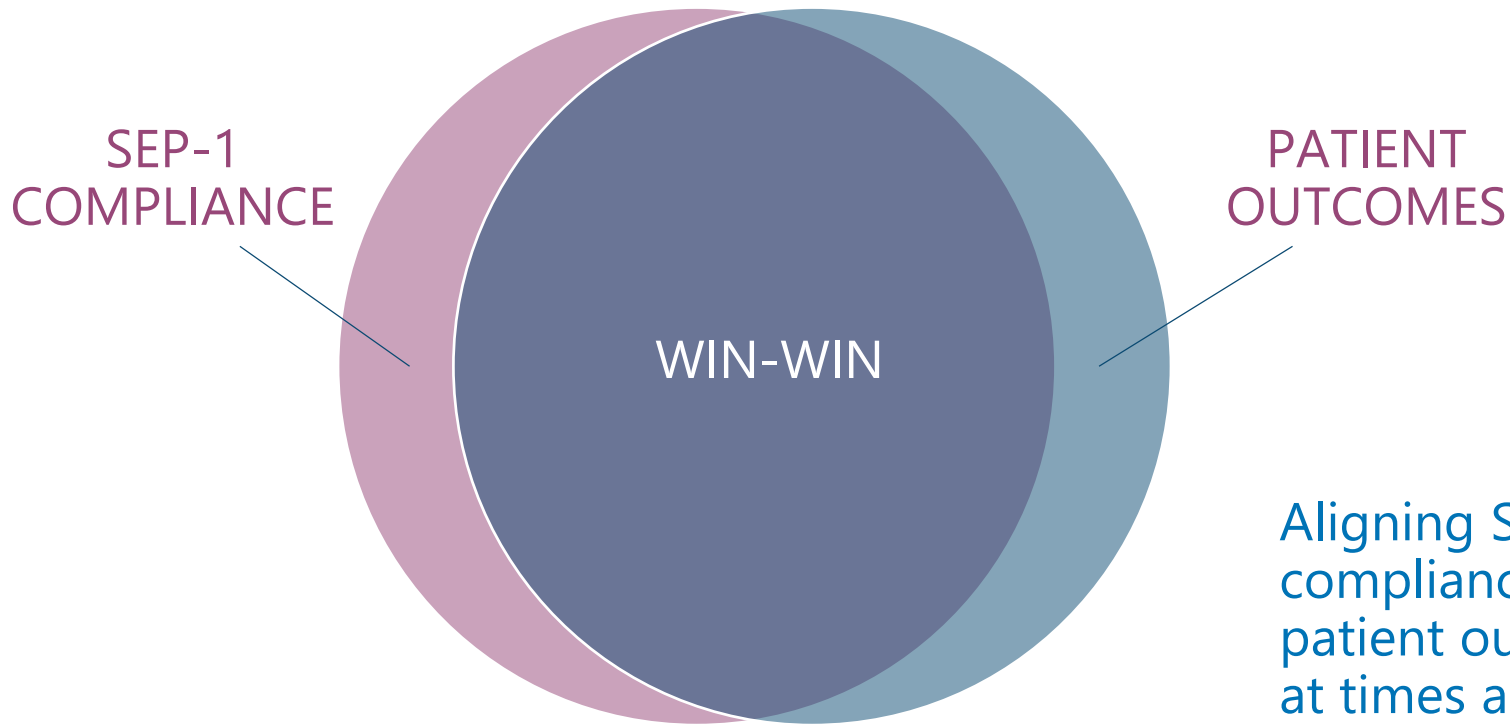
At 1836 on 08/16/21, I suspect the patient to be excluded from severe sepsis or septic shock consideration due to all SIRS criteria, abnormal vitals and evidence of organ dysfunction NOT being due to severe sepsis or septic shock, but due to alternative cause. This timestamp also applies to every infectious and/or SEP-1-related diagnosis in Clinical Impression or MDM sections of this note.

#### Fluid Management

The patient did not require 30 mL/kg fluid bolus, because patient did not present with an initial lactate  $\geq 4.0$  mmol/L or initial hypotension.

# Fluid Management

- “One of the most important principles of managing complex septic patients is the need for a **detailed initial assessment and ongoing re-evaluation of the response to treatment.**”
- To avoid over- and under-resuscitation, fluid administration beyond the initial resuscitation should be guided by **careful assessment of intravascular volume status and organ perfusion.**”
- “Dynamic measures have demonstrated better diagnostic accuracy at predicting fluid responsiveness compared with static techniques. Dynamic measures include passive leg raising combined with cardiac output (CO) measurement, fluid challenges against stroke volume (SV), systolic pressure or pulse pressure, and increases of SV in response to changes in intrathoracic pressure.” (Evans et al., 2021, p. e1076).



Aligning SEP-1 compliance with patient outcomes is at times a matter of documentation

## Suspected Sepsis Orders

 [Manage User Versions](#)

### ▼ Lab Orders

#### ▼ Inova Lab Orders

- ☐ Timed Lactic Acid Panel
- ☐ Blood Culture X 2
- ☐ CBC and differential  
STAT, Once
- ☐ Comprehensive metabolic panel  
STAT, Once

### ▼ Bolus Fluids

#### ▼ Inova Fluid Bolus Orders

30 mL/kg bolus is only required if patient has hypotension or lactic acid  $\geq 4$  due to sepsis. Ideal body weight may be used if BMI is documented  $>30$ .

- ☐ sodium chloride 0.9 % bolus (\$)  
30 mL/kg, Intravenous, Administer over 60 Minutes, Starting 8/16/21



### ▼ Medication - Unidentified Source

Consider gentamicin/tobramycin if septic shock (lactate greater than or equal to 4 mmol/L or hypotension despite fluids) or if patient has received antibiotics within the last 90 days.

Gentamicin/tobramycin 7 mg/kg x 1 dose if CrCl 30 mL/min or greater (order random level 6-12 hours after dose).

Gentamicin/tobramycin 2 mg/kg x 1 dose if CrCl less than 30 mL/min OR acute kidney injury.

▶ Inova Unidentified Source [Click for more](#)

### ▼ Medication - Suspected Source

Consider gentamicin/tobramycin if septic shock (lactate greater than or equal to 4 mmol/L or hypotension despite fluids) or if patient has received antibiotics within the last 90 days.

Gentamicin/tobramycin 7 mg/kg x 1 dose if CrCl 30 mL/min or greater (order random level 6-12 hours after dose).

Gentamicin/tobramycin 2 mg/kg x 1 dose if CrCl less than 30 mL/min OR acute kidney injury.

▶ Inova Pneumonia Antimicrobials [Click for more](#)

▶ Inova Intra-abdominal Infection [Click for more](#)

▶ Inova Bacterial Meningitis (Community Acquired)

▶ Inova Bacterial Meningitis (Immunocompromised and/or g

▶ Inova UTI - Community Acquired

▶ Inova UTI - Hospital/SNF/Catheter Related

▶ Inova Skin/Skin Structure Infection

▶ Inova Skin/Skin Structure Infections - Immunocompromised or DM Foot [Click for more](#)

▶ Inova Neutropenic Fever [Click for more](#)

### ▼ Inova UTI - Community Acquired

☐ cefTRIAxone IV

☐ levoFLOxacin +/- gentamicin IV (severe beta-lactam allergy)

☐ meropenem +/- gentamicin IV (history of ESBL/MDRO)

[Click for more](#)

Hyperspace - EMH EMERGENCY - Epic Nov 2020 Foundation System Hosted - OI E.

ED Chart | My Basket | My Reports

Asap, Septic

SA

CC10

Septic Asap

Male, 70 y.o., 4/21/1951

MRN: 206832

Total Time: 01:28

Code: Assume Full (no ACP docs)

Search

OI Attending Physician  
Emergency, MD  
Attending

COVID-19: Travel Screened  
4/21/2021

Isolation: None

ALLERGIES  
No Known Allergies

CHIEF COMPLAINT  
Urinary Problem

BP Temp Heart Rate  
89/50 39.4 °C 102  
(103 °F)

Resp SpO2 Wt  
18 95% 99.8 kg

Not Scanned

Alerts (1)

Time since Sepsis Call 00m

Essential Documentation

Active Meds & Blood MAR

Acknowledge Orders (0)

Specimen Collection/Tasks (0)

POCT Results (0)

Device data isn't always filed at the exact time a device collects the data. To see the exact time a device collected data, refer to the 'Device Time' field.

Load Past Sepsis

Time	Event	Details	User
09:10	Sepsis Huddle	Sepsis Huddle - Huddle Outcome/Alert Start. Sepsis ALERT Staff Present for Huddle: Attending physician; RN	OE
09:09	Sepsis Documentation Start	Sepsis Timer - Start Sepsis Timer: Start	OE

Sepsis Response Events

- Sepsis Documentation Start
- Sepsis 0-3 Hour Bundle Start
- Sepsis Documentation End
- Sepsis Bundle End

Sepsis Response Documentation

- Vitals
- Hemodynamics
- Sepsis Screening
- Sepsis Huddle
- Intake/Output

Existing LDAs/Wounds (0)

IVs

Index

- IsO and Results
- Diet Orders
- Active Lines
- History
- My Charges & Notes
- Med Dispense History
- SmartLinks and SmartPhrases
- Checklist
- Sepsis Checklist

Sepsis Timer

00:00

Refresh this section to update timer.

- Blood Cultures Not Ordered
- Lactate Not Ordered
- Lactate Not Resulted
- Repeat Lactate Not Resulted
- Antibiotics Not Ordered
- First Antibiotics Not Administered
- Fluid Resuscitation Not Ordered
- Fluid Resuscitation Not Administered
- Fluid Resuscitation Volume Not Documented
- Provider 6 Hour Note Not Complete

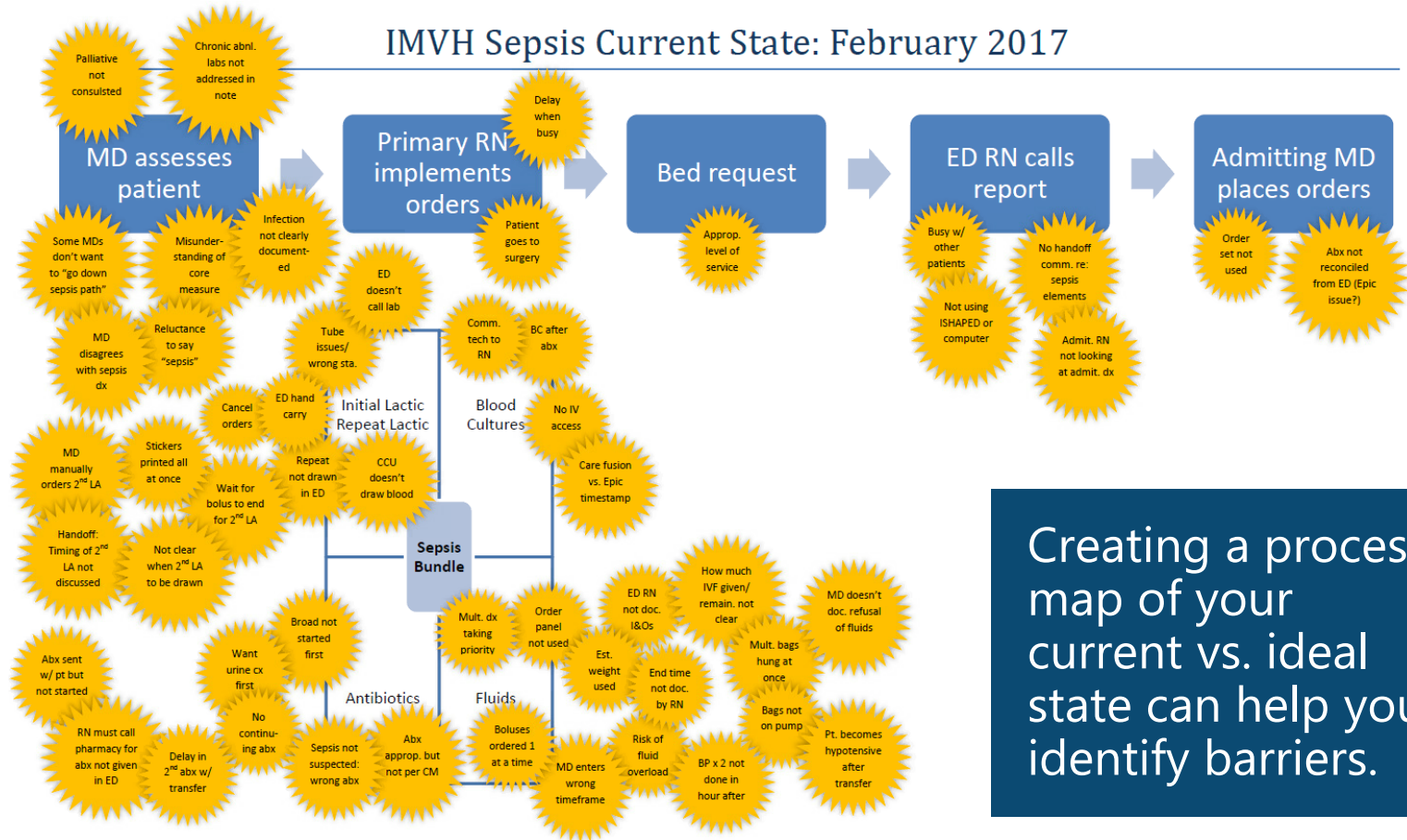
ED Events

Date/Time	Event	User	Comments
04/21/21 0743	Patient EMERGENCY, arrived	OI NURSE	in ED

All Component Based Labs

Currently working to implement an electronic version of the checklist in EHR with a timer.

## IMVH Sepsis Current State: February 2017



# Success Factors/ Facilitators



# Success Factors/Facilitators

- Having a sepsis coordinator, even part-time, has been key
  - Permanent position allows for succession planning
- Short feedback cycle for fallouts and successes
  - Value of concurrent reviews
- Leadership, accountability and support of CMO and medical directors (ED, hospitalists) has been critical
  - Emergency physician group allows me to attend quarterly meetings to give updates
- Regular sepsis committee meetings for last 5+ years
  - Role of interprofessional collaboration
- 24/7 support from TeleICU for inpatient nurses on *all* units



## Sepsis Coaching Record

Date		1. SIRS 2 or more	
Patient Name		2. Infection Documentation	
MRN		3. Organ Dysfunction	
Location		Severe Sepsis Presentation Time	
Employee(s)		Sepsis Screen Positive in Triage?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Provider(s)		Secondary Screen Completed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
		Copy of Sepsis Checklist Received?	<input type="checkbox"/> Yes <input type="checkbox"/> No

### Description of Event:

- ☐ Your patient met severe sepsis criteria, but no lactic acid was drawn or it was drawn late (not drawn within 3 hours).
- ☐ Blood cultures were not drawn before antibiotics. If there were any barriers to drawing cultures, documentation could not be found.
- ☐ Your patient did not receive broad-spectrum antibiotic coverage within 3 hours of severe sepsis presentation.
- ☐ A repeat lactic was not drawn within 6 hours of severe sepsis. The recommended timing is to redraw a repeat lactic within 1-2 hours of the initial lactic.
- ☐ Your patient had hypotension (SBP <90 or MAP <65) or a lactic of 4 or more, but a 30 mL/kg bolus was not initiated within 3 hours. If the provider orders individual boluses, instead of a single order with the total amount, the "start time" is considered when the final bolus, which completes the required amount, is begun. (Example: Patient needs 2500 mL and orders are written for 1000 mL, 1000 mL and 500 mL: start time is when the last bolus for 500 mL, is started. If a single order for 2500 mL is entered, start time is when first bolus hung. Don't forget to label boluses with pink stickers "Bag: \_\_ of \_\_"). If the provider is concerned about fluid overload, patient refusal must be documented or palliative care consulted. Ideal body weight may be used if BMI is greater than 30. Have the provider document this.
- ☐ Two BPs were not recorded during the hour after the 30 mL/kg fluid amount finished. The finish time was . (Because a stop time was not entered in Epic, the end time was calculated using the duration specified in the order.)
- ☐ The provider's note did not contain the statement, "Sepsis exam performed after fluids started." This statement is required when a patient receives the 30 mL/kg fluid bolus. Provider may also use .sepsiscms Smart Phrase.
- ☐ Vasopressor was not started within 6 hours of septic shock presentation, if patient had persistent hypotension after 30 mL/kg bolus.
- ☐ Other notes:

Coaching tool for  
fallouts

# Celebrate Successes



- Each month we recognize a nursing Sepsis Star
- They receive a gold star pin



# Keeping Things in Perspective





# Keeping Things in Perspective

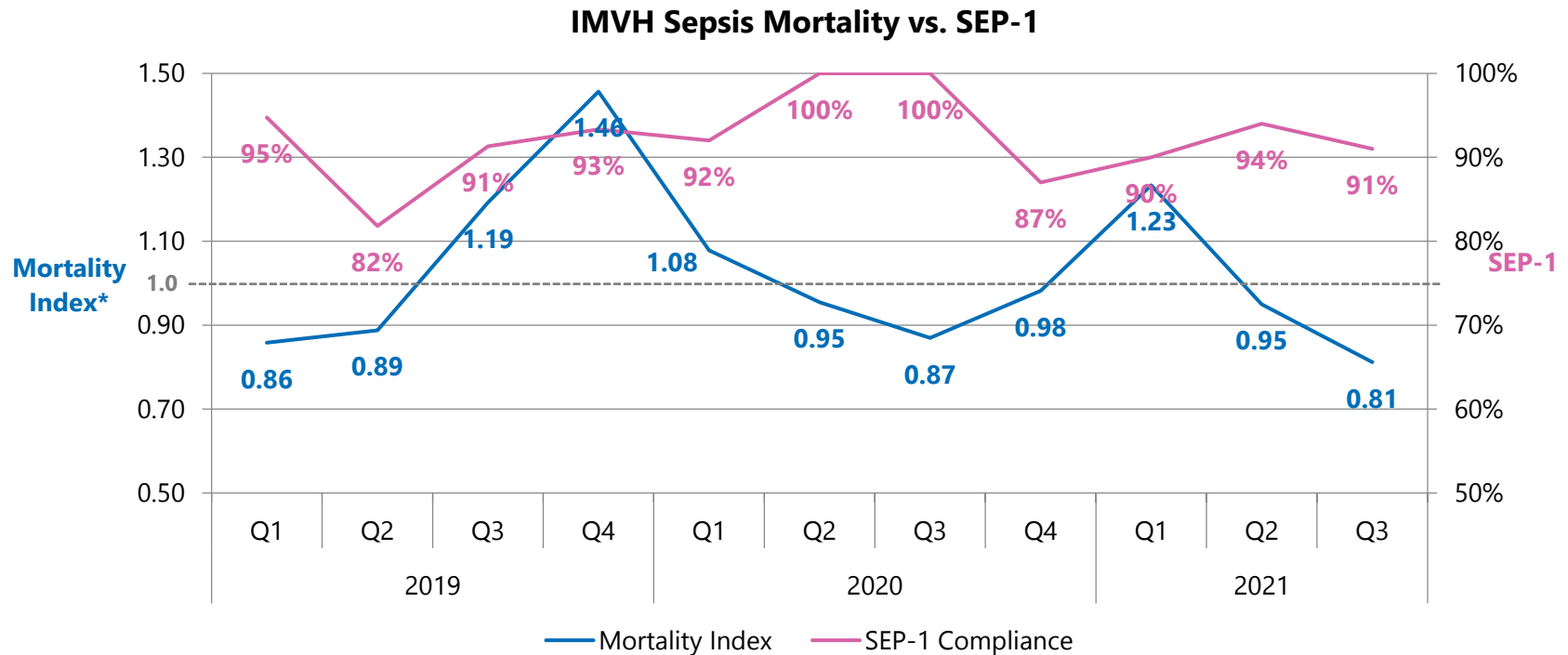
- SEP-1 is useful process measure for developing sepsis programs.
- SEP-1 serves as a catalyst for improvements in patient care – including interdisciplinary collaboration, staff education, order sets and early warning systems. (Mukherjee & Evans, 2017)



# Keeping Things in Perspective, continued

- In addition to compliance with SEP-1, nursing leaders should examine other variables and processes that may impact outcomes, for example
  - More aggressive antibiotic goals (<1 hour)
  - Timely source control (surgical interventions)
  - More nuanced fluid management and assessment of fluid responsiveness, etc.
- Pay attention to near misses and harm from other causes
- What do *you* consider a fallout?

# Mortality vs. SEP-1 Compliance



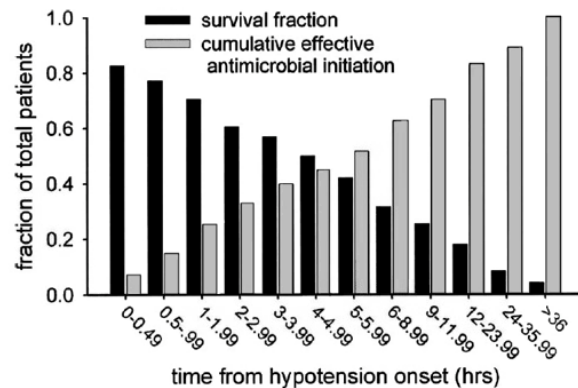
*\*Data from the Vizient Clinical Data Base used by permission of Vizient, Inc. All rights reserved.*

# Focus on Early Antibiotic Administration

## Surviving Sepsis



**Don't delay: Early antibiotics improve sepsis survival!**

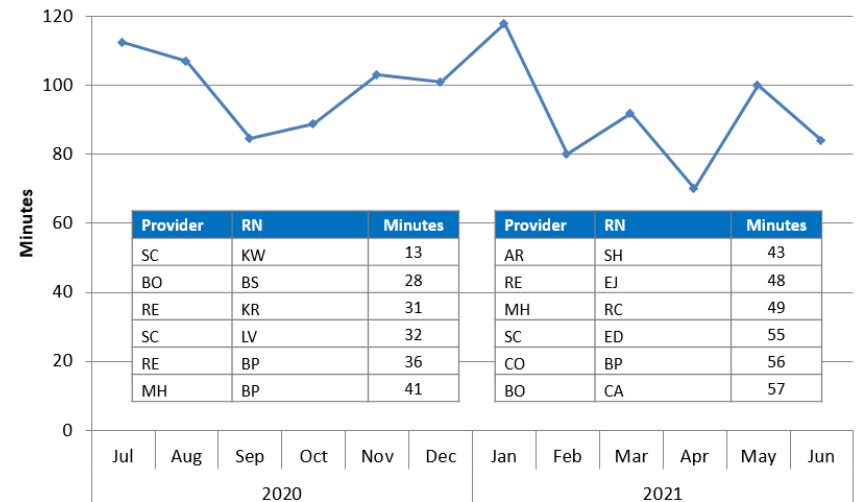


Kumar et al., 2006, p. 1592

## Process: Antibiotic Times



**ED Median Door to Antibiotic for Severe Sepsis & Septic Shock  
(Inset: Best June Times)**





**ST. JOSEPH | MARYVILLE | ALBANY**



Sepsis Presentation for the February 2022  
HQIC Community of Practice Call



- Monthly Sepsis Team Meeting – hospitalist, ER provider and front-line nurses having joined the team
- Reworked the Sepsis Flow Sheet (see slide #5)
- Process for documenting IV stop times on the inpt side
- Fall-outs reviewed monthly at dept staff mtgs, Nurse Practice Council and the Medical Staff Quality Affairs mtg
- Sending WOW notes to the providers and nurses whose pts pass the Sep-1 measure (see next slide)
- Real time chart reviews on Sepsis pts
- Work with providers on documentation opportunities





Maryville Sepsis Tracking Tool		Pt Name & Enc #	Date/Time Completed
If the provider does not suspect infection, document reason/time, complete icon(s) and turn in form.			
 <p><b>Sepsis =</b></p> <ul style="list-style-type: none"> <li>• 2 or more SIRS criteria</li> <li>• Suspected infection</li> </ul>	 <p><b>Severe Sepsis =</b></p> <ul style="list-style-type: none"> <li>• Sepsis +</li> <li>• 1 or more Organ Dysfunction</li> </ul>		
<p><b>SIRS Criteria (circle)</b></p> <p>Temp &gt; 38.3 °C or &lt; 36°C</p> <p>HR &gt; 90</p> <p>Resp &gt; 20</p> <p>WBC &gt; 12K or &lt; 4K cells per cubic millimeter of blood or Bands &gt; 10%</p>	<p><b>Organ Dysfunction (circle)</b></p> <p>SBP &lt; 90 mmHg or MAP &lt; 65 mmHg</p> <p>Plt &lt; 100,000 per microliter</p> <p>INR &gt; 1.5 or aPTT &gt; 60</p> <p>Bili &gt; 2 mg/dl</p> <p>Creatinine &gt; 2 mg/dl</p> <p>Need for Mechanical Ventilation - CPAP, BiPAP, or Intubation</p> <p>Lactate &gt; 2 mmol/L</p> <p>UOP &lt; 0.5 ml/kg/h for 2 Hours</p>		
<p><b>Septic Shock</b></p> <ul style="list-style-type: none"> <li>• Lactate ≥ 4 mmol/L OR</li> <li>• Severe sepsis with persistent or new hypotension in the 1 hour after IVF fluid completion</li> </ul>			
<p><b>Complete within 3 Hours</b></p> <p><input type="checkbox"/> Place ED (or Inpt) Sepsis Treatment Order Set-Maryville</p> <p><input type="checkbox"/> Obtain patient weight (avoid stated weight)</p> <p><input type="checkbox"/> Initial lactate drawn</p> <p><input type="checkbox"/> 2 set of blood cultures. It is recommended to obtain 2 sets of blood cultures prior to antibiotic administration, however, if time constraint, the first antibiotic can be initiated after the first blood culture</p> <p><input type="checkbox"/> Antibiotics initiated</p> <p><input type="checkbox"/> Initiate fluid bolus 30 mL/kg if SBP &lt; 90 or MAP &lt; 65, an initial lactate ≥ 4, or provider documentation of septic shock (if BMI &gt; 30 use ideal body weight)</p> <p><input type="checkbox"/> Document accurate IVF Stop Times when bolus is completed</p>			
<p><b>Complete within 6 Hours</b></p> <p><input type="checkbox"/> If initial lactate &gt; 2, repeat lactate x1 within 6 hours, ideally after fluid bolus</p> <p><input type="checkbox"/> Give appropriate vasopressor for persistent hypotension following fluid resuscitation</p> <p><input type="checkbox"/> Focus Exam by MD/PA/APN OR CVP, SvO2, Echo or Fluid Challenge completed</p>			
ED Provider	ED Nurse		
Hospitalist	Med-Surg Nurse		



**ST. JOSEPH | MARYVILLE | ALBANY**

## Discussion

---

- What excites you the most about the information provided? What information can you leverage to help expand opportunities in your communities?
- What actions will you take as a result of the call?
- Where can you begin with your facility to continue to ensure safety, and a true patient-centered approach as you engage collaboratively with others?
- Which activities do you have underway that will allow for you to expand and push forward to build on action in the next 30 days? 90 days?

# Final Thoughts

---

# Join Us for the Next Community of Practice Call!

---



Join us for the next  
Community of Practice Call on March 10, 2022  
from 1:00 – 2:00 PM ET

We invite you to register at the following link:

[https://zoom.us/webinar/register/WN\\_ASI\\_I3p\\_TExx\\_VY\\_YYFFeA](https://zoom.us/webinar/register/WN_ASI_I3p_TExx_VY_YYFFeA)

*You will receive a confirmation email with login details.*

# Thank You!

---



*Your opinion is valuable to us. Please take 4 minutes to complete the post event assessment here: [post assessment 2.10.22](#)*

*We will use the information you provide to improve future events.*