SEP-1, Sepsis 3, Oh MY!

MAUREEN A SECKEL, APRN, MSN, ACNS-BC, CCNS, CCRN, FCCM, FCNS, FAAN
CRITICAL CARE CLINICAL NURSE SPECIALIST & SEPSIS CONSULTANT
www.mseckel.com
maureenseckel@hotmail.com

DSC AACN
2/13/24

1

Disclosures

None

2

Review	Detail
Review current Sepsis-3 definitions and SEP-1 process measures	Apply knowledge through interactive case studies



Objectives

3

SEPSIS STATISTICS

- **1.7** million adults in US have sepsis annually
- **~350,000** die in the hospital or are discharged home to hospice
- **1 in 3** adults who die in the hospital had sepsis during that hospitalization
- **87%** of sepsis, or the infection causing sepsis, starts in the community

https://www.cdc.gov/sepsis/what-is-sepsis.html

4

SEPSIS-3

5

SEPSIS-3 Definition: Sepsis

- *Life-threatening NEW* ***organ dysfunction*** caused by patient response to an infection
- Sepsis starts with an infection but not all infections lead to sepsis

Singer, et al. JAMA. 2016;315(8):801-810.

6

SEPSIS-3 Definition: **Septic Shock**

Sepsis WITH profound circulatory and cellular/metabolic abnormalities that substantially increase mortality;

- **Persisting hypotension** requiring vasopressors to maintain a MAP ≥ 65 mmHg,

AND

- **Lactate > 2** despite fluid resuscitation

Singer, et al. JAMA. 2016;315(8):801-810.

7

Quick SEPSIS-related Organ Failure Assessment **(qSOFA)**

Tool for **non-ICU** SEPSIS patients to identify increased mortality risk/organ dysfunction

- **RR ≥22**
- **Altered Mental Status**
- **SBP ≤100**

POSITIVE= ≥ 2 CRITERIA

Singer, et al. JAMA. 2016;315(8):801-810.

8

SEPSIS-related Organ Failure Assessment (SOFA)

Tool for **ICU** SEPSIS patients to assess organ dysfunction

Increased risk of mortality ≥ 2 OR INCREASING SCORE OVER TIME

Table 1. Sequential [Sepsis-Related] Organ Failure Assessment Score[a]

	Score				
System	0	1	2	3	4
Respiration					
Pao_2/Fio_2, mm Hg (kPa)	≥400 (53.3)	<400 (53.3)	<300 (40)	<200 (26.7) with respiratory support	<100 (13.3) with respiratory support
Coagulation					
Platelets, $\times 10^3/\mu L$	≥150	<150	<100	<50	<20
Liver					
Bilirubin, mg/dL (μmol/L)	<1.2 (20)	1.2-1.9 (20-32)	2.0-5.9 (33-101)	6.0-11.9 (102-204)	>12.0 (204)
Cardiovascular	MAP ≥70 mm Hg	MAP <70 mm Hg	Dopamine <5 or dobutamine (any dose)[b]	Dopamine 5.1-15 or epinephrine ≤0.1 or norepinephrine ≤0.1[b]	Dopamine >15 or epinephrine >0.1 or norepinephrine >0.1[b]
Central nervous system					
Glasgow Coma Scale score[c]	15	13-14	10-12	6-9	<6
Renal					
Creatinine, mg/dL (μmol/L)	<1.2 (110)	1.2-1.9 (110-170)	2.0-3.4 (171-299)	3.5-4.9 (300-440)	>5.0 (440)
Urine output, mL/d				<500	<200

Abbreviations: Fio_2, fraction of inspired oxygen; MAP, mean arterial pressure; Pao_2, partial pressure of oxygen.

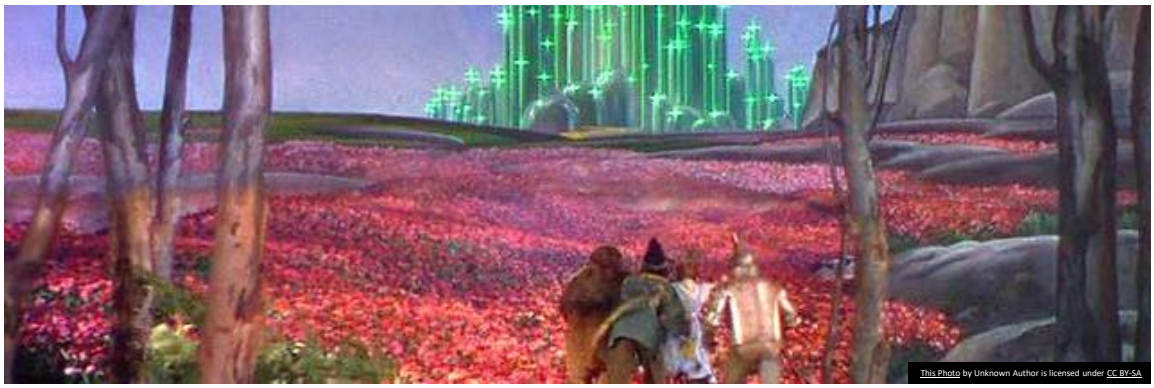
[a] Adapted from Vincent et al.[27]

[b] Catecholamine doses are given as μg/kg/min for at least 1 hour.

[c] Glasgow Coma Scale scores range from 3-15; higher score indicates better neurological function.

Vincent, et al. Intensive Care Med. 1996;22(7):707-710

9



SEP-1

EARLY MANAGEMENT BUNDLE, SEVERE SEPSIS/SEPTIC SHOCK

https://qualitynet.cms.gov/inpatient/specifications-manuals et al.

10

Development of SEP-1

1/1/24-6/30/24 – SEP-1 Version 5.15

Current National Average **60%**

https://qualitynet.cms.gov/inpatient/specifications-manuals/sepsis-resources

11

Hospital Value-Based Purchasing Program

The Hospital VBP Program is a budget-neutral program funded by reducing participating hospitals' base operating DRG payments each fiscal year by 2% and redistributing the entire amount back to the hospitals as value-based incentive payments.

Adopt the Severe Sepsis and Septic Shock Management Bundle measure in the Safety Domain beginning with the FY 2026 program year (October 1, 2026-September 30, 2027)

12

Reminder: SEPSIS-2

Sepsis

Infection (probable or suspected) with systemic signs and symptoms

Severe Sepsis

Sepsis plus signs of organ dysfunction and SIRS criteria

Septic Shock

Sepsis plus

Lactate ≥ 4

Or

Hypotension after fluid resuscitation

Systemic Inflammatory Response Syndrome

- Temperature > 38°C or < 36°C
- Heart Rate > 90
- Respiratory Rate > 20
- WBC > 12,000, or < 4000 cells/mm^3, or > 10% bands

Levy MM, et al. Crit Care Med. 2002;31:1250-1256.

13

SEP-1

START

ALL within 3 hours

- Lactate
- Antibiotic
- Blood cultures before antibiotic

AND within 3 hours of initial hypotension OR septic shock

- Fluids

AND within 6 hours if LA ≥ 2

- Repeat LA

AND within 6 hours of septic shock, ONLY if hypotension persists after fluids

- Vasopressors

AND within 6 hours of septic shock, ONLY if hypotension persists after fluids OR initial LA ≥ 4

- Repeat volume status and tissue perfusion assessment

END?

14

START

Severe Sepsis or Septic Shock

Severe Sepsis Time

No longer arrival to ED?

Combination retrospective chart abstraction;

- Provider note source of infection
- SIRS (2)
- OD (1)

OR

Provider note stating severe sepsis or septic shock

Septic Shock Time

- Provider documentation

OR

- Severe sepsis AND **Persistent Hypotension**
- Severe sepsis AND **initial LA ≥ 4**

Microsoft Stock Image

15

3-Hours: Lactate, Antibiotic, & Blood Cultures

Lactate

If 2nd LA > 2 AND higher than initial, must repeat within 6 hours

Example

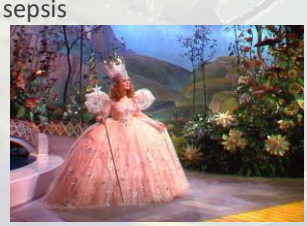
- **21:08 LA 2.1**
- **00:40 LA 2.6**
- **05:00 LA 2.3**

Document any delay due to difficult stick or refusal

Antibiotic

Any IV antibiotic

Within 24 hours prior to or within 3 hours of severe sepsis



Blood Culture

If delay due to difficult stick and documented (nursing or provider), may give antibiotic first and obtain BC ASAP

1 set blood cultures passes

Microsoft Stock Image

16

Definition: Hypotension

Hypotension = 2 measures (SBP < 90, MAP < 65, or decrease in SBP > 40 within 3 hours of each other without other causes

- Exclusions: OR, IR, delivery, CPR, conscious sedation, or provider documentation

Example: provider documentation that BP normal for the patient, due to a chronic condition, a medication, acute condition, acute on chronic condition, or due to an acute condition that has a non-infectious source/process

- *Hypotension due to acute onset of uncontrolled AFib*
- *BP normally < 90 mmHg, patient on midodrine for ESRD*

17

3-Hours: 30 mL/kg Crystalloid Fluids

Provider may order less than 30 mL/kg crystalloids for the following;

- Concerns for heart failure, renal failure, concern for fluid overload, or patient responded to lesser volume
- **MUST order a targeted volume AND reason MUST be documented by the provider**
- Examples

1500 mL bolus ordered due to heart failure

Smaller volume bolus given of total 500 mL due to fluid overload

Bolus stopped; patient responded to first liter

No fluids due to hemodialysis

18

3-Hours: 30 ml/kg Crystalloid Fluids (cont)

Calculated fluids must be given 6 hours prior or through 3 hours after initial hypotension OR septic shock presentation (don't forget about EMS)

May be within 10% of targeted volume

- 104 kg X 30 mL/kg = 3120 mL targeted volume
- 3000 mL bolus ordered
- = (3120 – 10% = 2808)

Any crystalloids over 125 mL/hour can be considered a bolus

(Don't forget about Vancomycin)

19

Definition: Persistent Hypotension

Nurse/tech must document BP **within the hour** of 30 mL/kg or targeted fluid completion

If SBP < 90 or MAP < 65, a second BP must be documented within that same hour

Example

- Targeted fluids 1500 mL completed 17:20
  - ***17:30 SBP 86***
  - ***18:10 SBP 92***
  - ***17:30 SBP 86***
  - ***18:30 SBP 92***

Microsoft Stock Image

20

6-Hours: Vasopressors

Vasopressor administration at septic shock presentation up to 6 hours after demonstrated by persistent hypotension after fluids

Recent Surviving Sepsis Guideline suggest infusing peripherally rather than delay

- Facility protocol/criteria

21

6-Hours: Sepsis Reassessment

Microsoft Stock Image

Provider documentation; 3 options after start of fluids and within 6 hours Septic Shock

☑ Option 1

Performing or completing Physical exam, *perfusion reassessment, sepsis or septic shock focused exam*, *sepsis reassessment,* or *systems review*

☐ Option 2

5/8 measures documented;

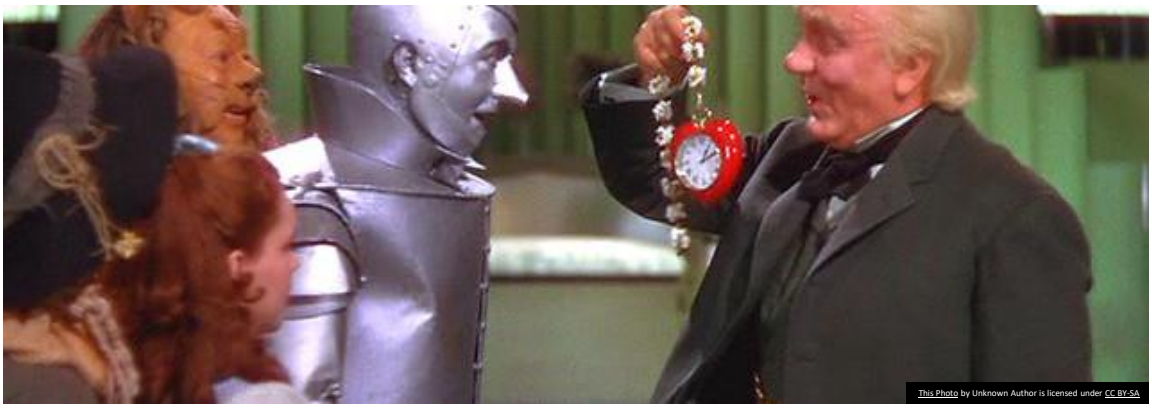
- PaO2
- Capillary refill
- Cardiopulmonary assessment
- Peripheral pulses
- Shock index
- Skin color or condition
- Urine output
- Vital signs

☐ Option 3

One of the following:

- CVP
- ScvO2, SvO2
- Echocardiogram
- Fluid challenge or PLR

22



CASE STUDIES

23

Practice

Mrs. W is an ED patient brought in by ambulance from the skilled nursing facility with confusion, cough, and fever.

- CXR shows a RUL infiltrate, CT head negative
- WBC 14.9, lactate 2.1
- Vital signs 38.4 C – 109 – 24, 98/60, SpO2 94 on 6LNC

You suspect pneumonia and possible sepsis. **What are the signs of organ dysfunction?**

- Lactate 2.1
- New oxygen use
- Respiratory rate
- New confusion
- Blood pressure 98/60

24

Practice

Mrs. W is an ED patient brought in by ambulance from the skilled nursing facility with confusion, cough, and fever.

- CXR shows a RUL infiltrate, CT head negative
- WBC 14.9, lactate 2.1
- Vital signs 38.4 C – 109 – 24, 98/60, SpO2 94 on 6LNC

What sepsis bundle measures do you anticipate?

- Antibiotics, fluid resuscitation, and vasopressors within 6-hours
- Lactate, blood cultures and antibiotics within 3-hours
- Blood cultures and antibiotics within 3-hours

25

Practice

Mr. A is an ESRD patient and difficult stick. While the ED nurse was able to insert a PIV and draw some blood for labs, he was unable to get BCs. Phlebotomy attempted and was also unable. It has been over an hour.

What is the next best step?

- Ask phlebotomy if there is someone else who could draw blood.
- Notify the provider and hang the antibiotic. Document unable to obtain blood cultures due to difficult stick. Obtain blood cultures as soon as able to.
- Notify the provider and set up for a central line. Hold antibiotic until you can draw BCs from central line.

26

Practice

Ms. T was admitted to a medical inpatient unit with a urinary tract infection and sepsis. The ED drew blood cultures, started antibiotics, and drew the repeat lactate. Initial lactate was 2.2 and repeat was 2.9. Her last 2 SBPs were 88/62 and 86/61.

You notify the provider and anticipate the following bundle measures next?

- Vasopressors and ICU admission
- Fluid bolus
- Repeat another lactate

27

Practice

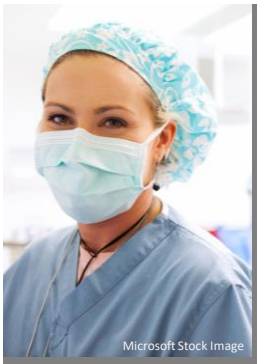
Mr. A is ordered to receive 1000 mL fluid bolus of lactated ringers due to his heart failure (documented by provider).

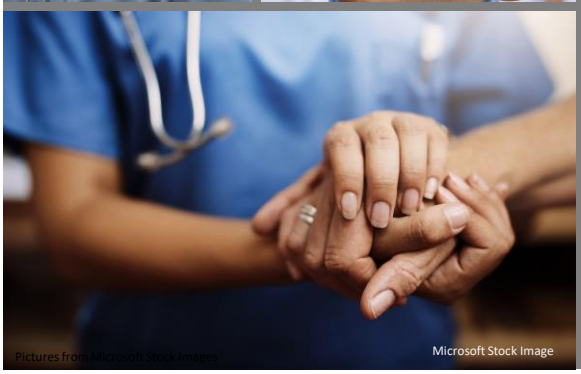
What are next steps?

- Hang the fluid bolus ASAP at prescribed rate.
- Document BP after fluid infused.
- Document repeat BP within the hour of infusion if SBP <90 or MAP < 65 and notify provider.

28

29





Thank You

Maureenseckel@hotmail.com

30

Resources

American Association of Critical Care Nurses - https://www.aacn.org/clinical-resources/sepsis

Center for Disease Control - https://www.cdc.gov/sepsis/index.html

Centers for Medicare & Medicaid ICD-10-CM Official Guidelines for Coding and reporting - https://www.cms.gov/files/document/fy-2022-icd-10-cm-coding-guidelines-updated-02012022.pdf

European Society of Intensive Care Medicine - https://www.esicm.org/resources/sepsis-resources/

Global Maternity Sepsis Study - https://srhr.org/sepsis/resources/

Sepsis Alliance – https://www.sepsis.org

Sepsis Alliance. Faces of Sepsis™. https://youtu.be/12Qbnn6XfH0. May 17, 2014.

Society of Critical Care Medicine - https://www.sccm.org/SurvivingSepsisCampaign/Home

UK Sepsis Trust - https://sepsistrust.org/about/about-sepsis/

World Federation of Critical Care Nurse - https://wfccn.org/sepsis-materials/

World Health Organization - Sepsis (who.int)

World Sepsis Day - https://www.worldsepsisday.org/declaration

31

References

Centers for Disease Control and Prevention. What is sepsis. Available at https://www.cdc.gov/sepsis/what-is-sepsis.html.

Singer M, Deutschman CS, Seymour C, et al. The third international consensus definitions for sepsis and septic shock (Sepsis-3). JAMA. 2016. 315(8):801-810.

Vincent JL, Moreno R, Takala J, et al. The SOFA (sepsis-related organ failure assessment) score to describe organ dysfunction/failure. Intensive Care Med. 1996;22(7):707-710.

QualityNet. Hospital inpatient specification manuals. Available at https://qualitynet.cms.gov/inpatient/specifications-manuals. Accessed December 19, 2022.

Evans L, Rhodes A, Alhazzani W, et al. Surviving Sepsis Campaign: international guidelines for management of sepsis and septic shock 2021. Crit Care Med. 2021;49(11):e1063-e1143.

Surviving Sepsis Campaign. Surviving sepsis bundle 2018. Available at https://www.sccm.org/sccm/media/PDFs/Surviving-Sepsis-Campaign-Hour-1-Bundle.pdf. Accessed December 19, 2022.ps://www.cdc.gov/sepsis/what-is-sepsis.html

32

33