Sepsis Update
Washington ACP 2023

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Virginia Mason Medical Center

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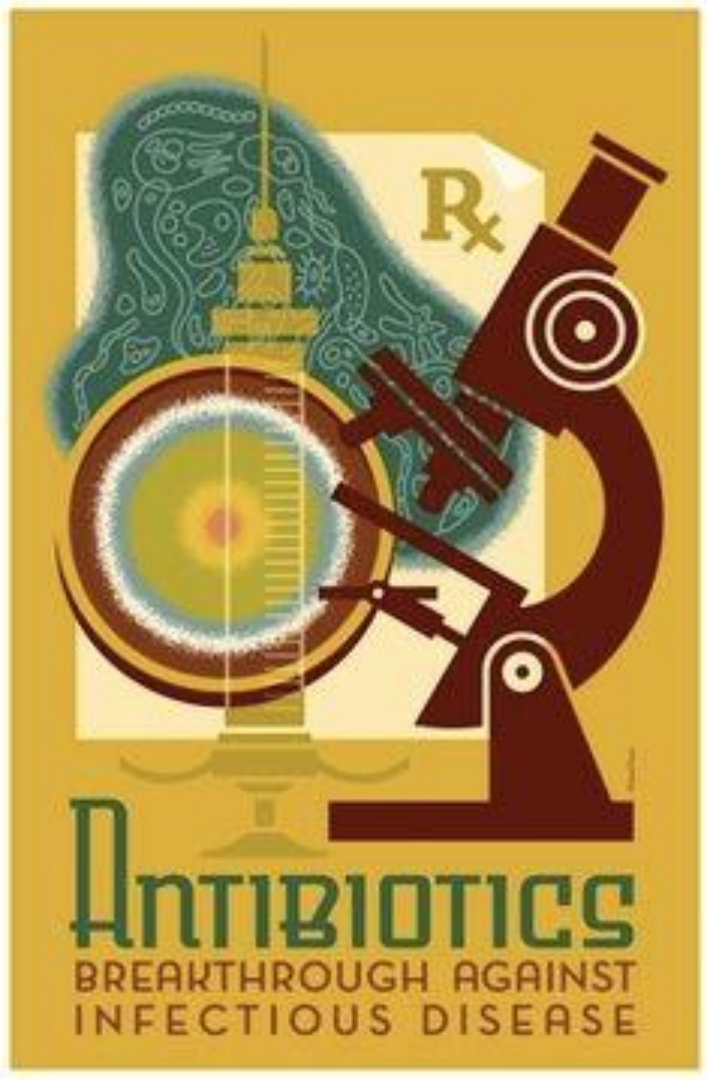

Agenda for this talk:

1) Review sepsis definitions
2) Discuss sepsis data
3) Walk through brief history of sepsis care
4) Talk about 2021 updated sepsis guidelines (*Critical Care Medicine 2021*)

Q1.

Ms.J is a 71yo woman with a history of coronary artery disease (PCI to LAD 2000). She presents with 3 days of painful urination, fever, and generally feeling poorly. Vital signs are notable for BP 104/45, HR 104, T 99.4C. On exam, she appears unwell, no focal findings. Labs notable for WBC 15.4, Cr 1.5 (0.9 baseline), lactate 3.2, and UA with 26-50 WBC, 2+ bacteria. What is the most appropriate diagnosis for her at this juncture?

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a) SIRS (systemic inflammatory response syndrome)
b) Severe sepsis
c) Sepsis
d) Septic shock

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Sepsis

Life threatening *dysregulated* host response to infection

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At its most extreme…

Sepsis ⇒ Septic shock

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At its most extreme…

Sepsis ⇒ Septic shock

Life threatening dysregulated host to infection

Severe abnormalities of circulation and/or cellular metabolism

Persistent hypotension (need for vasopressors to maintain MAP ≥ 65 and a serum lactate level > 2 mmol/L despite adequate volume resuscitation

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At its most extreme…

Sepsis ⇒ Septic shock

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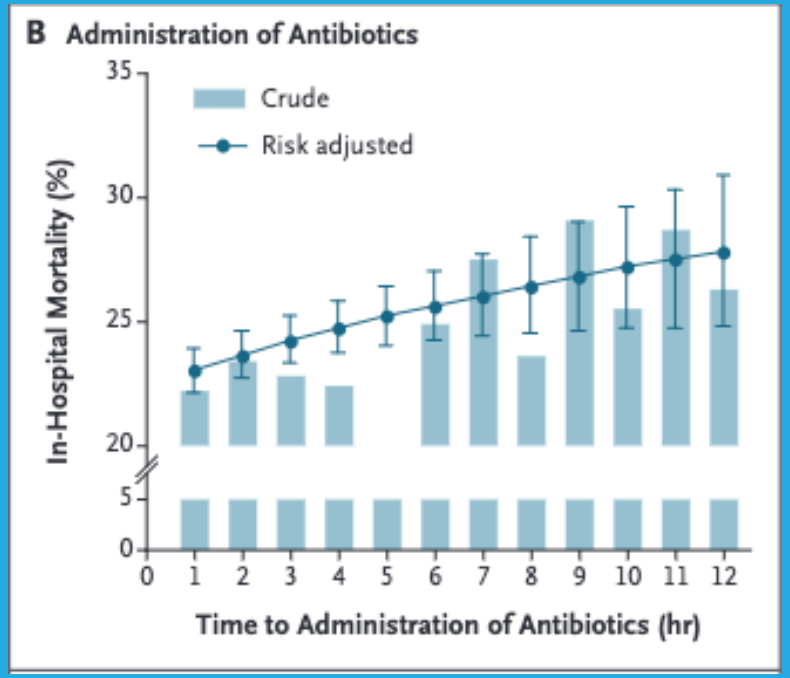
Sepsis and Septic Shock

Requires prompt recognition and management



Seymour et al NEJM 2017

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Sepsis and Septic Shock

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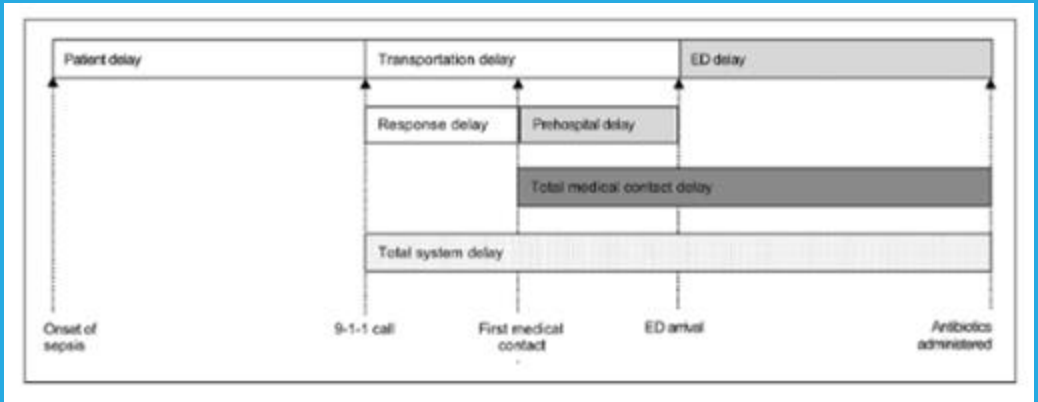

Seymour et al Critical Care Medicine 2017

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Sepsis and Septic Shock

Requires prompt recognition and management

Is not always obvious

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Two diagnostic pathways

Obvious

Signs of sepsis
+
A possible source
+
Lab tests (+/- micro)

= infection + organ dysfunction = SEPSIS

Entirely not obvious

Unexplained organ dysfunction + possible source = SEPSIS

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Vincent PLos Medicine 2016

On a higher level…

- Sepsis is expensive
  - > $20 billion (5.2% of US hospital costs, 2011)
  - Costs continue to rise
- A leading cause of morbidity and mortality worldwide
- Long term impacts
  - Physical, psychological, and cognitive

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On a longer timeline…

- 1970s
  - Sepsis, causes and physiology beginning to be understood, animal models of sepsis
- 1989
  - “sepsis syndrome” = infection-induced organ dysfunction
- 1992
  - Consensus conference published first definitions of sepsis
- 2002
  - SSC launched
  - Goal to inform the public and government agencies about sepsis, develop guidelines, reduce mortality
- 2004
  - First Surviving Sepsis guidelines
- 2016
  - Updated guidelines
- 2021
  - Updated guidelines

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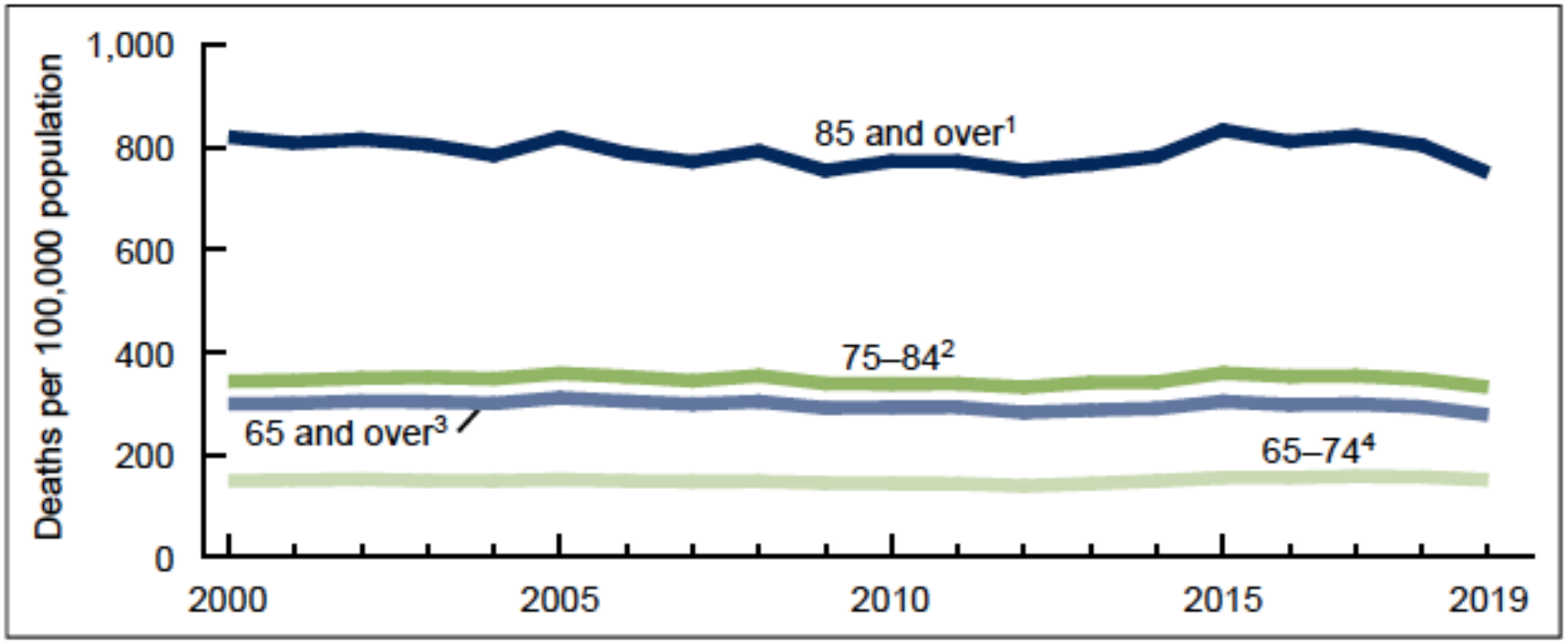
Figure 1. Sepsis-related death rates for adults aged 65 and over, by age group: United States, 2000–2019



US Dept Health and Human Services 2019

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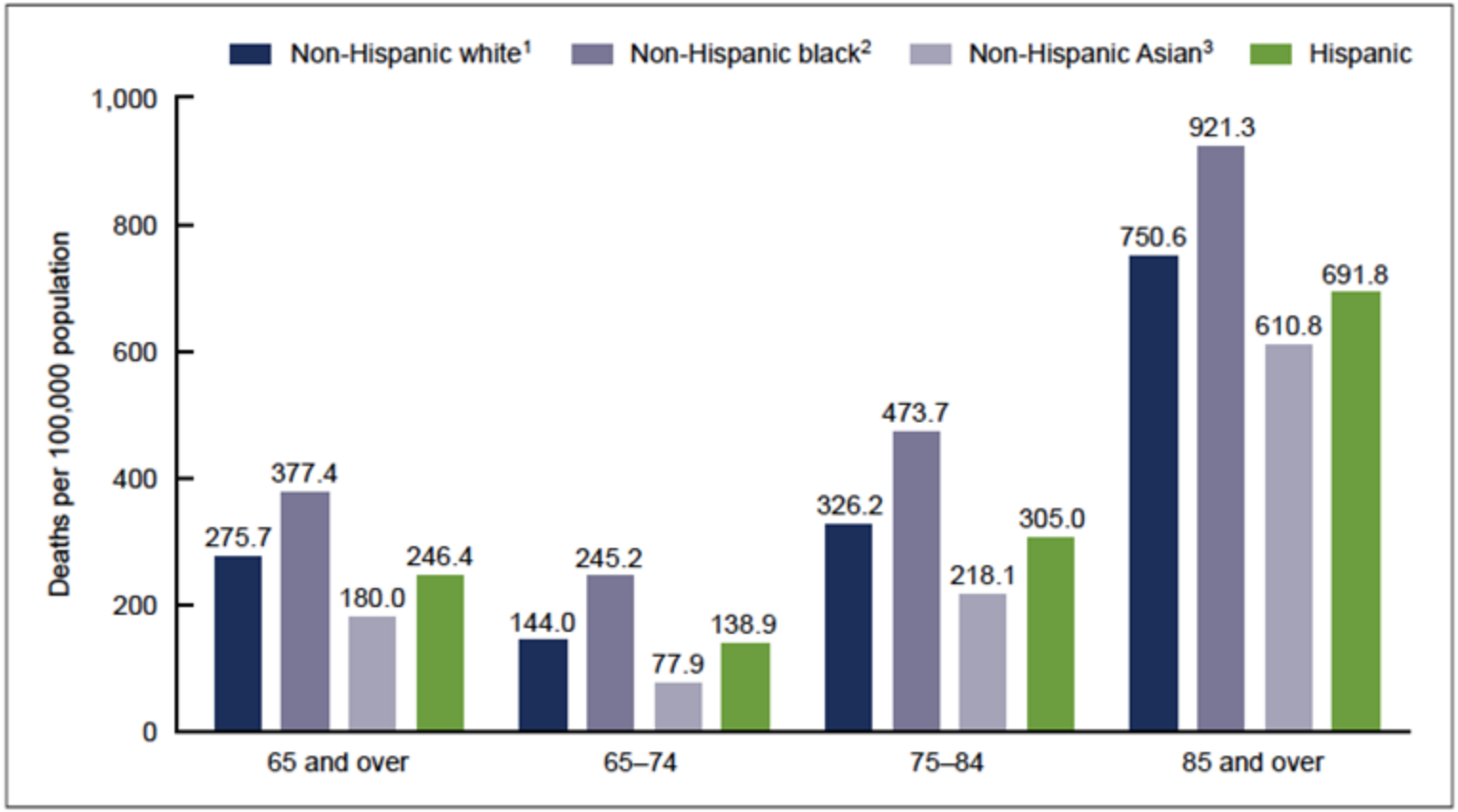
Figure 3. Sepsis-related death rates for adults aged 65 and over, by age group and race and Hispanic origin: United States, 2019



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US Dept Health and Human Services 2019

Updated Guidelines 2021

(compared to 2016)

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Surviving Sepsis Campaign

Screening and resuscitation

Infection

Hemodynamics

Adjunctive therapies

Updated Guidelines 2021

(compared to 2016)

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Reminder about recommendation strength

Strong ungraded = best practice	Weak graded
“We recommend”	**“We suggest”**
Strong graded = evidence supported	Insufficient evidence
“We recommend”	***No recommendation***

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Q2.

Ms.J is a 71yo woman with a history of coronary artery disease (PCI to LAD 2000) and hyperlipidemia. She presents with 3 days of painful urination, fever, and generally feeling poorly. Vital signs are notable for BP 104/45, HR 104, T 99.4C. On exam, she appears unwell, no focal findings. Labs notable for WBC 15.4, Cr 1.5 (0.9 baseline), lactate 3.2, and UA with 26-50 WBC, 2+ bacteria. Which of the following are appropriate steps in her initial management?

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a) Calculate a qSOFA score to decide if she has sepsis or not
b) Hold on giving fluids due to concerns for heart failure with history of CAD
c) Trend lactate to guide resuscitation
d) Trend lactate and monitor capillary refill to guide resuscitation

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Screening and Resuscitation

3 guidelines

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Screening and resuscitation

1) Screening (*new*)

We recommend against using qSOFA compared with SIRS, NEWS, or MEWS as a single screening tool for sepsis or septic shock.
Quality of evidence: Moderate

Screening | Strong | Screening Tools

qSOFA
Elevated RR
Altered mentation
Low SBP

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Screening and resuscitation

2) **Initial fluid bolus** (downgraded strength from *strong* to *weak*)

For patients with sepsis-induced hypoperfusion or septic shock, we suggest that at least 30 mL/kg of IV crystalloid fluid be given within the first 3 hours of resuscitation.

Quality of evidence: Low

Initial Resuscitation **Weak** **Fluid Resuscitation**

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Screening and resuscitation

3) **Resuscitation targets** (*new*)

For adults with sepsis or septic shock, we suggest guiding resuscitation to decrease serum lactate in patients with elevated lactate levels over not using serum lactate.
Quality of evidence: Low

Initial Resuscitation **Weak** **Serum Lactate**

For adults with septic shock, we suggest using capillary refill time to guide resuscitation as an adjunct to other measures of perfusion.
Quality of evidence: Low

Initial Resuscitation **Weak** **Perfusion**

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Infection

1 guideline

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a) Immediately upon recognition of sepsis
b) Within 3 hours of recognition of sepsis
c) After blood cultures and fluid have been given
d) Once admitted to the medicine ward

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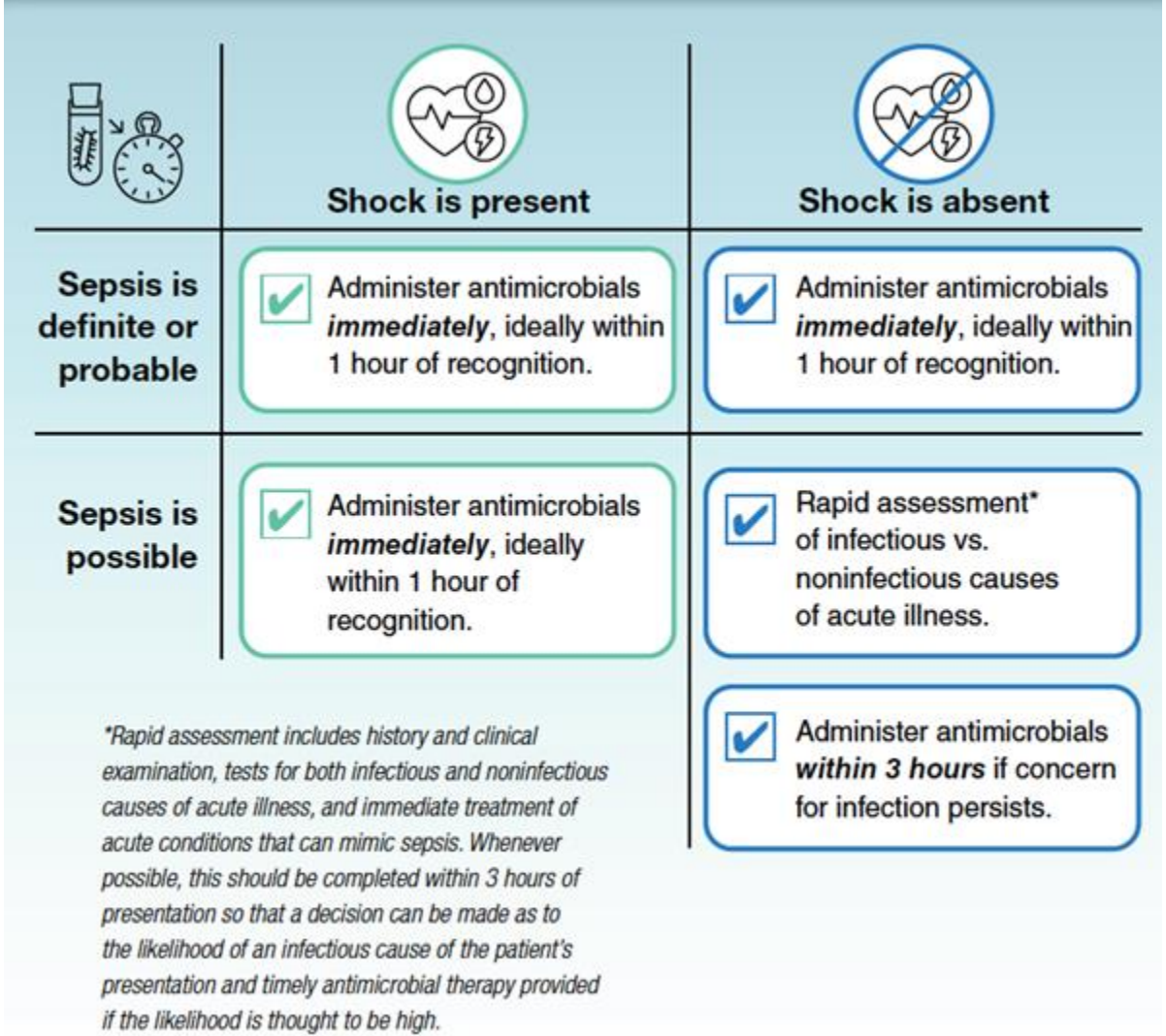

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Hemodynamics

3 guidelines

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Q4.

Mr.B is a 59 yo man with history of COPD and HTN. He presents to the ED with 5 days of progressively worsening dyspnea and increased sputum production. On arrival, O2 saturation 82% on RA, HR 117, BP 99/39, afebrile. He has slightly increased work of breathing, decreased breath sounds at the R lung base. Labs are notable for WBC 12k, plts 497, lactate 4.3, VBG showing appropriate ventilation. CXR with RLL infiltrate. He is given broad spectrum antibiotics and blood cultures are sent. Which of the following reflects current guideline based resuscitation?

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a) 30 cc/kg normal saline should be started
b) No fluids should be started given concerns for respiratory compromise
c) If vasopressors needed after volume resuscitation, a central line must be placed for administration
d) It is up to the provider to decide if additional fluids are warranted after the first 30 cc/kg

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Hemodynamics

1) **Fluid type** (changed)

For adults with sepsis or septic shock, we suggest using balanced crystalloids instead of normal saline for resuscitation.
Quality of evidence: Very low

Hemodynamic Management **Weak** **Fluid Resuscitation**

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Hemodynamics

2) **Vasopressor initiation** (new)

For adults with septic shock, we suggest starting vasopressors peripherally to restore mean arterial pressure rather than delaying initiation until central venous access is secured.

Quality of evidence: Very low

Hemodynamic Management **Weak** **Monitoring & IV Access**

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Hemodynamics

3) **Fluid strategy** (new)

There is insufficient evidence to make a recommendation on the use of restrictive versus liberal fluid strategies in the first 24 hours of resuscitation in patients with sepsis and septic shock who still have signs of hypoperfusion and volume depletion after the initial resuscitation.

Hemodynamic Management **No Recommendation** **Fluid Resuscitation**

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Adjunctive Therapies

2 guidelines

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Adjunctive therapies

1) IV corticosteroids (*changed*)

For adults with septic shock and an ongoing requirement for vasopressor therapy, we suggest using IV corticosteroids.

Quality of evidence: Moderate

Additional Therapies **Weak** **Corticosteroids**

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Adjunctive therapies

2) **IV Vitamin C** (*new*)

For adults with sepsis or septic shock, we suggest against using IV vitamin C.

Quality of evidence: Low

Additional Therapies | Weak | Vitamin C

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Post Sepsis Syndrome

For adults with sepsis or septic shock and their families, we suggest offering written and verbal sepsis education (diagnosis, treatment, and post-ICU/post-sepsis syndrome) prior to hospital discharge and in the follow-up setting. Quality of evidence: Very low

LTO-GOC | Weak | Education PT & Families

For adults with sepsis or septic shock and their families, we recommend screening for economic and social support (including housing, nutritional, financial, and spiritual support), and making referrals where available to meet these needs.

LTO-GOC | Best Practice | Economic Social Support | Transitions of Care

For adult survivors of sepsis or septic shock, we recommend assessment and follow-up for physical, cognitive, and emotional problems after hospital discharge.

LTO-GOC | Best Practice | Post Discharge Follow-up

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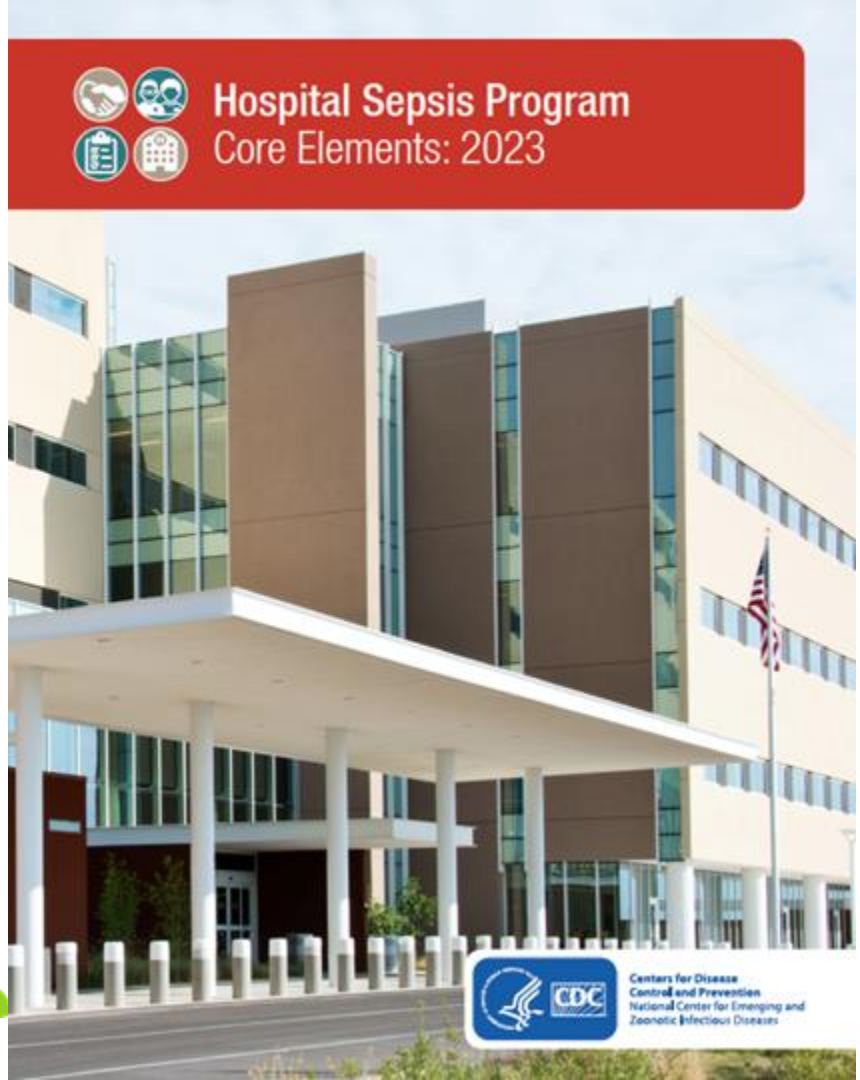

Hospital Sepsis Program Core Elements

Hospital Leadership Commitment
Dedicating the necessary human, financial, and information technology resources.

Accountability
Appointing a leader or co-leaders responsible for program goals and outcomes.

Multi-Professional Expertise
Engaging key partners throughout the hospital and healthcare system.

Action
Implementing structures and processes to improve the identification of, management of, and recovery from sepsis.

Tracking
Measuring sepsis epidemiology, management, and outcomes to assess the impact of sepsis initiatives and progress toward program goals.

Reporting
Providing information on sepsis management and outcomes to relevant partners.

Education
Providing sepsis education to healthcare professionals, patients, and family/caregivers.

Key Points to Remember

- Sepsis vs. septic shock; Severe sepsis is no longer a choice
- Sepsis mortality remains high with frustratingly little improvement
- Time to antibiotics still king
- Don’t despair if you don’t qSOFA
- Use LR, give fluids until fluids stop helping
- If choice is inadequate perfusion vs peripheral vasopressors, use a PIV
- The effect of sepsis is longer and greater than we see in the hospital
- Taking care of patients with sepsis well requires organizational support and constant programmatic improvement

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Thank you.

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