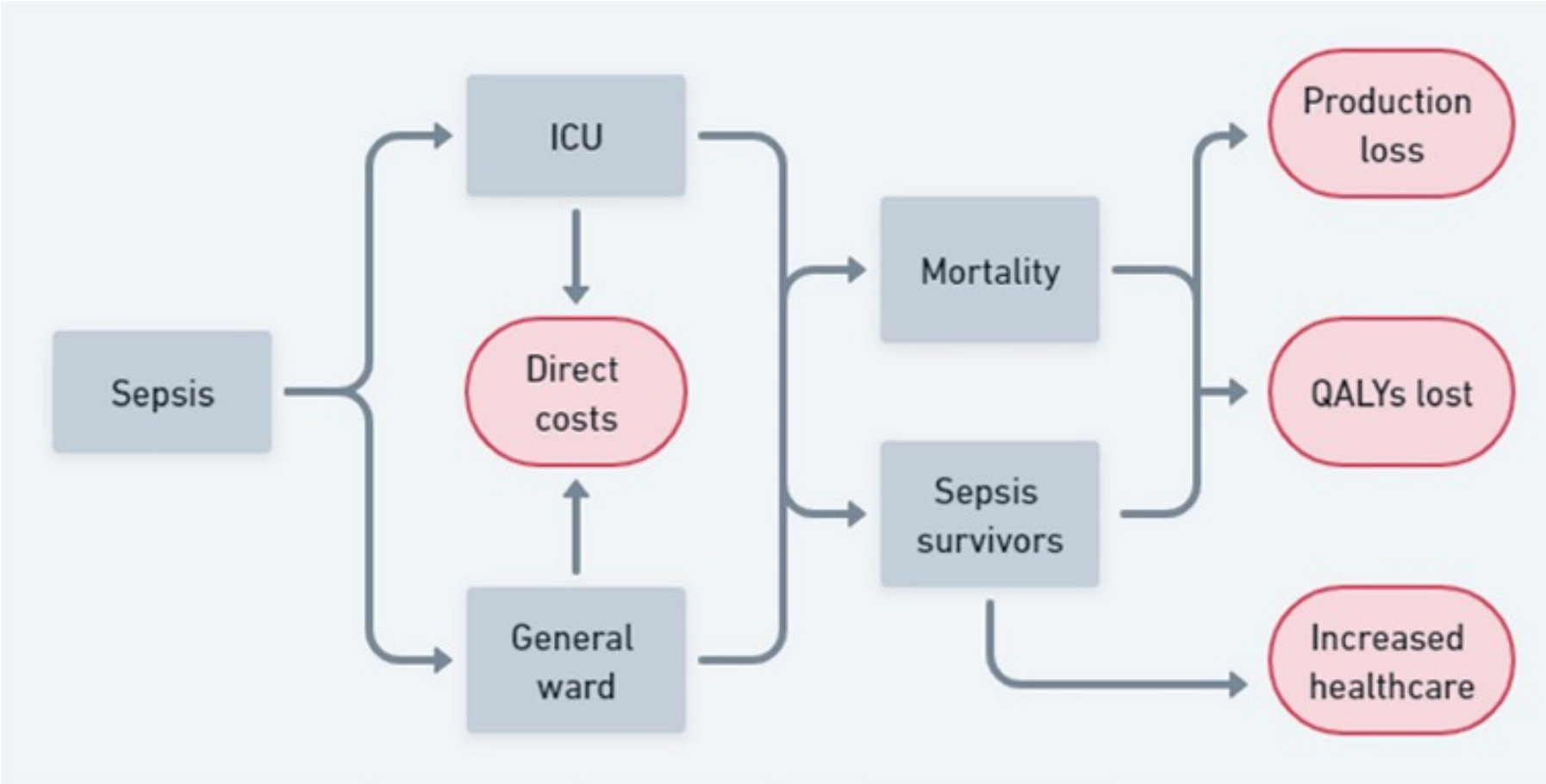
UWTASP

tele-antimicrobial stewardship program

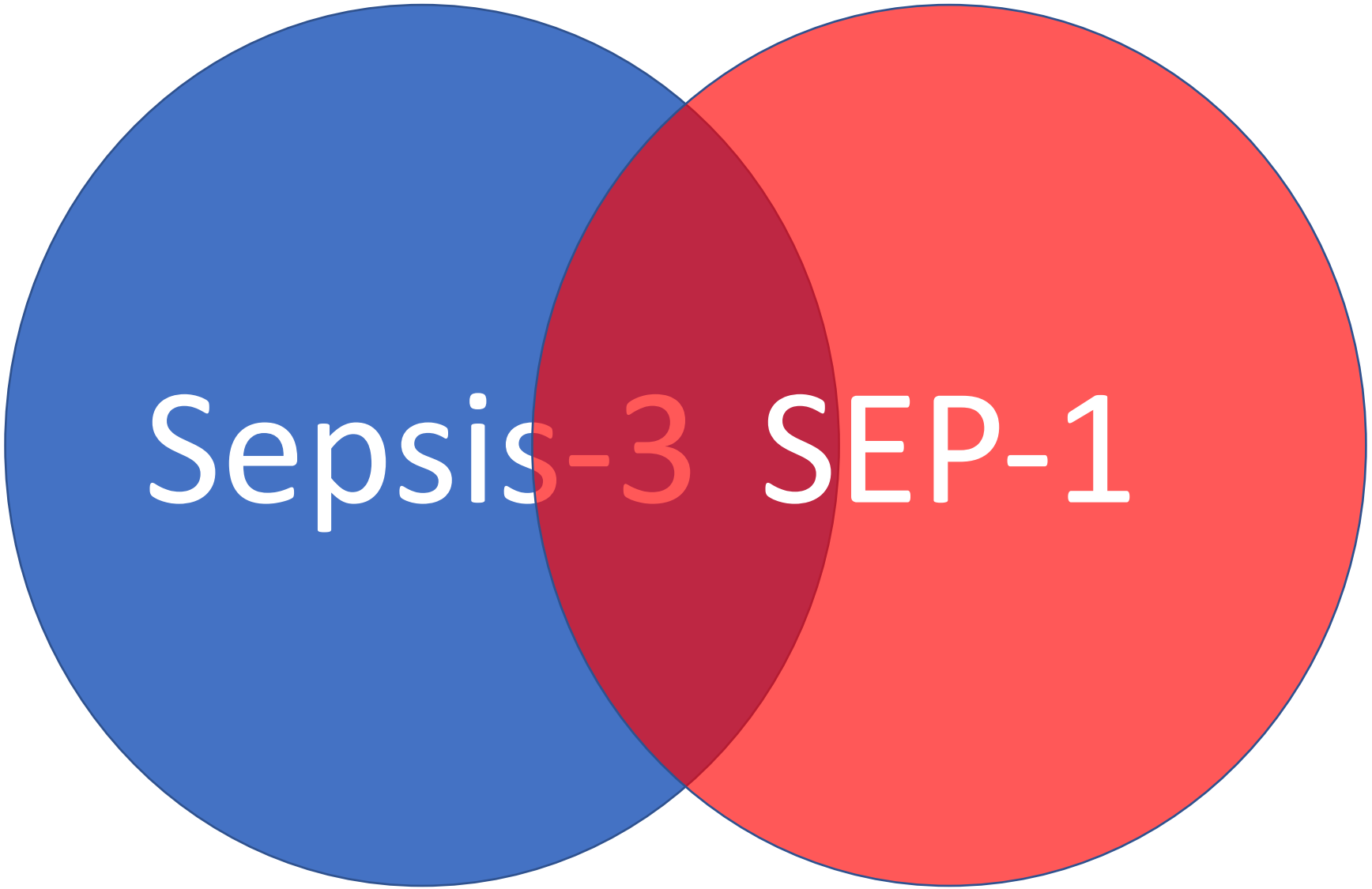
January 30th, 2024

Announcements
Didactic: *Sepsis*
Case Question Convo

The Complex Costs of Sepsis



https://doi.org/10.1186/s13054-024-04816-3


Sepsis-3
SEP-1

Sepsis-3

Sepsis Words

Sepsis-3

- "..life threatening organ dysfunction caused by a dysregulated host response to infection"
- Organ dysfunction = increase in Sequential Organ Failure Assessment score of 2 points or more
- Septic shock = "..profound circulatory, cellular, and metabolic abnormalities…associated with a greater risk of mortality…"

JAMA. 2016;315(8):801-810. doi:10.1001/jama.2016.0287

doi:10.1001/jamanetworkopen.2021.38823 (Gesten and Evans)

Sepsis Words

- Sepsis-3
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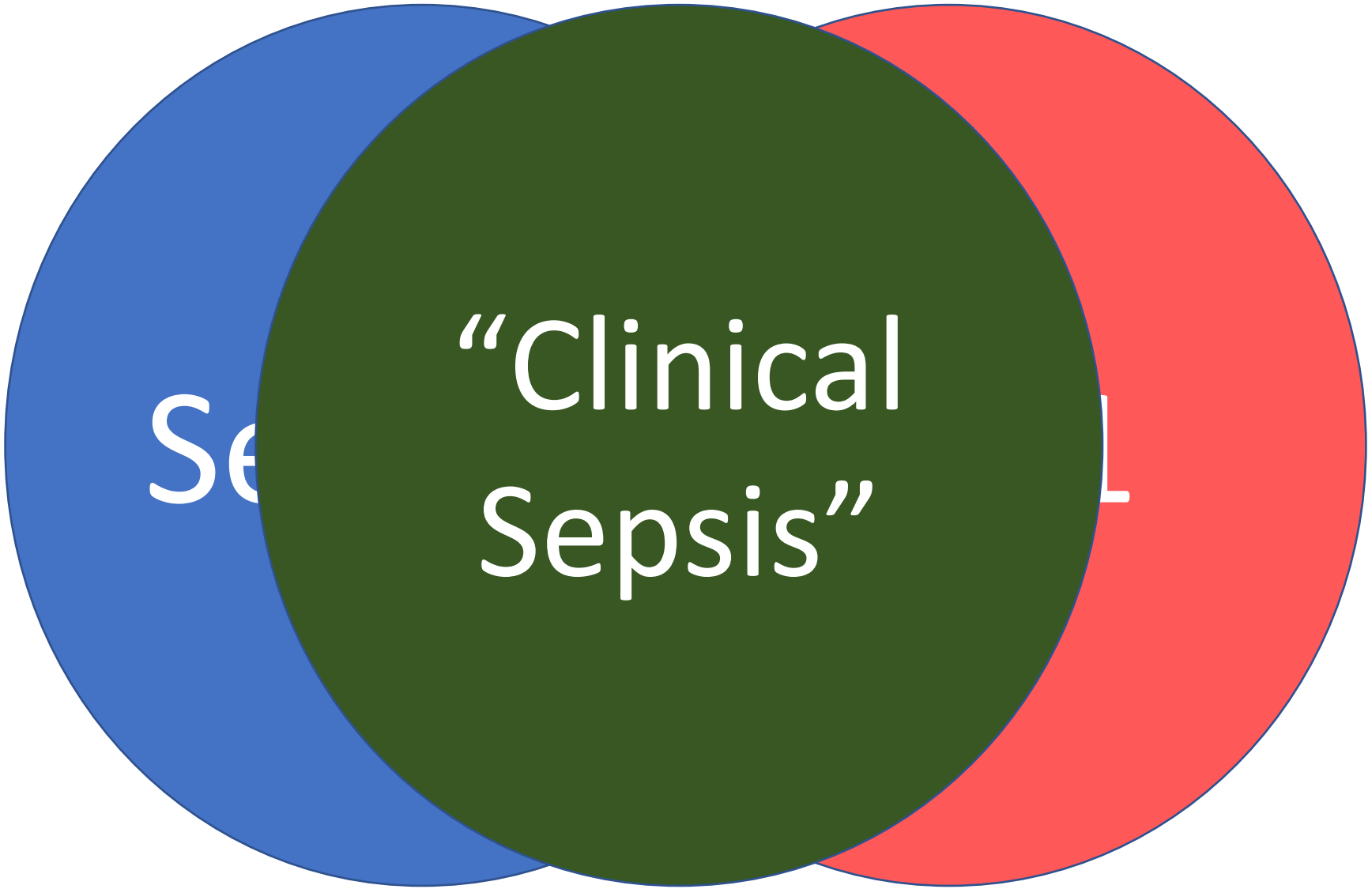
- **SEP-1**
  - The Severe Sepsis and Septic Shock Bundle (6 elements)
  - CMS reporting element (PFR 2018, **PFP 2024**)

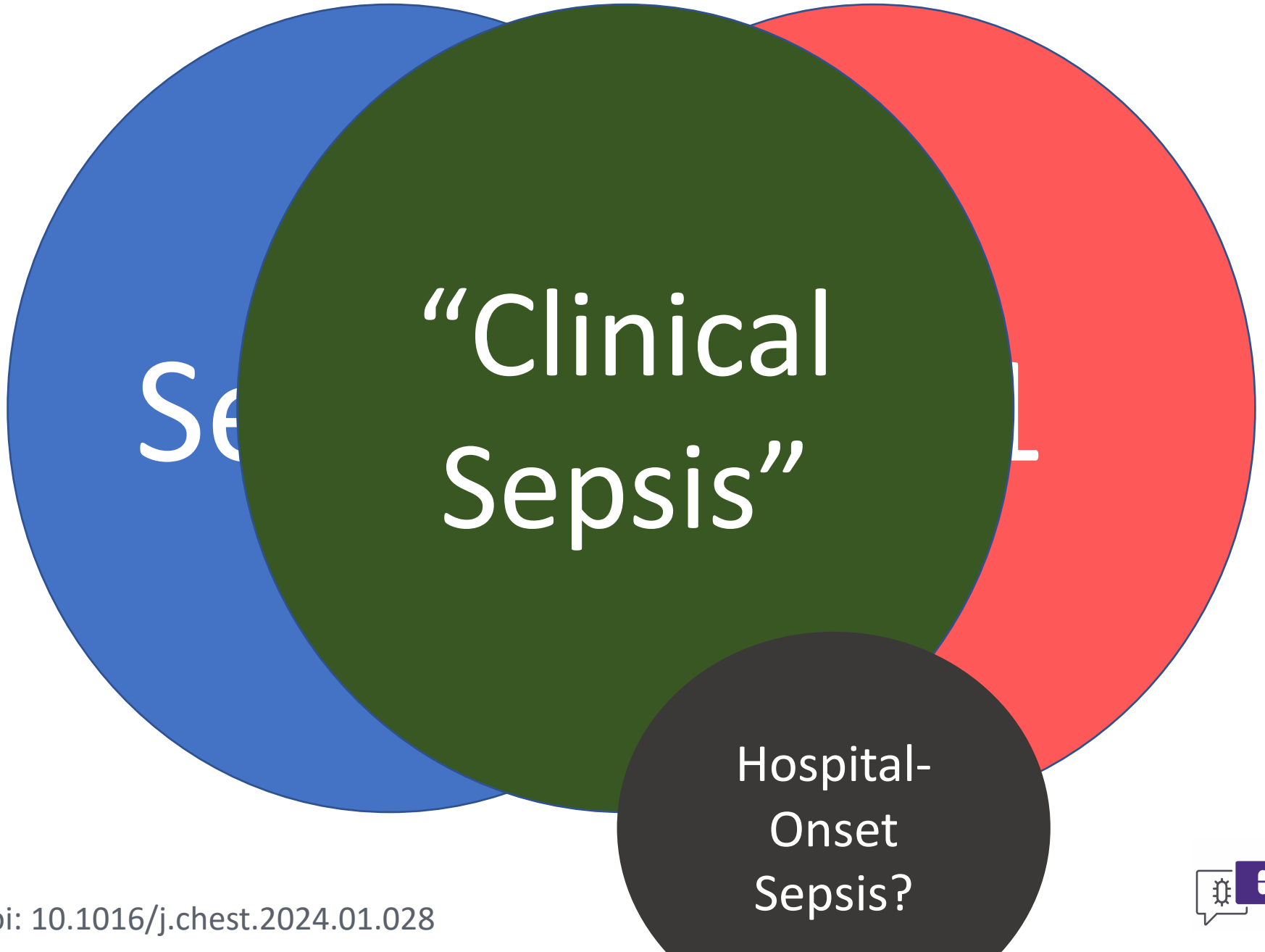
JAMA. 2016;315(8):801-810. doi:10.1001/jama.2016.0287

SEP-1 Bundle

- Severe sepsis (within 3 hours)
  - Blood cultures
  - Antimicrobials
  - Lactate (repeat if >2 w/in 6 hours)
  - IV fluids: 30 mL/Kg for hypotension or lactate >=4)
- Septic shock (within 3-6 hours)
  - Pressors for persistent hypotension (w/in 3 hours)
  - Volume reassessment

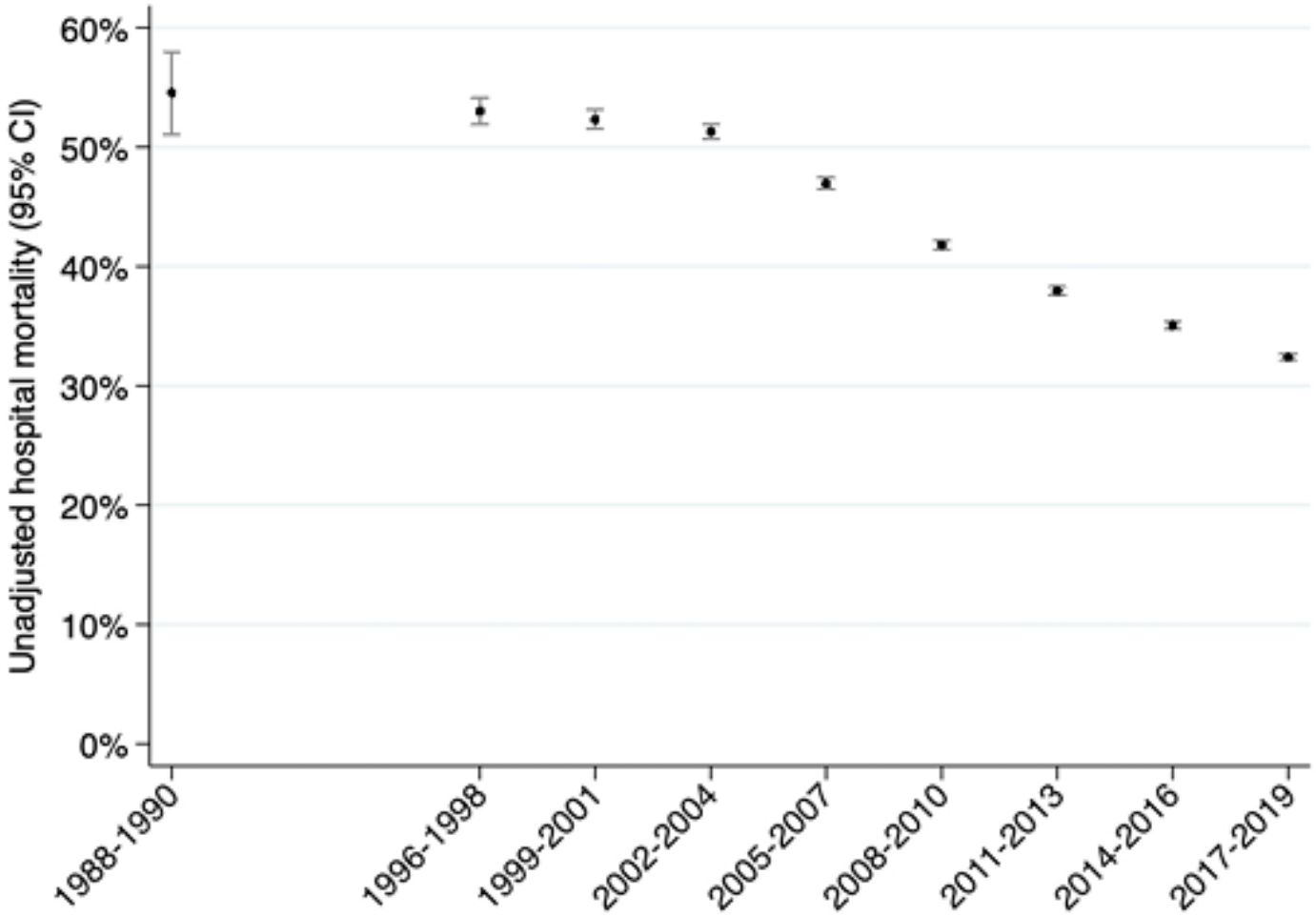
Pro/Con: JAMA. 2016;315(8):801-810. doi:10.1001/jama.2016.0287


Se
“Clinical Sepsis”



doi: 10.1016/j.chest.2024.01.028

ICU Sepsis Mortality in the UK



DOI: 10.1164/rccm.202309-1636OC

A Few Hot Topics

citations

Hot (and Unanswered) Topics in Sepsis

Clinical questions

Top Clinical Priorities
What is the best strategy for screening and identification of patients with sepsis? Can predictive modeling be used in real-time to assist recognition of sepsis?
Organ injury and dysfunction in sepsis: what cause it, how to define, how to detect?
How should fluid resuscitation be individualized? (Initial and beyond)?
What is the best vasopressor approach for treating the different phases of septic shock?
Can a personalized/precision medicine approach identify optimal therapies to improve patient outcomes?

DOI: 10.1097/CCM.0000000000006135

Other Clinical Priorities
Should immunosuppressed patients be included in surviving sepsis campaign recommendations?
Does obesity affect sepsis outcomes? Obese patients can be subclassified based on their metabolic health. Does metabolic health (obese healthy/obese not healthy) affect outcomes?
What is the ideal hemodynamic monitoring tool (or association of tools/clinical signs/biomarkers) to apply to septic shock patients (beyond mean arterial pressure)?
How to better define right ventricular failure, for which therapeutic consequence (fluids, vasopressors, respiratory settings)?
How to better characterize LV systolic dysfunction? Do we need to treat LV systolic dysfunction, and if so, for which subgroups of patients and which treatment (dobutamine, norepinephrine, other inotropes, ECMO venoarterial...)?
Can epinephrine be used as an inotropic agent?
How is bacterial sepsis different than viral, fungal or parasitic sepsis?
What mechanisms underlie sepsis-induced cellular and subcellular dysfunction?
Are there methods to determine the status of the immune response (pro vs. anti-inflammatory) to guide precision therapy?
How to induce immunity after sepsis? Can the immune system be modulated post-sepsis to reduce risk for recurrent sepsis?
How do sepsis-induced changes in endocrine activity affect inflammation? Do they contribute to a state of excessive inflammation? To immunosuppression?
Does reversing immunosuppression improve sepsis outcomes?
Can we diagnose infection rapidly upon presentation? What is the role of molecular testing in the early phase and beyond?
Should new antibiotics be reserved for targeted treatment of empiric therapy?
Should antifungal drugs be included in the treatment of patients with multiple organ failure without clinical improvement and negative cultures?
Does any o_2 saturation target to be achieved in patients with sepsis/septic shock exist?
Should the use of ECMO be indicated in patients with acute respiratory distress syndrome with sepsis and MOF?
What are the indications for noninvasive (noninvasive ventilation or high-flow oxygen therapy) and invasive respiratory support in patients with sepsis/septic shock? Does it affect outcome?
What are the optimal targets/endpoints for resuscitation? How to determine the time point where individual organs have reached their capacity (to cope) and organ support is needed?
What is the global burden of morbidity and mortality from sepsis?
Should sepsis definition operationalization be different depending on resources?
What is the role of multilevel omics and other biomarkers in the diagnosis and treatment of sepsis?
How to monitor vascular permeability in clinical practice?
Do racial and socioeconomic inequities contribute to sepsis outcomes? If so, how?
Is there a room for antagonist of interleukin-6 receptor?
Is there a room for systematic corticosteroids in sepsis-related pneumonia?
Is Grading of Recommendations Assessment, Development, and Evaluation still the best system to evaluate the evidence and to produce guidelines?
What interventions in the ICU/hospital will lead to better long-term sepsis outcomes? How do therapies during the acute phase of sepsis affect intermediate and long-term outcomes (morbidity and mortality)? What are the best tools to screen for new morbidity (functional impairment, cognitive impairment) after sepsis? What should be the ideal rehabilitation program after hospital discharge of a severe episode of sepsis or septic shock?
Should studies "about sepsis" actually demonstrate organ dysfunction?

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Hot (and Unanswered) Topics in Sepsis

Corticosteroids in sepsis

Corticosteroids in Sepsis and Septic Shock

Recommendation

1A) We suggest administering corticosteroids to adult patients with septic shock (conditional recommendation, low certainty).
1B) We recommend against administration of high dose/short duration corticosteroids (defined as > 400 mg/d of hydrocortisone equivalent for < 3 d) for adult patients with septic shock (strong recommendation, moderate certainty).

***Remark*:**

We make no recommendation for corticosteroid use in pediatric patients with sepsis.

Septic shock	Hydrocortisone 200 mg IV per day (continuous infusion or divided every 6 hr) with or without fludrocortisone 50 µg enteral daily for 7 d or until ICU discharge[a]

DOI: 10.1097/CCM.0000000000006171

Hot (and Unanswered) Topics in Sepsis

Prediction models

Hot (and Unanswered) Topics in Sepsis

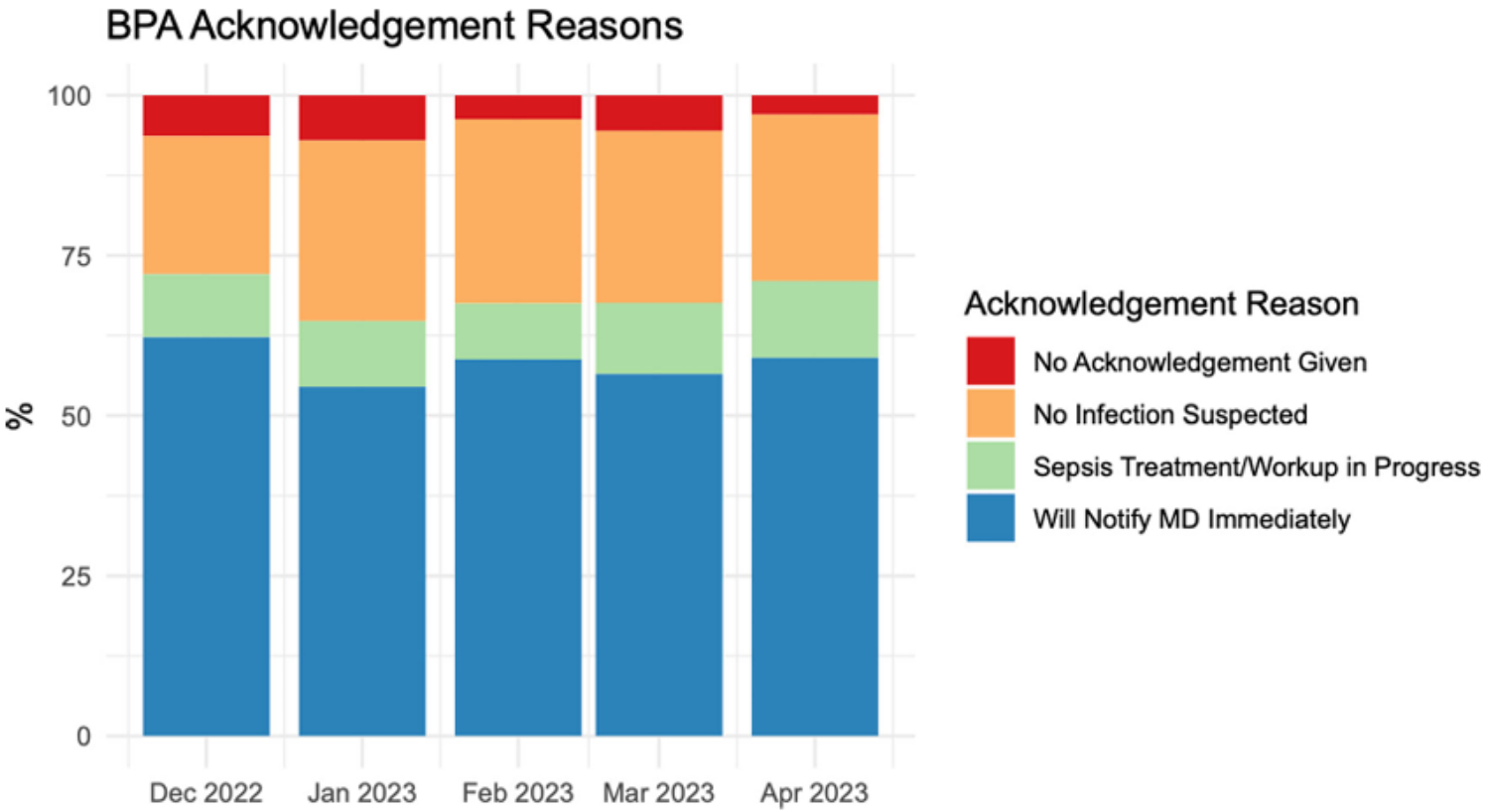

Fig. 1 Acknowledgements to Each COMPOSER Best Practice Advisory alert from December, 2022 until April, 2023.

doi: 10.1038/s41746-023-0098doi: 10.1038/s41746-023-00986-66-6

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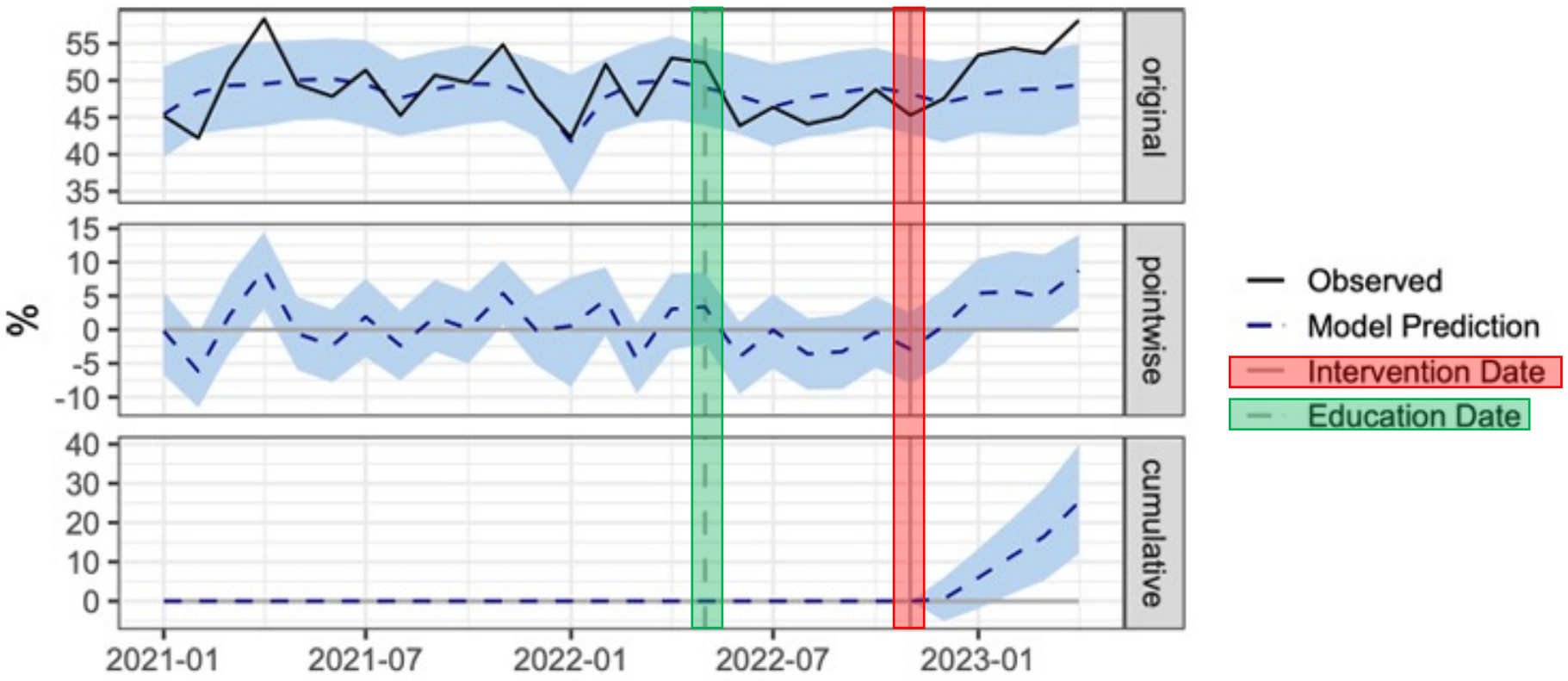

doi: 10.1038/s41746-023-0098doi: 10.1038/s41746-023-00986-66-6

Programs, QI, and Reporting

citations

NHSN
NATIONAL HEALTHCARE SAFETY NETWORK

Form Approved
OMB No. 0920-0666
Exp. Date: 12/31/24
www.cdc.gov/nhsn

Patient Safety Component—Annual Hospital Survey

Instructions for this form are available at: http://www.cdc.gov/nhsn/forms/instr/57_103-TOI.pdf

Sepsis Management and Practices

*59. Our facility has a program or committee charged with monitoring and improving sepsis care and/or outcomes.

☐ Yes ☐ No

59a. If Yes: The responsibilities of this committee include the following: (Check all that apply; check at least one)

- ☐ Developing and updating hospital sepsis guidelines
- ☐ Developing and updating hospital sepsis order sets
- ☐ Monitor and review compliance with Centers for Medicare & Medicaid SEP-1 measure
- ☐ Monitor and review effectiveness of early sepsis identification strategies
- ☐ Monitoring and reviewing management of patients with sepsis
- ☐ Monitor and review outcomes among patients with sepsis
- ☐ Monitor and review antimicrobial use in sepsis in conjunction with antimicrobial stewardship or infectious disease staff
- ☐ Providing education to hospital staff on sepsis
- ☐ Setting annual goals for sepsis management and/or outcomes
- ☐ None of the above

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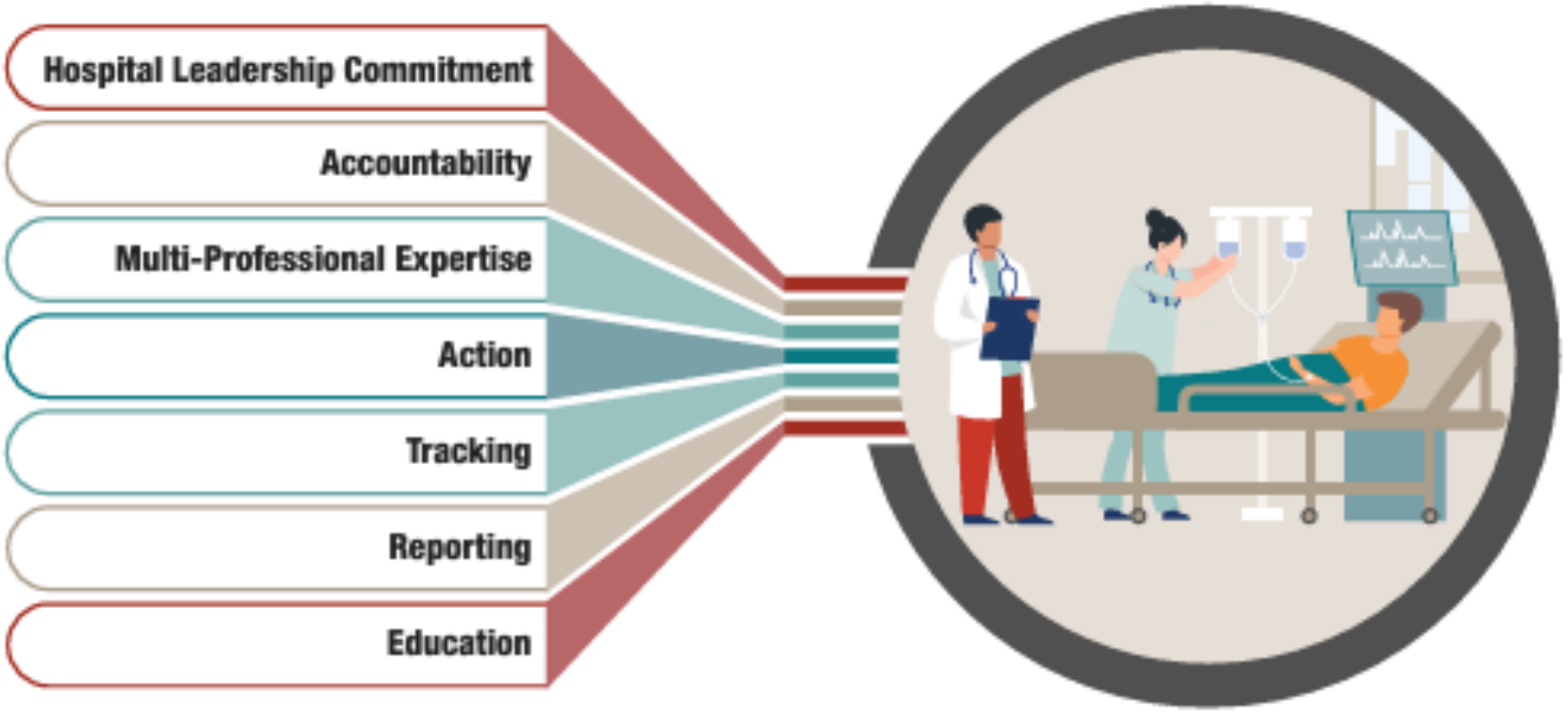
https://www.cdc.gov/nhsn/forms/57.103_pshospsurv_blank.pdf

https://www.cdc.gov/sepsis/pdfs/sepsis-core-elements-H.pdf

Figure: Hospital Sepsis Program Core Elements



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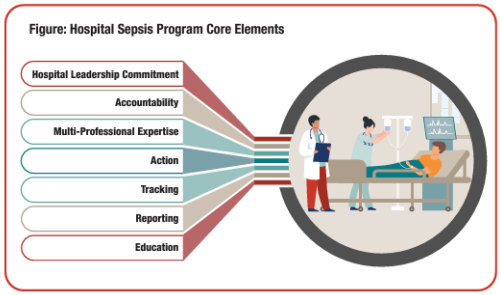


Hospital Sepsis Program Core Elements

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.

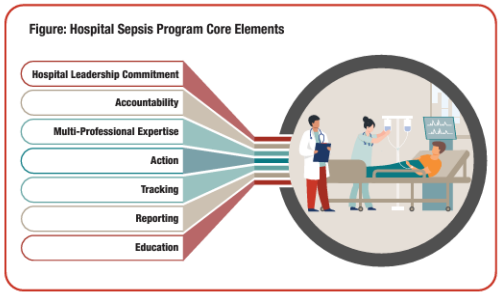
Reporting

Providing information on sepsis management and outcomes to relevant partners.

Education

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

https://www.cdc.gov/sepsis/pdfs/sepsis-core-elements-H.pdf



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Antibiotic Stewardship and Sepsis

There have been some misperceptions that antibiotic stewardship may hinder efforts to improve management of sepsis. However, rather than hindering effective patient care, antibiotic stewardship programs can play an important role in optimizing the use of antibiotics, leading to better patient outcomes. It is possible for hospitals to make simultaneous improvements in sepsis management and antimicrobial stewardship.[42]

https://www.cdc.gov/sepsis/pdfs/sepsis-core-elements-H.pdf

Questions/Discussion

Get Ahead of Sepsis – Know the Risks. Spot the Signs. Act Fast. | Patient Safety | CDC

Costs of Sepsis

- Higher mortality (short- and long-term)
- Longer length of stay
- More interventions
- Increased risk of long-term mortality
- Reduced Quality of Life (QoL)
- Economic burden

CATEGORY	PRIORITY	CONCEPT	EXAMPLE
Sepsis epidemiology	**Priority**	Community-onset sepsis	**Numerator:** Hospitalizations meeting criteria for sepsis within 48 hours of arrival to hospital or emergency department **Denominator:** All hospitalizations not admitted through inter-hospital transfer
Sepsis epidemiology	**Priority**	Hospital-onset sepsis	**Numerator:** Hospitalizations meeting criteria for sepsis after 48 hours of arrival to hospital or emergency department **Denominator:** All hospitalizations
Sepsis epidemiology	**Priority**	Sepsis (without shock)	**Numerator:** Hospitalizations meeting criteria for sepsis without shock **Denominator:** All hospitalizations
Sepsis epidemiology	**Priority**	Septic shock	**Numerator:** Hospitalizations meeting criteria for sepsis and criteria for shock **Denominator:** All hospitalizations
Sepsis epidemiology	Additional	Sepsis transfers out	**Numerator:** All hospitalizations meeting criteria for sepsis whose hospital discharge disposition was to another acute care hospital **Denominator:** Al hospitalizations meeting criteria for sepsis
Sepsis epidemiology	Additional	Sepsis transfers in	**Numerator:** All hospitalizations meeting criteria for sepsis who were admitted as an inter-hospital transfer **Denominator:** Al hospitalizations meeting criteria for sepsis
Sepsis epidemiology	Additional	Community-onset sepsis in special population(s)	**Numerator:** Hospitalizations among special population meeting criteria for sepsis within 48 hours of arrival to hospital or emergency department **Denominator:** All hospitalizations among special population (e.g., neonatal, pediatric, obstetric, oncology, transplant)

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Sepsis epidemiology	Additional	Hospital-onset sepsis in special population(s)	**Numerator:** Hospitalizations meeting criteria for sepsis after 48 hours of arrival to hospital or emergency department **Denominator:** All hospitalizations among special population (e.g., neonatal, pediatric, obstetric, oncology, transplant)
Sepsis epidemiology	Additional	Sepsis site(s) of infection	**Numerator:** Hospitalizations meeting criteria for sepsis with a specific site of infection (e.g., pneumonia, genitourinary, gastrointestinal, neurologic, skin/soft tissue, bacteremia, endocarditis, etc.) **Denominator:** Hospitalizations meeting criteria for sepsis
Sepsis epidemiology	Additional	Sepsis pathogen(s)	**Numerator:** Hospitalizations meeting criteria for sepsis with a specific pathogen identified (e.g., staph aureus, MRSA, etc.) **Denominator:** Hospitalizations meeting criteria for sepsis
Sepsis epidemiology	Additional	Surgical sepsis	**Numerator:** Hospitalizations meeting criteria for sepsis with a surgical or interventional procedure for source control **Denominator:** Hospitalizations meeting criteria for sepsis
Sepsis management	**Priority**	Time-to-antimicrobial in community-onset sepsis with hypotension	**Measure:** Time from emergency department or hospital arrival to time of administration of systemic antimicrobial therapy **Eligibility:** Hospitalizations meeting criteria for community onset sepsis, with evidence of hypotension on presentation (e.g., SBP<90, MAP<65, or initiated on systemic vasopressor therapy), without a viral cause of infection (e.g., influenza, COVID-19), and without intravenous antimicrobial therapy prior to hospital arrival.
Sepsis management	**Priority**	Time from antibiotic order to administration	**Measure:** Time from first antimicrobial order to first administration of systemic antimicrobial therapy **Eligibility:** Hospitalizations meeting criteria for sepsis and not admitted as an inter-hospital transfer and not on intravenous antimicrobial therapy prior to arrival

https://www.cdc.gov/sepsis/pdfs/sepsis-core-elements-H.pdf