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SURVIVING SEPSIS UPDATES: 2021

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What is Sepsis?

Mechanism

- **Life-threatening** organ dysfunction
- Dysregulated response to infection

Common organisms:

- *Staph aureus*
- *Pseudomonas aeruginosa*

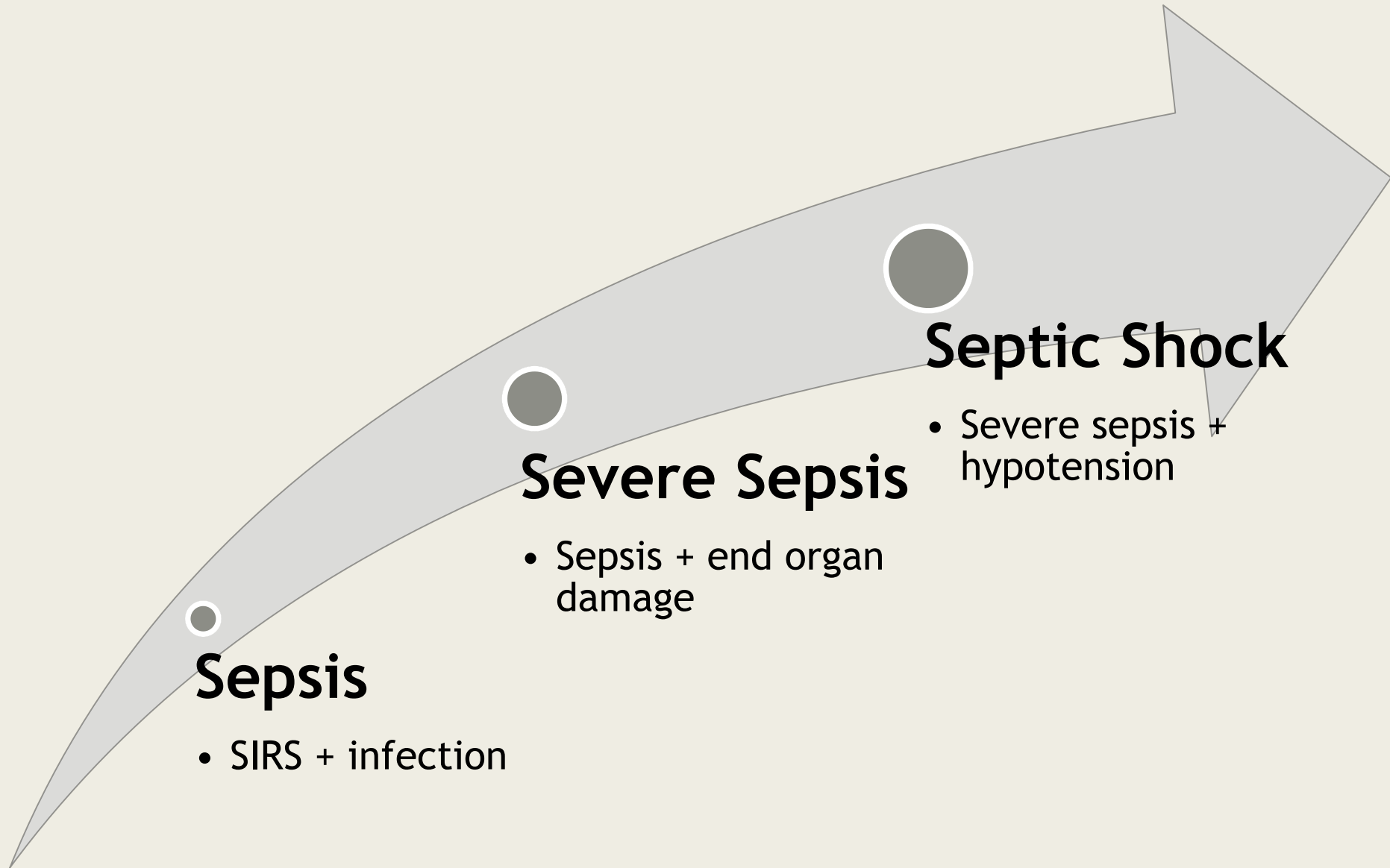
SIRS Criteria:

Body temperature: $>38^{\circ}\text{C}$ or $<36^{\circ}\text{C}$

Heart rate: >90 beats per minute

Tachypnea: manifested by a respiratory rate >20 breaths per minute or a PaCO_2 of <32 mmHg

White blood cell count: $>12,000/\text{mm}^3$ or $<4,000/\text{mm}^3$, or the presence of $>10\%$ immature neutrophils



Septic Shock

Mechanism

- Sepsis with underlying circulatory, cellular, and metabolic changes
- Inadequate oxygen delivery to the body

Symptoms:

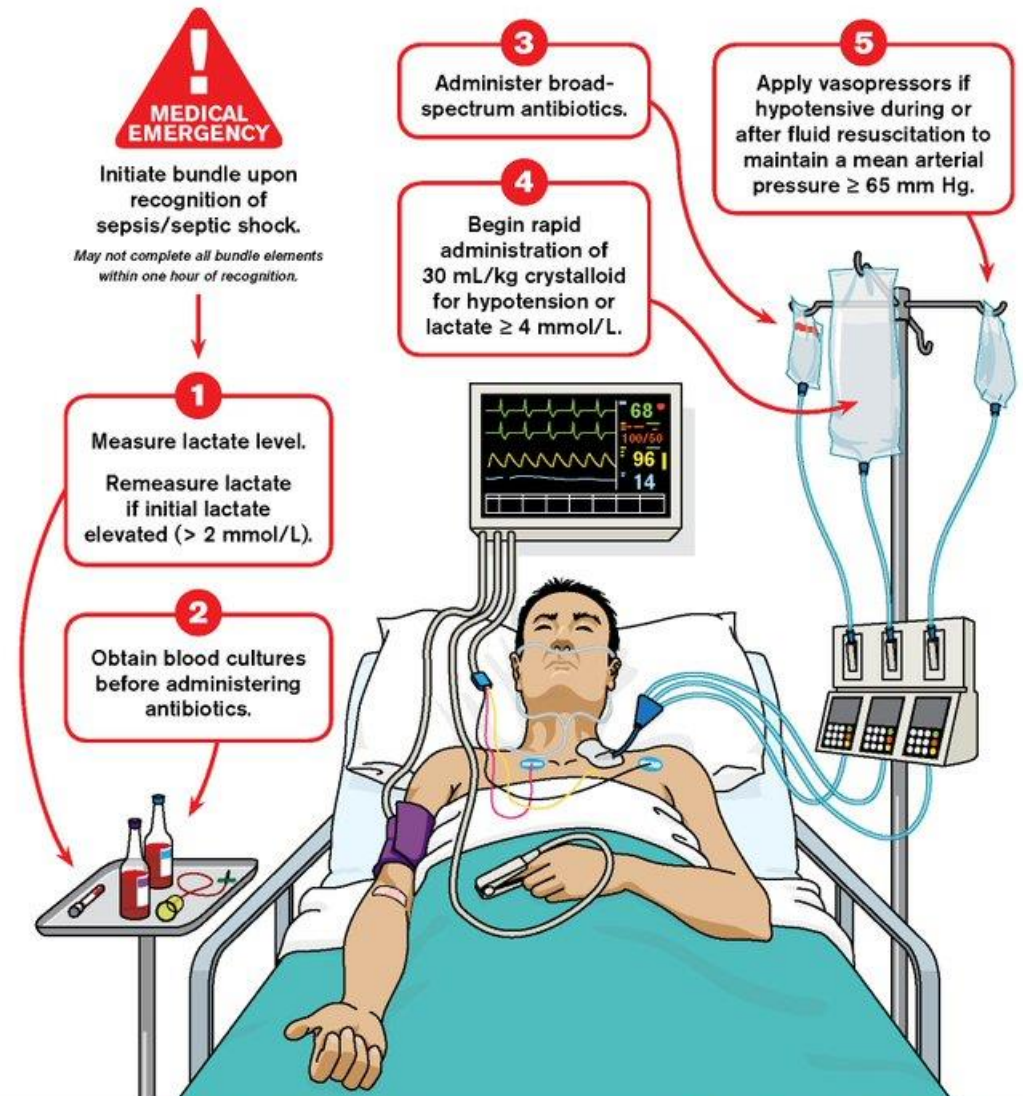
- Signs of sepsis
- Persistent hypotension needing vasopressors
- Lactate of >2 mmol/L despite appropriate fluids

SURVIVING SEPSIS CAMPAIGN, 2018

Hour-1 Bundle

Initial Resuscitation for Sepsis and Septic Shock

Surviving Sepsis
Campaign



Bundle: [SurvivingSepsis.org/Bundle](https://www.survivingsepsis.org/Bundle)

Complete Guidelines: [SurvivingSepsis.org/Guidelines](https://www.survivingsepsis.org/Guidelines)

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Surviving Sepsis Guidelines: 2021

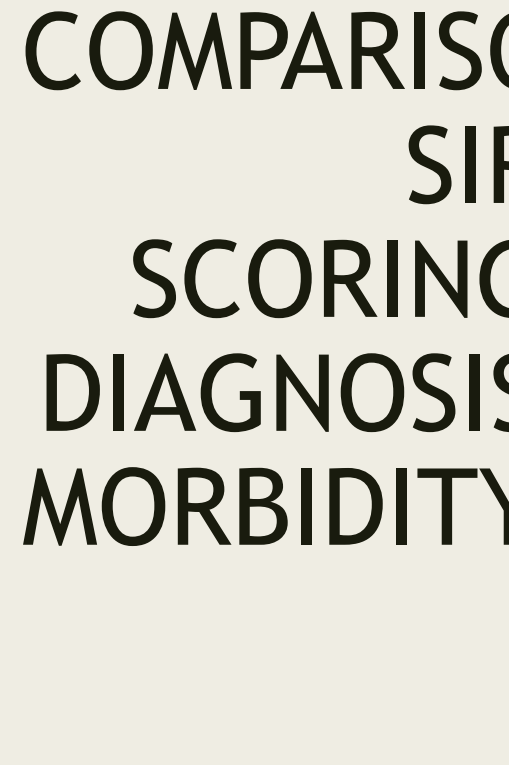


Sepsis Screening


2021 Recommendation

We recommend against using qSOFA compared with SIRS, NEWS, or MEWS as a single-screening tool for sepsis or septic shock.

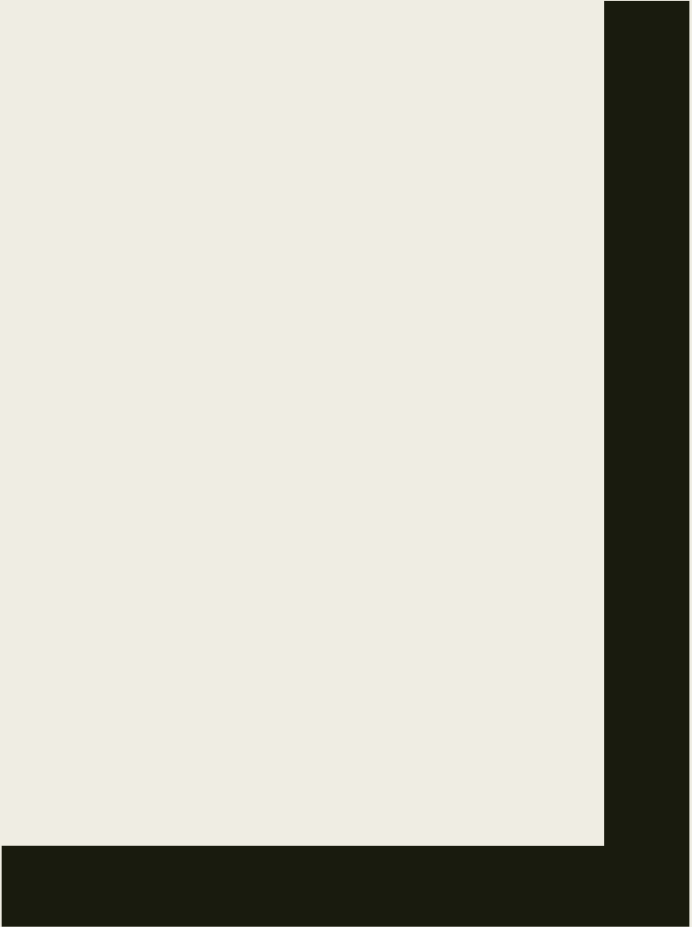




COMPARISON OF QSOFA,
SIRS, AND NEWS
SCORING SYSTEM FOR
DIAGNOSIS, MORTALITY,
MORBIDITY OF SEPSIS IN
EMERGENCY
DEPARTMENT

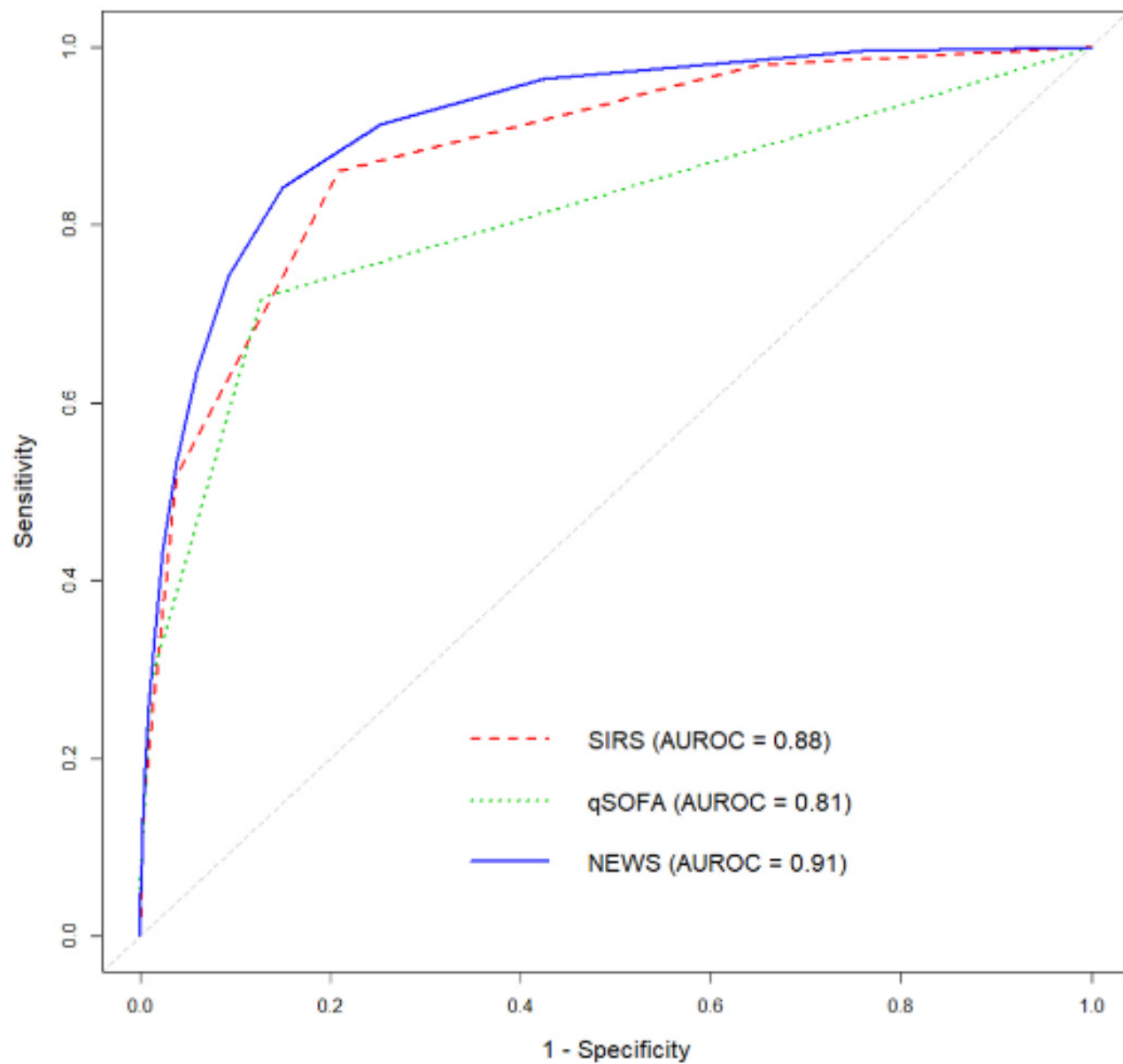


Oduncu A.F. et al. *American Journal of Emergency
Medicine*. 2021;48:54-59



	SIRS	qSOFA	NEWS
Temperature	X		X
Heart rate	X		X
Blood pressure		X	X
Respiratory rate	X	X	X
Oxygen saturation			X
Use of supplemental oxygen			X
Mental status		X	X
Leukocyte count	X		

Severe Sepsis or Septic Shock (SS/SS)



How much fluid should a patient with sepsis be resuscitated with?

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Fluid Resuscitation



2016 Recommendation	2021 Recommendation
<p data-bbox="486 401 1090 815">We recommend that in the resuscitation from sepsis-induced hypoperfusion, at least 30 mL/kg of IV crystalloid fluid be given within the first 3 hours.</p>	<p data-bbox="1485 372 2137 836">For patients with sepsis-induced hypoperfusion or septic shock we suggest that at least 30 mL/kg of IV crystalloid fluid should be given within the first 3 hours of resuscitation.</p>
<p data-bbox="461 901 1090 1286">We suggest using either balanced crystalloids or saline for fluid resuscitation of patients with sepsis or septic shock.</p>	<p data-bbox="1485 901 2104 1286">For adults with sepsis or septic shock, we suggest using balanced crystalloid instead of normal saline for resuscitation.</p>

Which of the following is a balanced crystalloid?

0.9% Normal Saline

Plasma-Lyte

Dextrose 5%

Albumin

None of the above

Infection

2016 Recommendation

“We recommend that administration of IV antimicrobials should be initiated as soon as possible after recognition and within 1 hr for both a) septic shock and b) sepsis without shock”




“We recommend that administration of intravenous antimicrobials should be initiated as soon as possible after recognition and within one hour for both a) septic shock and b) sepsis without shock”

2021 Recommendation

For adults with possible septic shock or a high likelihood for sepsis, we recommend administering antimicrobials immediately, ideally within 1 hr of recognition.

For adults with possible sepsis without shock, we suggest a time-limited course of rapid investigation and if concern for infection persists, the administration of antimicrobials within 3 hr from the time when sepsis was first recognized.

For adults with a low likelihood of infection and without shock, we suggest deferring antimicrobials while continuing to closely monitor the patient.

	 Shock is present	 Shock is absent
Sepsis is definite or probable	<input checked="" type="checkbox"/> Administer antimicrobials immediately , ideally within 1 hour of recognition.	<input checked="" type="checkbox"/> Administer antimicrobials immediately , ideally within 1 hour of recognition.
Sepsis is possible	<input checked="" type="checkbox"/> Administer antimicrobials immediately , ideally within 1 hour of recognition.	<input checked="" type="checkbox"/> Rapid assessment* of infectious vs. noninfectious causes of acute illness.
<p><i>*Rapid assessment includes history and clinical examination, tests for both infectious and noninfectious causes of acute illness, and immediate treatment of acute conditions that can mimic sepsis. Whenever</i></p>		<input checked="" type="checkbox"/> Administer antimicrobials within 3 hours if concern for infection persists.

TIMING OF ANTIBIOTIC

S



What patient risk factors put them at an increased risk for MRSA infections?

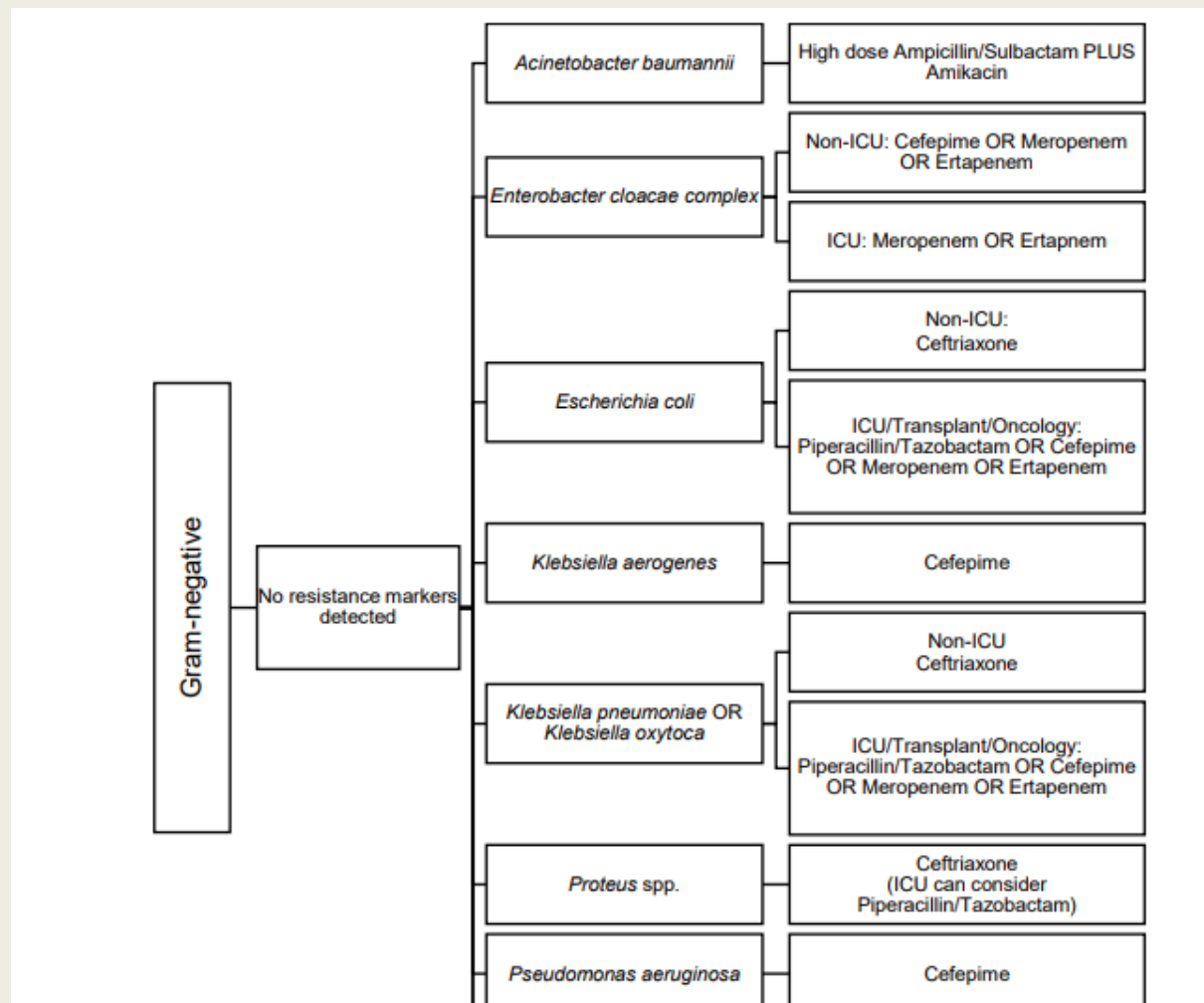
Antibiotic Choice



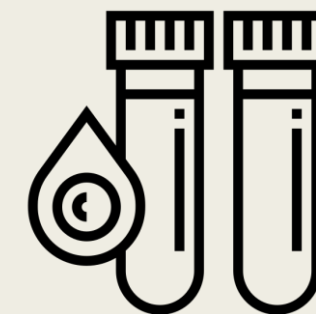
MRSA Risk Factors	Fungal Risk Factors	Multi-Drug Resistance (MDR) Factors
<ul style="list-style-type: none">• Prior history of MRSA• Recent IV antibiotics• History of recurrent skin infections or chronic wounds• Presence of invasive devices• Hemodialysis• Recent hospital admission	<ul style="list-style-type: none">• History of a fungal infection• Immunosuppression• Neutropenia• PWID• Presence of invasive devices• Hemodialysis	<ul style="list-style-type: none">• History of MDR within the preceding year• Hospital acquired infection• Broad spectrum antibiotics within 90 days• Hospitalization within 90 days

MRSA: Methicillin resistant *Staph aureus*

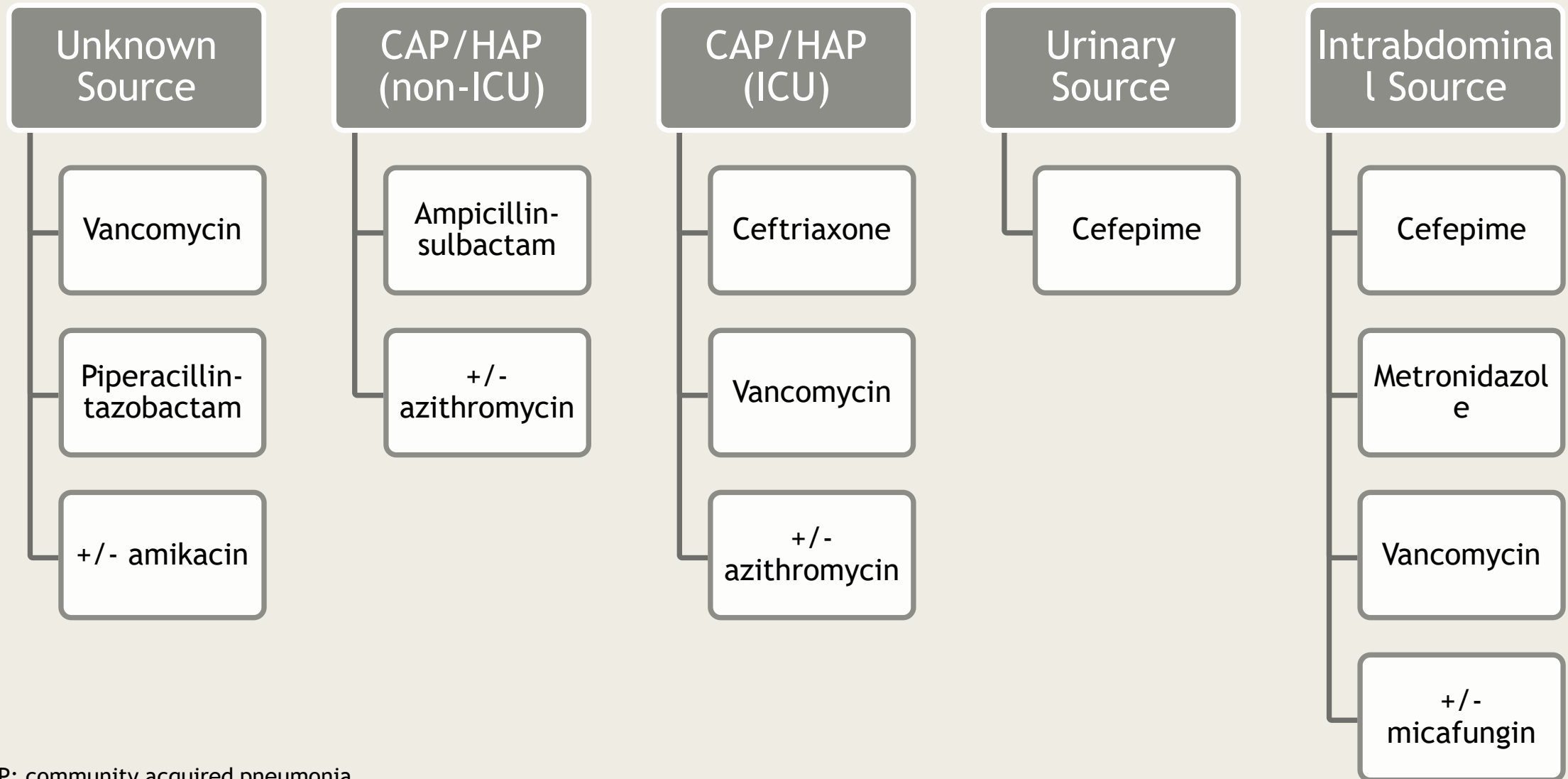
PWID: persons who inject drugs



BIOFIRE ALGORITHMS



UMMC Sepsis Order Set Updates



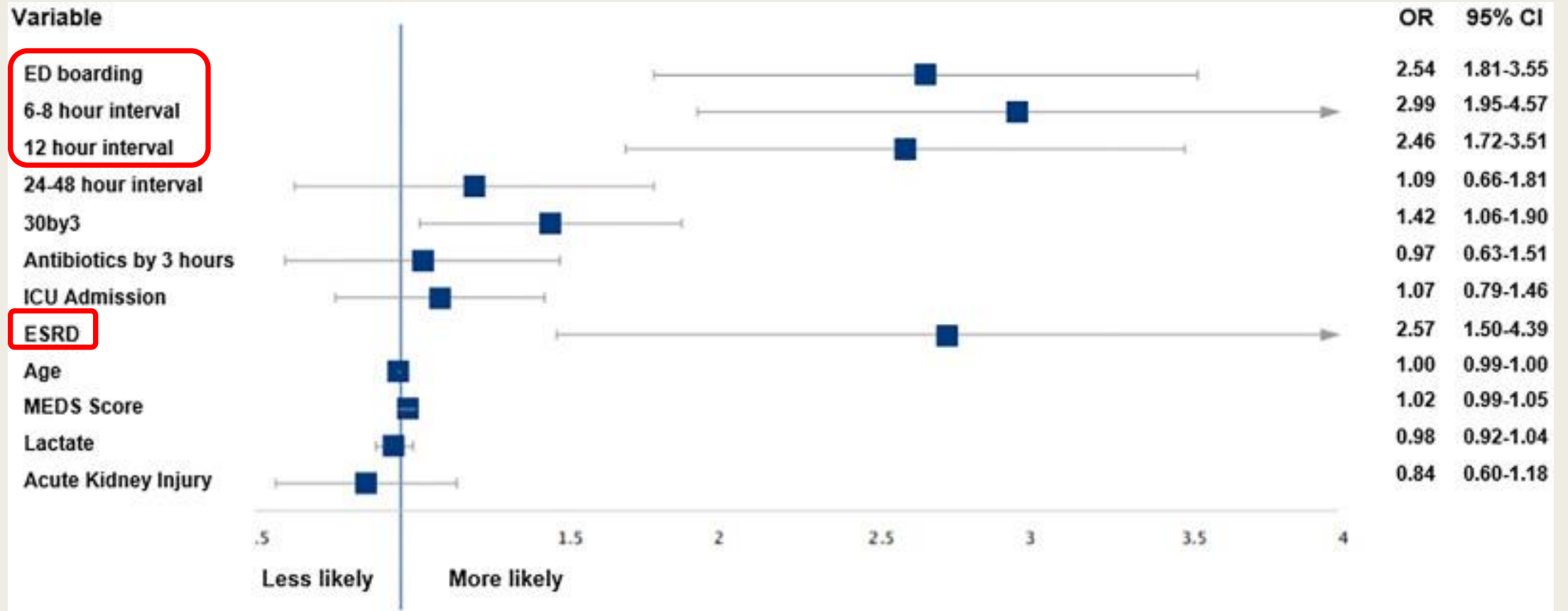
CAP: community acquired pneumonia
HAP: hospital acquired pneumonia

THE EFFECT OF DELAYS IN SECOND-DOSE ANTIBIOTICS ON PATIENTS WITH SEVERE SEPSIS AND SEPTIC SHOCK

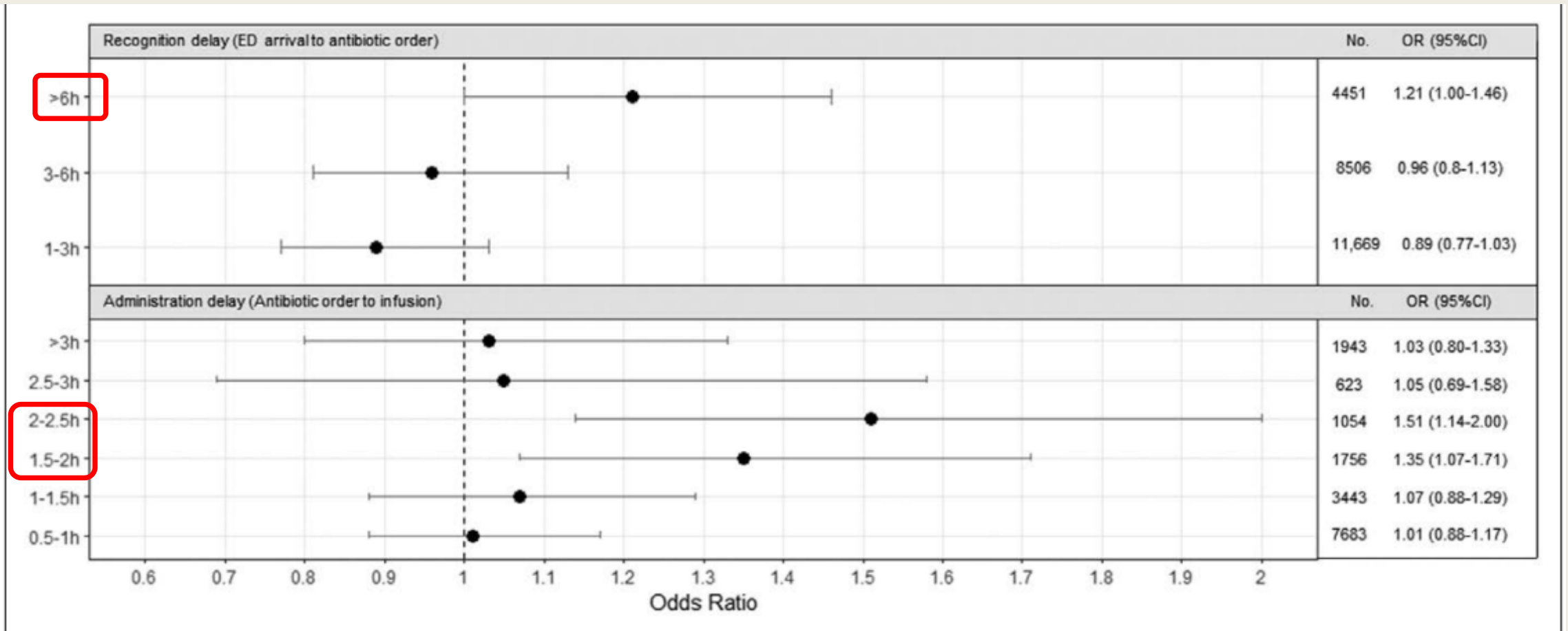


Lykins J.D. et al. *American Journal of Emergency Medicine.*
2021; 47:80-85

Study Design	<p>Retrospective analysis over 2 years</p> <p>Included 1075 patients - Timely (740 patients) and delayed (355 patients)</p>
Objectives	Determine predictors of delay and impact on outcomes in septic patients
Methods	<p>Patients presenting to the ED with severe sepsis or septic shock within 8h of arrival</p> <p>Each case reviewed by a physician to assess for infection related organ dysfunction</p>
Limitations	<p>No causal relationships</p> <p>Unknown reasons for antibiotic delays</p> <p>Retrospective</p>



Delays in 1st dose antibiotics does affect mortality...



When poll is active, respond at pollev.com/emilyvonbulo945

Text **EMILYVONBULO945** to **37607** once to join



Which of the following is the first line vasopressor used for patients with septic shock?

Norepinephrine

Epinephrine

Vasopressin

Dopamine

Dobutamine

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Hemodynamic Management

2021 Recommendation

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



Additional Therapies



2016 Recommendations	2021 Recommendations
<p data-bbox="517 596 1047 886">“We suggest against using IV hydrocortisone to treat septic shock patients if adequate fluid resuscitation and vasopressor therapy are able to restore hemodynamic stability (see goals</p>	<p data-bbox="1352 654 2211 811">For adults with septic shock and an ongoing requirement for vasopressor therapy we suggest using IV corticosteroids.</p>
	<p data-bbox="1378 1058 2211 1168">For adults with sepsis or septic shock we suggest against using IV vitamin C.</p>

Support After Sepsis

2021 Recommendation

For adult survivors of sepsis or septic shock and their families, we suggest referral to peer support groups over no such referral.



What issues or challenges do you see with implementing these new guidelines into your institution?

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Updates at UMMC...



Sepsis task force

Diagnostic stewardship

Antibiotic choice
and timing

Anti fungal use

Thank you!

- Emily Heil, PharmD, MS, BCIDP, AAHIVP
- Mande Noval, PharmD, BCIDP
- Ashley Martinelli, PharmD, BCCCP





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