2-2024

Sepsis

Children's Mercy Kansas City

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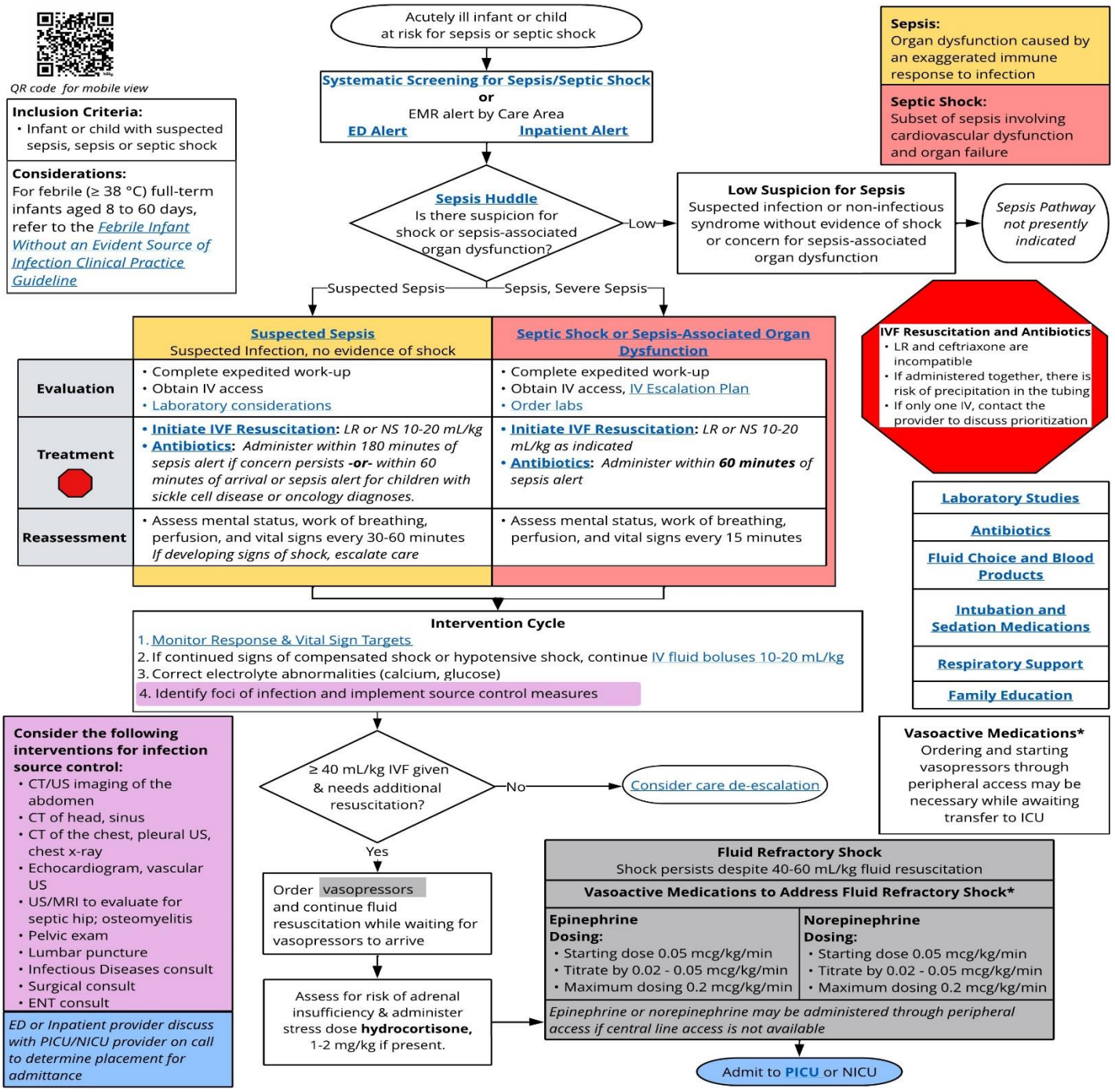
Sepsis
Care Process Model Synopsis

Sepsis: ED, Inpatient Algorithm



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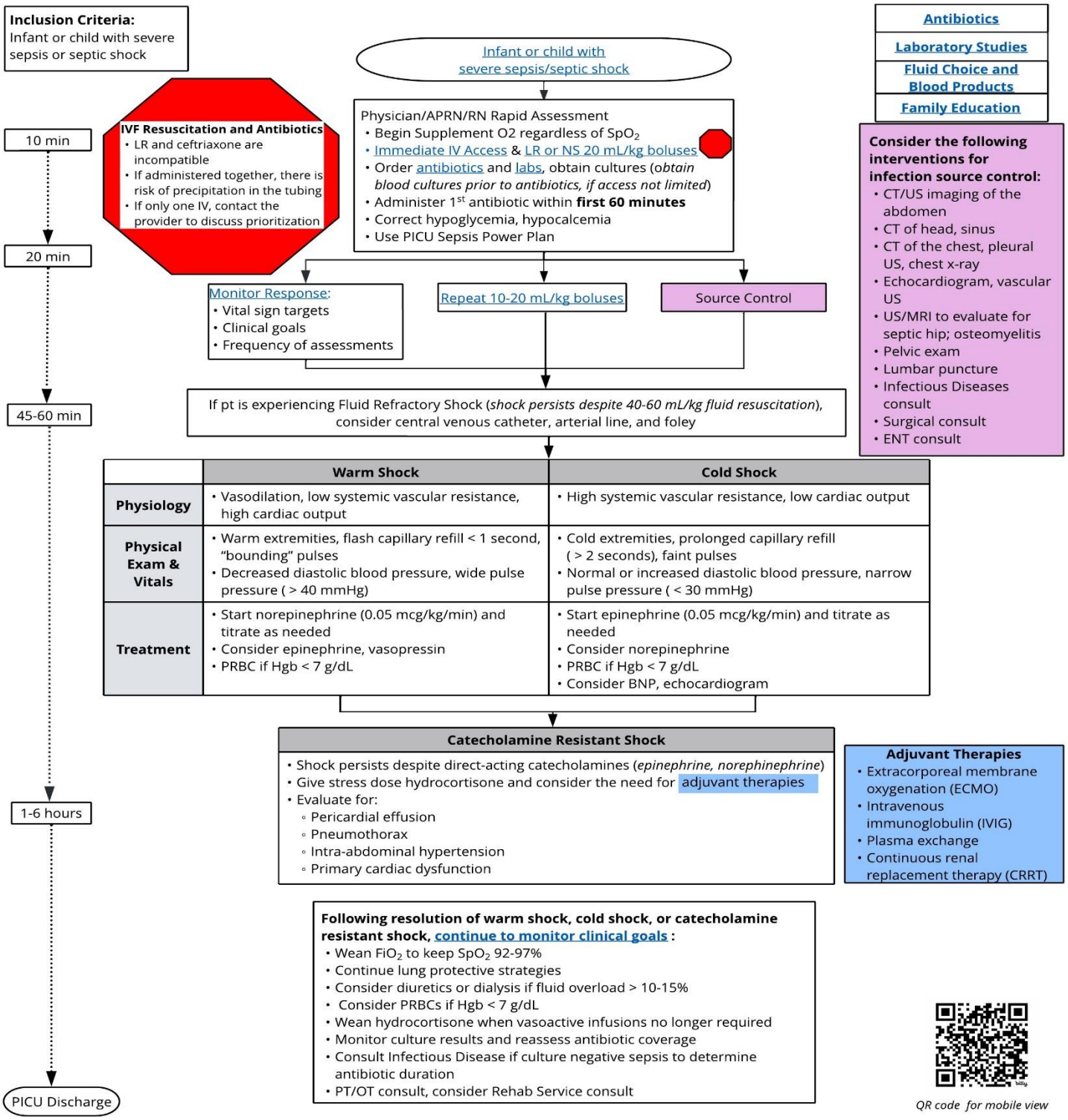
Sepsis: PICU Algorithm



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Objective of Care Process Model

The objective of the Sepsis Care Process Model (CPM) is to provide care standards for the infant or child with suspected sepsis, sepsis, or septic shock. The Sepsis CPM provides guidance regarding recommended evaluation, treatment, and reassessment to minimize variation in care.

Background

Sepsis, a life-threatening condition involving organ dysfunction caused by an exaggerated immune response to infection, is estimated to occur at a rate of 158.7 cases per every 100,000 children in the United States (Watkins, L.A., 2019). More than 75,000 of these cases develop severe sepsis, including septic shock each year, in which one or more organ systems fail (Balamuth et al., 2014; Watkins, L.A., 2019). For up to 20% of the children diagnosed with sepsis, particularly if requiring admittance to the intensive care unit, mortality is the outcome (Balamuth et al., 2014; Watkins, L.A., 2019).

Mortality, for children experiencing sepsis, is often associated with refractory shock, multiple organ dysfunction syndrome, or a combination of both (Watkins, L.A., 2019; Weiss et al., 2020). Early recognition, initial resuscitation, and ongoing management are critical to sepsis survivorship (Weiss et al., 2020). The Sepsis CPM aims to provide an evidence-based pathway which provides guidance for early recognition, initial resuscitation, ongoing management, stabilization, and resolution which are critical to optimizing outcomes.

Target Users

- Physicians (Emergency Department, Critical Care Medicine, Urgent Care, Neonatology, Hospital Medicine, Infectious Diseases, Hematology/Oncology, Fellows, Resident Physicians, Community Physicians)
- Nurse Practitioners
- Nurses
- Pharmacy

Target Population

Inclusion Criteria

- Infant or child with suspected sepsis, sepsis, or septic shock

Considerations

- For febrile (≥ 38°C) full term infants aged 8 to 60 days, consider referring to the *Febrile Infant Without an Evident Source of Infection Clinical Practice Guideline*

AGREE II

The Surviving Sepsis Campaign International Guidelines for the Management of Septic Shock and Sepsis-Associated Organ Dysfunction in Children (Weiss et al., 2020) provided guidance to the Sepsis CPM committee. See Table 1 for AGREE II.

Table 1

AGREE II[a] Summary for the Surviving Sepsis Campaign Guidelines (Weiss et al., 2020)

Domain	Percent Agreement	Percent Justification^
Scope and purpose	100%	The aim of the guideline, the clinical questions posed, and the target populations **were** identified.
Stakeholder involvement	99%	The guideline **was developed** by the appropriate stakeholders and represents the views of its intended users.
Rigor of development	85%	The process used to gather and synthesize the evidence, the methods to formulate the recommendations, and to update the guidelines **were** explicitly stated.
Clarity and presentation	93%	The guideline recommendations **are** clear, unambiguous, and easily identified; in addition, different management options are presented.
Applicability	61%	The guideline **did not fully** address implementation barriers and facilitators, utilization strategies, or resource costs associated with implementation.
Editorial independence	98%	The recommendations **were not** biased by competing interests.

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Overall guideline assessment	89%
See Practice Recommendations	

Note: Four EBP Scholars completed the AGREE II on this guideline.
^Percentage justification is an interpretation based on the Children's Mercy EBP Department standards.

Practice Recommendations

Please refer to the Surviving Sepsis Campaign International Guidelines for the Management of Septic Shock and Sepsis-Associated Organ Dysfunction in Children (Weiss et al., 2020) for full practice recommendations, evaluation, and treatment recommendations.

Additional Questions Posed by the Sepsis CPM Committee

No clinical questions were posed for this review.

Recommendation Specific for Children's Mercy

Children's Mercy adopted the majority of the practice recommendations made by the Surviving Sepsis Campaign International Guidelines for the Management of Septic Shock and Sepsis-Associated Organ Dysfunction in Children (Weiss et al., 2020). Variations/Additions include:

- Antibiotic recommendations were made in consideration of the guidance provided for the empiric antimicrobial treatment by the Children's Hospital Association's Improving Pediatric Sepsis Outcomes (IPSO) Collaborative Infectious Disease Workgroup and Antimicrobial Recommendations Working Group (2018, 2022).

Measures

- Utilization of the Sepsis CPM
- Utilization of the Sepsis-associated power plans
- Time to fluids
- Time to antibiotics
- Sepsis Huddle completion for patient with sepsis alert

Value Implications

The following improvements may increase value by reducing healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families and reducing costs and resource utilization for healthcare facilities.

- Decreased risk of overdiagnosis
- Decreased risk of overtreatment (i.e., treatment for meningitis when treatment for urinary tract infection is more appropriate)
- Decreased frequency of admission
- Decreased inpatient length of stay
- Decreased unwarranted variation in care
- Decreased morbidity and mortality

Potential Organizational Barriers and Facilitators

Potential Barriers

- Identification and diagnosis of sepsis
- Variability of an acceptable level of risk among providers

Potential Facilitators

- Collaborative engagement across care continuum settings during Sepsis CPM development
- High rate of use of Sepsis CPM
- Standardized order set for Emergency Department, Hospital Medicine, and Pediatric Intensive Care

Diversity/Equity/Inclusion
Our aim is to provide equitable care. These issues were discussed with the Committee, reviewed in the literature, and discussed prior to making any practice recommendations.

Power Plans
- EDP Sepsis
- Sepsis Inpatient CPG
- PICU Sepsis
- ICN Sepsis
    - The Sepsis Care Process Model does not address care provided in the ICN.

Associated Policies
- Vital Signs (2021)

Education Materials
- The Sepsis CPM has no associated educational materials

Care Process Preparation
This product was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Sepsis CPM Committee composed of content experts at Children's Mercy Kansas City. The development of this product supports the Quality Excellence and Safety initiative to promote care standardization that is evidenced by measured outcomes. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Sepsis CPM Committee Members and Representation
- Leslie Hueschen, MD | Hospital Sepsis Director & Emergency Department | Committee Chair
- Jay Rilinger, MD | Critical Care Medicine | Committee Member
- Josh Herigon, MD, MPH, MBI | Infectious Diseases | Committee Member
- Lauren Kirkpatrick, MD | Hospital Medicine | Committee Member
- Margaret Boyden, MD | Hematology/Oncology/BMT | Committee Member
- Priya Tiwari, MD | Neonatology | Committee Member
- Grace Arends, MD | Pediatric Emergency Medicine | Committee Member
- Christopher Kaberline, MBA, RRT-NPS, CPHQ | Quality and Safety | Committee Member
- Jolene Palmer, MSN, RN, CPN | Quality and Safety | Committee Member

EBP Committee Members
- Todd Glenski, MD, MSHA, FASA | Anesthesiology, Evidence Based Practice
- Kelli Ott, OTD, OTR/L | Evidence Based Practice
- Kori Hess, PharmD | Evidence Based Practice

Care Process Model Development Funding
The development of this care process model was underwritten by the following departments/divisions: Emergency Department, Critical Care Medicine, Infectious Diseases, Hospital Medicine, Hematology/Oncology/BMT, Neonatology, Pediatric Emergency Medicine, Quality and Safety, Evidence Based Practice.

Conflict of Interest
The contributors to the Sepsis CPM have no conflicts of interest to disclose related to the subject matter or materials discussed in this care process.

Approval Process
- This product was reviewed and approved by the Sepsis Committee, Content Expert Departments/Divisions, and the EBP Department; after which they were approved by the Medical Executive Committee.
- Products are reviewed and updated as necessary every 3 years within the EBP Department at CMKC. Content expert teams are involved with every review and update.

Review Requested

Department/Unit	Date Obtained
Emergency Department	May 2023
Critical Care Medicine	May 2023
Infectious Diseases	May 2023
Hospital Medicine	May 2023
Hematology/Oncology/BMT	May 2023
Neonatology	May 2023
Pharmacy, Infectious Diseases	May 2023
Evidence Based Practice	May 2023

Version History

Date	Comments
April 2017	Version one (ED, Inpatient, PICU algorithms and power plans developed)
June 2023	Version two (ED, Inpatient, PICU algorithms and power plans revised, Sepsis Synopsis developed)
February 2024	Version three (ED, Inpatient, PICU algorithms revised to include LR and ceftriaxone incompatibility information)

Date for Next Review:

- June 2026

Implementation & Follow-Up

- Once approved, the care process was presented to appropriate care teams and implemented. Care measurements will be assessed and shared with appropriate care teams to determine if changes need to occur.
- Order sets/power plans consistent with recommendations were created or updated for each care setting.
- Additional institution-wide announcements were made via email, hospital website, and relevant huddles.
- Metrics will be assessed and shared with appropriate care teams to determine if changes need to occur.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the guideline and the power plans that accompany the guideline.

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