JOHNS HOPKINS ALL CHILDREN'S HOSPITAL

Pediatric Sepsis Clinical Pathway

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Owners: Diana Young, MD, Courtney Titus, PA-C

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Pediatric Sepsis Clinical Pathway

Rationale

This clinical pathway was developed by a consensus group of Johns Hopkins All Children's Hospital (JHACH) physicians, advanced practice providers, nurses and pharmacists to standardize the recognition and management of children presenting with clinical signs of sepsis. It addresses the following clinical questions or problems:

1. When to evaluate for pediatric sepsis
2. How to define sepsis and septic shock

Background

Pediatric sepsis is a common cause of morbidity and mortality in the United States. It accounts for over 75,000 pediatric inpatient admissions annually, is associated with a mortality rate of 5 to 20%, and results in decreased functional status in approximately one-third of survivors. (Ames 2018)

In the past, pediatric sepsis management was based on adaptations from adult management however recent efforts have suggested that the unique physiologic factors in pediatric patients may contribute to different outcomes. Timely early recognition of pediatric sepsis has been identified as a crucial step in sepsis management, and so this clinical pathway was developed as an adaptation from several sources to improve the care of pediatric patients presenting with signs of sepsis at Johns Hopkins All Children's Hospital.

Definitions

The definition of sepsis has evolved over time and now many advocate defining sepsis by organ dysfunction rather than by a systemic inflammatory response (SIRS). Specifically, the Third International Consensus Definitions for Sepsis and Septic Shock (Balamuth 2022) stresses that sepsis is a function of 4 variables, namely:

(1) threat to life
(2) organ dysfunction (using pSOFA score)
(3) dysregulated host response
(4) presence of highly suspected or documented infection

Pediatric Sequential Organ Failure Assessment (pSOFA) is a scoring tool that is used to identify organ dysfunction in the Sepsis-3 definition. (Balamuth 2022) While pSOFA is a reasonable definition for organ dysfunction in sepsis, it has not been found to be a sensitive screening tool for sepsis. Rather, pSOFA has been shown to be a predictor for severity of illness and in-hospital mortality. At JHACH we use Sepsis-2 criteria (SIRS criteria plus a suspected or

identified source) as the basis of screening for sepsis because it is more sensitive for recognizing sepsis, despite lacking specificity for sepsis. (Weiss, 2020)

Pediatric Early Warning Systems (PEWS) are nursing-administered clinical acuity tools associated with escalation algorithms used to improve the early identification of clinical deterioration in hospitalized patients. There are numerous published PEWS tools which vary in accuracy predicting deterioration; some have been successfully validated in multicenter trials, and across various subspecialty populations. Hospital implementation of the PEWS tool and escalation algorithm (rescue system triggering a physician assessment or rapid response team) has been shown to decrease rates of cardiopulmonary arrest outside of the Pediatric Intensive Care Unit (PICU), severity of illness on PICU transfer, PICU utilization, and overall hospital mortality. (Agulnik 2017) Partnering PEWS as a tool to identify early, acute clinical deterioration with a sepsis recognition tool may assist providers in identifying if a patient's acute clinical deterioration is sepsis related.

Sepsis Definitions Tables

	Definition	ICD10 codes
Sepsis	Life-threatening organ dysfunction caused by a dysregulated host response to infection	R65.20
Septic Shock	A subset of sepsis with circulatory and cellular/metabolic dysfunction that is associated with a higher risk of mortality	R65.21

Fluid Refractory Shock	Persistent shock despite at least 40–60 ml/kg of fluid resuscitation in the first hour (Martin 2015). Consider patients at risk for fluid overload.
Catecholamine Refractory Shock	Shock that persists despite 60 ml/kg of fluid and escalating doses of vasoactive infusions (Martin 2015)

Process Definitions Tables

Sepsis Screen	An electronic health record (EHR)-based form used to identify patients at risk for sepsis adapted from the *Pediatric Septic Shock Collaborative Patient Identification Tool*.
Sepsis Score	A numerical score calculated by assessing for abnormal vital signs and physical exam findings. This scoring system is adapted from the *Pediatric Septic Shock Collaborative Patient Identification Tool* and modified to decrease over-triggering based on unit demographics.
Sepsis Trigger	A patient that generates a BPA (best practice advisory) which identifies them as being at risk for sepsis based on their sepsis score. This varies by the unit based on their sepsis score. See *Unit-Based Positive Sepsis Trigger Scoring Table*.
Sepsis Huddle	A multidisciplinary bedside evaluation occurs after a patient is identified as being at risk for sepsis or with a positive sepsis trigger. The goal of clear communication is that the provider determines the Sepsis Huddle Outcome (Continue Routine Care, Sepsis Watcher, or Sepsis Alert) and relays the next steps in the medical care plan to the nursing team.
Sepsis Alert	A patient at risk for sepsis with impending clinical deterioration. Blood cultures will be obtained and fluid resuscitation and antibiotics will be given within the hour.
Sepsis Watcher	A patient at-risk for sepsis without impending clinical deterioration. Further evaluation is recommended. A BPA is triggered in 45 minutes for the care team to re-huddle and reassess the patient.
Continue Routine Care	A patient who does not meet sepsis criteria after a clinical evaluation (Sepsis Huddle) or does not require further intervention along the Sepsis Pathway. Does not trigger BPA for re-huddle.

**IPSO = Improving Pediatric Sepsis Outcomes; BPA = Best Practice Advisory

Sepsis Screening

An electronic health record (EHR)-based form used to identify patients at risk for sepsis adapted from the *Pediatric Septic Shock Collaborative Patient Identification Tool*.

Sepsis screening in children is driven by the premise that earlier recognition will lead to more timely initiation of therapy, which will translate to improved morbidity and/or mortality.

At JHACH, we use an electronic health record (EHR)-based form to identify patients at risk for sepsis adapted from the *Pediatric Septic Shock Collaborative Patient Identification Tool*.

Sepsis screening in children is driven by the premise that earlier recognition will lead to more timely initiation of therapy, which will translate to improved morbidity and/or mortality. Studies demonstrate that an EHR-based screening tool can yield high sensitivity and when coupled with sequential clinician assessment, improved specificity. (Weiss 2020)

Sepsis Screening Criteria and Frequency by Unit

	EC	**PICU/CVICU/ CDH**	**Heme/Onc**	**Med/Surg**
Screening Criteria	Patients with fever **OR** answers **"yes" to ANY** of the following three** triage questions	Every patient is routinely screened	Every patient is routinely screened	Abnormal temperature (< 36 °C or ≥ 38.5 °C) **AND** tachycardia^
Frequency	Positive screening criteria at triage **OR** PRN clinical concerns	Q4 hours **OR** PRN clinical concerns	Q4 hours **OR** PRN clinical concerns	Positive screening criteria **OR** PRN clinical concerns

PRN = as needed

****EC Triage Screening Questions:**

- Recent history of fevers or chills?
- Does the patient have a known infection or signs/symptoms of a new infection?
- Does the patient have altered mental status from baseline?

Sepsis Score

Patients who are screened and are identified as being at risk for sepsis are given a numerical Sepsis Score calculated by assessing for abnormal vital signs and physical exam findings. This scoring system is adapted from the *Pediatric Septic Shock Collaborative Patient Identification Tool* and has been modified at JHACH to decrease over-triggering based on unit demographics.

Sepsis Score by JHACH Unit

	EC	PICU/CVICU/ CDH	Heme/Onc	Med/Surg
Abnormal Temperature*	1	1	1	1
Tachycardia	1	1	1	1
Tachypnea	0	0	1	0
Hypotension	1	3	3	3
Abnormal Mental Status	1	1	1	1
Abnormal Capillary Refill	1	1	1	1
Abnormal Pulse	1	1	1	1
Abnormal Skin Exam	1	1	1	1
High-Risk Condition	1	1	1	1

*Refer to Appendix with EHR Vital Signs & Appendix with JHACH Sepsis Screen Points

The rationale for the difference of points in units:

- Hypotension: Assigning higher values in the EC leads to over-triggering of the sepsis tool due to patients coming in with hypovolemia from reasons other than sepsis like dehydration or emesis.
- Tachypnea: Over-triggering in all other units besides Heme/Onc due to higher rates of admission from respiratory ailments like bronchiolitis or asthma that may not be contributing to sepsis.

High-Risk Conditions (including but not limited to):

- Immunocompromised (acquired or medication-induced), primary immunodeficiency, asplenia, sickle cell anemia, neutropenia
- Central line: peripherally inserted central catheter (PICC), port, or Broviac®
- Malignancy/induction leukemia patient or on chemotherapy, solid organ, or stem cell transplant
- Technology dependent: ventriculoperitoneal (VP) shunt, ventriculoatrial (VA) shunt, feeding tube, tracheostomy, continuous positive airway pressure (CPAP), bilevel positive airway pressure (BiPAP)
- Severe intellectual disability/global developmental delay

Sepsis Trigger

Patients who have been identified as being at-risk for sepsis based on their Sepsis Score or clinical presentation. This varies by unit based on their Sepsis Score. See *Unit Based Positive Sepsis Trigger Scoring Table*.

Unit Based Positive Sepsis Trigger Scoring Table

	EC	PICU/CVICU/CDH	Heme/Onc	Med/Surg
Positive Sepsis Trigger	Sepsis Score $\geq$ 3	Sepsis Score $\geq$ 4	Sepsis Score $\geq$ 4	Sepsis Score $\geq$ 2: Assess for sepsis Sepsis Score $\geq$ 4: Assess for sepsis and call rapid response (RR) to assist with evaluation and management

Sepsis Huddle

A multidisciplinary bedside evaluation which occurs after a patient is identified as being at risk for sepsis or with a positive Sepsis Trigger. The goal of clear communication is that the physician, PA or ARNP determines the Sepsis Huddle Outcome (Continue Routine Care, Sepsis Watcher, or Sepsis Alert) and relays the next steps in the medical care plan to the nursing team.

Per the *2020 Surviving Sepsis Campaign*, for facilities that use an EHR, a step-wise approach combining EHR-triggered alerts followed by clinician assessment has the potential to shorten the time to sepsis recognition. Therefore, once a positive Sepsis Trigger is identified, the goal is to get attending physician, advanced practice providers (APPs), fellows and resident physicians to the bedside as quickly as possible to assess if a patient is at risk for sepsis and escalate sepsis care.

The Improving Pediatric Sepsis Outcomes (IPSO) Collaborative with the Children's Hospital Association (CHA) states **the goal of timeliness to therapeutics for patients with sepsis is one hour**.

	Who Must be Present	Timeliness to Evaluation	Huddle Outcomes
EC	Attending physicians APPs*	Assess the patient within 10 minutes of positive Sepsis Trigger	Sepsis Alert Sepsis Watcher Continue Routine Care
PICU/CVICU/CDH	Attending physicians APPs, Fellows **Residents	Assess the patient within 15 minutes of positive Sepsis Trigger	Sepsis Alert Continue Routine Care
Heme/Onc	Attending physicians APPs **Residents	Assess the patient within 15 minutes of positive Sepsis Trigger	Sepsis Alert Sepsis Watcher Continue Routine Care
Med/Surg	Attending physicians, Fellows **Residents	Assess the patient within 15 minutes of positive Sepsis Trigger	Sepsis Alert Sepsis Watcher Continue Routine Care

*In the EC, residents MUST be supervised directly due to time sensitivities
Due to the time-sensitivity of achieving this goal to decrease sepsis mortality, **residents should be supervised in assessing positive Sepsis Triggers to ensure the timeliness of ordering labs, starting fluids, and initiating antibiotics.

Huddle Outcomes:

- *Sepsis Alert:* Patient at risk for sepsis with impending clinical deterioration; intramuscular (IM) or intravenous (IV) antibiotics will be given for possible sepsis. (*Peds ED Sepsis – JHH-BMC-ACH* or *JHH-ACH Pediatric Suspected Sepsis (Focused)* order set recommended to ensure orders are STAT)
    - Intramuscular (IM) or intravenous (IV) antibiotics
    - Fluids
    - Timer started: Timer should be discontinued when labs are sent (including blood culture), the first antibiotic has been administered, and 2 fluid boluses or a vasopressor have been administered and completed
- *Sepsis Watcher:* Patient at risk for sepsis without impending clinical deterioration. Further evaluation is recommended, consider initiation of screening labs and therapeutics as indicated. A Best Practice Advisory (BPA) is triggered in 45 minutes for the care team to re-huddle and reassess the patient. ICU teams do not currently utilize this huddle outcome.
- *Continue Routine Care:* The patient does not meet sepsis criteria after a clinical evaluation (Sepsis Huddle) or does not require further intervention along the sepsis pathway. Does not trigger BPA for re-huddle.

	Providers	Nursing	Re-evaluations
Sepsis Alert High risk for septic shock Antibiotics + fluids +/- pressors	Place orders within 15 minutes of the huddle Antibiotics + at least 2 fluid boluses* OR document risks	Give antibiotics within 60 minutes of a positive Sepsis Trigger	Reassess frequently to assess for fluid refractory shock
Sepsis Watcher At risk for sepsis	Repeat the huddle in 45 minutes and decide if antibiotics are warranted	BPA at 45 minutes Find provider and ask to huddle again	2nd huddle at 45 minutes to determine "Sepsis Alert" or "Continue Routine Care" (do not continue as a "Sepsis Watcher")
Continue Routine Care	-	Nursing assessments per unit protocol	Nursing assessments per unit protocol

*Consider lower bolus doses for patients at risk for fluid overload

Laboratory/Diagnostics

EC Laboratory Tests/Diagnostics

Always Obtain	• Complete blood count (CBC) • Comprehensive metabolic panel (CMP) • Blood culture (BCx) • Venous Blood Gas (VBG) with lactate • Type and screen • Urine studies - urinalysis (UA)/urine culture (UCx)
Consider	• Respiratory pathogen panel (RPP) • Chest x-ray (CXR) • Other imaging as clinically indicated • Cerebrospinal fluid (CSF) studies • Coagulation tests • Cortisol

PICU/CVICU/CDH Laboratory Tests/Diagnostics

Consider	• Cortisol • B-type natriuretic peptide (BNP) • Echocardiogram (ECHO)

Heme/Onc and Med/Surg Laboratory Tests/Diagnostics

Consider	• Complete blood count (CBC) • Comprehensive metabolic panel (CMP) • C-reactive protein (CRP) • Lactate • Blood culture (BCx) • Urine studies - urinalysis (UA)/urine culture (UCx)

Cultures should be drawn per HPO policy

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Emergency Center Pediatric Sepsis Evaluation

Nursing team can request a Huddle at ANY TIME for ANY CONCERN

Concern for sepsis:
- Abnormal temperature + sepsis screen
- High-risk condition
- Sepsis score ≥ 3
- Concern for sepsis despite the score

HUDDLE WITHIN 10 MINUTES
Charge nurse notifies provider of Sepsis Trigger and need for huddle

Provider STATES Huddle Outcome

Continue Routine Care:
Off pathway

Sepsis Watcher:
(Order Set: Peds ED Sepsis – JHH-BMC-ACH)
Consider labs, imaging, antipyretics, fluids, and antibiotics as indicated
REPEAT HUDDLE IN 45 MINUTES:
Provider reassesses and nurse to re-score and update vital signs in 45 minutes

Provider gives new Huddle Outcome

DO NOT REPEAT WATCHER STATUS

Sepsis Alert:
(Order Set: Peds ED Sepsis – JHH-BMC-ACH)
- Obtain IV in 3 attempts or 20 minutes (Consider IO if needed)
- CBC, CMP, BCx, VBG, type and screen, UA/UCx
- Consider: RPP, CXR, other imaging, CSF studies, coags, cortisol

Antibiotics:
Refer to the Antibiotic Selection Table
- Review previous cultures if available
- Infuse gram-negative coverage (e.g., cefTRIAXone, cefEPIME, cefTAZidime, levoFLOXacin) first then gram-positive (e.g., vancomycin)
  - Neonates ≤ 28 days, meningitis not suspected - administer ampicillin before aminoglycoside

DO NOT DELAY ANTIBIOTICS FOR IV ACCESS (MAX 20 MIN OR 3 ATTEMPTS) CONSIDER IM

PATIENTS AT LOW RISK FOR FLUID OVERLOAD:
Refer to the Fluid Dosing Table
Total fluids should be administered within the first hour of presentation
- 20 mL/kg bolus, (max 1 L)
- Reassess, if needed repeat 20mL/kg bolus (total 40 mL/kg, total max 2 L)
- Reassess, if needed give an additional 20mL/kg bolus (max 60m/kg, max 3 L) and consider vasopressors
- Admit to appropriate unit

PATIENTS AT HIGH RISK FOR FLUID OVERLOAD:
Cardiac history, BMT patients, severe anemia, renal failure, symptoms of volume overload (short of breath (SOB), rales, edema, hepatomegaly)
Refer to the Fluid Dosing Table
Total fluids should be administered within the first hour of presentation
- 5-10 mL/kg bolus (max 1 L)
- Reassess, if needed repeat 5-10mL/kg (total max 2 L)
- reassess and consider vasopressors
- Admit to appropriate unit

IF NO RESPONSE TO FLUIDS, CONSIDER VASOPRESSORS
Refer to the Vasoactive Selection Table

If fluid refractory after 2nd bolus, consider:
- EPINEPHrine or NORepinephrine (from pharmacy)
-Consider DOPamine if EPINEPHrine or NORepinephrine not immediately available

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Emergency Center Standardized NURSING Huddle

TRIAGE

Patient has abnormal temperature, or **TRIAGE NURSE** answers "yes" to any of the three triage sepsis screening questions

TRIAGE NURSE uses Septic Shock Identification Tool to calculate Sepsis Score
(If score ≥ 3, Sepsis Huddle must occur within 10 minutes of score)

NURSE COORDINATION

TRIAGE NURSE should room the patient if possible
TRIAGE NURSE notifies individual in this order (call tree):

1. Charge Nurse
2. Trauma (Float) Nurse
3. Bedside Nurse

CHARGE NURSE or TRAUMA (FLOAT) NURSE or BEDSIDE NURSE:

- Assigns room/rooms patient (if needed)
- Notifies provider/coordinates huddle (rotate the providers to "spread the love")
- Should go to patient room and help with tasks as needed

PROVIDER NOTIFICATION

NURSE to **PROVIDER (Physician/APP):**
"Patient _(name)_ triggered a sepsis score of _____, please come to bedside in room _____ for a Sepsis Huddle"

BEDSIDE NURSE should document huddle,
if unavailable then CHARGE NURSE should document

PROVIDER EVALUATION, COMMUNICATION AND DOCUMENTATION

PROVIDERS (Physician/APP)
(Residents must have an attending present)

- Immediately goes bedside to huddle, examine patient and **verbally state:**
  - "***Huddle is happening***"
  - The plan/outcome: "***The Sepsis Huddle Outcome is….***
    - *Continue Routine Care:* Discontinues sepsis trigger
    - *Sepsis Watcher*: Re-huddle in 45 minutes
    - *Sepsis Alert:* Antibiotics and at least 2 fluid boluses will be ordered **within 15 minutes of huddle**
- Uses *Peds ED Sepsis – JHH-BMC-ACH* order set
- Documentation: **.ACHECSEPSISEVAL**

SEPSIS ALERT GOALS AND PLAN:

- Antibiotic **order placed within 15 minutes** of seeing the patient (huddle)
- Medics/Patient Care Technicians (PCTs) help with tasks
- Pharmacy prioritizes medications
- Nurses can ask for a huddle at any time
- **IV(s): 20 minutes or 3 attempts**
  - Consider IO if needed
- Labs including blood cultures
- **Antibiotics (IV OR IM) given within 60 minutes**
- IV fluids (2 boluses then reassess) within 60 minutes

Emergency Center (EC) Management

Early recognition, fluid boluses and IV antibiotic administration are key in the management of pediatric patients with suspected sepsis. Use of a Sepsis Score can help teams identify early indicators of sepsis and improve the time to notification of a clinical provider, which can also improve the time to therapeutic management. The *EC Pediatric Sepsis Evaluation Clinical Pathway* is a guide for use of the Sepsis Score in the emergency center (EC).

Patients are screened and if they meet the criteria, are assigned a Sepsis Score. All patients with Sepsis Scores of three or higher require a bedside huddle, which is coordinated by the charge nurse. Providers including EC attending physicians, APPs, and staff will huddle and declare if that patient is a “Sepsis Alert”, “Sepsis Watcher”, or if there is no concern for sepsis (the outcome of the huddle is “Continue Routine Care”).

Emergency Center Timeline:

All Patients with a Sepsis Score of >/= 3:

- Sepsis Huddle within 10 minutes of the score

Sepsis Watchers:

- Re-huddle in 45 minutes and determine if the patient is a “Sepsis Alert” or if the outcome is “Continue Routine Care”

Sepsis Alerts:

- Antibiotic ordered within 15 minutes of the Sepsis Huddle
- Obtain IV within 3 attempts or 20 minutes
    - Consider IO if needed
- Antibiotics are given within 60 minutes of the Sepsis Score
- IV Fluid boluses should be given within 60 minutes
    - Consider patients at high risk for fluid overload

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Sepsis or Septic Shock Clinical Pathway in the PICU/CVICU/CCDH

Nursing team can request a Huddle at ANY TIME for ANY CONCERN

Nursing: Complete Q4 hour Sepsis Screening

Positive Sepsis Trigger ≥ 4 or concern for sepsis despite score

Providers (APP/fellow/attending): Assess within 15 minutes of notification and select Huddle Outcome

Huddle Outcome: Continue Routine Care

- Patient already on Sepsis Pathway and currently on broad-spectrum antibiotics, has received IV fluid resuscitation, and cultures within the past 24 hours and no concern for shock
- No change in score/same score
- Vital signs within specified order parameters
- Alternative explanation for positive Sepsis Trigger and patient stable without signs of shock

Huddle Outcome: Sepsis Alert

If the following have not already occurred:

- Oxygen supplementation as needed
- Obtain two IV access points
- Obtain lab studies as needed
  - Consider cortisol level
- Fluid resuscitation: 20 mL/kg (max 1 L) fluid bolus x 2 (total 40 mL/kg (max 2 L)) within 1 hour (consider patients at risk for fluid overload)
- Infection Source Control
  - Assure 1st antibiotic is infused within 1 hour of suspected sepsis
- Correct electrolytes/labs: hypocalcemia, hypoglycemia, etc.

Hemodynamic Reassessment

- Monitor response, vital sign targets and goals
- Repeat fluid boluses (consider patients at risk for fluid overload)

Fluid Refractory Shock

Refer to the Vasoactive Selection Table

Consider: Central line, arterial line, Foley, intubation, B-type natriuretic peptide (BNP), echocardiogram (ECHO), pRBCs for symptomatic anemia

- EPINEPHrine
- NORepinephrine
- *DOPamine - if needed STAT pending another vasoactive agent
- milrinone
- VASOpressin

Catecholamine Resistant Shock:

Refer to the Vasoactive Selection Table

- Administer stress dose hydrocortisone
- Evaluate for pericardial effusion, pneumothorax, intra-abdominal hypertension, primary cardiac dysfunction
- Consider extracorporeal membrane oxygenation (ECMO)
- Consider plasmapheresis (e.g., patients with thrombocytopenia-associated multiple organ failure (TAMOF)

Critical Care Management (PICU/CVICU/CCDH)

Routine sepsis screening when a patient has a deteriorating clinical condition can lead to early recognition and escalation of sepsis care. A standardized Sepsis Score provides nursing an objective tool to identify early signs of sepsis and notify physicians in a timely manner. Prompt notification allows providers to perform a bedside Sepsis Huddle to evaluate a patient for sepsis. Pairing prompt notification of positive Sepsis Screens with bedside provider Sepsis Huddles leads to improved time to fluid resuscitation and IV antibiotic administration, which are critical in decreasing pediatric sepsis morbidity and mortality. The *Care of Patients with Suspected Sepsis in the Critical Care Units Clinical Pathway* is a guide for sepsis screening, huddle expectations, and timely escalation of sepsis interventions in the Critical Care units.

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Sepsis or Septic Shock Clinical Pathway in the Hematology/Oncology/BMT Clinical Pathway

Nursing team can request a Huddle at ANY TIME for ANY CONCERN

Nursing: Complete Q4 hour **Sepsis Screening Assessment OR** if concern for sepsis or deteriorating condition, may complete assessment at any time

Providers: Assess within 15 minutes of notification and select Huddle Outcome

Positive Sepsis Trigger: Concern for sepsis despite score OR score ≥ 4, consider also obtaining Pediatric Early Warning Score (PEWS)

RN calls APP/Attending for **Sepsis Huddle**

"Patient in room ___ triggered the Sepsis Recognition Tool with a Sepsis Score of ___"

Providers (APP/Attending): Assess within 15 minutes of notification and **select Huddle Outcome**

SEPSIS ALERT:

JHH-ACH Pediatric Suspected Sepsis (Focused)

Concerns for sepsis despite score OR Sepsis Scores of ≥ 5

INTERVENTIONS:

NURSE:

- **Start Sepsis Timer**
- Initiate **Rapid Response (RR)** to assist with establishing access and initiating sepsis work up and fluid resuscitation
- Complete Sepsis Huddle Documentation

PROVIDER:

- Initiate Sepsis Order Set:
  - Labs to consider: CBC, CMP, CRP, lactate, blood culture, urine studies
  - Fluids
  - Begin broad-spectrum antibiotics
- Complete Sepsis Template Documentation

SEPSIS WATCHER:

Patient is stable for Heme/Onc unit

AND

Patient not already on Sepsis Pathway **OR** requires new intervention on Sepsis Pathway **AND/OR** Sepsis Scores of 4

Requires repeat Sepsis Huddle in 1 hour

INTERVENTIONS:

NURSE:

- Complete Sepsis Huddle Documentation

PROVIDER:

- Consider initiation of Sepsis Order Set *JHH-ACH Pediatric Suspected Sepsis (Focused)*
  - Labs to consider: CBC, CMP, CRP, lactate, blood culture, urine studies
  - Fluids
  - Begin broad-spectrum antibiotics
- Complete Sepsis Template Documentation

CONTINUE ROUTINE CARE/ HUDDLE DEFERRED:

- Patient already on Sepsis Pathway and currently on broad-spectrum antibiotics, has received IV fluid resuscitation, and cultures within the past 24 hours and no concern for shock
- No change in score/same score
- Vital signs within specified order parameters
- Alternative explanation for positive Sepsis Trigger and patient stable without signs of shock

NURSE: Complete Sepsis Huddle Documentation

PROVIDER: Complete Sepsis Documentation Template

1 Hour: repeat Sepsis Huddle:

Repeat Sepsis Screen and Huddle to assign ultimate Huddle Outcome: "Sepsis Alert" OR "Continue Routine Care"

DO NOT REPEAT WATCHER STATUS

ICU Transfer Criteria:

- Ongoing hypotension despite 20 mL/kg (max 1 L) fluid bolus x 2 (total 40 mL/kg (max 2 L)) within 1 hour (consider patients at risk for fluid overload)
- Requirement for continuous ICU monitoring or respiratory support
- Lactate ≥ 4 mmol/L
- Sustained change in mentation or perfusion > 15 minutes
- Cold extremities, mottled skin, poor perfusion, and altered mental status

Hematology/Oncology
Patients with who are medically complex and immune suppressed are one of the highest risk populations for sepsis. Risk factors include:

- On medications/treatments or have conditions causing neutropenia
- At risk for volume overload
- Risk for septic shock secondary to endotoxin release because of immunosuppression
- Have a lower threshold for initiation of antibiotics
- More likely to have indwelling catheters, putting them at higher risk for central line-associated bloodstream infection (CLABSI) and bacteremia

Pairing prompt notification of positive Sepsis Screens with bedside provider Sepsis Huddles leads to improved time to fluid resuscitation and IV antibiotic administration, which are critical in decreasing pediatric sepsis mortality. The *Care of Patients with Suspected Sepsis in Heme/Onc Clinical Pathway* is a guide for sepsis screening, huddle expectations, and timely escalation of sepsis interventions in the Heme/Onc unit.

Inpatient teams use PEWS to a screening tool to identify patients with signs of early clinical deterioration.

Volume resuscitation may include blood products as deemed clinically indicated by primary team.

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Sepsis or Septic Shock in the Med/Surg Unit Clinical Pathway

Nursing team can request a Huddle at ANY TIME for ANY CONCERN

Abnormal Temperature and tachycardia
Nurse to complete Sepsis Screen for Sepsis Score AND complete PEWS

RN concern for sepsis despite score **OR**
Sepsis Score ≥ 2 OR elevated PEWS score

POSITIVE SEPSIS TRIGGER
RN calls APP/Resident/Attending for **Sepsis Huddle**:
"Patient in room ___ triggered the Sepsis Recognition Tool with a Sepsis Score of ___"

Providers (APP/Resident/Attending):
Assess within 15 minutes of notification and STATE Huddle Outcome
APPs or Residents MUST notify attending physician of Sepsis Huddle

SEPSIS ALERT:
JHH-ACH Pediatric Suspected Sepsis (Focused) order set recommended to ensure orders are STAT

Concerns for sepsis despite score **OR**
Sepsis Scores of ≥ 4

Interventions:

NURSE:
- **Start Sepsis Timer**
- Initiate **Rapid Response (RR)** to assist with establishing access and initiating sepsis work up and fluid resuscitation
- Complete Sepsis Huddle Documentation

PROVIDER:
- Initiate Sepsis Order Set:
  - Labs to consider: CBC, CMP, CRP, lactate, blood culture, urine studies
  - Fluids
  - Begin broad-spectrum antibiotics
- Complete Sepsis Documentation Template

SEPSIS WATCHER:
Patient is stable for Med/Surg unit
AND
Patient not already on Sepsis Pathway **OR** requires new intervention on Sepsis Pathway
AND/OR Sepsis Scores of 2 or 3
Requires repeat Sepsis Huddle in 1 hour

INTERVENTIONS:
NURSE:
- Complete Sepsis Huddle Documentation

PROVIDER:
- Consider initiation of Sepsis Order Set
JHH-ACH Pediatric Suspected Sepsis (Focused)
  - Labs to consider: CBC, CMP, CRP, lactate, blood culture, urine studies
  - Fluids
  - Begin broad-spectrum antibiotics
- Complete Sepsis Template Documentation

1 Hour: repeat Sepsis Huddle:
Repeat Sepsis Screen and Huddle to assign ultimate Huddle Outcome: "Sepsis Alert" OR "Continue Routine Care"
DO NOT REPEAT WATCHER STATUS

CONTINUE ROUTINE CARE/ HUDDLE DEFERRED:
- Patient already on Sepsis Pathway and currently on broad-spectrum antibiotics, has received IV fluid resuscitation, and cultures within the past 24 hours and no concern for shock
- No change in score/same score
- Vital signs within specified order parameters
- Alternative explanation for positive Sepsis Trigger and patient stable without signs of shock

NURSE: Complete Sepsis Huddle Documentation

PROVIDER: Complete Sepsis Documentation Template

ICU Transfer Criteria:
- Ongoing hypotension despite 20 mL/kg (max 1 L) fluid bolus x 2 (total 40 mL/kg (max 2 L)) within 1 hour (consider patients at risk for fluid overload)
- Requirement for continuous ICU monitoring or respiratory support
- Lactate ≥ 4 mmol/L
- Sustained change in mentation or perfusion > 15 minutes
- Cold extremities, mottled skin, poor perfusion, and altered mental status

Inpatient Management

Screening for sepsis when a patient begins showing signs of infection or has a deteriorating clinical condition can lead to early recognition and escalation of sepsis care. A standardized Sepsis Score allows nurses to notify providers as soon as a patient shows early signs of sepsis. Prompt notification allows providers to perform a bedside Sepsis Huddle to evaluate a patient for sepsis. Pairing prompt notification of positive Sepsis Screens with bedside provider Sepsis Huddles leads to improved time to fluid resuscitation and IV antibiotic administration, which are critical in decreasing pediatric sepsis mortality. The *Care of Patients with Suspected Sepsis in the Med/Surg Unit Clinical Pathway* is a guide for sepsis screening, huddle expectations, and timely escalation of sepsis interventions in the Med/Surg unit.

Inpatient teams use PEWS to a screening tool to identify patients with signs of early clinical deterioration.

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Antimicrobial Selection by Patient Population

Patient Population	Antibiotic Selection	Alternatives and Comments
Neonates ≤ 28 days, meningitis or HSV **IS** suspected	ampicillin + cefTAZidime OR *cefTRIAXone + acyclovir	*Use cefTRIAXone if post-menstrual age (PMA) > 42 weeks and no other contraindications such as hyperbilirubinemia, total parenteral nutrition (TPN) or calcium containing fluids
Neonates ≤ 28 days, meningitis and HSV **NOT** suspected	ampicillin + gentamicin OR tobramycin	If clinical concerns of herpes simplex virus (HSV), add empiric acyclovir Choice of aminoglycoside is dependent on availability/shortages
Neonates ≤ 28 days, with any of the following: • Significant surgical procedure (e.g., congenital diaphragmatic hernia (CDH) repair, cardiac, intra-abdominal, neurosurgical) • Central line • Immunocompromised host	cefEPIME + vancomycin	**Suspect anaerobic infection (e.g., sinus, abdominal source, Lemierre's):** Add metroNIDAZOLE **Suspect toxin-mediated infection (e.g., toxic shock, skin-soft tissue source):** Add clindamycin **Risk of Fungemia** No clear guidelines for when to begin empiric antifungal therapy exist in non-neutropenic patients, but empiric antifungal coverage can be considered in the presence of known risk factors and severe illness. Please call Infectious Diseases Service to discuss.
Previously healthy ≥ 29 days of age, community acquired sepsis	cefTRIAXone + vancomycin	**Suspect anaerobic infection (e.g., sinus, abdominal source, Lemierre's):** Add metroNIDAZOLE **Suspect toxin-mediated infection (e.g., toxic shock, skin-soft tissue source):** Add clindamycin
≥ 29 days of age with any of the following: • Central line • Immunocompromised • Recent hospitalization • Long-term care facility resident • Central nervous system (CNS) infection in patient with previous neurosurgical procedure	cefEPIME + vancomycin	**Neutropenic fever and hemodynamically unstable****: Meropenem + Vancomycin **Suspect anaerobic infection (e.g., sinus, abdominal source, Lemierre's):** Add metroNIDAZOLE (not recommended to add if patient on meropenem) **Suspect toxin-mediated infection (e.g., toxic shock, skin-soft tissue source):** Add clindamycin **Risk of Fungemia** No clear guidelines for when to begin empiric antifungal therapy exist in non-neutropenic patients, but empiric antifungal coverage can be considered in the presence of known risk factors and severe illness. Please call Infectious Diseases Service to discuss.
Severe beta-lactam (e.g., penicillin, cephalosporin) allergy Severe defined as airway involvement, bronchospasm, anaphylaxis, angioedema, extensive urticaria, cardiovascular collapse, hypotension	levoFLOXacin + vancomycin	**Suspect anaerobic infection (e.g., sinus, abdominal source, Lemierre's):** Add metroNIDAZOLE **Suspect toxin-mediated infection (e.g., toxic shock, skin-soft tissue source):** Add clindamycin **Risk of Fungemia** No clear guidelines for when to begin empiric antifungal therapy exist in non-neutropenic patients, but empiric antifungal coverage can be considered in the presence of known risk factors and severe illness. Please call Infectious Diseases Service to discuss.

****Hemodynamically unstable**: requiring vasoactive therapy AND/OR being admitted to or in an ICU for shock OR new hemodynamic instability while receiving cefepime.

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Antibiotic Selection Pathway

Well Appearing Infants age 8-60 days see the Febrile Infant AgileMDPathway

Exclusion:
- NICU patients

Considerations:
- Always review previous culture results
- Infuse gram-negative coverage first
  - ≤ 28 days, meningitis not suspected - administer ampicillin 1st
- Patients at higher risk of antibiotic-resistant infection or fungemia discuss with ID

Patients ≤ 28 days

NO

Severe beta-lactam (e.g., penicillin, cephalosporin) allergy

Severe defined as airway involvement, bronchospasm, anaphylaxis, angioedema, extensive urticaria, cardiovascular collapse, hypotension

YES

NO

Does patient have **ANY** of the following?
- Central line
- Immunocompromised
- Recent hospitalization
- Long-term care facility resident
- CNS infection in patient with previous neurosurgical procedure

YES

Does patient have **ANY** of the following?
- Significant surgical procedure (e.g., congenital diaphragmatic hernia (CDH) repair, cardiac, intra-abdominal, neurosurgical)
- Central line
- Immunocompromised host

NO

Is meningitis or HSV suspected?

YES YES NO

Gram -

levoFLOXacin

NO

cefTRIAXone

YES

cefEPIME (Neutropenic fever and hemodynamically unstable** use meropenem)

cefTAZidime or *cefTRIAXone

*Use cefTRIAXone if PMA > 42 weeks and no other contraindications such as hyperbilirubinemia, TPN or calcium containing fluids

gentamicin OR tobramycin

Gram +

Add vancomycin

Add ampicillin

Antiviral

Add acyclovir

YES

Suspected meningitis or clinical concerns for HSV (lesions on skin/mucous membrane, meningitis, disseminated)

Anaerobe

Suspect anaerobic infection (e.g., sinus, abdominal source, Lemierre's)

YES

Add metroNIDAZOLE

Toxin

NO

Suspect toxin-mediated infection (e.g., toxic shock, skin-soft tissue source)

YES

Add clindamycin

****Hemodynamically unstable**: requiring vasoactive therapy AND/OR being admitted to or in an ICU for shock OR new hemodynamic instability while receiving cefepime.

Additional Considerations

- Always review previous culture results to assist with selection of empiric therapy
- Infuse the antibiotic with gram-negative coverage first (e.g., cefTRIAXone, cefEPIME, cefTAZidime), then infuse antibiotic with gram-positive coverage (e.g., vancomycin)
    - Neonates ≤ 28 days, meningitis not suspected - administer ampicillin before aminoglycoside
- Patients at higher risk of antibiotic-resistant infection because of past infection or colonization, local epidemiology, or recent broad-spectrum antibiotic use should receive an individually tailored empiric therapeutic regimen. Please contact Infectious Diseases (ID) Service to discuss.
- Patients at risk for fungemia: Please contact ID to discuss.
- For negative cultures at 48 hours - recommend narrowing or stopping empiric antimicrobial therapy according to clinical presentation, site of infection, host risk factors, and adequacy of clinical improvement. Consider discussion with ID.

Consider additional antimicrobials with the following clinical scenarios:

- Suspicion of Influenza: oseltamivir

Fluids

Per the *Surviving Sepsis Campaign*, “In healthcare systems with availability of intensive care, we suggest administering up to 40 – 60 mL/kg in bolus fluid (10 – 20 mL/kg per bolus) over the first hour, titrated to clinical markers of cardiac output and discontinued if signs of fluid overload develop, for the initial resuscitation of children with septic shock or other sepsis-associated organ dysfunction (weak recommendation, low quality of evidence).” It is important to be mindful of volume overload in patients with sepsis. Do not bolus a patient if they are normotensive. If a septic patient is normotensive, they will benefit from maintenance IV fluids.

<u>Patients at risk for fluid overload:</u>

- Cardiac history, lung disease, existing fluid overload, Bone Marrow Transplant (BMT) patients, severe anemia, renal failure (not an exhaustive list)
- *Symptoms of volume overload:*
    - Short of breath (SOB), rales, extremity edema, hepatomegaly

Fluid Management Tables

Patients at risk for fluid overload

Fluids for Patients at Risk for Fluid Overload	**Dose per Bolus for Patients at Risk for Fluid Overload**	**Max Dose for** Patients at Risk for Fluid Overload **(within an hour) if Hypotension Present**
Normal Saline	5 – 10 mL/kg (max 1 L)	40 mL/kg (max 2 L)
Plasma-Lyte	5 – 10 mL/kg (max 1 L)	40 mL/kg (max 2 L)
Lactated Ringer’s	5 – 10 mL/kg (max 1 L)	40 mL/kg (max 2 L)

Patients with low risk of fluid overload

Fluids	**Dose per Bolus**	**Max Dose (within an hour) if Hypotension Present**
Normal Saline	10– 20 mL/kg (max 1 L)	60 mL/kg (max 3 L)
Plasma-Lyte	10 – 20 mL/kg (max 1 L)	60 mL/kg (max 3 L)
Lactated Ringer’s	10 – 20 mL/kg (max 1 L)	60 mL/kg (max 3 L)

Septic Shock

Literature review reports pediatric septic shock mortality rates between 20 – 30% for patients in "developed countries". However, statistics are influenced by variability in definitions of septic shock, exclusion of septic shock mortality rates from "developing countries", and up to 25% of septic shock cases which happen prior to the patient's arrival at the hospital. (De Souza 2018) Per the *Surviving Sepsis Campaign*, "No pediatric data identify when shock becomes [fluid-refractory] and, thus, to guide when to start vasoactive infusions. However, excessive fluid resuscitation can lead to fluid overload, which has been associated with increased mortality in critically ill children." Therefore, it is reasonable to begin vasoactive infusions after 40 – 60 mL/kg of fluid resuscitation if the patient continues to have evidence of abnormal perfusion, or sooner if fluid overload develops or other concerns for fluid administration are present.

Similarly, there is a potential role for hydrocortisone to assist in managing septic shock that is catecholamine resistant due to its role in homeostasis and stress response. Per the *Surviving Sepsis Campaign*, "either IV hydrocortisone or no hydrocortisone may be used if adequate fluid resuscitation and vasopressor therapy are not able to restore hemodynamic stability." The table illustrates types of vasoactive agents and steroid dosing used in septic shock at the discretion of the clinical provider.

Septic Shock	A subset of sepsis with circulatory and cellular/metabolic dysfunction is associated with a higher risk of mortality	Sepsis definition **PLUS** vasopressor therapy is needed to elevate MAP to goal **AND** lactate > 2 mmol/L despite adequate fluid resuscitation

Fluid Refractory Shock

Persistent shock despite at least 40–60 ml/kg of fluid resuscitation in the first hour (Martin 2015). Consider patients at risk for fluid overload.

Catecholamine Resistant Shock

Shock that persists despite 60 ml/kg of fluid and escalating doses of vasoactive infusions (Martin 2015)

Suggested Septic Shock Resuscitation Goals

Septic Shock HR and MAP Goals		
Age	**Heart Rate Goals** (beats per minute (BPM))	**MAP Goals** (mmHg)
29 days to < 1 year	100 – 160	> 45
1 year to < 2 years	90 – 160	> 50
2 years to < 6 years	< 140	> 50
6 years to < 13 years	< 130	> 60
≥ 13 years	< 110	> 65

Septic Shock Clinical Targets & Parameters

Parameter	Comment	Target
Urine Output (UOP)	Inadequate urine output is one sign of poor end-organ perfusion	< 30 kg: > 1 mL/kg/hr ≥ 30 kg: ≥ 30 mL/hr
Central Venous Pressure (CVP)	Most accurately measured from central venous line (CVL) with tip at the superior vena cava (SVC)-right atrial (RA) junction; Femoral CVL, PICC and Broviac® measurements less reliable, but trends may be useful	8 – 12 cm H_2O (natural airway) 12 – 15 cm H_2O (mechanical ventilation)
Lactate	Elevated lactate ≥ 4 mmol/L may be sign of shock with inadequate oxygen delivery (Scott 2017)	< 4 mmol/L *or* ≥ 10% decrease every 2 hours (Puskarich 2011)
Central Venous Oxygen Saturation (ScvO2) or Venous Co-oximetry	Most accurately measured from CVL with tip at the SVC-RA junction or long femoral line with tip near RA	≥ 70% *Note:* Elevated ScvO2 (> 80%) may occur in sepsis due to "cytopathic hypoxia" despite ongoing shock
Hemoglobin	Hemoglobin is a primary determinant of O_2 delivery; thus, anemia should be treated in shock Patients NOT in shock may tolerate a lower Hgb level of 7 g/dL	Hgb ≥ 10 g/dL (for patients in shock – ScvO2 < 70%, lactate ≥ 4 mmol/L) Hgb > 7 g/dL (after resolution of shock)

Vasoactive and Steroid Dosing for Septic Shock

Vasoactive	Starting Dose	Max Dose	Titration
EPINEPHrine	0.03 mcg/kg/min	1 mcg/kg/min	Titrate in increments of 0.01 mcg/kg/min no more frequently than every 10 minutes to a maximum of 1 mcg/kg/min to maintain {Systolic/MAP} greater than ***.
NORepinephrine	0.05 mcg/kg/min	2 mcg/kg/min	Titrate in increments of 0.05 mcg/kg/min no more frequently than every 10 minutes to a maximum of 2 mcg/kg/min to maintain {Systolic/MAP} greater than ***.
DOPamine	5 mcg/kg/min	20 mcg/kg/min	Titrate in increments of 2.5 mcg/kg/min no more frequently than every 10 minutes to a maximum of 20 mcg/kg/min to maintain {Systolic/MAP} greater than ***.
milrinone	0.25 mcg/kg/min	0.75 mcg/kg/min	--
VASOpressin (shock dosing)	0.5 MILLIunits/kg/min	2 MILLIunits/kg/min	Titrate by 0.5 MILLIunits/kg/min no more frequently than every 10 minutes to a maximum of 2 MILLIunits/kg/min to maintain {Systolic/MAP} greater than ***.

*** Objective measurement is dependent on patient weight and age. MAP Goals can be found here.

Steroid	Loading Dose	Maintenance Dose	Note
hydrocortisone	2 mg/kg/dose (max 100 mg) once	1 mg/kg/dose (max 50 mg) Q6h	BSA-directed dosing: 50 to 100 mg/m^2/day

Documentation Reminders

- Specify underlying organism (when known) using cause and effect language.
    - Bacterial, viral, fungal
    - Example documentation: Enterobacter sepsis, sepsis due to covid19, sepsis secondary to candidiasis
    - If specific organism not identified, type may be specified as bacterial, viral, fungal or organism unknown.
- Specify source using cause and effect language:
    - Sepsis due to bacterial pneumonia, Staphylococcal sepsis due to pneumonia
    - Sepsis secondary RSV pneumonia
    - Sepsis secondary to perforated appendix
    - Sepsis due to postoperative wound infection
    - Sepsis due to central line infection
- Patient Class Recommendations:
    - Observation: If patient is hemodynamically stable and well appearing at time of admission
    - Inpatient: If patient is admitted to the floor but is ill-appearing and/or continues to trigger sepsis alert with vital sign changes OR is admitted to the ICU

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Outcome Measures:

- Time to antibiotics

Clinical Pathway Team

Pediatric Sepsis Clinical Pathway

Johns Hopkins All Children's Hospital

Owner(s): Diana Young, MD; Courtney Titus, PA-C

Original JHACH Sepsis Collaborative Panel:
Submitted February 14, 2017
Dipti Amin (Chair), Irmel Ayala, Shelley Baranowski, (Co-chair), Patricia Clark, Kristen Celona, Stephen Kennedy, Elise Kolosvary, Jennifer Longo, Amanda McCollum, Elliot Melendez, Allison Messina, Michelle Smith, Marla Tanski and Cherish Nero (Parent).

Clinical Pathway Management Team: Joseph Perno, MD; Courtney Titus, PA-C
Date Approved by JHACH Clinical Practice Council:
Date Available on Webpage: February 14, 2017
Last Revised: March 13, 2023

Update: March 2023 by
Owners: Diana Young, MD and Courtney Titus, PA-C
Emergency: Elias Matta, MD
Hospitalist: Diana Young, MD; John Morrison, MD, PhD
Critical Care: Federico Fernandez Nievas, MD ; Michelle Smith, MD
Hematology/Oncology: Stacie Stapleton, MD
Pharmacy: Corey Fowler, PharmD, BCPPS, Katie Namtu, PharmD; Amanda Memkin, PharmD
Antimicrobial Stewardship Program (ASP): Katie Namtu, PharmD (co-director of ASP)
Nursing: Tammy Sandillo, RN

Disclaimer

Clinical Pathways are intended to assist physicians, physician assistants, nurse practitioners and other health care providers in clinical decision-making by describing a range of generally acceptable approaches for the diagnosis, management, or prevention of specific diseases or conditions. The ultimate judgment regarding care of a particular patient must be made by the physician in light of the individual circumstances presented by the patient.

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Appendix A: JHACH EHR Vital Sign Trigger References

Vital Signs Alert (BPA)

Temperature	Hypothermia	Hyperthermia
< 3 months	Less than 36 C (96.8 F)	≥ 38 C (100.4 F)
> 3 months	Less than 36 C (96.8 F)	≥ 38.5 C (101.3 F)

AND

Tachycardia

Age in months (m) or years (yr)*	Heart rate (in bpm) which triggers in EHR
0-2 m	>190
2m-3m	>182
3m-9m	>178
9m-12m	>176
12m – 18m	>173
18m - 24m (2yr)	>170
2yr - 3yr	>167
3yr- 4yr	>164
4yr- 6yr	>161
6yr – 8yr	>155
8yr – 12yr	>147
12yr- 15yr	>138
15yr – 19yr	>132
19yr – 20yr	>130

* Age noted is the average, actual EHR parameters are in days of life

Appendix B: JHACH Sepsis Screening Points

Temperature Points

Temperature	Hypothermia	Hyperthermia	Points Assigned (Emergency Center)	Points Assigned (Inpatient)
< 3 months	Less than 36 C (96.8 F)	≥ 38 C (100.4 F)	1	1
> 3 months	Less than 36 C (96.8 F)	≥ 38.5 C (101.3 F)	1	1

Heart Rate Points

Age	Heart Rate	Points Assigned (Emergency Center)	Points Assigned (Inpatient)
<3 months	>205	1	1
3m – 24 m	>190	1	1
24m – 10yr	>140	1	1
> 10 yr	>100	1	1

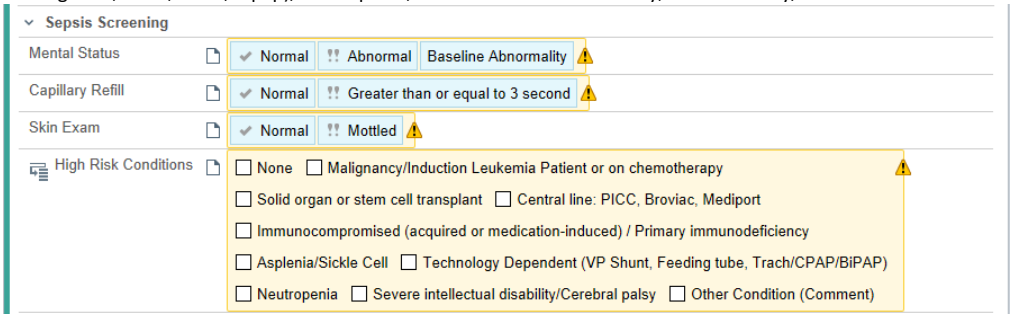
Blood Pressure Points

Age	Systolic Blood Pressure	Points Assigned (Emergency Center)	Points Assigned (Inpatient)
0 – 1 yr	< 70 mmHg	1	3
1 year - 2 years	< 72 mmHg	1	3
2 years - 3 years	< 74 mmHg	1	3
3 years - 4 years	< 76 mmHg	1	3
4 years - 5 years	< 78 mmHg	1	3
5 years - 6 years	< 80 mmHg	1	3
6 years - 7 years	< 82 mmHg	1	3
7 years - 8 years	< 84 mmHg	1	3
8 years - 9 years	< 86 mmHg	1	3
9 years - 10 years	< 88 mmHg	1	3
> 10 years	< 90 mmHg	1	3

** The other sections of the Sepsis Assessment Tool will score 1 point for each section if anything other than a "normal" value is selected.

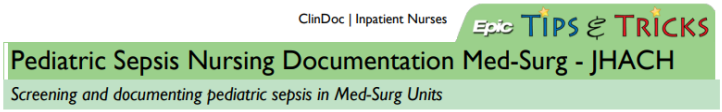
*** Respiratory Abnormality only scores for patients on Hem/Onc unit

Tachypnea= age dependent
Abnormal Mental Status = Abnormal from Baseline
Abnormal Capillary Refill = >3 seconds
Abnormal skin exam = mottled skin, cyanosis
High Risk Condition: Malignancy/Induction Leukemia or On Chemotherapy, Solid organ or stem cell transplant, central line (PICC, Broviac, Mediport), Immunocompromised (acquired or induced), Primary Immunodeficiency, Asplenia/Sickle Cell, Technology Dependent (VP Shunt, feeding tube, trach, CPAP, Bipap), neutropenia, severe intellectual disability, Cerebral Palsy, or Other



Appendix C: EPIC TIPS & TRICKS SHEETS

NURSING



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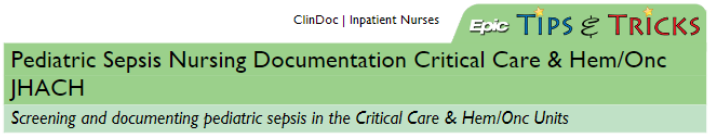

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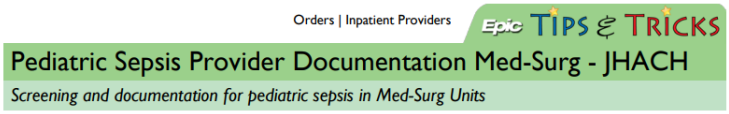

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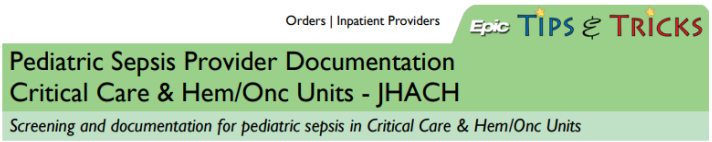

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