It takes a team: Management of pediatric sepsis in 2023

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What's the plan?

What's new in pediatric sepsis?

What are the current guidelines?

I don't know if I'm "ready" for this!!

What's this about a team approach?

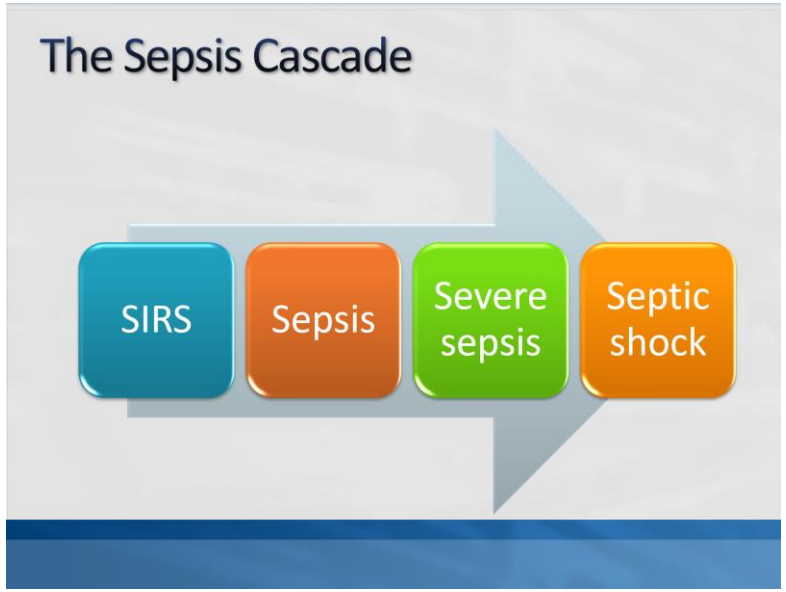
Sepsis revisited

- Sepsis is the leading cause of morbidity and mortality in children worldwide
  - Mortality estimates range from 4% to 10% in US settings
- Sepsis is the leading cause of death in hospitals
  - Sepsis is the leading cost of care

What is sepsis? (a review)

- “Insult”
- Inflammation
- Normal host response goes crazy
- Tissues/organs, immune, microcirculation systems respond (all dysregulated and self-sustaining)

History lesson



We've been hearing about this for years, why is this still such a problem?????

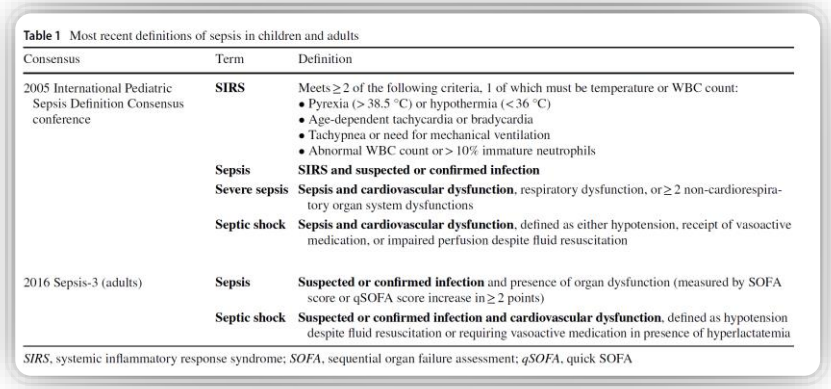


Table 1 Most recent definitions of sepsis in children and adults

Consensus	Term	Definition
2005 International Pediatric Sepsis Definition Consensus conference	**SIRS**	Meets ≥ 2 of the following criteria, 1 of which must be temperature or WBC count: • Pyrexia (> 38.5 °C) or hypothermia (< 36 °C) • Age-dependent tachycardia or bradycardia • Tachypnea or need for mechanical ventilation • Abnormal WBC count or > 10% immature neutrophils
	Sepsis	**SIRS and suspected or confirmed infection**
	Severe sepsis	**Sepsis and cardiovascular dysfunction**, respiratory dysfunction, or ≥ 2 non-cardiorespiratory organ system dysfunctions
	Septic shock	**Sepsis and cardiovascular dysfunction**, defined as either hypotension, receipt of vasoactive medication, or impaired perfusion despite fluid resuscitation
2016 Sepsis-3 (adults)	**Sepsis**	**Suspected or confirmed infection** and presence of organ dysfunction (measured by SOFA score or qSOFA score increase in ≥ 2 points)
	Septic shock	**Suspected or confirmed infection and cardiovascular dysfunction**, defined as hypotension despite fluid resuscitation or requiring vasoactive medication in presence of hyperlactatemia

SIRS, systemic inflammatory response syndrome; *SOFA*, sequential organ failure assessment; *qSOFA*, quick SOFA

Miranda, M., & Nadel, S. (2023). Pediatric Sepsis: a Summary of Current Definitions and Management Recommendations. *Current pediatrics reports*, *11*(2), 29–39.

- Research 101: What you can't define, you can't measure!!
- Def 1: "sepsis" = "severe infection"
- Def 2: "Life-threatening organ dysfunction caused by a dysregulated host response to infection (adult)
  - Septic shock: "Subset of sepsis with circulatory and cellular/metabolic dysfumction associated with a higher risk of mortality."
- Def 3: (Miranda and Nadel) Septic shock: Severe infection leading to cardiovascular dysfunction (including hypotension, need for treatment with a vasoactive medication, or impaired perfusion) and "sepsis-associated organ dysfunction" defined as severe infection leading to cardiovascular and/or non-cardiovascular organ dysfunction.

Is there a swab for that?

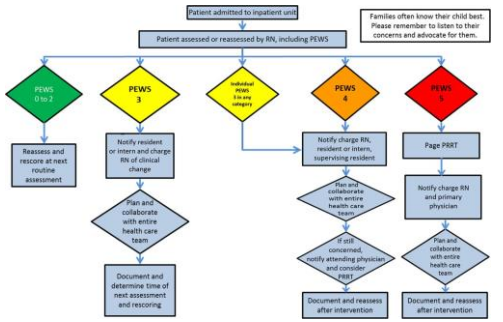
Screening, Diagnosis, Initial management

Summary of the 2020 surviving sepsis campaign international guidelines for the initial management of pediatric septic shock and sepsis-associated organ dysfunction

Screening and early recognition

- Have a tool!
- Know normal (vs abnormal) vital signs
- Monitor labs
- PEWS (Pediatric Early Warning System

	0	1	2	3
Behavior	• Playing • Alert • Appropriate at baseline	• Sleep • Fussy but consolable	• irritable or inconsolable	• Lethargic • Confused • Reduced response to pain
Cardiovascular	• Pink • Capillary refill 1 to 2 seconds	• Pale • Capillary refill 3 seconds	• Grey or cyanotic • Capillary refill 4 seconds • Tachycardia of 20 beats above normal rate	• Grey or cyanotic • Mottled • Capillary refill ≥5 seconds • Tachycardia of 30 beats above normal rate or bradycardia
Respiratory	• Within normal parameters • No retractions	• ≥10 breaths above normal parameters • Use of accessory muscles • 30%+ FiO_2 • 3+ liters/minute	• ≥20 breaths above respiratory parameters • 40%+ FiO_2 • 6+ liters/minute • Tracheostomy and ventilator dependent	• ≥5 breaths below normal parameters with retractions • Grunting • 50% FiO_2 • 8+ liters/minute



Pediatrics. 2021;147(3). doi:10.1542/peds.2019-1947

Selected guidelines from 2020 surviving sepsis campaign

Category	Recommendations
• Screening, diagnosis, and systematic management	• Implement systematic screening for timely recognition • Blood lactate to ID low- vs- high risk of shock • Protocol/guideline • Blood cultures before abx IF no delay in abx administration
• Source control	• Emergently attain source control if possible • Remove intravascular access devices if confirmed to be source of sepsis

Selected guidelines from 2020 surviving sepsis campaign, cont.

Category	Recommendations
• Antibiotic therapy	• Administer < 1 hr of recognition (septic shock), <3 hr sepsis without shock • Start with broad coverage • Narrow abx after culture results • Narrow or dc abx if no pathogen identified, or clinical improvement • Antibiotic dosing based on serious risk doses • Reassess daily for improvement • Determine duration of treatment

Selected guidelines from 2020 surviving sepsis campaign, cont.

Category	Recommendations
• Fluid therapy	• If PICU is available, give up to 40-60 ml/kg • If PICU is unavailable, administer fluids judiciously • Use balanced/buffered crystalloids (i.e. LR or Plasmolyte) instead of 0.9% NS for initial resuscitation
• Hemodynamic monitoring	• Target MAP >50th percentile for age • Do not use clinical signs to categorize “warm” or “cold” shock • Use trends in lactate levels along with monitoring to guide resuscitation

Other recommendations

Category	Recommendations
• Vasoactive medications	• Use epinephrine (rather than dopamine) and/or norepinephrine • Consider epinephrine or norephrine as the first-line vasoactive guided by clinician preference, patient physiology, and local factors • Give vasoactives through peripheral lines in diluted strengths if no central venous access • Consider adding vasopressin or further titrating catecholamines if refractory shock • Consider adding inodilators if evidence of persistent hypoperfusion and cardiac dysfunction despite other vasoactive agents.

Ventilation	1. Consider intubating children with fluid-refractory, catecholamine-resistant septic shock without respiratory failure (IOPS) 2. Do not use etomidate when intubating (WR) 3. Consider a trial of non-invasive mechanical ventilation (over invasive mechanical ventilation) in children responding to resuscitation with sepsis-induced PARDS without a clear indication for intubation (WR) 4. If severe sepsis-induced PARDS use high PEEP, prone positioning, neuromuscular blockage, and use inhaled nitric oxide only as emergency rescue therapy (WR)
Corticosteroids	1. Do not use IV hydrocortisone if fluid resuscitation and vasopressor therapy are able to restore hemodynamic stability (WR) 2. Consider either IV hydrocortisone or no hydrocortisone in refractory shock (WR)
Endocrine and metabolic	1. Do not use insulin to target lower blood glucose levels (SR) 2. Consider targeting blood glucose levels below 180 mg/dl (10 mmol/l) (IOPS) 3. Consider targeting normal calcium levels if requiring vasoactive support (IOPS) 4. Do not routine administer levothyroxine in hypothyroxinemia of nonthyroidal illness (WR) 5. Use antipyretic therapy or a permissive approach to fever (WR)
Nutrition	1. Consider early enteral nutrition, within 48 hours of admission, if no contraindications to enteral nutrition, and to increase in a stepwise fashion (IOPS) 2. Do not withhold enteral feeding solely because vasoactive-inotropic support (WR) 3. Prefer enteral nutrition through a gastric tube, rather than a postpyloric feeding tube (WR) 4. Parenteral nutrition may be withheld in the first 7 days of PICU admission (WR) 5. Do not do routine measurements of gastric residual volumes (WR) 6. Do not routinely use prokinetic agents for feeding intolerance (WR) 7. Do not routinely correct acute vitamin D deficiency or do selenium, glutamine, arginine, zinc and/or thiamine supplementation (WR)
Blood products	1. Do not transfuse RBCs if the hemoglobin concentration is $\geq$7 g/dl in hemodynamically stabilized (WR) 2. Do not transfuse platelet or plasma prophylactic in nonbleeding children (WR)
Plasma exchange, renal replacement, and extracorporeal support	1. Do not use plasma exchange (PLEX) if patient does not have TAMOF (WR) 2. Use renal replacement therapy to prevent/treat fluid overload, unresponsive to fluid restriction and diuretic therapy, with standard hemofiltration (WR) 3. Use venovenous ECMO in children with sepsis-induced PARDS and refractory hypoxia, and venoarterial ECMO as a rescue therapy only if refractory to all other treatments (WR).
Immunoglobulins	1. Do not routinely use IV immune globulin, apart from those with Toxic Shock Syndrome (WR)
Prophylaxis	1. Do not routinely do stress ulcer prophylaxis, except for high-risk patients (WR) 2. Do not routinely do deep vein thrombosis prophylaxis (mechanical or pharmacologic), although consider in high-risk populations (WR)

BPS, Best practice statement; SR, Strong recommendation; IOPS, In our practice statement (Not a recommendation); PARDS, Pediatric acute respiratory distress syndrome; PEEP, positive end-expiratory pressure; PICU, Pediatric intensive care unit; RBC, Red blood cells; TAMOF, thrombocytopenia-associated multiple organ failure; WR, Weak recommendation.

Other categories

Miranda, M., & Nadel, S. (2023). Pediatric Sepsis: a Summary of Current Definitions and Management Recommendations. *Current pediatrics reports*, *11*(2), 29–39.

How can this be a team approach?????

Time, assessment, intervention

Pre-hospital
emergency department
ICU
inpatient

ASSESSMENT at ANY TIME and early, standardized approach means better outcomes

Pediatric sepsis

+

pediatric readiness

=

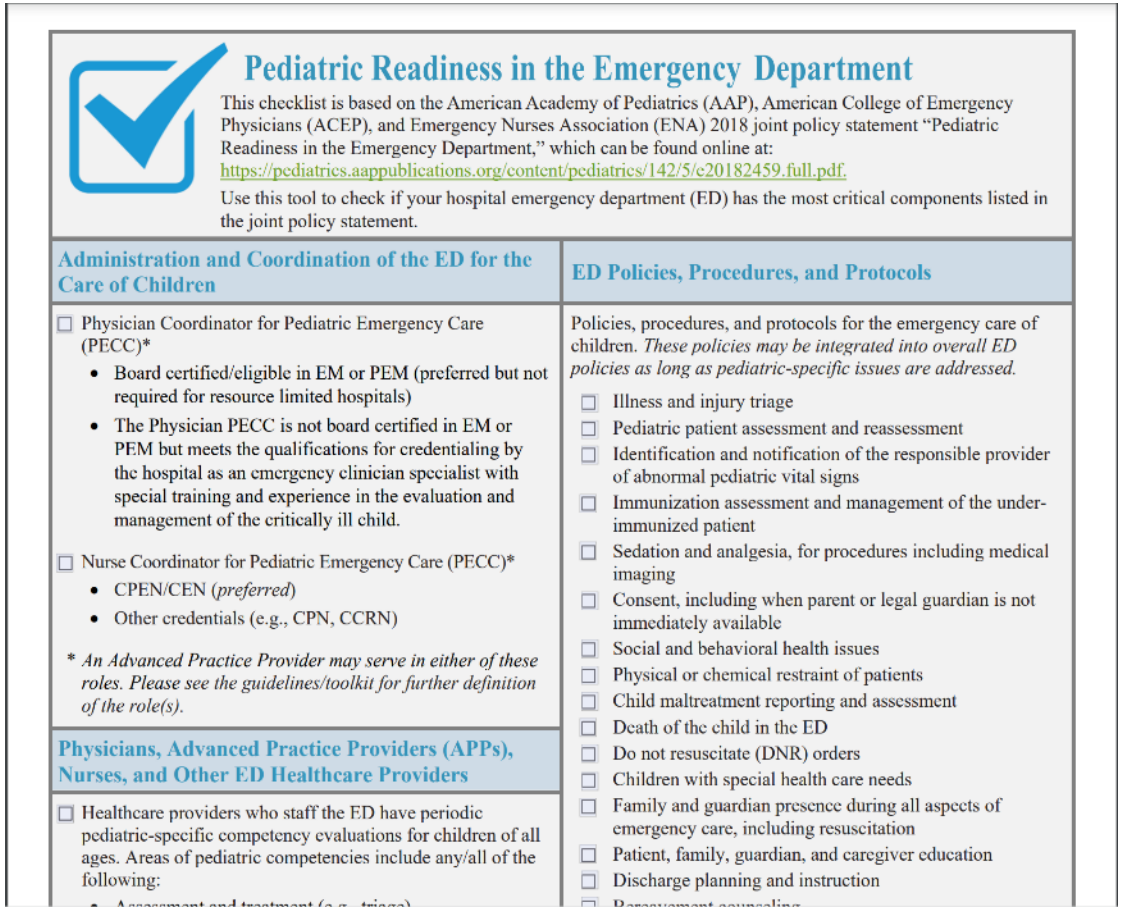
Better patient outcomes!!!

how does pediatric readiness apply to surviving sepsis?????

PEDIATRIC READINESS INITIATIVES

https://emscimprovement.center/domains/pediatric-readiness/

ED Checklist



Pediatric Readiness in the Emergency Department

This checklist is based on the American Academy of Pediatrics (AAP), American College of Emergency Physicians (ACEP), and Emergency Nurses Association (ENA) 2018 joint policy statement "Pediatric Readiness in the Emergency Department," which can be found online at: https://pediatrics.aappublications.org/content/pediatrics/142/5/e20182459.full.pdf.

Use this tool to check if your hospital emergency department (ED) has the most critical components listed in the joint policy statement.

Administration and Coordination of the ED for the Care of Children

☐ Physician Coordinator for Pediatric Emergency Care (PECC)*
- Board certified/eligible in EM or PEM (preferred but not required for resource limited hospitals)
- The Physician PECC is not board certified in EM or PEM but meets the qualifications for credentialing by the hospital as an emergency clinician specialist with special training and experience in the evaluation and management of the critically ill child.

☐ Nurse Coordinator for Pediatric Emergency Care (PECC)*
- CPEN/CEN (*preferred*)
- Other credentials (e.g., CPN, CCRN)

* *An Advanced Practice Provider may serve in either of these roles. Please see the guidelines/toolkit for further definition of the role(s).*

Physicians, Advanced Practice Providers (APPs), Nurses, and Other ED Healthcare Providers

☐ Healthcare providers who staff the ED have periodic pediatric-specific competency evaluations for children of all ages. Areas of pediatric competencies include any/all of the following:

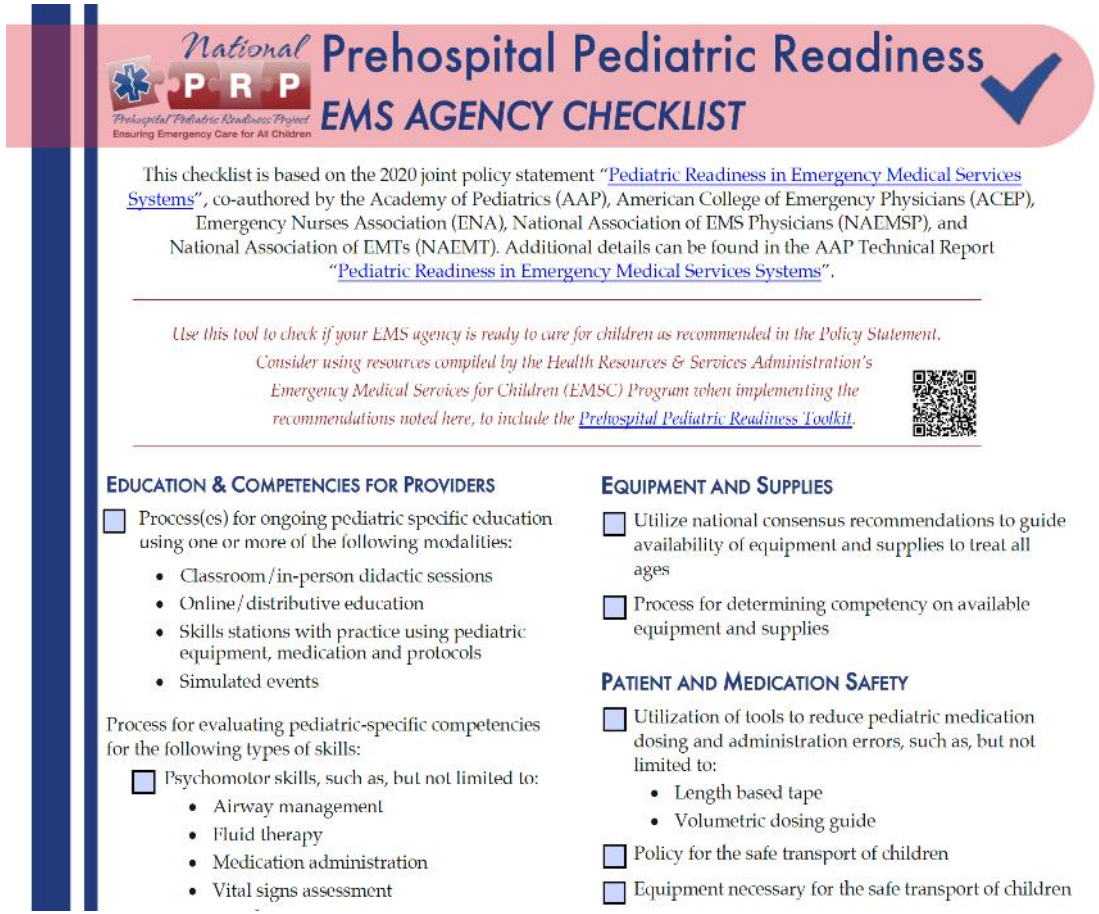
ED Policies, Procedures, and Protocols

Policies, procedures, and protocols for the emergency care of children. *These policies may be integrated into overall ED policies as long as pediatric-specific issues are addressed.*

☐ Illness and injury triage
☐ Pediatric patient assessment and reassessment
☐ Identification and notification of the responsible provider of abnormal pediatric vital signs
☐ Immunization assessment and management of the under-immunized patient
☐ Sedation and analgesia, for procedures including medical imaging
☐ Consent, including when parent or legal guardian is not immediately available
☐ Social and behavioral health issues
☐ Physical or chemical restraint of patients
☐ Child maltreatment reporting and assessment
☐ Death of the child in the ED
☐ Do not resuscitate (DNR) orders
☐ Children with special health care needs
☐ Family and guardian presence during all aspects of emergency care, including resuscitation
☐ Patient, family, guardian, and caregiver education
☐ Discharge planning and instruction

https://emscimprovement.center/domains/pediatric-readiness-project/readiness-toolkit/readiness-ED-checklist/

Prehospital Checklist



National PRP Prehospital Pediatric Readiness Project — Ensuring Emergency Care for All Children

Prehospital Pediatric Readiness EMS AGENCY CHECKLIST

This checklist is based on the 2020 joint policy statement "Pediatric Readiness in Emergency Medical Services Systems", co-authored by the Academy of Pediatrics (AAP), American College of Emergency Physicians (ACEP), Emergency Nurses Association (ENA), National Association of EMS Physicians (NAEMSP), and National Association of EMTs (NAEMT). Additional details can be found in the AAP Technical Report "Pediatric Readiness in Emergency Medical Services Systems".

Use this tool to check if your EMS agency is ready to care for children as recommended in the Policy Statement. Consider using resources compiled by the Health Resources & Services Administration's Emergency Medical Services for Children (EMSC) Program when implementing the recommendations noted here, to include the Prehospital Pediatric Readiness Toolkit.

Education & Competencies for Providers

☐ Process(es) for ongoing pediatric specific education using one or more of the following modalities:
- Classroom/in-person didactic sessions
- Online/distributive education
- Skills stations with practice using pediatric equipment, medication and protocols
- Simulated events

Process for evaluating pediatric-specific competencies for the following types of skills:

☐ Psychomotor skills, such as, but not limited to:
- Airway management
- Fluid therapy
- Medication administration
- Vital signs assessment

Equipment and Supplies

☐ Utilize national consensus recommendations to guide availability of equipment and supplies to treat all ages

☐ Process for determining competency on available equipment and supplies

Patient and Medication Safety

☐ Utilization of tools to reduce pediatric medication dosing and administration errors, such as, but not limited to:
- Length based tape
- Volumetric dosing guide

☐ Policy for the safe transport of children

☐ Equipment necessary for the safe transport of children

https://emscimprovement.center/domains/prehospital-care/prehospital-pediatric-readiness/checklist-faq/

Pediatric patient safety

- Weighing children in kilograms only
- Monitoring, ability for
  - Puse oximetry monitoring
  - End tidal CO2 monitoring
- Medication safety
  - Pre-calculated drug dosing guides
  - Process for safe prescribing and administration
- Process and policy for safe transport of chidren

- [Pediatric Resuscitation and Emergency Medications - Excel Calculator]

Medication safety

tions

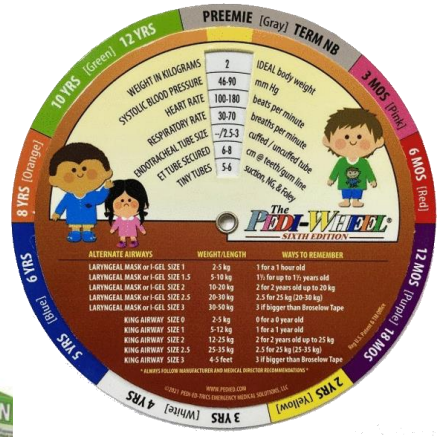
Please note the disclaimer at the bottom of the calculator.
The use of preprinted weight-based medication cards and/or length-based resuscitation tapes is recommended when treating an emergency.
Enter the drug concentration available at the facility into the spreadsheet for accurate milliliter calculations.
The tab for each weight can be preprinted.

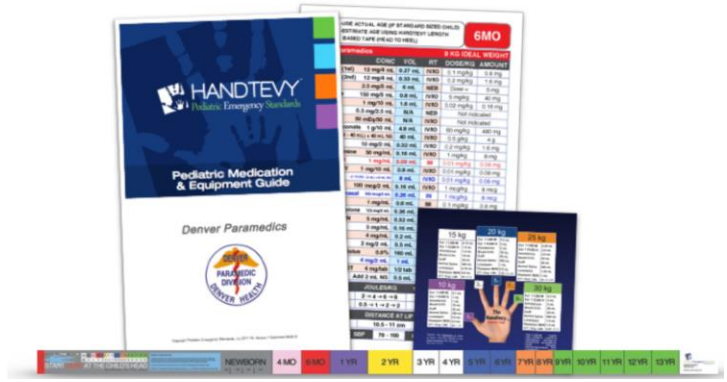
Name:
Age: Years 1 year and older
OR
Months up to 12 months
Weight (kg): 12.0 Estimated 0 Actual

check concentration prior to administration!

Route	Usual Dosage	Maximum Dose	Calculated Dosage	Drug Concentration	Calculated Volume
IV/IO/IM/ET/T	0.001 mg/kg	10 mg cumulativ	0.012 mg	0.4 mg/mL	0.030 mL
IV/IO	0.1 mcg/kg/min	2 mcg/kg/min	1.2 mcg/kg/min	1 mg/mL	1.200 mL/min
IV	2 mcg/kg/min	2 mcg/kg/min	2 mcg/kg/min	1 mg/mL	2.000 mL/min
IV	1 mg/kg	200 mg	12 mg	50 mg/mL	0.240 mL
IV	3 mg/kg	200 mg	36 mg	50 mg/mL	0.720 mL
PO	4 mg/kg	200 mg	48 mg	50 mg/mL	0.960 mL
IV	15 mg/kg	480 mg total	180 mg	130 mg/mL	1.385 mL
IV	20 mg/kg	1000 mg	240 mg	130 mg/mL	1.846 mL
IV	15 mcg/kg load	100 mg	100 mcg	500 mg/mL	0.200 mL
IV	20 mcg/kg/min		240 mcg/min	500 mg/mL	0.480 mL/min
IV	80 mcg/kg/min		960 mcg/min	500 mg/mL	1.920 mL/min
IV	0.5 mg/kg	50 mg	6.0 mcg	10 mg/mL	0.600 mcg
IV	50 mg/kg/min	200 mcg/kg/min	200 mcg/min	10 mg/mL	20.000 mL/min
IV	1 mg/kg		12 mg	10 mg/mL	1.200 mL
IV	1.2 mg/kg		14 mg	10 mg/mL	1.440 mL
IV/IO	1 mEq/kg	50 mEq	12 meq	1 mEq/mL	12.000 mL
IV/IO	1 mEq/kg	50 mEq	12 meq	0.5 mEq/mL	24.000 mL
IV/IO	20 mL/kg	1000 mL	240 mL		240.000 mL
IV/IO	10 mL/kg	1000 mL	120 mL		120.000 mL
IV	3 mL/kg		36 mL		36.000 mL
IV	5 mL/kg		60 mL		60.000 mL
IV	2 mg/kg	150 mg/dose	24 mg	20 mg/mL	1.200 mL
IV	1 mg/kg	150 mg/dose	12 mg	20 mg/mL	0.600 mL
IV	1 mg/kg	150 mg/dose	12 mg	20 mg/mL	0.600 mL
IM	4 mg/kg	150 mg/dose	48 mg	20 mg/mL	2.400 mL
IM	4 mg/kg	150 mg/dose	48 mg	20 mg/mL	2.400 mL
IM	3 mg/kg	150 mg/dose	36 mg	20 mg/mL	1.800 mL
SC	0.01 mg/kg	0.4 mg	0.12 mg	1 mg/mL	0.120 mL
IV	40 mg/kg	3000 mg/kg/day	480 mg	30 mg/mL	16.000 mL
	0.5 joules/kg	100 joules	6.0 joules		6.000 joules
	1 joules/kg	100 joules	12 joules		12.000 joules
	2 joules/kg	360 joules	24 joules		24.000 joules
	4 joules/kg	360 joules	48 joules		48.000 joules

tor, however, the user is urged to consult other physicians or appropriate references when in emergency medicine practice settings may necessitate approaches other than those appropriate use or treatment errors. This calculator is meant only as a general guide to therapy.

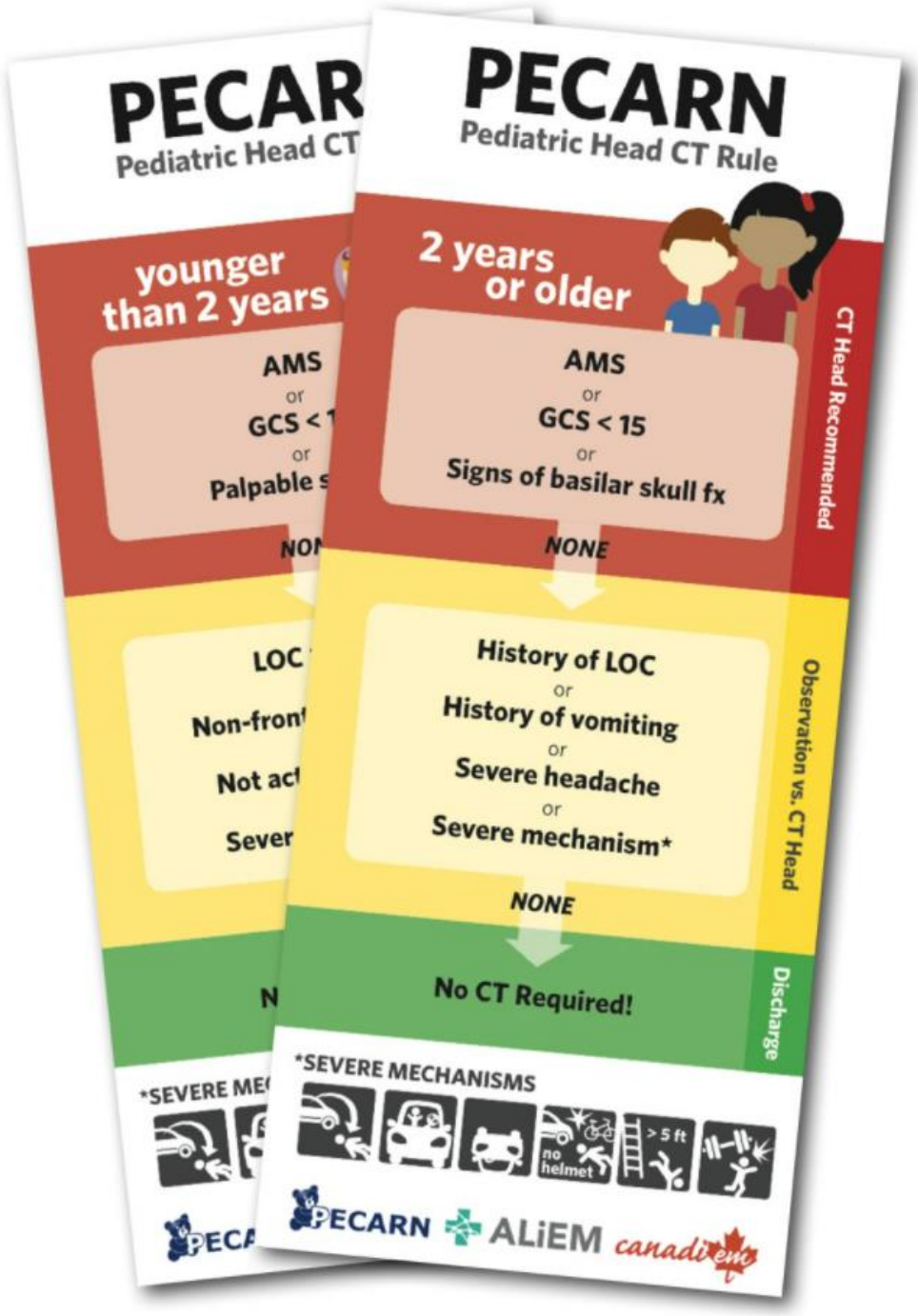




Evidence-based Clinical Pathways

Local Children's Hospitals and Academic Centers can be a resource

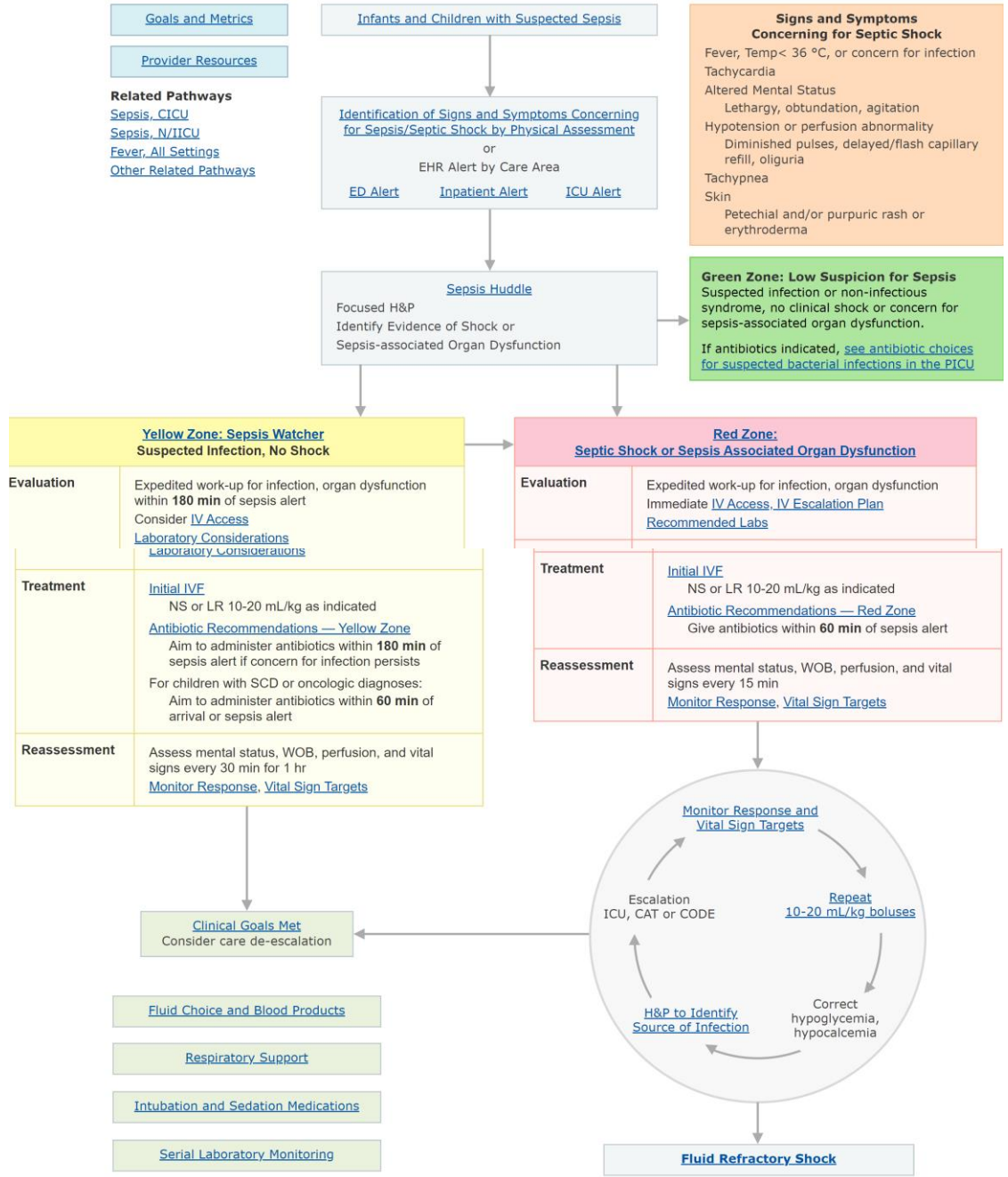
Use the updated and complete lists of EB Clinical Pathways on the NPRP website at www.pedsready.org



https://pecarn.org/publications-studies/
PECARN Pediatric Head Injury/Trauma Algorithm - MDCalc

Use of tools and/or pathways

Emergency Department, PICU, and Inpatient Clinical Pathway for Infants > 28 Days and Children with Suspected Sepsis, Sepsis and Septic Shock



Type of Sepsis Screen	
Type of Sepsis Screen	○ Primary ○ Secondary
Predisposition	
Predisposition	○ Yes ○ No
	Predisposition includes but is not limited to: Referring diagnosis of sepsis, rule out sepsis, or bacterial infection Confirmed infection with Influenza Age less than 2 months Female with history of vaginal tampon use Indwelling catheters Previous hospitalization due to bacterial infection Acute or chronic immunosuppression Chronic medical problems (i.e. Status Post Bone Marrow Transplant, Chronic Lung
If yes, please describe:	
Infectious Symptoms	
History and Physical Exam Suggest Infection	○ Yes ○ No
	Examples: Fever or hypothermia, rash, reddened draining area of skin, joint pain, dysuria, productive cough.
If yes, please describe:	
Response to Infection	
Response to Infection	○ Yes ○ No
	If BOTH abnormal heart rate and tachypnea are present, choose "yes": 0 - 1 month: Less than 100 or greater than 180 HR and greater than 50 RR 2 months - 11 months: Less than 90 or greater than 180 HR and greater than 40 RR 1 year: Less than 90 or greater than 180 HR and greater than 35 RR 2 years - 5 years: Greater than 140 HR and greater than 25 RR 6 years - 12 years : Greater than 130 HR and greater than 20 RR

Organ Dysfunction	
Respiratory Dysfunction	○ Yes ○ No
	Choose "yes" for any of the following: Less than 91% on room air Need for ventilatory support (non-invasive or invasive)
Neurological Dysfunction	○ Yes ○ No
	Choose "yes" for any of the following: GCS less than 11 or decreased by 3 Acute change in mental status Irritable or confused
Hypotension	○ Yes ○ No
	Systolic Blood Pressure (mmHg): 0-1 month: 65 or less 2 months - 11 months: 70 or less 1 year: 80 or less 2 years - 5 years: 90 or less 6-12 years: 100 or less
Decreased or Bounding Pulses	○ Yes ○ No
Capillary Refill Greater than 3 Seconds or Immediate(Flash)	○ Yes ○ No
Skin cool, mottled, red, pale, cyanotic OR gray	○ Yes ○ No
Decreased Urine Output	○ Yes ○ No
Sepsis Alert	
Sepsis Alert	○ Yes ○ No **Comment**

ONLY Complete for Secondary Screening	
Lactate Greater Than 4	○ Yes ○ No
Metabolic Base Excess (Blood Gas Greater Than -4)	○ Yes ○ No
Sepsis Tool Total	
Sepsis Tool Total	
	If total is greater than or equal to 5, notify NP or physician.

Application....

Use of a tool..

Ems is called to the scene…

EMS ResourceS:

WAVE THOSE RED FLAGS

Sepsis is not always septic shock

The smaller they are, the harder they fall

Sepsis isn’t the infection, it's the reaction

Measure temperature accurately

Develop a strong history of the chief complaint

Assess lactate levels if possible

Measure exhaled carbon dioxide to strengthen a suspicion of sepsis

Treat sepsis early and aggressively

Duckworth, Rommie (2020) EMS May Not Be Prepared to Treat Children for Sepsis. JEMS. **https://www.jems.com/patient-care/ems-may-not-be-prepared-to-treat-children-for-sepsis/**. Accessed 8/25/2023.

Hsieh, Arthur (2016.) 6 useful sepsis assessment and treatment tips. In Topics: Infectious Diseases. *EMS1*. **https://www.ems1.com/infectious-diseases/articles/6-useful-sepsis-assessment-and-treatment-tips-WVcIOZf8uzleUAFR/**. Accessed 8/25/2023.

Your patient:

- 5yo, history of fever for 2 days, fussiness earlier today
- Decreased appetite for 2 days
- Breathing hard, per parents
- Very tired this afternoon
- No past medical history, no allergies, no meds
- Behind on immunizations

Your assessment:

- VS: T 96.8F; HR 168; RR 48; BP 98/60; SP02 94% EtCO2 32
- GCS: 11
  - Opens eyes when stimulated (3)
  - Mumbles when you talk to him (3)
  - Resists when you take his BP (5)
- Dry, cracked lips
- Capillary refill 3 seconds

He arrives in the emergency department…

Resources:

- Miranda, M., & Nadel, S. (2023). Pediatric Sepsis: a Summary of Current Definitions and Management Recommendations. *Current pediatrics reports*, *11*(2), 29–39. https://doi.org/10.1007/s40124-023-00286-3
- Raina Paul, Matthew Niedner, Ruth Riggs, *et al.* for the IPSO COLLABORATIVE INVESTIGATORS; Bundled Care to Reduce Sepsis Mortality: The Improving Pediatric Sepsis Outcomes (IPSO) Collaborative. *Pediatrics* August 2023; 152 (2): e2022059938. 10.1542/peds.2022-059938
- Holly Depinet, Charles G. Macias, Fran Balamuth, *et al*; for the American Academy of Pediatrics Pediatric Septic Shock Collaborative (PSSC) Investigators, Pediatric Septic Shock Collaborative Improves Emergency Department Sepsis Care in Children. *Pediatrics* March 2022; 149 (3): e2020007369. 10.1542/peds.2020-007369
- Mariana Miranda, Simon Nadel, Septic shock: early rapid recognition and ongoing management, Paediatrics and Child Health, Volume 33, Issue 5, 2023, Pages 134-143, ISSN 1751-7222, https://doi.org/10.1016/j.paed.2023.02.003.

Your patient:

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- Decreased appetite for 2 days
- Breathing hard, per parents
- Very tired this afternoon
- No past medical history, no allergies, no meds
- Behind on immunizations

- EMS gave 400ml NS, BSG 68

Your assessment:

Wt: 20kg

- VS: T 96.4F; HR 163; RR 50; BP 90/48; SP02 92%
- GCS: 10
  - Opens eyes when stimulated (3)
  - Moaning (2)
  - Resists when you take his BP (5)
- Dry, cracked lips
- Capillary refill 3-4 seconds

What are your actions?

What’s going on?

Fluid Refractory Shock

The scenario continues

Your assessment:

- VS: T 96.8F; HR 172; RR 20; BP 78/30; SP02 92% (6 lpm O2 via mask)
- GCS: 8
  - Opens eyes to pain (2)
  - Moaning (2)
  - Withdraws to IV attempt (4)
- Capillary refill 4-5 seconds

- Important labs:
  - WBC 18
  - Lactate 6.2
  - CRP 48

Remember our sepsis definition?

- Septic shock: Severe infection leading to cardiovascular dysfunction (including hypotension, need for treatment with a vasoactive medication, or impaired perfusion) and “sepsis-associated organ dysfunction” defined as severe infection leading to cardiovascular and/or non-cardiovascular organ dysfunction.

What are priority interventions?

A: Support and protect the airway

B: Appropriate ventilatory support

C: Cardiovascular support

D: Assessment and ? interventions

E: Environmental control

Summary

- Early recognition and intervention saves lives
- That recognition can occur anywhere: Prehospital, Emergency Department, Inpatient, ICU…..
  - It takes a team!!!
- Assessment tools to aid in recognition, and pathways with bundled care save lives

- The ONLY way this all works is if YOU are READY to care for pediatric patients… and there are lots of resources for that!!

Resources

- Miranda, M., & Nadel, S. (2023). Pediatric Sepsis: a Summary of Current Definitions and Management Recommendations. *Current pediatrics reports*, *11*(2), 29–39. https://doi.org/10.1007/s40124-023-00286-3
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