

A photograph of a male doctor with glasses, wearing a white lab coat, a surgical mask, and purple gloves. He is holding a young child with curly hair who is smiling and giving a thumbs up. The doctor's lab coat has a name tag that reads "Dr. Salazar, Pediatric J.D." and a small colorful logo. The background is a clinical setting with large windows. The image is overlaid with large, semi-transparent blue and green circular shapes.

Sepsis Clinical Pathway: Recognition and Initial Management

April 2025

What Is a Clinical Pathway?

An evidence-based guideline that decreases unnecessary variation and helps promote safe, effective, and consistent patient care

Objectives of the Pathway

- To standardize the approach in caring for patients with sepsis and septic shock
- To improve the early recognition of sepsis
- To create an understanding of the benefits of using a shared mental model framework for recognizing and managing sepsis (use of sepsis huddle)
- To treat sepsis early and rapidly with timely administration of antibiotics and fluid resuscitation
- To standardize the supportive care of patients with sepsis

Why Is a Pathway Necessary?

- Sepsis is a life threatening condition that requires rapid recognition and treatment
- A clinical pathway can empower early recognition and treatment to reduce morbidity and mortality

Background

Every year
40,000
children are
hospitalized
for sepsis in
the U.S.

Almost
5,000
children die
from sepsis
yearly

The window
for diagnosis
and effective
intervention
in children is
1-4 hours

**Every hour delay
in treatment increases
mortality by nearly 8%**

Pediatric Sepsis: Mortality

Schlapback LJ et al. JAMA 2024

- ▶ Overall sepsis mortality: 7.1%
 - ▶ 9.8% in 2005 (Watson et al)
 - ▶ LMIC - 28.5%
 - ▶ If effective QI, < 3% mortality
- ▶ Septic Shock mortality (defined as CV dysfunction)
 - ▶ 10.8% mortality (33.5% in LMIC)
- ▶ Adult sepsis mortality: 20-24%
 - ▶ ARISE, ProMISE, ProCESS (2014-2016)

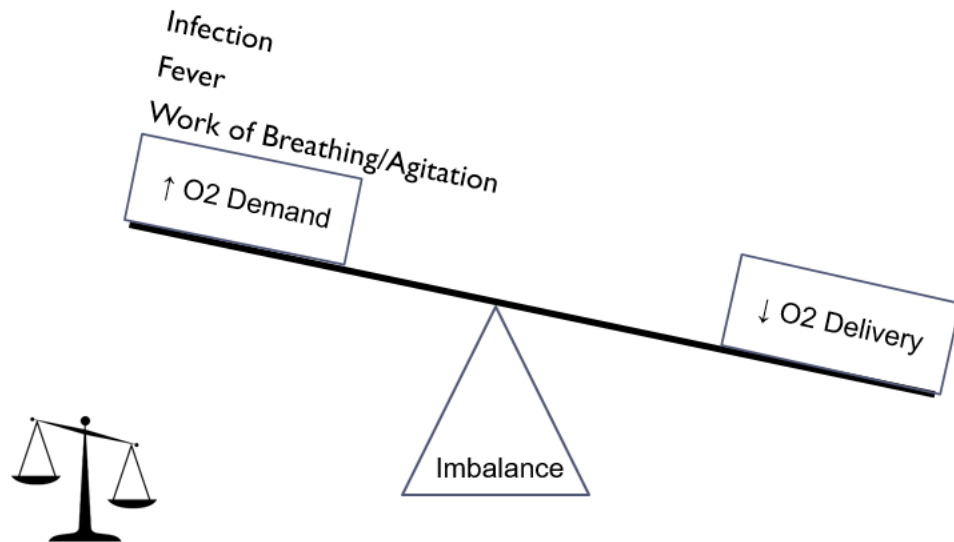
Pediatric sepsis research and guidelines are evolving,
and preventing child deaths requires continual refining of
evidence-based interventions

Clinical practice guidelines and bundles improve patient
outcomes

Goal is to prevent septic shock, and if there is shock, treat it ASAP

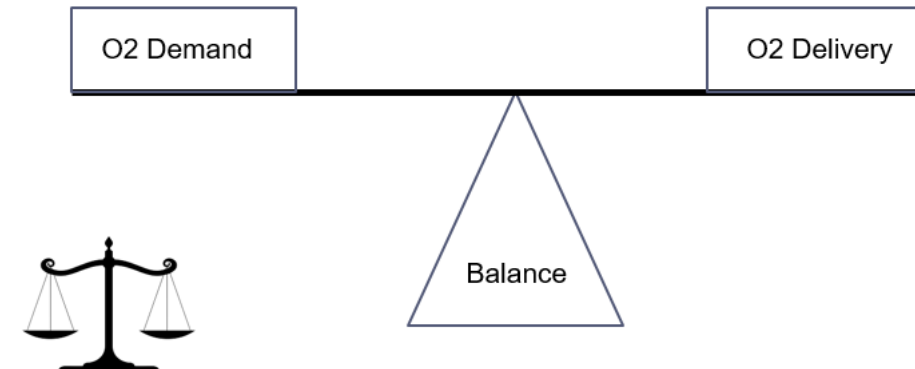
Septic Shock Physiology

- Increased oxygen demand



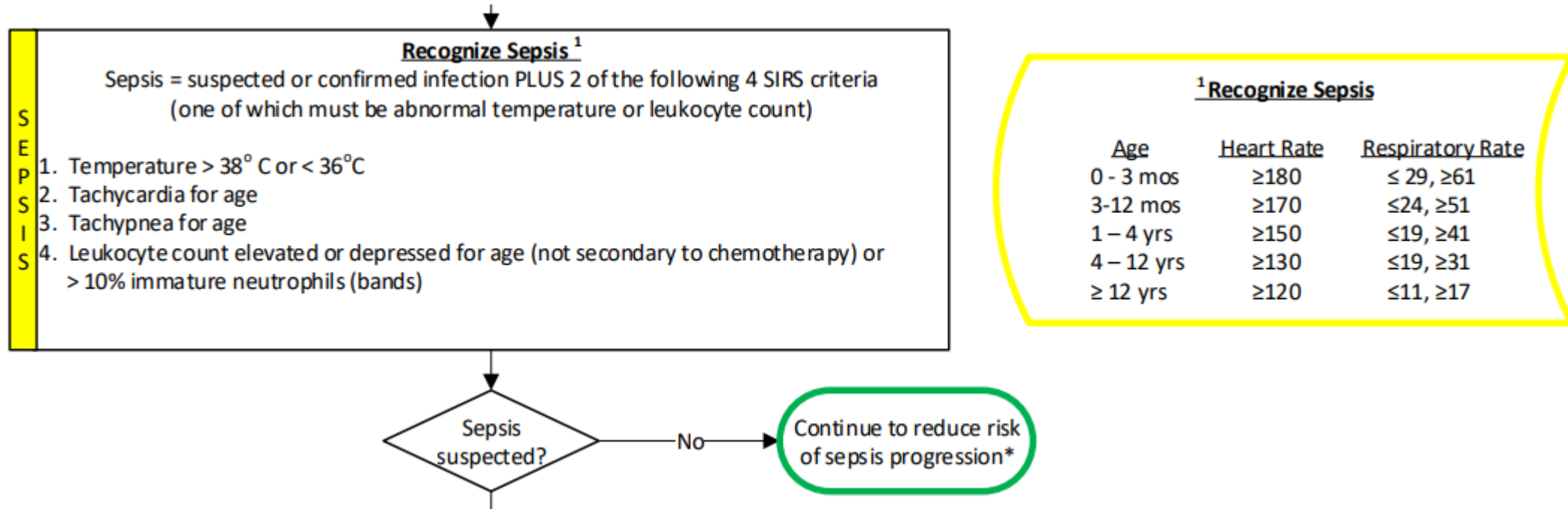
Shock Management Goal

- Restore the balance by reducing O2 demand



- Control infection (early antibiotics and source control)
- Control fever (antipyretics)
- Reduce agitation and work of breathing (CPAP/BiPAP, early intubation with muscle relaxation)

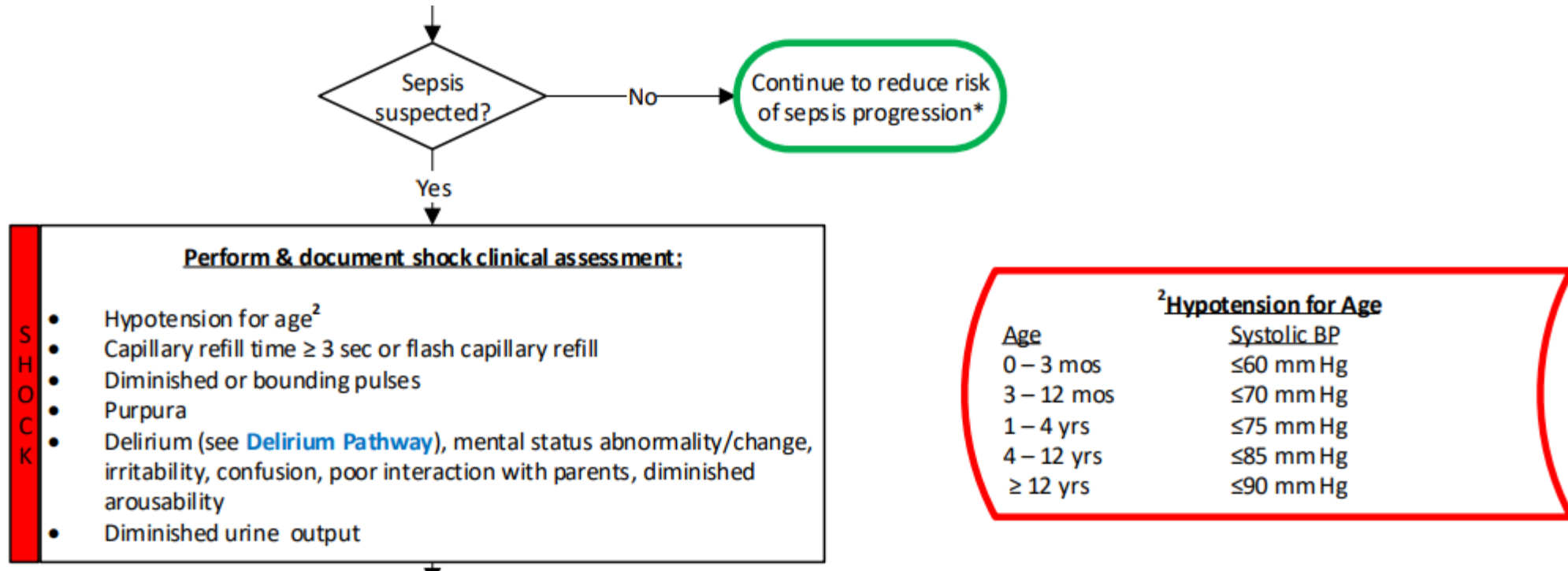
SEPSIS PATHWAY: RECOGNITION



Early recognition and treatment of Sepsis and Septic Shock are ***essential***

Positive screen → timely clinical assessment

SEPSIS PATHWAY: RECOGNITION & DOCUMENTATION



MD evaluates patient within **15 minutes**, confirms diagnosis of septic shock and need to proceed with Septic Shock Clinical Pathway

If MD not readily available, contact Medical Emergency Team (except in ED or PICU)

Hypotension Definition

- Normal systolic BP defined as:
 - $90 + (2 \times \text{age in years up to 10 yrs})$
- Hypotension
 - $< 70 + (2 \times \text{age in years to 10 yrs})$
- Patient is 4 years old \rightarrow minimal SBP 78

SEPSIS PATHWAY: RESUSCITATION

Place on
Oxygen for O2
Sats $\leq 97\%$

IV Access

- Ideally 2 points of access
- Move to IO if unable to obtain IV within 5min

Fluid
Resuscitation

- 20mL/kg
- Up to 60mL/kg *unless patient has a known cardiac history*

Labs

- iStat Blood Gas and Lactate*
 - iStat Chem 8*
 - Blood culture*
 - CBC with differential
 - Cortisol
 - DIC panel
- *Priorities if limited blood sample available**

Administer 1st
dose of
antibiotics

See next 2
slides

ANTIBIOTICS

SEPTIC SHOCK MEDICATION GUIDE

**ANTIBIOTICS – GIVE ASAP WITHIN ONE HOUR; give gram negative first (except for neonate)
IN OMNI (ER Main, PICU B, MS6C, MS7C, MS8C)**

Bedside RN to mix initial doses. Give "push" meds first

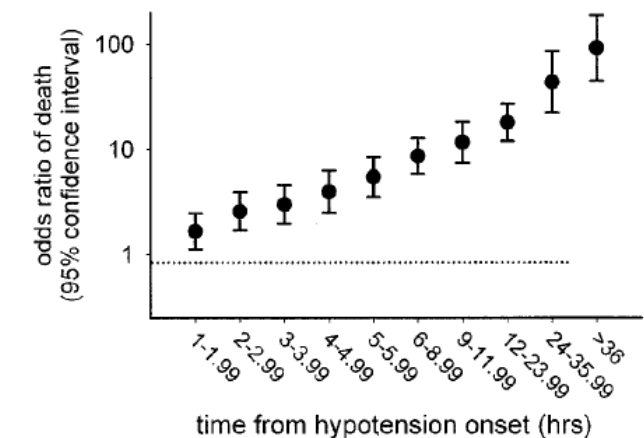
DRUG	INDICATION	DOSE	RECONSTITUTE	DILUTE in NS or D ₅ W	RATE
CEFTRIAXONE 1 gram vial	GRAM NEGATIVE	100 mg/kg/day divided q12hr (max 2000 mg/dose)	9.6ml SW= 100 mg/mL solution	<= 8 Kg add dose to 10 mL in a syringe 8-15 Kg - add dose to 20 mL in a syringe >=15 Kg - add dose to 50 mL bag	Over 10 min
CEFTAZIDIME 1 gram vial	GRAM NEGATIVE FEVER + NEUTROPENIA / IMMUNOCOMPROMI SE/CHRONIC HOSPITALIZATION	150 mg/kg/day divided q8hr (max 2000 mg/dose)	10ml SW= 100 mg/mL solution	N/A	Pushover 3-5 min
GENTAMICIN 2 mg/mL	GRAM NEGATIVE <i>Only for neonate ≤21 days old ≥35 weeks gestation</i>	4 mg/kg q24hr	Pharmacy to prepare STAT		Over 30 min
VANCOMYCIN 500 mg vial	GRAM POSITIVE	<3 mo: 15 mg/kg q8hr ≥52 wks/≥3 mo old: 70 mg/kg/day divided q6hr (max 750 mg/dose); ≥12 yrs: 60 mg/kg/day divided q8hr (max 1 g/dose)	10 mL SW= 50 mg/mL solution	0-7 Kg see below*** 8-29 Kg - add dose to 100 mL bag >30Kg - add dose to 250 mL bag	Over 90 min
LINEZOLID 2 mg/mL	GRAM POSITIVE VANCO ALLERGIC/ RENAL INSUFFICIENT	<12 years: 30 mg/kg/day divided q8hr (max 600 mg/dose); ≥12 yrs: 600 mg q12hr; if ≥12 yrs old but <45 kg: 20 mg/kg/day divided q12hr (max 600 mg/dose)	Pharmacy to prepare STAT		Over 30 min
AMPICILLIN 500 mg vial	GRAM POSITIVE NEONATE ≤28 DAYS	300 mg/kg/day divided q8hr ≤7 day olds, divided q6hr for >7 day olds	1.8 mL SW = 250 mg/mL	0-7 kg see below***	Over 15 min
CLINDAMYCIN 12 mg/mL	TOXIC SHOCK	40 mg/kg/day divided q8hr (max 900 mg/dose)	Pharmacy to prepare STAT		Over 30 min
METRONIDAZOLE 12 mg/mL	INTRA-ABDOMINAL / ANAEROBIC	30 mg/kg/day divided q8hr (max 500 mg/dose)	Pharmacy to prepare STAT		Over 30 min

***For patients weighing 1-3 Kg, add medication to 10 mL in a syringe

***For patients weighing 4-7 Kg, add medication to 20 mL in a syringe

Select both gram positive AND gram negative coverage

- Administer gram negative coverage first unless neonate ≤28 days
- Add metronidazole for intra-abdominal infection/anaerobic coverage when clinically necessary



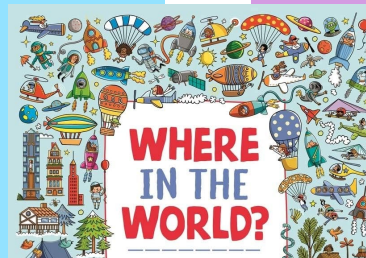
ANTIBIOTICS – Where Can I Find Them?

Pull from unit Omnicell and Mix:

- Ceftriaxone
- Ceftazidime
- Vancomycin
- Ampicillin

Pharmacy will send:

- Gentamicin
- Linezolid
- Clindamycin
- Metronidazole *(Pharmacy will send to ED, all other antibiotics will be mixed by ED RN's)*



ED – Main Omni
MS6/7/8 – Pod C Omni
PICU – Pod B Omni

ELECTROLYTE & LAB CORRECTION

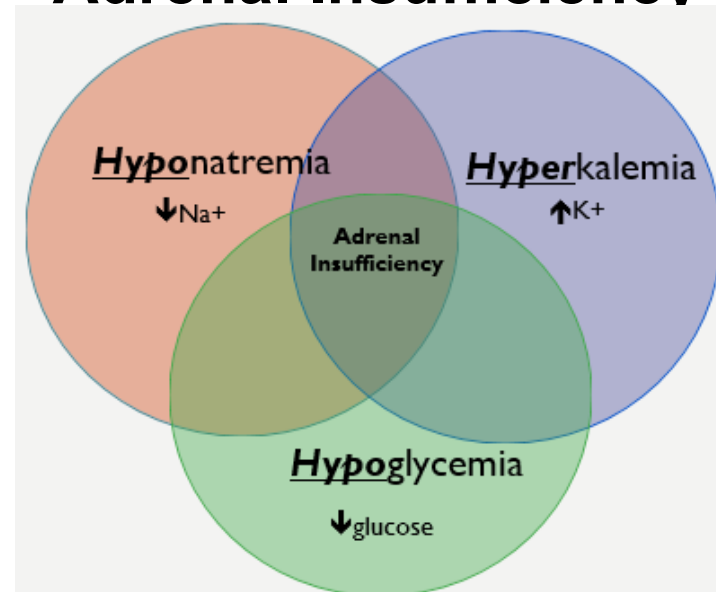
Hypoglycemia <60

Give: D10W 5mL/kg or D25W 2mL/kg

Hypocalcemia $<1.1\text{mg/dl}$

Give: CaCl 20 mg/kg or 1000mg if $\geq 50\text{kg}$

Adrenal Insufficiency



Consider: Hydrocortisone (2 mg/kg, standard adult dose 100 mg)

Fluid Resistant Shock

If signs of hypoperfusion after fluid resuscitation:

- Reassess ventilation status, mentation, work of breathing
- Start vasoactive agent*

Which agent should you use?**

- **Epinephrine**: if hypotensive and vasoconstricted (cold shock)
- **Norepinephrine**: if hypotensive and vasodilated (warm shock)

*For rapidly deteriorating patients, consider starting fluids AND vasopressors concurrently

** Always reassess patient and alter therapy if not effective

Resources



QR Code will be on Code Carts

Sepsis Card in Code Cart Notebook
(1st section)

Children's Hospital Association –
[Challenge Sepsis, Save Lives](#)

Nursing Septic Shock Card also
available on Sepsis Clinical Pathway
internet site

Clinical Pathway INTERnet Site

<https://www.connecticutchildrens.org/medical-professionals/clinical-pathways/septic-shock>

Quality Metrics

- Sepsis recognition compliance
 - Screening with BPA
 - Huddles and METs
 - Sepsis order set usage
- Clinically derived time zero to antibiotic administration
- Clinically derived time zero to antibiotic order
- Time from antibiotic order to administration
- Clinically derived time zero to bolus administration
- Mortality

Pathway Contacts

- Elliot Melendez, MD
 - Critical Care
- Matt Laurich, MD
 - Emergency Medicine

References

- Kumar A, Roberts D, Wood KE, Light B, Parrillo JE, Sharma S, Suppes R, Feinstein D, Zanotti S, Taiberg L, Gurka D, Kumar A, Cheang M. Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock. *Crit Care Med*. 2006 Jun;34(6):1589-96. doi: 10.1097/01.CCM.0000217961.75225.E9. PMID: 16625125.
- Schlapbach LJ, Watson RS, Sorce LR, et al; Society of Critical Care Medicine Pediatric Sepsis Definition Task Force. International Consensus Criteria for Pediatric Sepsis and Septic Shock. *JAMA*. 2024 Feb 27;331(8):665-674. doi: 10.1001/jama.2024.0179. PMID: 38245889; PMCID: PMC10900966.