

Septic Shock: Current Concepts and Clinical Treatment Implications.

31 July 2026

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- <https://www.sccm.org/survivingsepsiscampaign/guidelines-and-resources>



Surviving Sepsis Campaign

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Guidelines and Resources

Review evidence-based practice guidelines for adult and pediatric sepsis, along with implementation tools to use in your practice.

Surviving Sepsis Campaign

ADULT GUIDELINES

GUIDELINE

Surviving Sepsis Campaign Adult Guidelines

Review updated guidance for clinicians caring for adult patients with sepsis or septic shock.

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CHILDREN'S GUIDELINES

GUIDELINE

Surviving Sepsis Campaign Pediatric Guidelines

Review updated guidance for clinicians caring for children with sepsis or septic shock.

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COVID-19 GUIDELINES

GUIDELINE

Surviving Sepsis Campaign COVID-19 Guidelines

Review guidelines on the management of critically ill adults with COVID-19.

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Pediatric Critical Care Medicine

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SPECIAL ARTICLE

Surviving Sepsis Campaign International Guidelines for the Management of Sepsis and Septic Shock in Children 2026

Scott I. Weiss MD, MSCE, FCCM

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

International Consensus Criteria for Pediatric Sepsis and Septic Shock

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JAMA. doi:[10.1001/jama.2024.0179](https://doi.org/10.1001/jama.2024.0179)
Published online January 21, 2024.

Definitions

- Shock = oxygen delivery does not meet oxygen consumption / demand or oxygen utilization impaired at mitochondrial level
- Sepsis = Life-threatening organ dysfunction caused by a dysregulated host response to infection.
- Septic Shock = subset of sepsis with circulatory and cellular/metabolic dysfunction (associated with a higher risk of mortality)

JAMA | Original Investigation

Development and Validation of the Phoenix Criteria for Pediatric Sepsis and Septic Shock

L. Nelson Sanchez-Pinto, MD, MBI; Tellen D. Bennett, MD, MS; Peter E. DeWitt, PhD; Seth Russell, MS; Margaret N. Rebull, MA; Blake Martin, MD; Samuel Akech, MBChB, MMED; David J. Albers, PhD; Elizabeth R. Alpern, MD, MSCE; Fran Balamuth, MD, PhD, MSCE; Melania Bembea, MD, MPH, PhD; Mohammod Jobayer Chisti, MBBS, MMed, PhD; Idris Evans, MD, MSc; Christopher M. Horvat, MD, MHA; Juan Camilo Jaramillo-Bustamante, MD; Niranjana Kissoon, MD; Kusum Menon, MD, MSc; Halden F. Scott, MD, MSCS; Scott L. Weiss, MD; Matthew O. Wiens, PharmD, PhD; Jerry J. Zimmerman, MD, PhD; Andrew C. Argent, MD, MBBCh, MMed; Lauren R. Sorce, PhD, RN, CPNP-AC/PC; Luregn J. Schlapbach, MD, PhD; R. Scott Watson, MD, MPH; and the Society of Critical Care Medicine Pediatric Sepsis Definition Task Force

2024;331;(8):665-674. doi:10.1001/jama.2024.0179

Phoenix Sepsis Score

Sepsis = suspected /proven infection with sepsis score >2

Septic shock = sepsis with >1 cardiovascular point.

Table 2. The Phoenix Sepsis Score^a

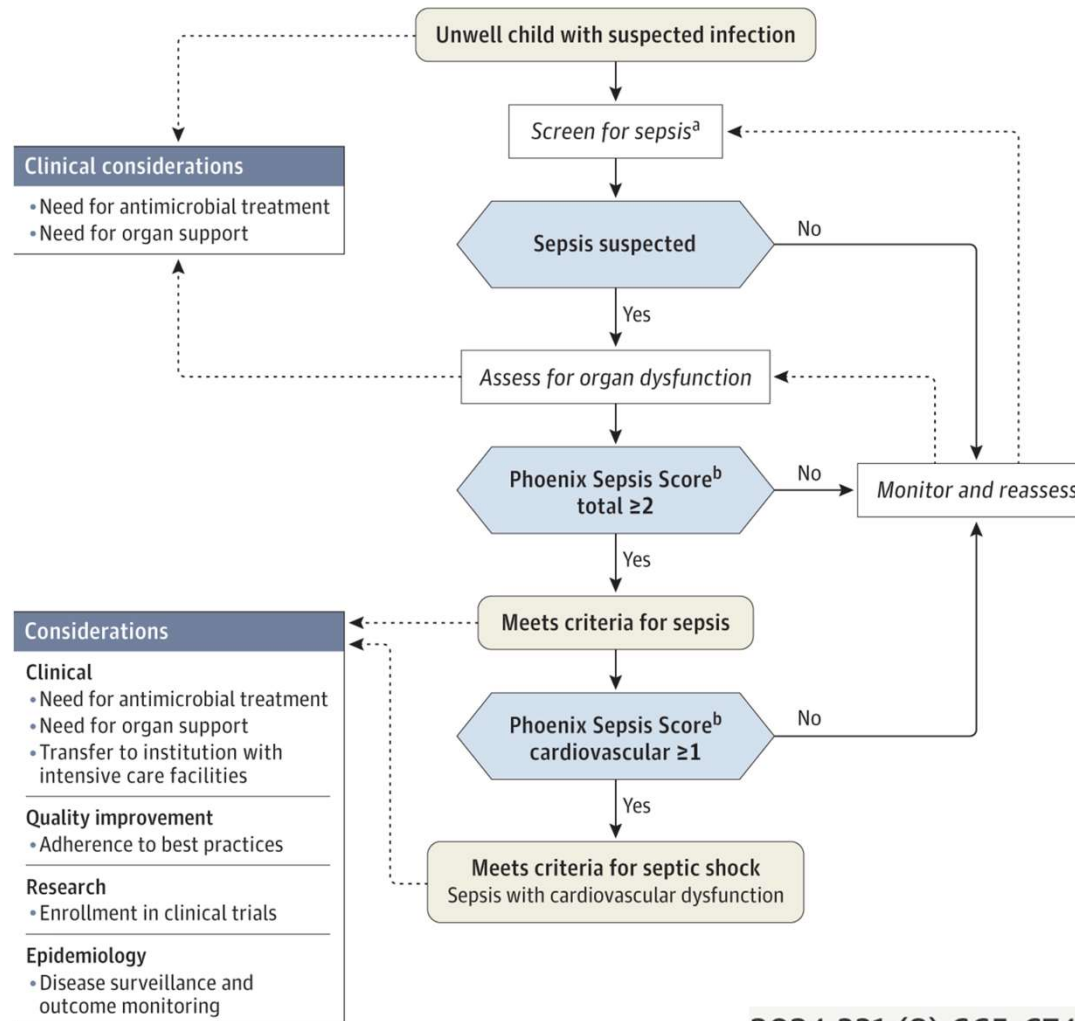
	0 Points	1 Point	2 Points	3 Points
Respiratory (0-3 points)				
	$\text{PaO}_2\text{:FIO}_2 \geq 400$ or $\text{SpO}_2\text{:FIO}_2 \geq 292^b$	$\text{PaO}_2\text{:FIO}_2 < 400$ and any respiratory support ^c or $\text{SpO}_2\text{:FIO}_2 < 292$ and any respiratory support ^c	$\text{PaO}_2\text{:FIO}_2$ 100-200 and IMV or $\text{SpO}_2\text{:FIO}_2$ 148-220 and IMV	$\text{PaO}_2\text{:FIO}_2 < 100$ and IMV or $\text{SpO}_2\text{:FIO}_2 < 148$ and IMV
Cardiovascular (0-6 points)				
		1 point each (up to 3) for:	2 points each (up to 6) for:	
	No vasoactive medications ^d	1 Vasoactive medication ^d	≥ 2 Vasoactive medications ^d	
	Lactate < 5 mmol/L ^e	Lactate 5-10.9 mmol/L ^e	Lactate ≥ 11 mmol/L ^e	
Mean arterial pressure by age, mm Hg ^{f,9}				
<1 mo	>30	17-30	<17	
1 to 11 mo	>38	25-38	<25	
1 to <2 y	>43	31-43	<31	
2 to <5 y	>44	32-44	<32	
5 to <12 y	>48	36-48	<36	
12 to 17 y	>51	38-51	<38	

Coagulation (0-2 points)^h

		1 point each (maximum of 2 points) for:
	Platelets $\geq 100 \times 10^3/\mu\text{L}$	Platelets $< 100 \times 10^3/\mu\text{L}$
	International normalized ratio ≤ 1.3	International normalized ratio > 1.3
	D-dimer ≤ 2 mg/L FEU	D-dimer > 2 mg/L FEU
	Fibrinogen ≥ 100 mg/dL	Fibrinogen < 100 mg/dL

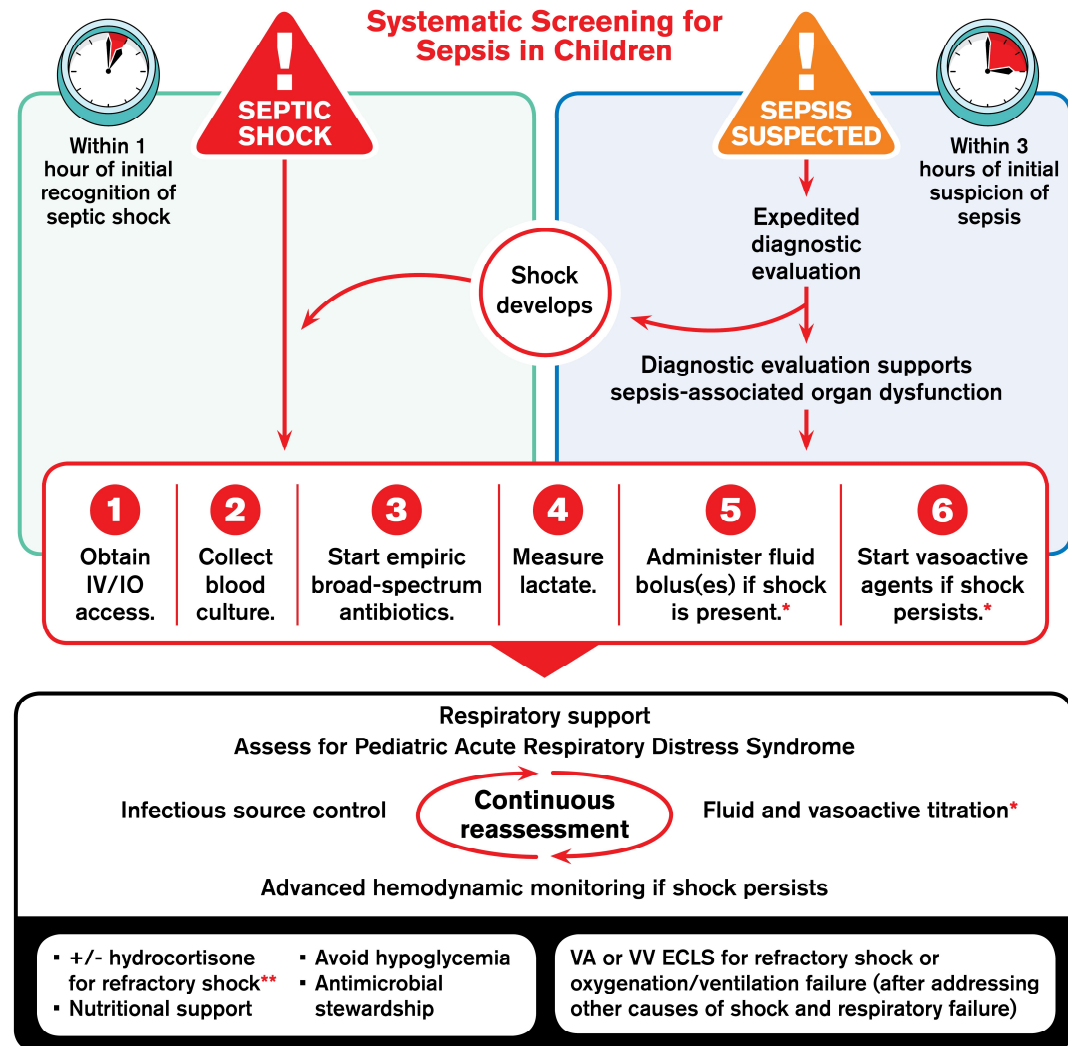
Neurologic (0-2 points)ⁱ

	Glasgow Coma Scale score $> 10^j$; pupils reactive	Glasgow Coma Scale score $\leq 10^j$	Fixed pupils bilaterally
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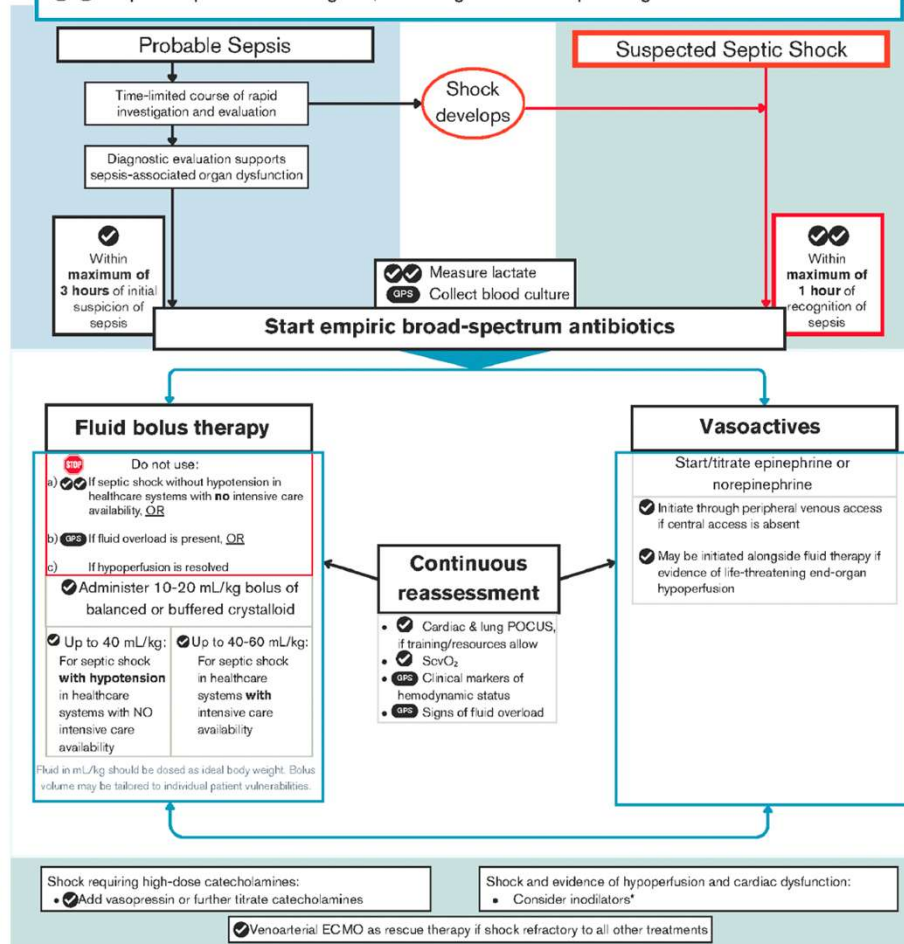
Initial Resuscitation Algorithm for Children

Surviving Sepsis Campaign



Symbol Key ✓✓ Strong Recommendation For ✓ Conditional Recommendation For GPS Good Practice Statement †

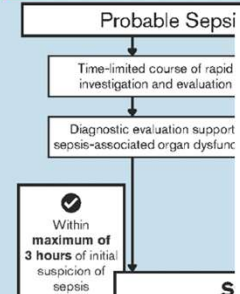
✓✓ Sepsis Improvement Program, Including Standard Operating Procedures for Treatment



† Strong Recommendation ("We recommend"): All or almost all informed patients would prefer the recommended treatment.
 Conditional Recommendation ("We suggest"): Most informed patients would prefer the recommended treatment, but a substantial proportion would not.
 Good Practice Statement: Generally, most informed patients are expected to prefer the treatment suggested by the good practice statement.
 *In Our Practice Statement: Never used to issue formal recommendations.

Symbol Key ✓✓ Strong Recommendation For ✓ Conditional Recommendation For GPS Good Practice Statement †

✓✓ Sepsis Improvement Program, Including Standard Operating Procedures for Treatment



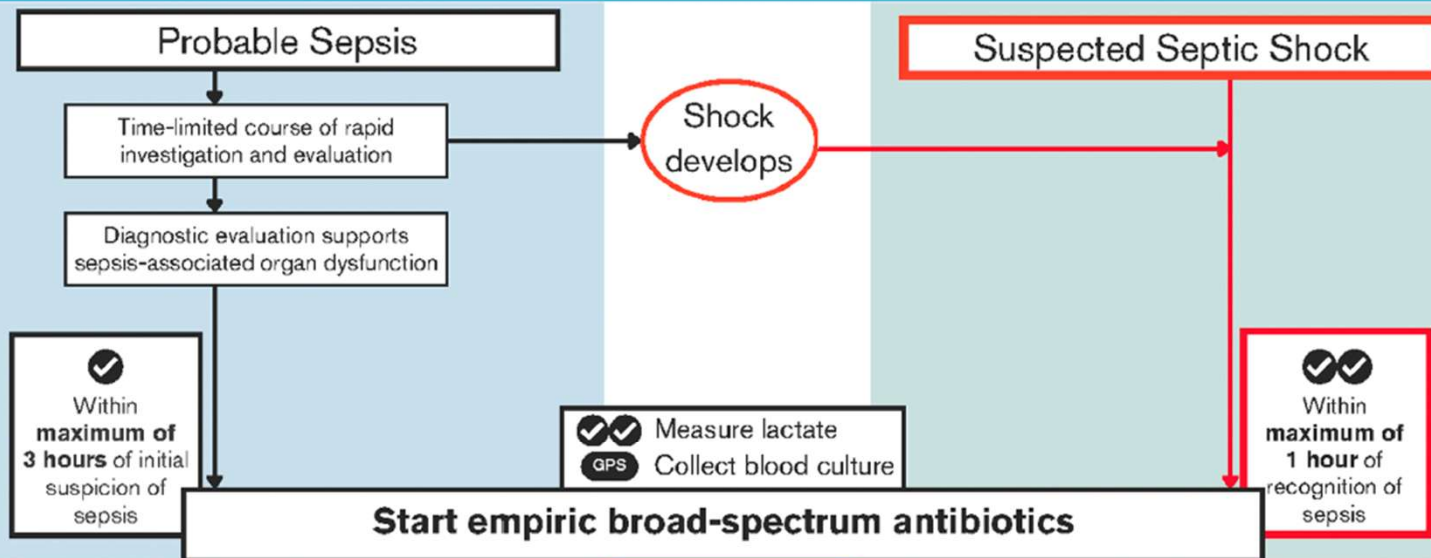
Fluid bolus therapy

- Do not use:
- a) ✓✓ If septic shock without hypotension in healthcare systems with **no** intensive availability, QR
 - b) GPS If fluid overload is present, QR
 - c) If hypoperfusion is resolved
- ✓ Administer 10-20 mL/kg bolus balanced or buffered crystalloids
- | | |
|--|---|
| ✓ Up to 40 mL/kg:
For septic shock with hypotension in healthcare systems with NO intensive care availability | ✓ Up to 40-60 mL/kg:
For septic shock in healthcare systems with intensive care availability |
|--|---|
- Fluid in mL/kg should be dosed as ideal body weight volume may be tailored to individual patient volume

- Shock requiring high-dose catecholamine
- ✓ Add vasopressin or further titrate catecholamine
- ✓ Veno

Symbol Key ✓✓ Strong Recommendation For ✓ Conditional Recommendation For GPS Good Practice Statement †

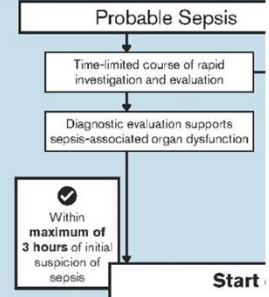
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✓✓ Sepsis Improvement Process



Fluid bolus therapy

- Do not use:
- a) ✓✓ If septic shock without hypotension in healthcare systems with **no** intensive care availability, OR
 - b) GPS If fluid overload is present, OR
 - c) If hypoperfusion is resolved
- ✓ Administer 10-20 mL/kg bolus of balanced or buffered crystalloid
- | | |
|--|--|
| ✓ Up to 40 mL/kg:
For septic shock with hypotension in healthcare systems with NO intensive care availability | ✓ Up to 40-60 mL/kg:
For septic shock in healthcare systems with intensive care availability |
|--|--|
- Fluid in mL/kg should be dosed as ideal body weight. Bolus volume may be tailored to individual patient vulnerabilities.

Shock requiring high-dose catecholamines:
• ✓ Add vasopressin or further titrate catecholamines

✓ Venoarterial

Fluid bolus therapy

- Do not use:
- a) ✓✓ If septic shock without hypotension in healthcare systems with **no** intensive care availability, OR
 - b) GPS If fluid overload is present, OR
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For septic shock in healthcare systems with intensive care availability |
|--|--|

Fluid in mL/kg should be dosed as ideal body weight. Bolus volume may be tailored to individual patient vulnerabilities.

Continuous reassessment

- ✓ Cardiac & lung POCUS, if training/resources allow
- ✓ ScvO₂
- GPS Clinical markers of hemodynamic status
- GPS Signs of fluid overload

Vasoactives

Start/titrate epinephrine or norepinephrine

- ✓ Initiate through peripheral venous access if central access is absent
- ✓ May be initiated alongside fluid therapy if evidence of life-threatening end-organ hypoperfusion

Shock requiring high-dose catecholamines:
• ✓ Add vasopressin or further titrate catecholamines

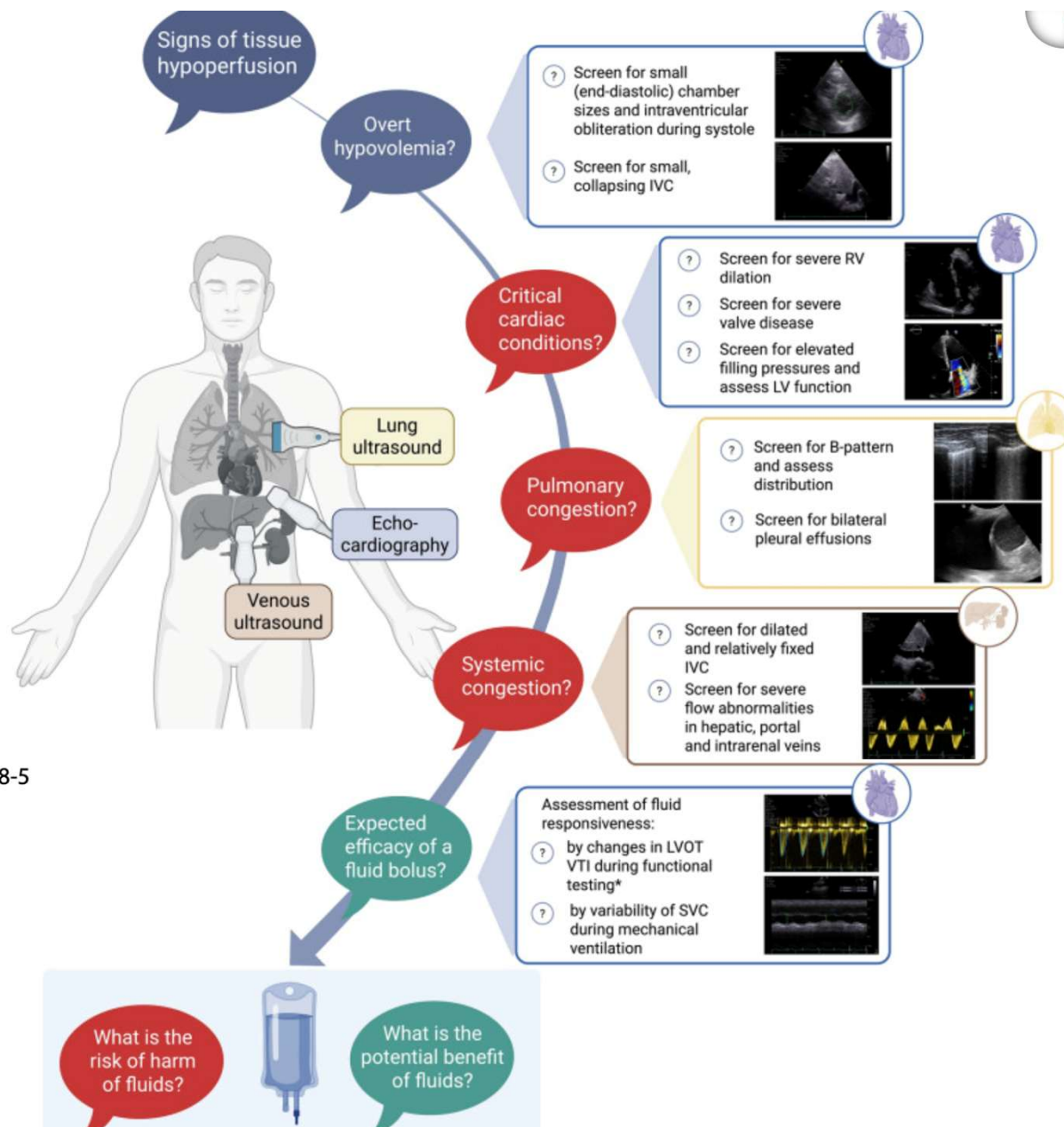
Shock and evidence of hypoperfusion and cardiac dysfunction:
• Consider inodilators*

✓ Venoarterial ECMO as rescue therapy if shock refractory to all other treatments

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Monitoring response to therapy

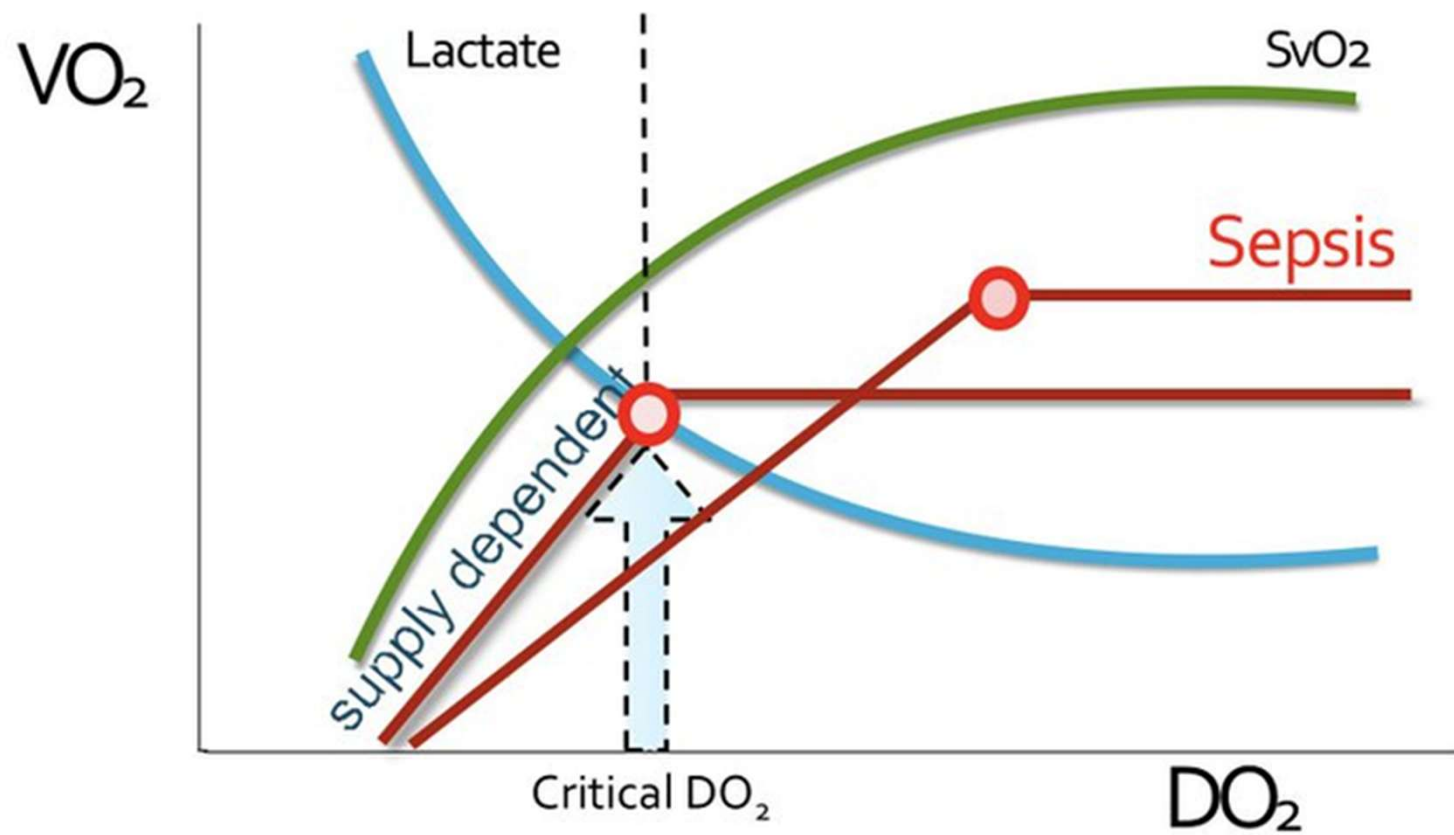
- CV sats (>70%)
- Capillary refill time
- Declining lactate
- POCUS (cardiac and lung)

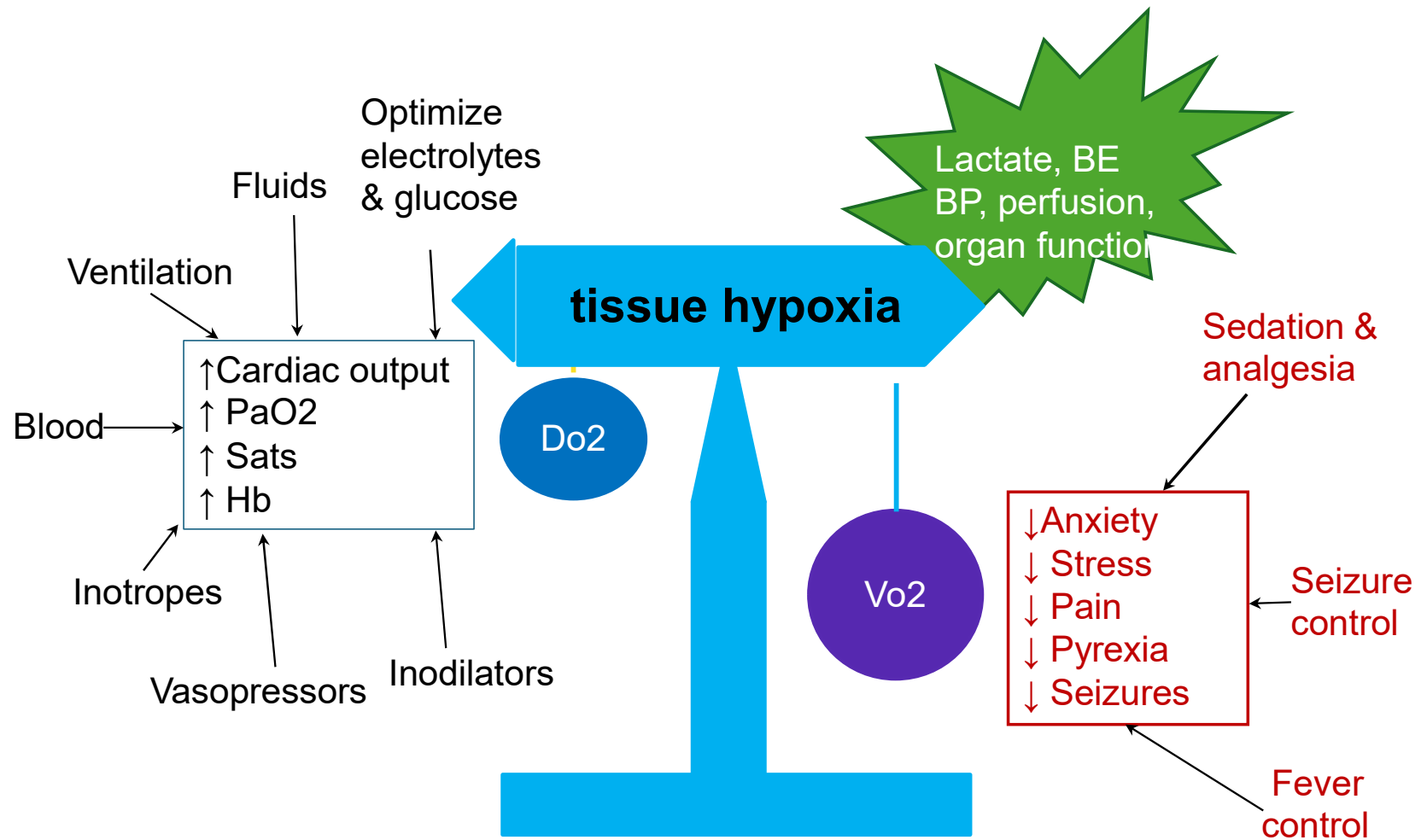


Concept 1: D02:V02 relationship

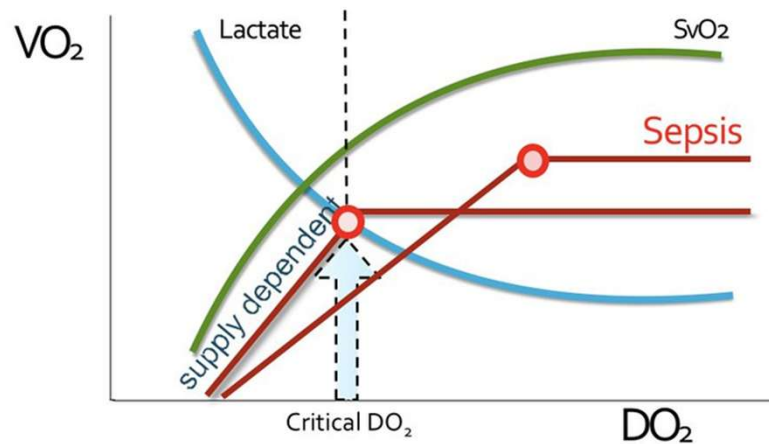
$$\begin{aligned} D02 &= \text{Oxygen Delivery} \\ &= \text{Cardiac output} \times \text{Oxygen Content blood} \\ &= (\text{HR} \times \text{SV}) \times [\% \text{ Sat} \times \text{Hb} \times 1.34 + \text{PaO}_2(0.003)] \end{aligned}$$

V02 = Oxygen Consumption



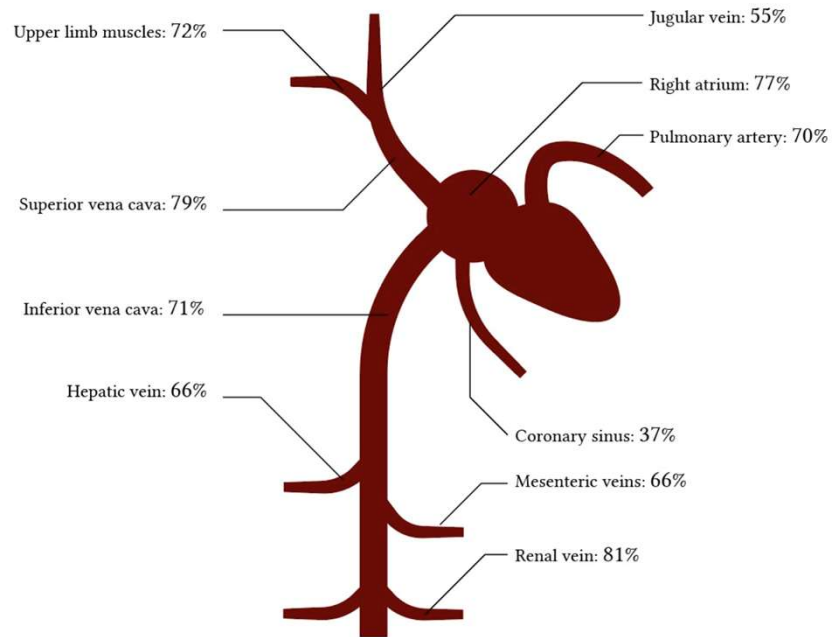


Concept 2: serum Lactate

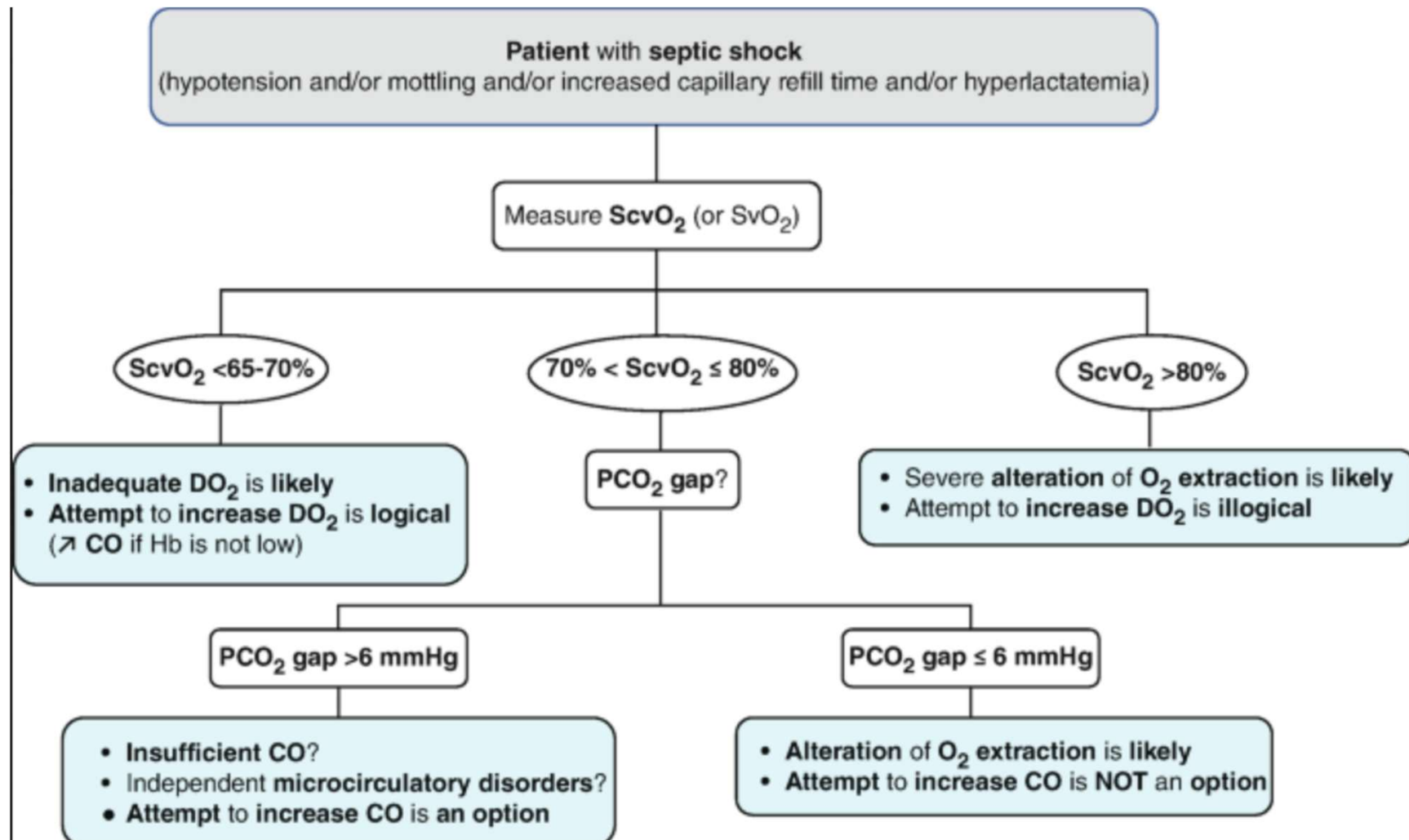


- Aid in diagnosis of septic shock
- Prognostic marker
- Guiding resuscitation efficacy (Clearance)
- Limitations exist

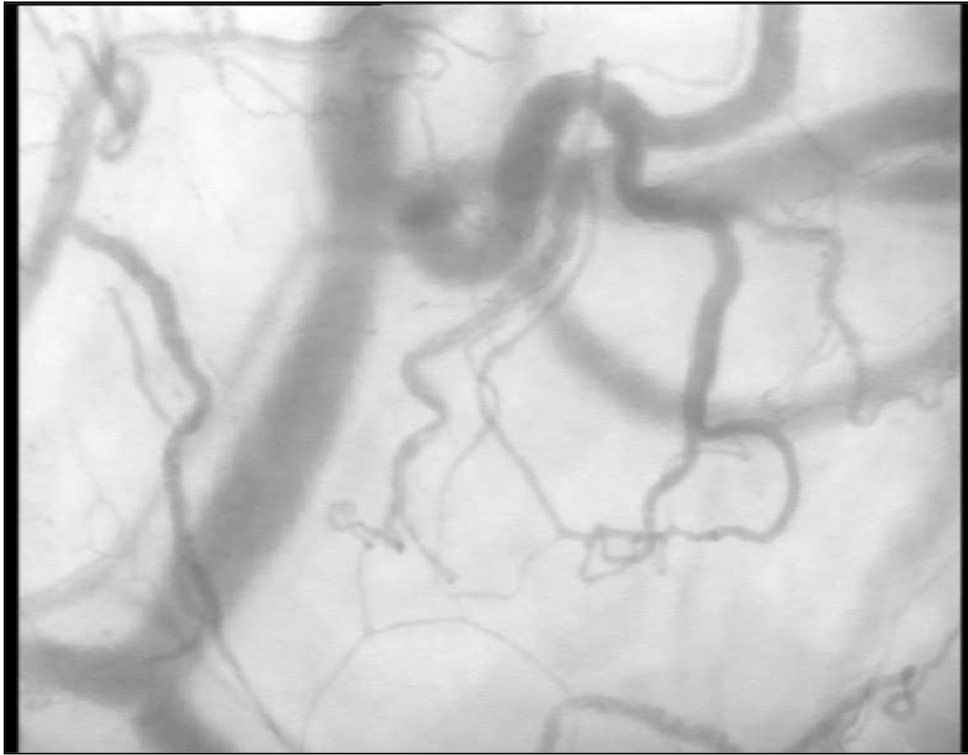
Concept 3: Central venous saturations



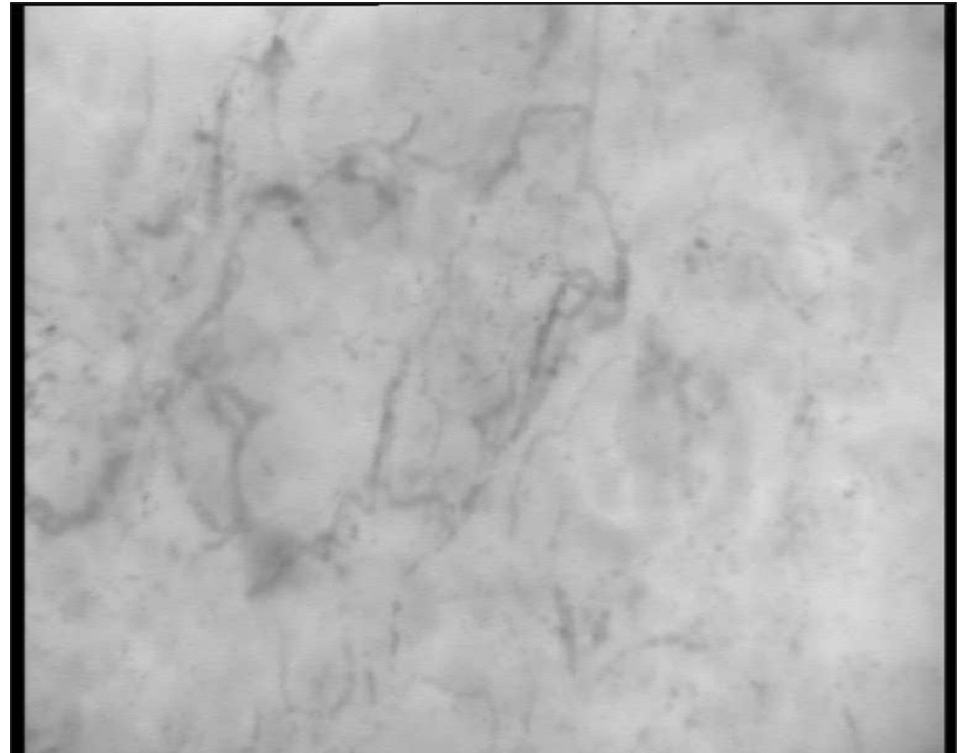
- Oxygen Extraction Ratio (OER)
$$= V_{O2} / D_{O2}$$
$$= (S_{aO2} - S_{vO2}) / S_{aO2}$$



Concept 4: BP $\neq$ Perfusion



Normal



Septic shock with normal BP

Concept 5: Vasopressors/ Inotropes/ Inopressors.

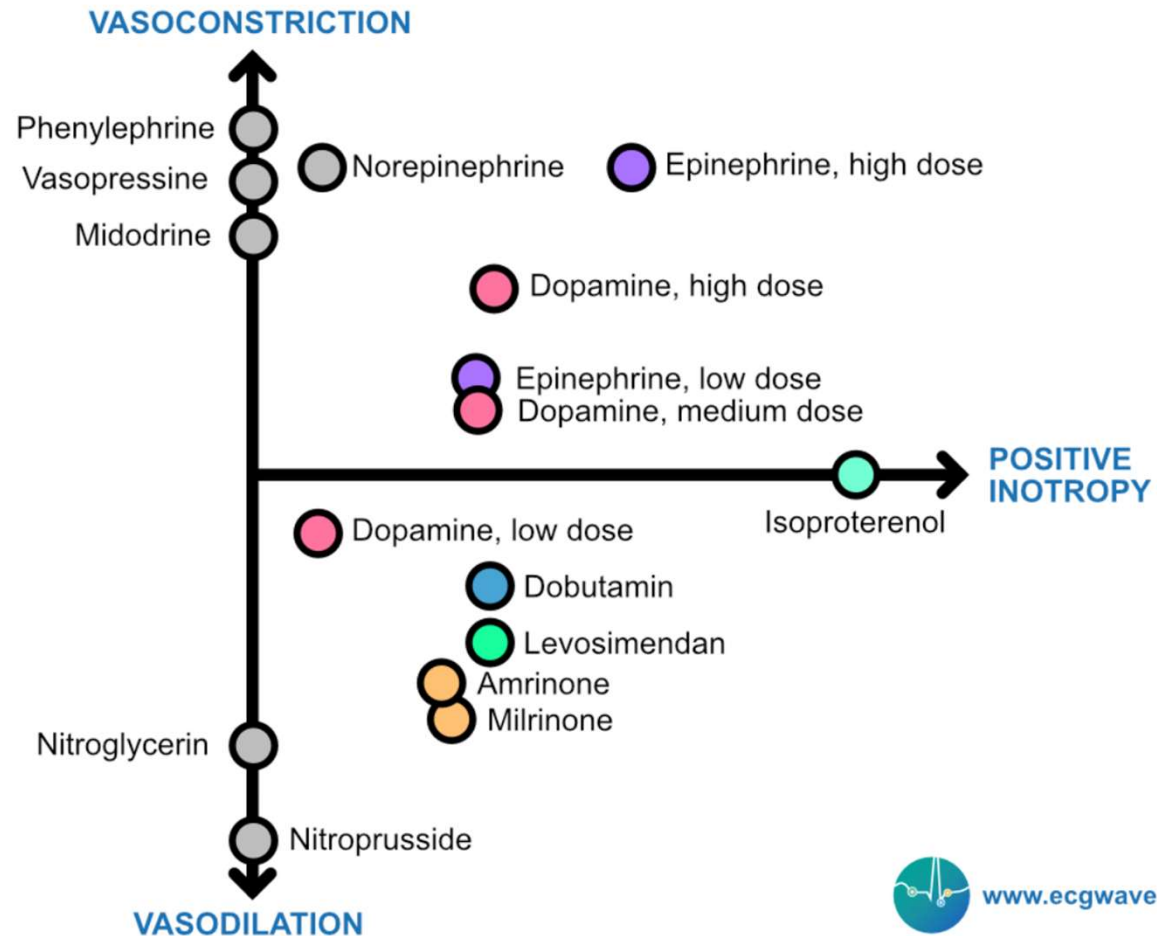


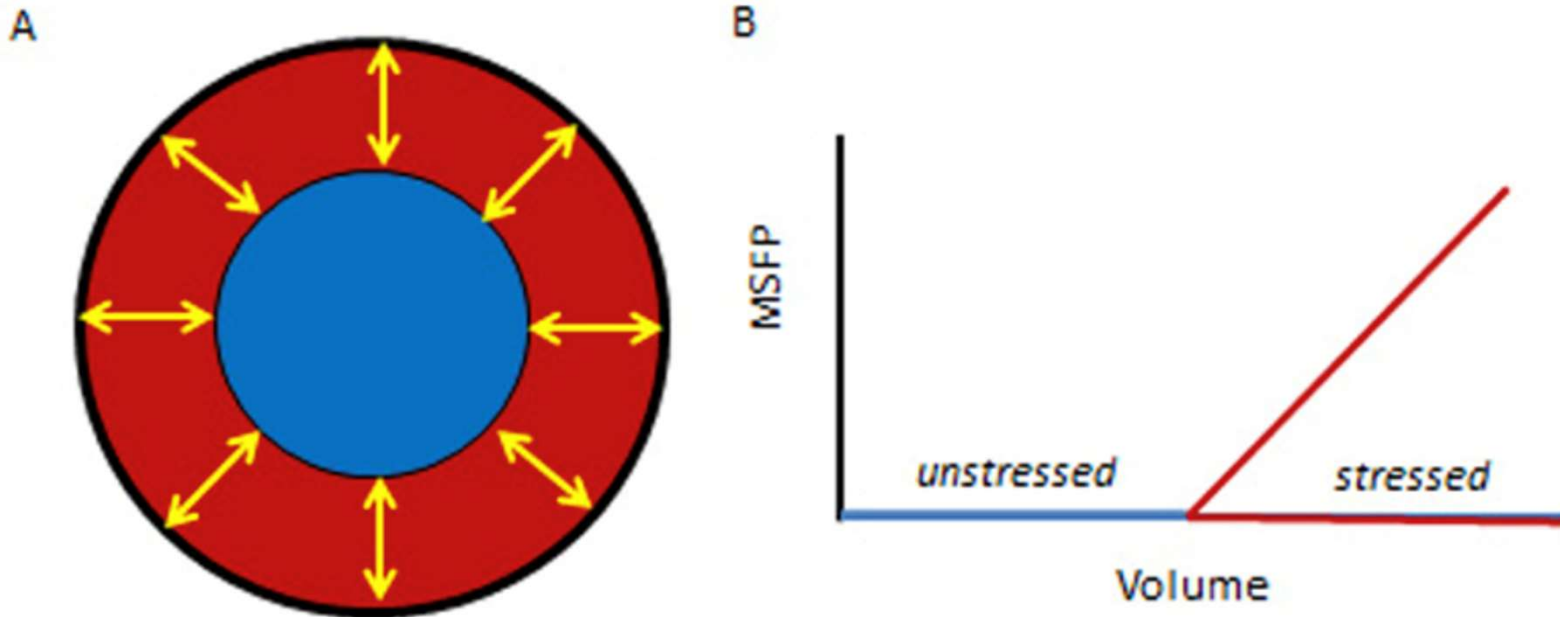
Table 1 Relative Receptor Potency³

Agent	Alpha-1	Beta-1	Beta-2	Dopamine	Vasopressin-1
Dobutamine	+	+++++	+++	0	0
Dopamine	+++	++++	++	+++++	0
Epinephrine	+++++	++++	+++	0	0
Milrinone	0	0	0	0	0
Norepinephrine	+++++	+++	++	0	0
Phenylephrine	+++++	0	0	0	0
Vasopressin	0	0	0	0	+++++
0 = no significant receptor affinity; + through +++++ = minimal to maximal receptor affinity					

Concept 6 : Fluid therapy in septic shock

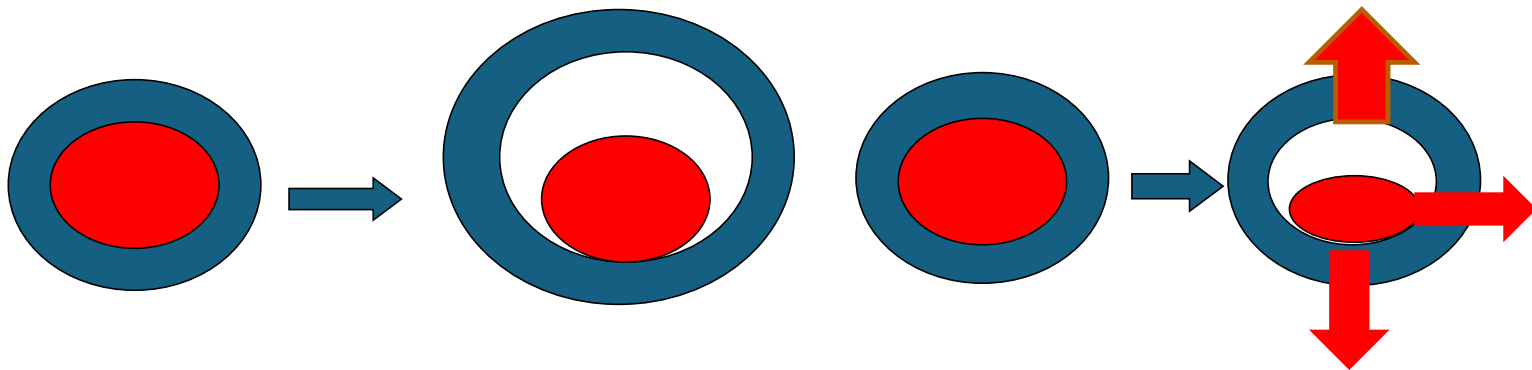
- More conservative volumes of fluid
- Early vasopressors
- Isotonic balanced crystalloids
- Assess response to fluid administration.

Stressed and Unstressed Volume



Mechanisms of hypotension in septic shock

- Vasodilatation/vasoplegia
- Capillary leak (3rd spacing)- hypovolemic
- Myocardial suppression - cardiogenic
- DIC – obstructive
- Adrenal suppression
- Hypovolemic



Fluid Tolerance

- Fluid Tolerance = the ability of the body to receive an infusion of fluids without progressing to organ dysfunction.
- Fluid responsiveness = increase in cardiac output >10-15% induced by an increased preload.

Concept 7: Early Intubation

D02/V02 Considerations

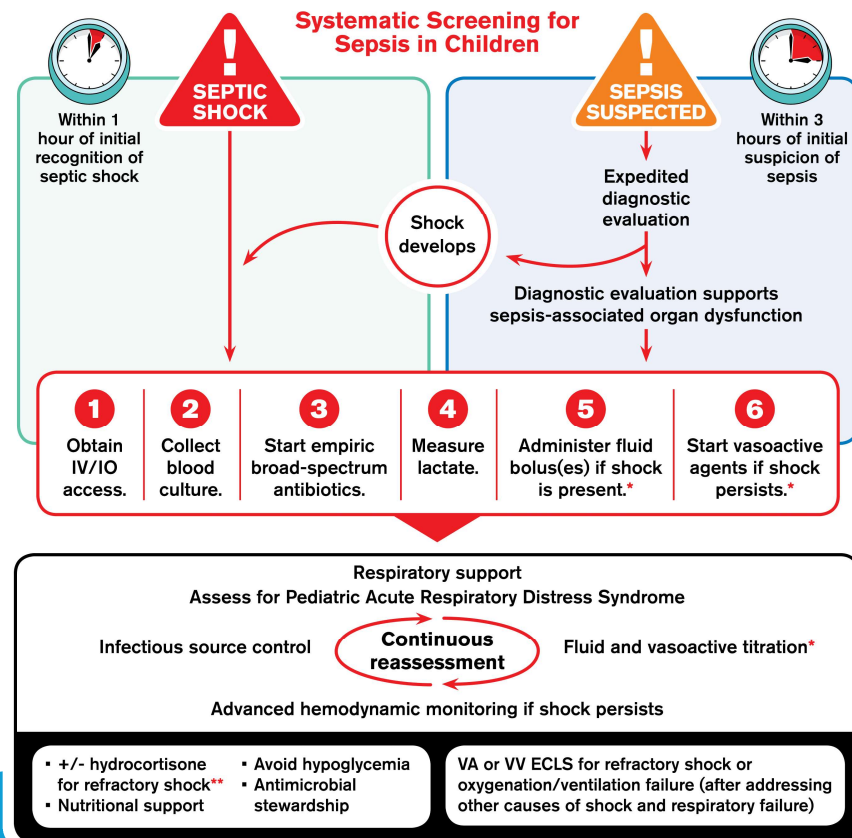
- Up to 60% of cardiac output may go to support work of breathing
- PSILI
- Haemodynamic effects:
 - Cardiac output

“Physiologically challenging Airway”

- Apnoeic interval (acidosis, hypercapnoea, hypoxaemia)
- Vasodilation: loss of sympathetic tone
- Transition to PPV : reduced preload.

Initial Resuscitation Algorithm for Children

Surviving Sepsis Campaign



To sum up....

- New Definitions: Phoenix
- “Sepsis Six”
- Important concepts highlighted
 - D02/V02
 - Fluid tolerance / fluid responsiveness/ stressed v unstressed volume
- Early intervention = better outcomes.



Concept 8: pathophysiological phenotypes

STATE-OF-THE-ART REVIEW | DECEMBER 12 2023

Pediatric Sepsis Diagnosis, Management, and Sub-phenotypes

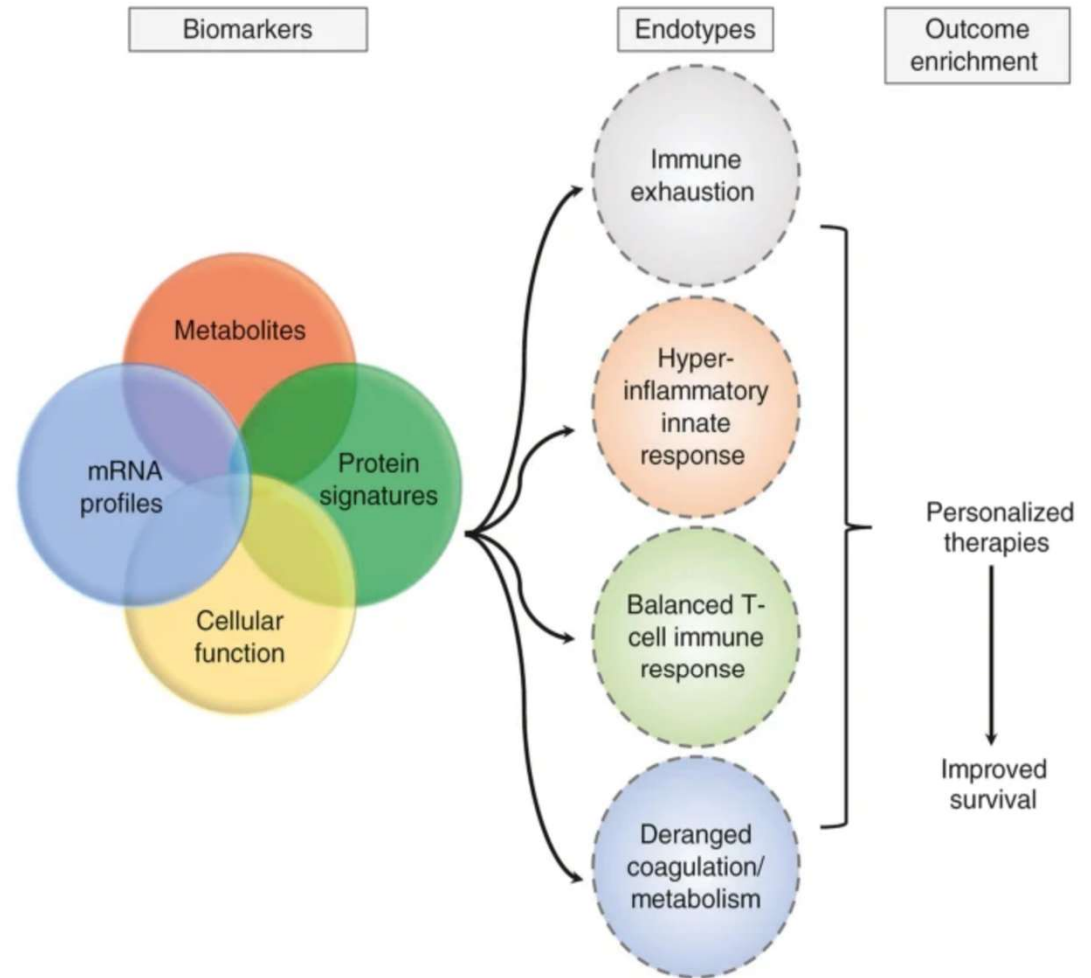


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ORIGINAL ARTICLE

Global Epidemiology of Pediatric Severe Sepsis: The Sepsis Prevalence, Outcomes, and Therapies Study

Scott L. Weiss^{1*}, Julie C. Fitzgerald^{1*}, John Pappachan^{2,3}, Derek Wheeler^{4,5}, Juan C. Jaramillo-Bustamante⁶, Asma Salloo⁷, Sunit C. Singhi⁸, Simon Erickson⁹, Jason A. Roy¹⁰, Jenny L. Bush¹, Vinay M. Nadkarni¹, and Neal J. Thomas^{1,11}; for the Sepsis Prevalence, Outcomes, and Therapies (SPROUT) Study Investigators and the Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) Network

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