Sepsis & Septic Shock

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The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)

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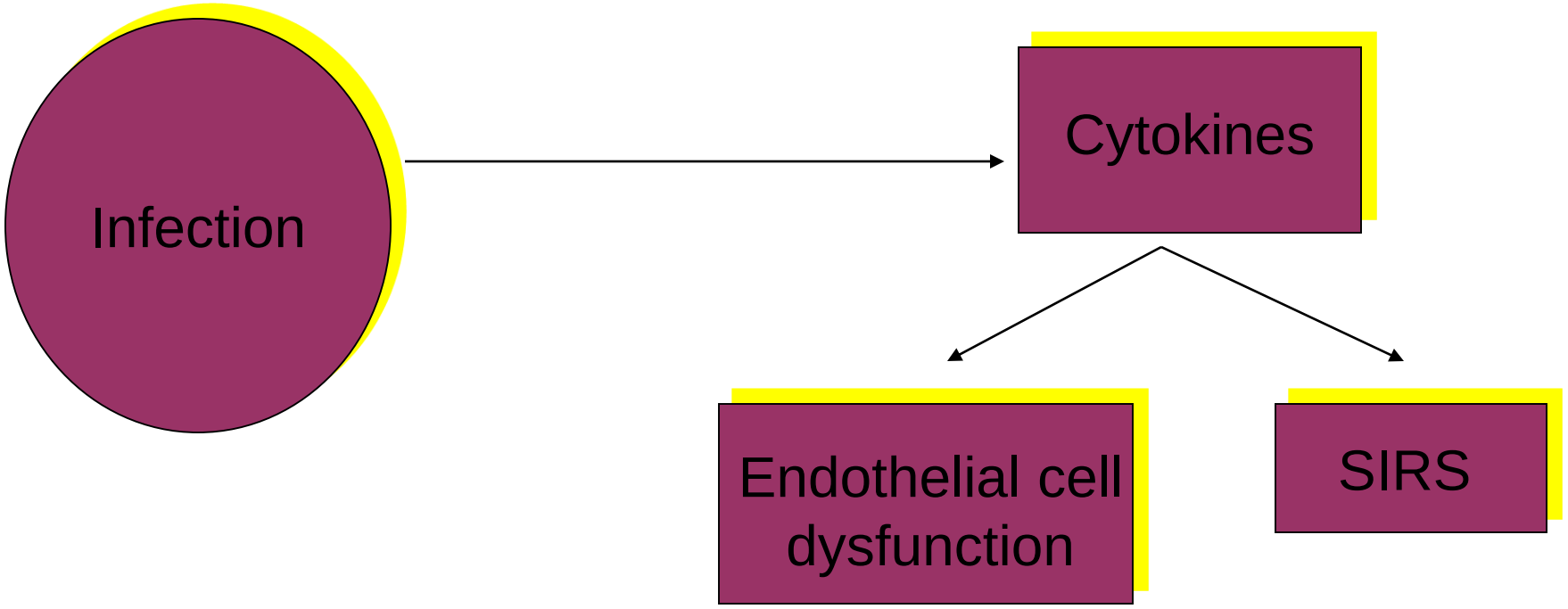
JAMA. 2016;315(8):801-810. doi:10.1001/jama.2016.0287.

Sepsis

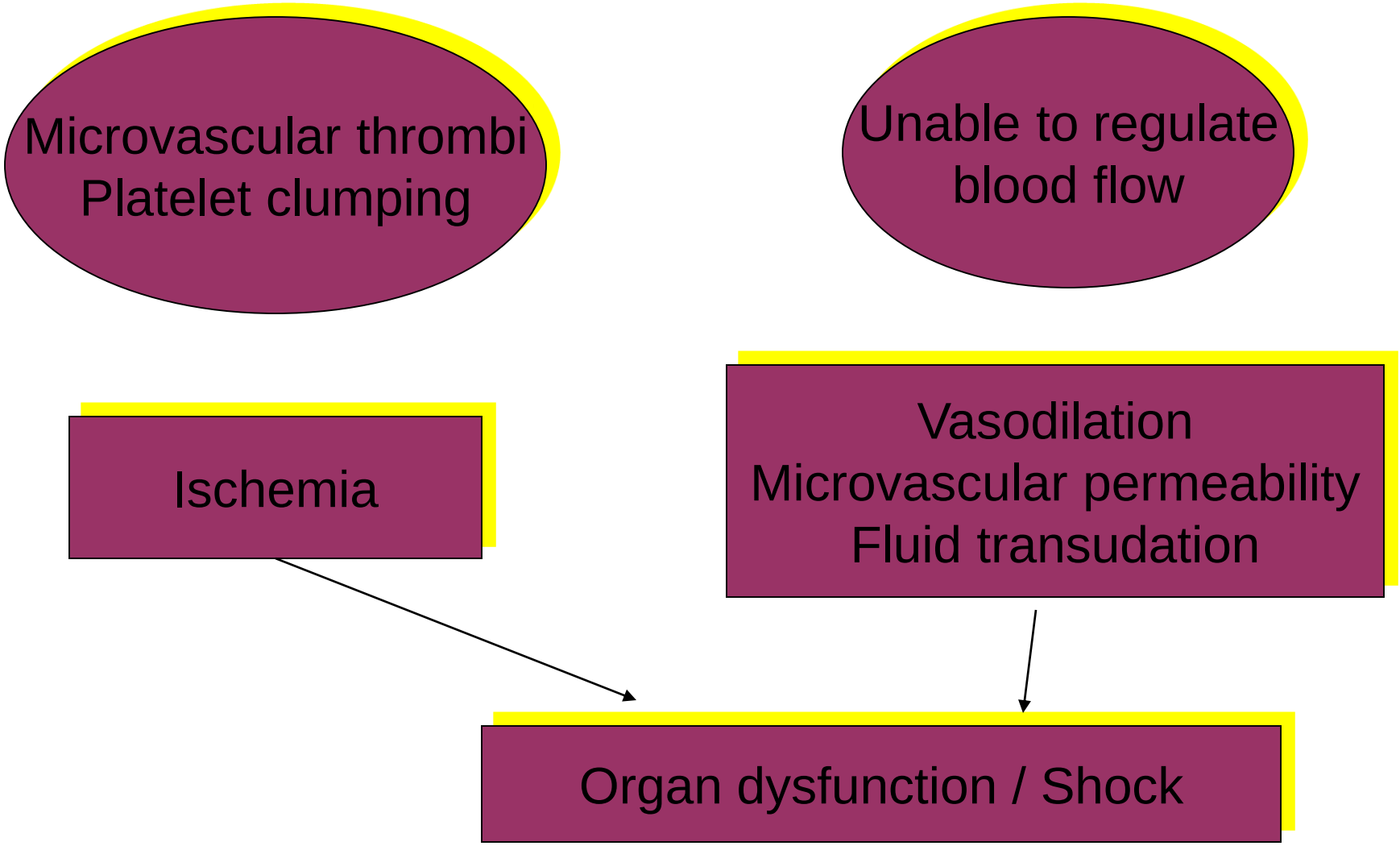
…is defined as life-threatening organ dysfunction caused by a dysregulated host response to infection.

JAMA. 2016;315(8):801-810

Proinflammatory Mediators



Endothelial Cell Dysfunction



In lay terms…

Sepsis is a life-threatening condition that arises when the bodies response to infection injures its own tissues and organs.

JAMA. 2016;315(8):801-810

SIRS vs Organ Dysfunction

- Heart rate
- Respiratory rate
- Temperature
- WBC

- Respiratory
- Hematologic
- GI
- Hemodynamic
- CNS
- Renal

Organ Dysfunction

…can be identified as an acute change in total SOFA score ≥2 points consequent to the infection

JAMA. 2016;315(8):801-810

SOFA

- PaO_2/FiO_2 ratio
- Platelet count
- Bilirubin
- MAP
- Glascow Coma Scale
- Creatinine & urine output

qSOFA

- Respiratory rate ≥ 22
- Altered mentation
- Systolic BP ≤ 100 mmHg

- Early recognition
- Aggressive and immediate intervention

Fill the Tank!

Normal saline or
Lactated Ringers

30 ml/kg (1.5-3 liters)

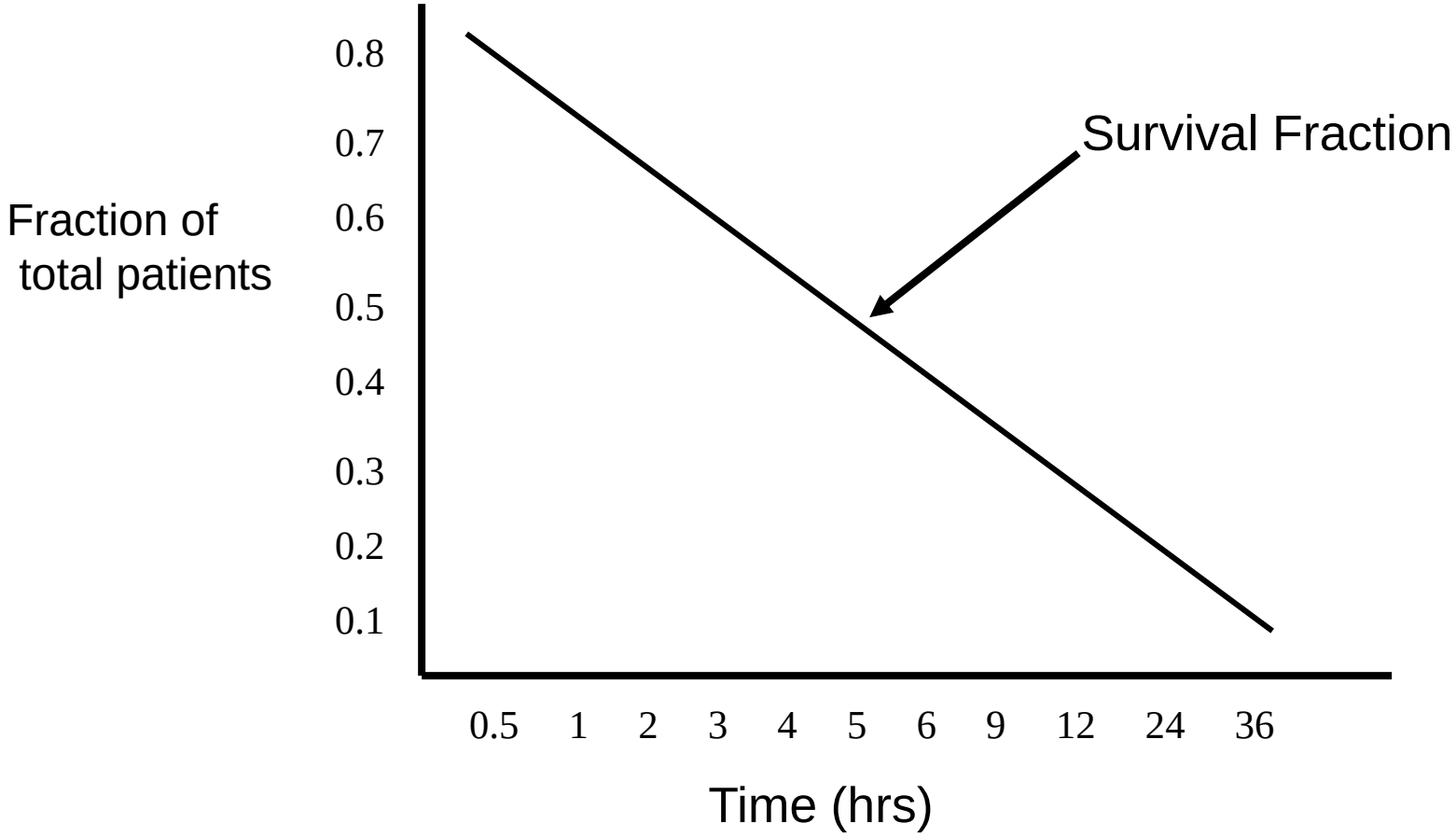
Wide Open!

Fluid Resuscitation

- Blood pressure/ HR response
- Urine output
- Cardiothoracic US
- CVP/$ScvO_2$ Pulse pressure variation
- Lactate clearance/normalization
- Dynamic measurements

Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016

Antibiotic Timing



Kumar A, Crit Care Med 2006; 34(6): 1589-96

Antibiotic Timing

… every hour delay was associated with an approximately 12% decreased probability of survival…

Kumar A, Crit Care Med 2006; 34(6): 1589-96

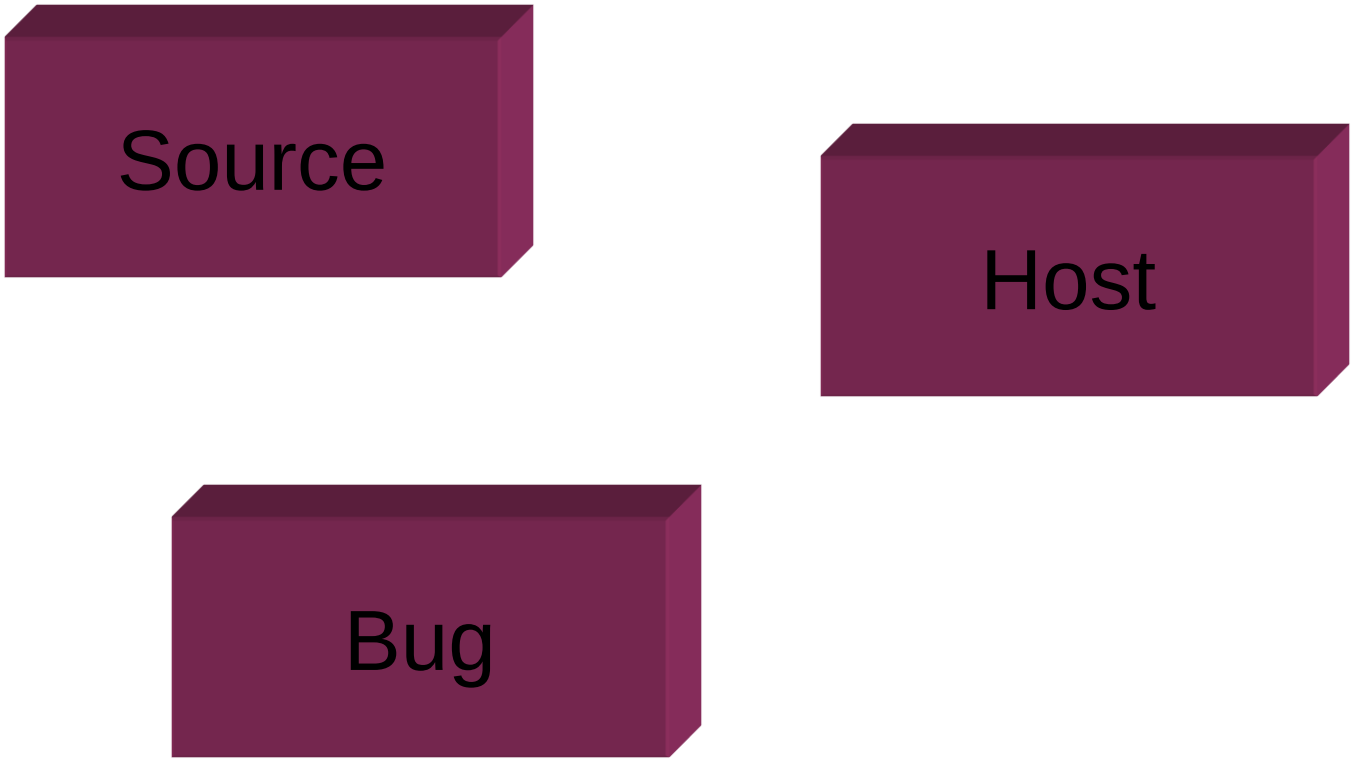
Empiric Antibiotics

- Blood Stream Infections (BSI)

	Mortality
– appropriate	20%
– inappropriate	34%

Leibovici L, J Intern Med 1998; 244:379-386

Antibiotic Choices



Antibiotic Choices

Empiric broad-spectrum therapy

Narrow: pathogen ID/ sensitivities
&/or clinical improvement

Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016

Control the Source

Glucose control

- Maintain serum glucose <150 mg/dL
- IV vs. SQ insulin
- Start enteral nutrition ASAP

Surviving Sepsis Campaign: International guidelines for management of severe sepsis and septic shock. Crit Care Med. 2013 Feb; 41(2): 580-637

Steroids?

- Unresponsive to vasopressors
- “Stress” dosing
- Hydrocortisone 50mg IV q6h

Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock. Crit Care Med. 2013 Feb; 41(2): 580-637

1 Hour Bundle

- Measure lactate
- Obtain blood cultures
- Administer broad-spectrum antibiotics
- Begin 30mL/kg crystalloids for ↓BP or lactate > 4
- Vasopressors for persistent hypotension

The Surviving Sepsis Campaign Bundle: 2018 Update
DOI: 10.1097/CCM.0000000000003119

Septic Shock

…is a subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities are profound enough to substantially increase mortality.

JAMA. 2016;315(8):801-810

Septic Shock

Sepsis with…

- persistent hypotension requiring vasopressors and
- Lactate > 2 mmol/L

*despite adequate fluid resuscitation

Procalcitonin

- Bacterial infection w/ severe inflammatory reaction (>2.0)
- Early and highly specific
- Not elevated in viral, chronic inflammatory or autoimmune disorders (<0.5)

Lessons for Practice

- Sepsis is life-threatening due to organ dysfunction
- Early recognition, aggressive IV fluid resuscitation and early antibiotics are key to reducing mortality
- Source control needs to be addressed ASAP

Citations

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