General Internal Medicine Review Course

NOVEMBER 2020

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Surviving Sepsis Campaign

- VERY evidence based
- SAVES lives
- HAPPENS weekly if not daily to someone in YOUR hospital
- SHOULD be protocolized
- COOPERATION from doctors, nurses, pharmacy, supervisors

- The following slides are selected from presentations found online and are MEANT for sharing and teaching!

The New Surviving Sepsis Bundles: From Time Zero to Tomorrow

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NEW sepsis BUNDLES

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SURVIVING SEPSIS CAMPAIGN BUNDLES

[redacted]:

1) Measure lactate level

2) Obtain blood cultures prior to administration of antibiotics

3) Administer broad spectrum antibiotics

4) Administer 30 mL/kg crystalloid for hypotension or lactate 4mmol/L

TO BE COMPLETED WITHIN 6 HOURS:

5) Apply vasopressors (for hypotension that does not respond to initial fluid resuscitation to maintain a mean arterial pressure [MAP] 65 mm Hg)

6) In the event of persistent arterial hypotension despite volume resuscitation (septic shock) or initial lactate ≥ 4 mmol/L (36 mg/dL):

- Measure central venous pressure (CVP)*
- Measure central venous oxygen saturation (ScvO2)*

7) Remeasure lactate if initial lactate was elevated*

*Targets for quantitative resuscitation included in the guidelines are CVP of 8 mm Hg, ScvO2 of 70%, and normalization of lactate

Why measure lactate?

Why measure lactate?

- Diagnose severe sepsis with elevated lactate as a diagnosis of tissue hypoperfusion
- Trigger for quantitative resuscitation if lactate is 4 mg/dL or more

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Blood Cultures

Diagnosis

To optimize identification of causative organisms, we recommend at least two blood cultures be obtained before antimicrobial therapy is administered as long as such cultures do not cause significant delay (>45 minutes) in antimicrobial administration, with at least one drawn percutaneously and one drawn through each vascular access device, unless the device was recently (<48 hr.) inserted (Grade 1C).

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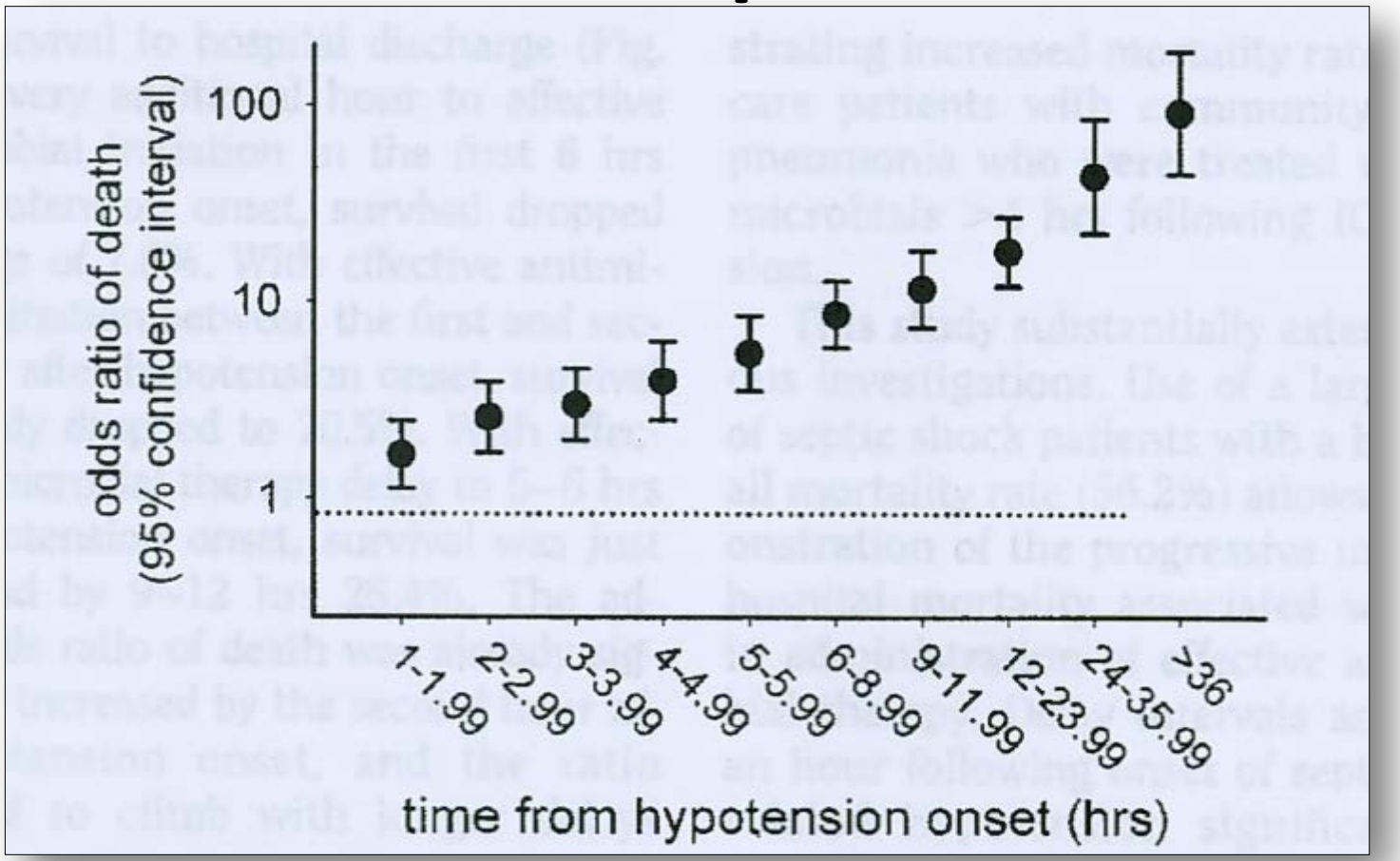
Time to Antibiotics Following Onset Septic Shock



Kumar A, et al. *Crit Care Med* 2006; 34:1589-1596

Antibiotic Therapy

- **We recommend that intravenous antibiotic therapy be started as early as possible and within the first hour of recognition of septic shock (1B) and severe sepsis without septic shock (1C).**

Remark: Although the weight of evidence supports prompt administration of antibiotics following the recognition of severe sepsis and septic shock, the feasibility with which clinicians may achieve this ideal state has not been scientifically validated.

Antibiotic Therapy

- Initial empiric anti-infective therapy – activity against all likely pathogens and adequate concentrations into suspected or potential sources of infection (1B)

- Reassess antibiotic regimen daily for de-escalation (1B)

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Fluid therapy

1. Crystalloids (1B)
2. Albumin (2C)
3. Avoid HES (1B)

Meta-Analysis

Delaney AP, Dan A, McCaffrey J, et al: The role of albumin as a resuscitation fluid for patients with sepsis: A systematic review and meta-analysis. *Crit Care Med 2011; 39:386–391*

Fluid therapy

4. Initial fluid challenge in sepsis-induced tissue hypoperfusion (hypotension or elevated lactate) with suspicion of hypovolemia to be a minimum of 30ml/kg of crystalloids(a portion of this may be albumin equivalent). More rapid administration and greater amounts of fluid, may be needed in some patients (1B)

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Resuscitation of Sepsis Induced Tissue Hypoperfusion

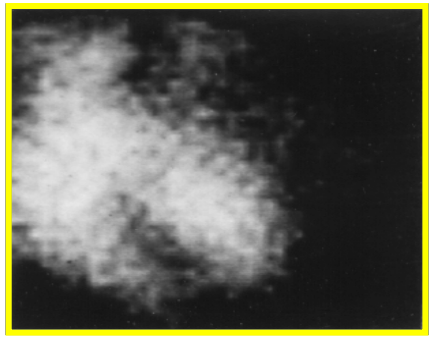
- **Recommend MAP 65 mm Hg**

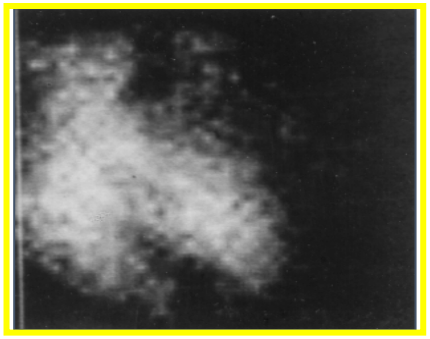
Grade 1C

Vasopressors

During Septic Shock

Diastole

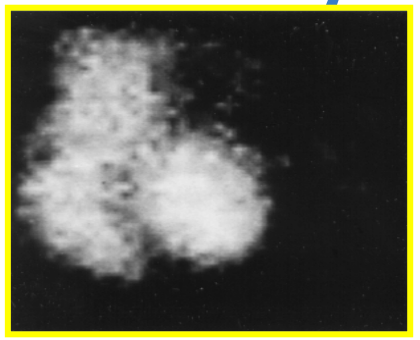


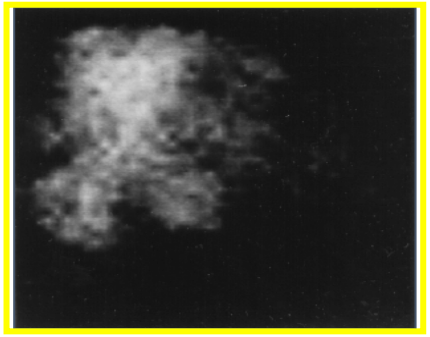


Systole

10 Days Post Shock

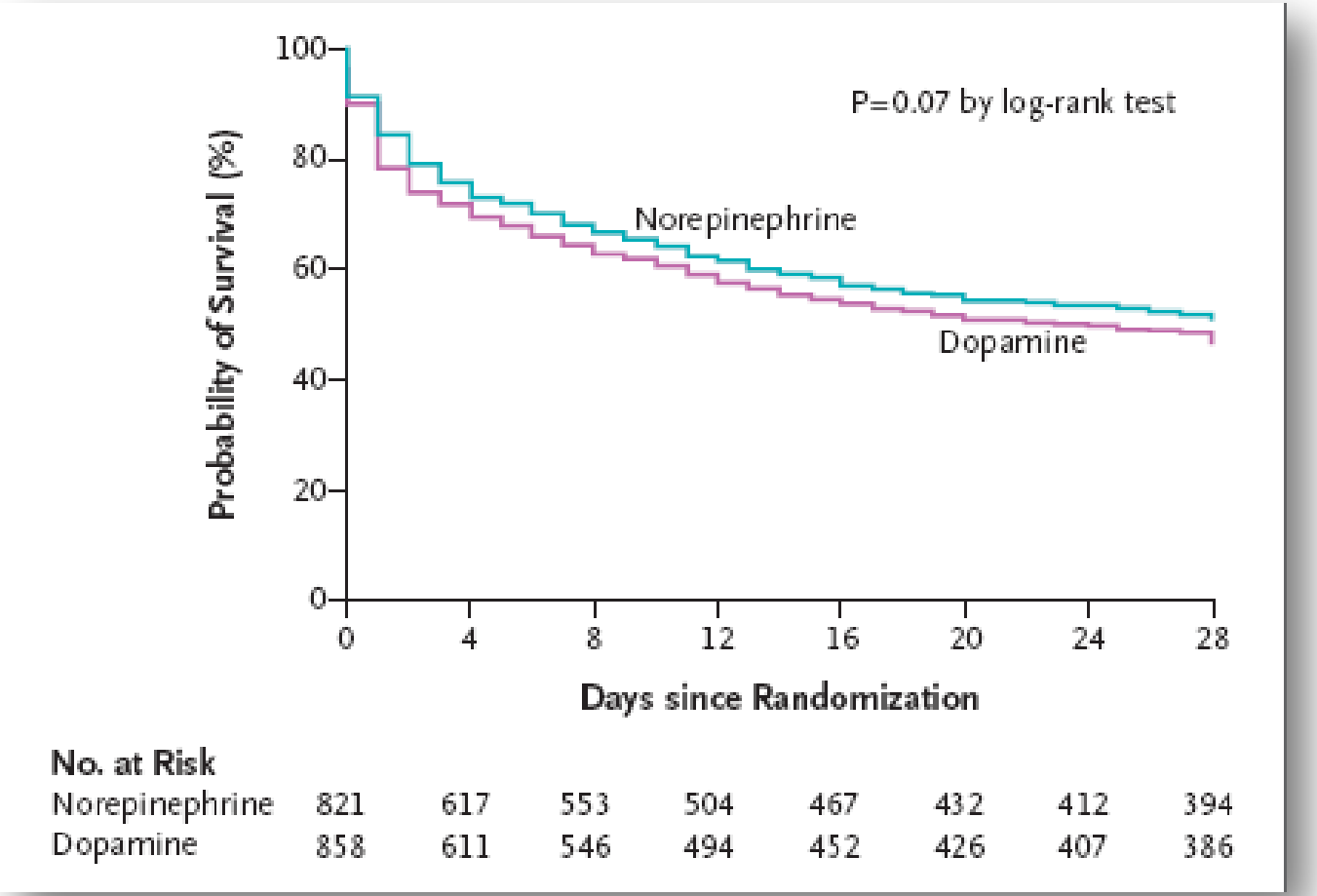
Diastole





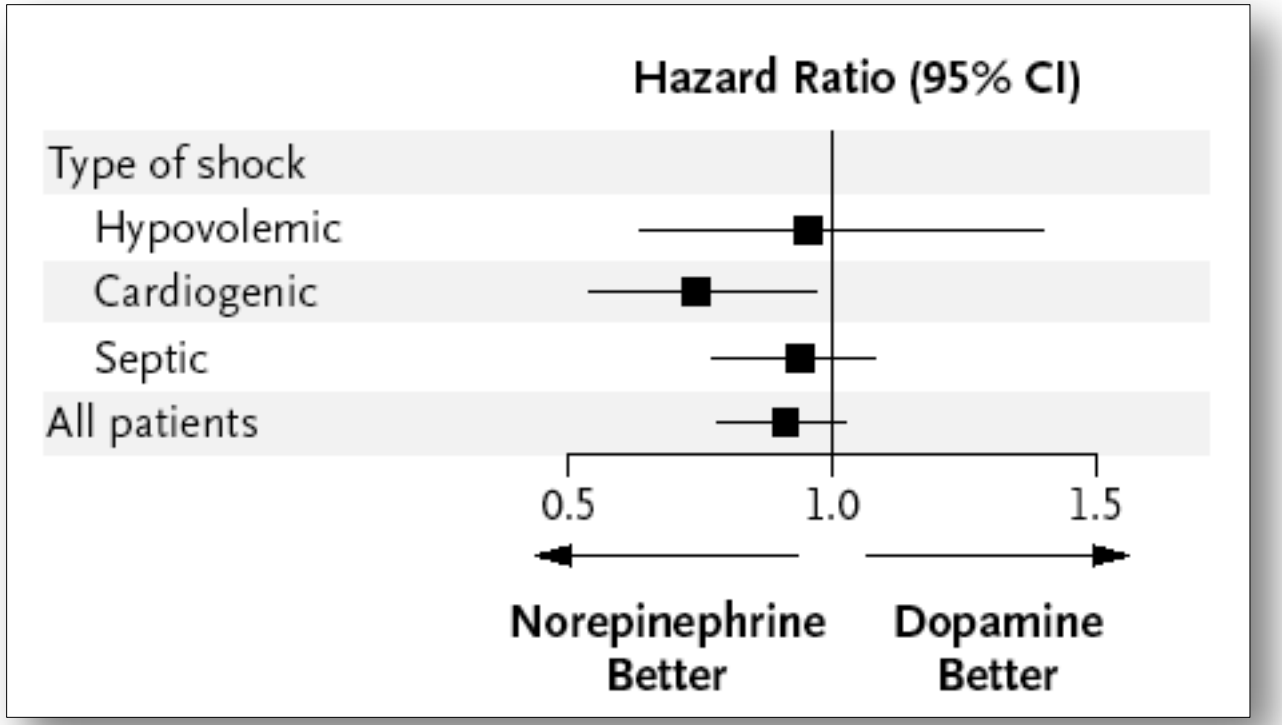
Systole

28-day Survival



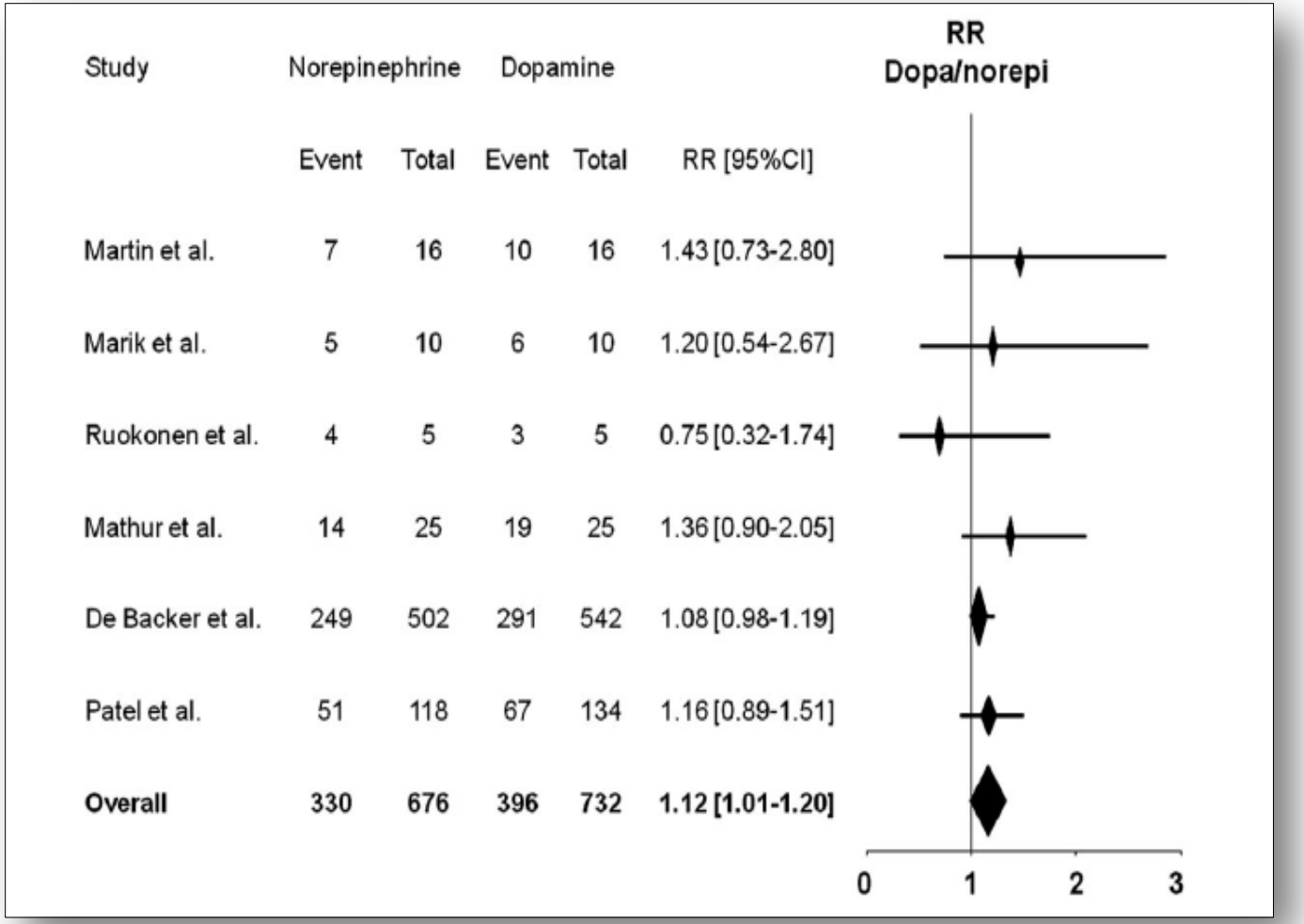
De Backer D, et al. N Engl J Med 2010, 362;9:779-789

Predefined subgroup analysis by type of shock



De Backer D, et al. N Engl J Med 2010, 362;9:779-789

Meta-analysis – NE versus dopamine



Crit Care Med. 2012 Mar;40(3):725-30

Vasopressors

Front line:

(1) Norepinephrine (1B).

(2) Epinephrine (2B)

Vasopressin .03 units/min (UG)

Vasopressors

- In general avoid
  - Dopamine, unless
    - Relative or absolute bradycardia and low risk of tachyarrhythmias

    (2C)
  - Phenylephrine, unless
    - Norepinephrine associated with serious arrhythmias
    - Cardiac output is known to be high and blood pressure target difficult to achieve
    - As salvage therapy

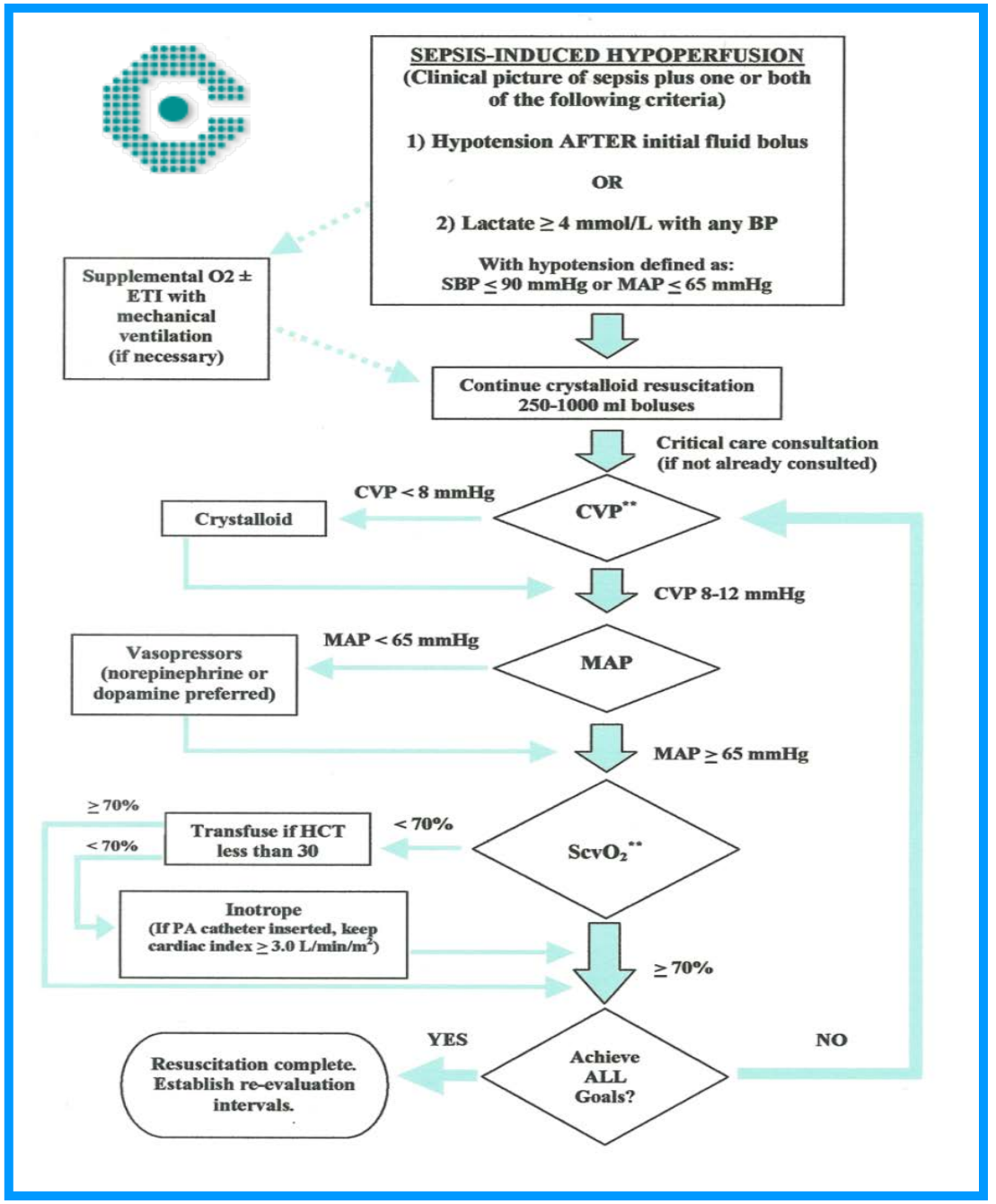
    (1C)

Sepsis Induced Tissue Hypoperfusion

- Requirement for vasopressors after fluid challenge

- Lactate ≥ 4 mg/dL

Protocolized Care



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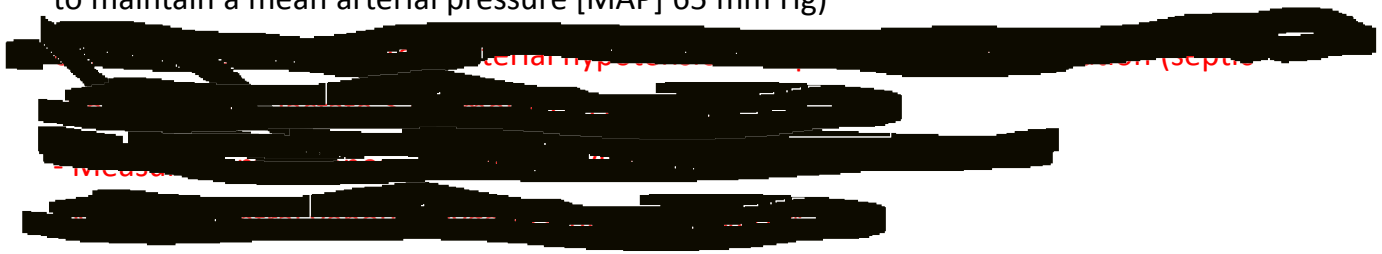

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d normalization of lactate

Initial Resuscitation of Sepsis Induced Tissue Hypoperfusion

Recommend

Insertion central venous catheter

Recommended goals :

- **Central venous pressure: 8–12 mm Hg**
    - **Higher with altered ventricular compliance or increased intrathoracic pressure**
- **ScvO2 saturation (SVC) ≥ 70%**

Grade 1C

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Lactate Clearance

In patients with elevated lactate levels as a marker of tissue hypoperfusion we suggest targeting resuscitation to normalize lactate as rapidly as possible (grade 2C).

www.survivingsepsis.org

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- BEST if there is an identifiable institutional advocate