

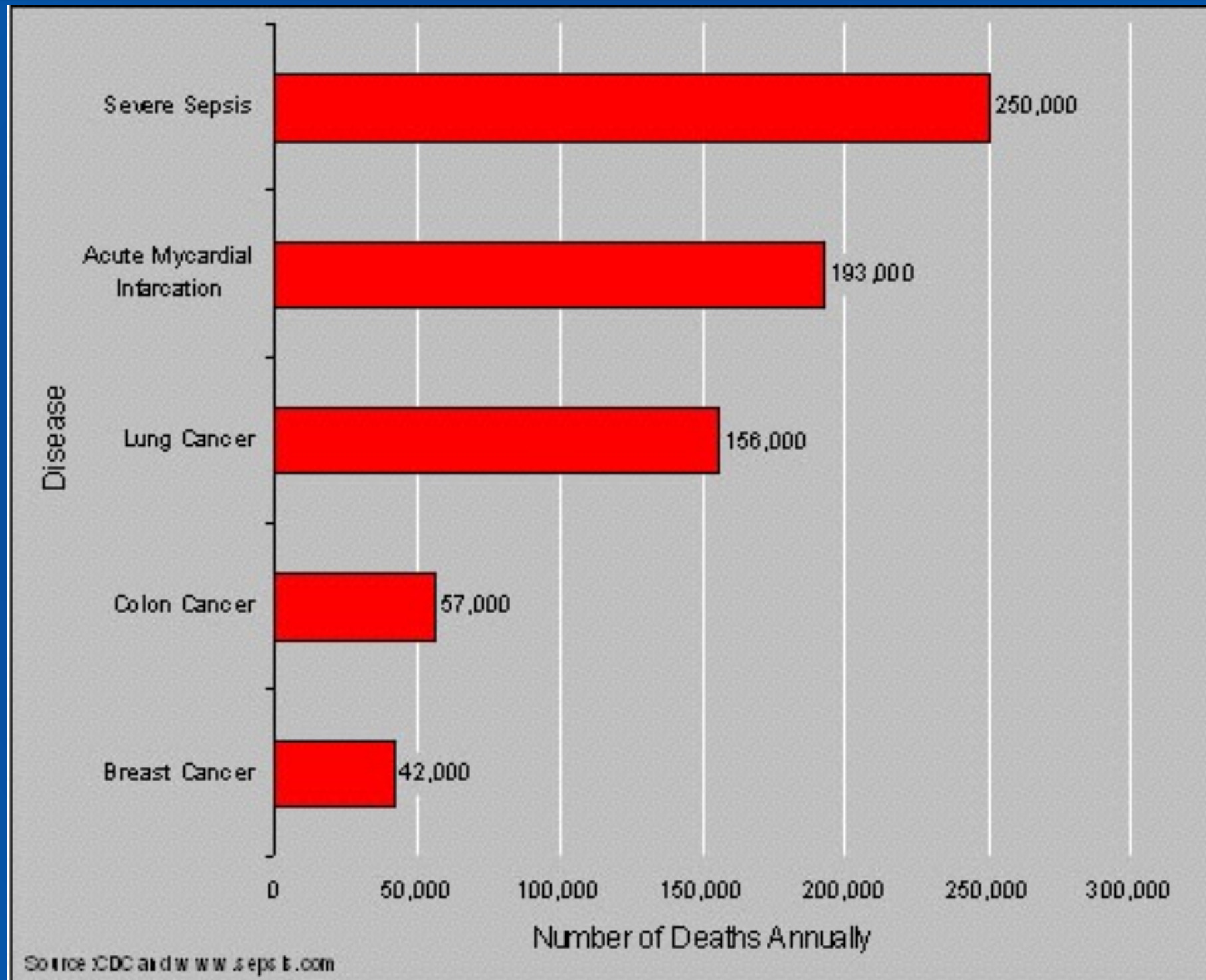
Sepsis **UPDATES** 2015



<http://tinyurl.com/q4zu5g6>

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Why Sepsis...AGAIN?!?!



<http://www.cdc.gov/sepsis>

Objectives

Effectively and appropriately Care for a patient in Septic Shock in accordance with current guidelines and care standards

Sepsis Review



<http://tiny.cc/7rfb5x>



<http://www.survivingsepsis.org/>

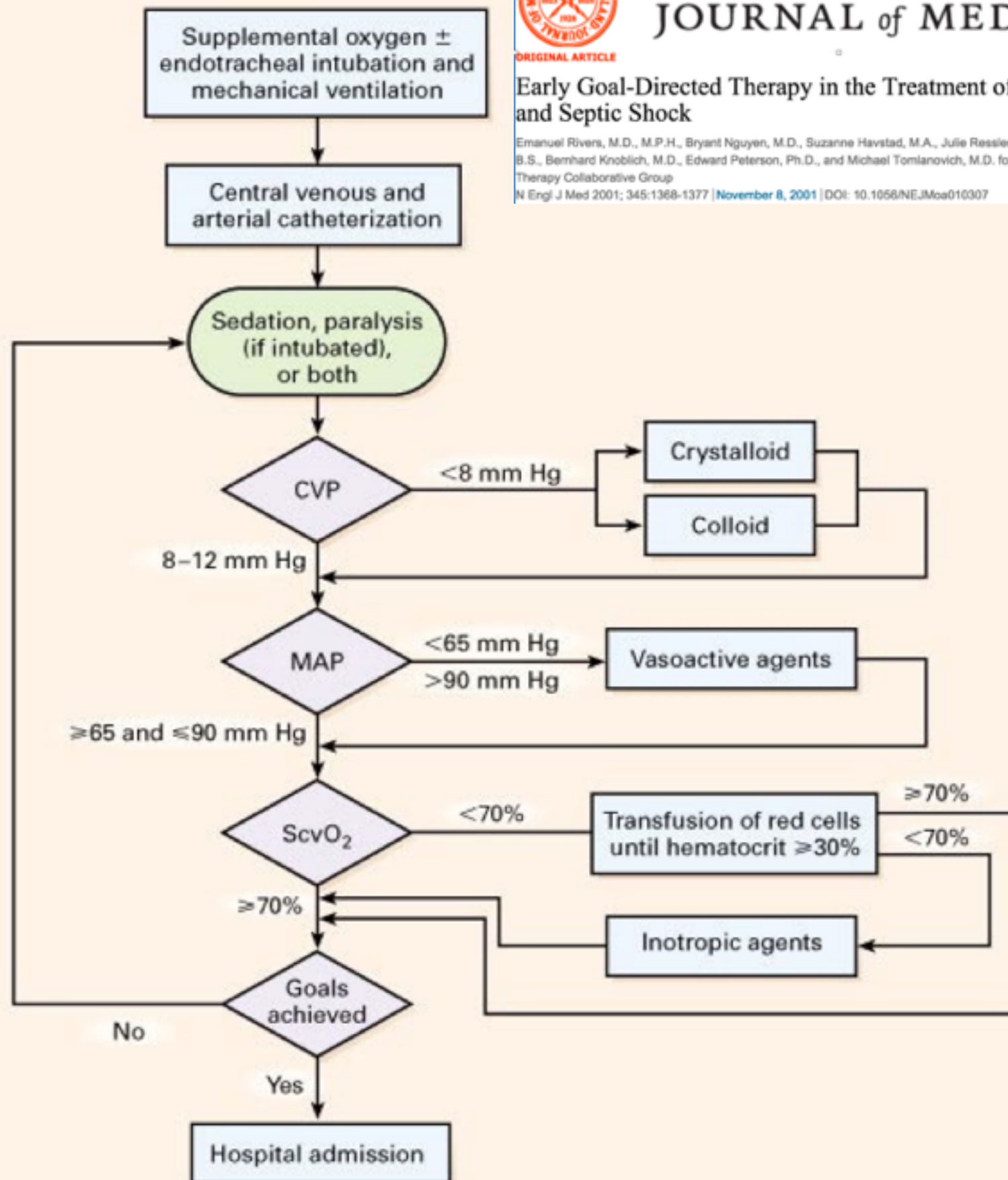


ORIGINAL ARTICLE

Early Goal-Directed Therapy in the Treatment of Severe Sepsis and Septic Shock

Emanuel Rivers, M.D., M.P.H., Bryant Nguyen, M.D., Suzanne Havstad, M.A., Julie Reissler, B.S., Alexandria Muzzin, B.S., Bernhard Knoblich, M.D., Edward Peterson, Ph.D., and Michael Tomlanovich, M.D. for the Early Goal-Directed Therapy Collaborative Group

N Engl J Med 2001; 345:1368-1377 | November 8, 2001 | DOI: 10.1056/NEJMoa010307



The “Big 3”

1. ARISE
2. ProCESS
3. ProMISe

Surviving Sepsis Campaign

Updated Bundles in Response to New Evidence

TO BE COMPLETED WITHIN 3 HOURS OF TIME OF PRESENTATION*:

1. Measure lactate level
2. Obtain blood cultures prior to administration of antibiotics
3. Administer broad spectrum antibiotics
4. Administer 30ml/kg crystalloid for hypotension or lactate ≥ 4 mmol/L

** "Time of presentation" is defined as the time of triage in the emergency department or, if presenting from another care venue, from the earliest chart annotation consistent with all elements of severe sepsis or septic shock ascertained through chart review.*

TO BE COMPLETED WITHIN 6 HOURS OF TIME OF PRESENTATION:

5. Apply vasopressors (for hypotension that does not respond to initial fluid resuscitation) to maintain a mean arterial pressure (MAP) ≥ 65 mmHg
6. In the event of persistent hypotension after initial fluid administration (MAP < 65 mm Hg) or if initial lactate was ≥ 4 mmol/L, re-assess volume status and tissue perfusion and document findings according to Table 1.
7. Re-measure lactate if initial lactate elevated.

Surviving Sepsis Campaign

Updated Bundles in Response to New Evidence

TABLE 1

DOCUMENT REASSESSMENT OF VOLUME STATUS AND TISSUE PERFUSION WITH:

EITHER

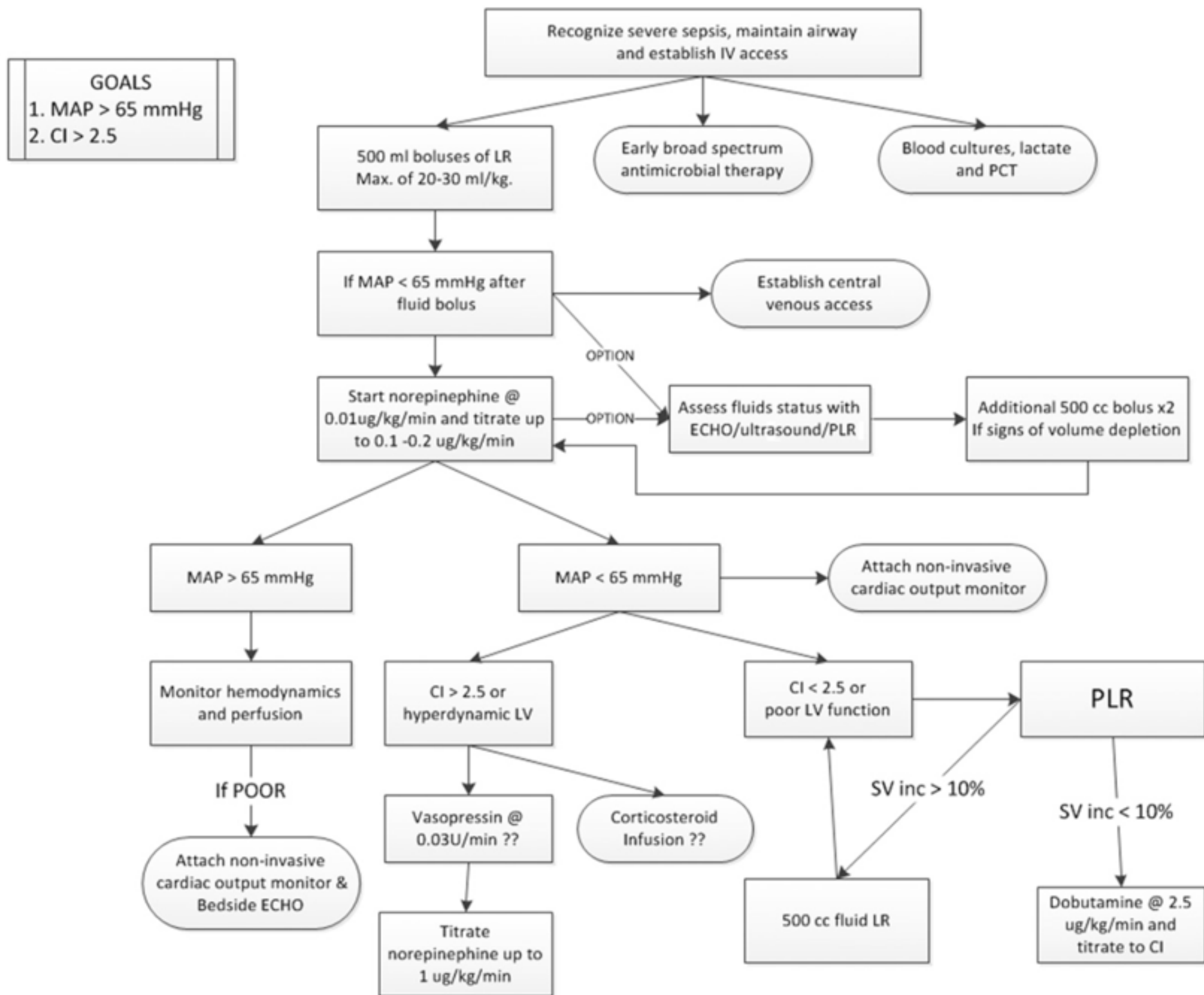
- Repeat focused exam (after initial fluid resuscitation) by licensed independent practitioner including vital signs, cardiopulmonary, capillary refill, pulse, and skin findings.

OR TWO OF THE FOLLOWING:

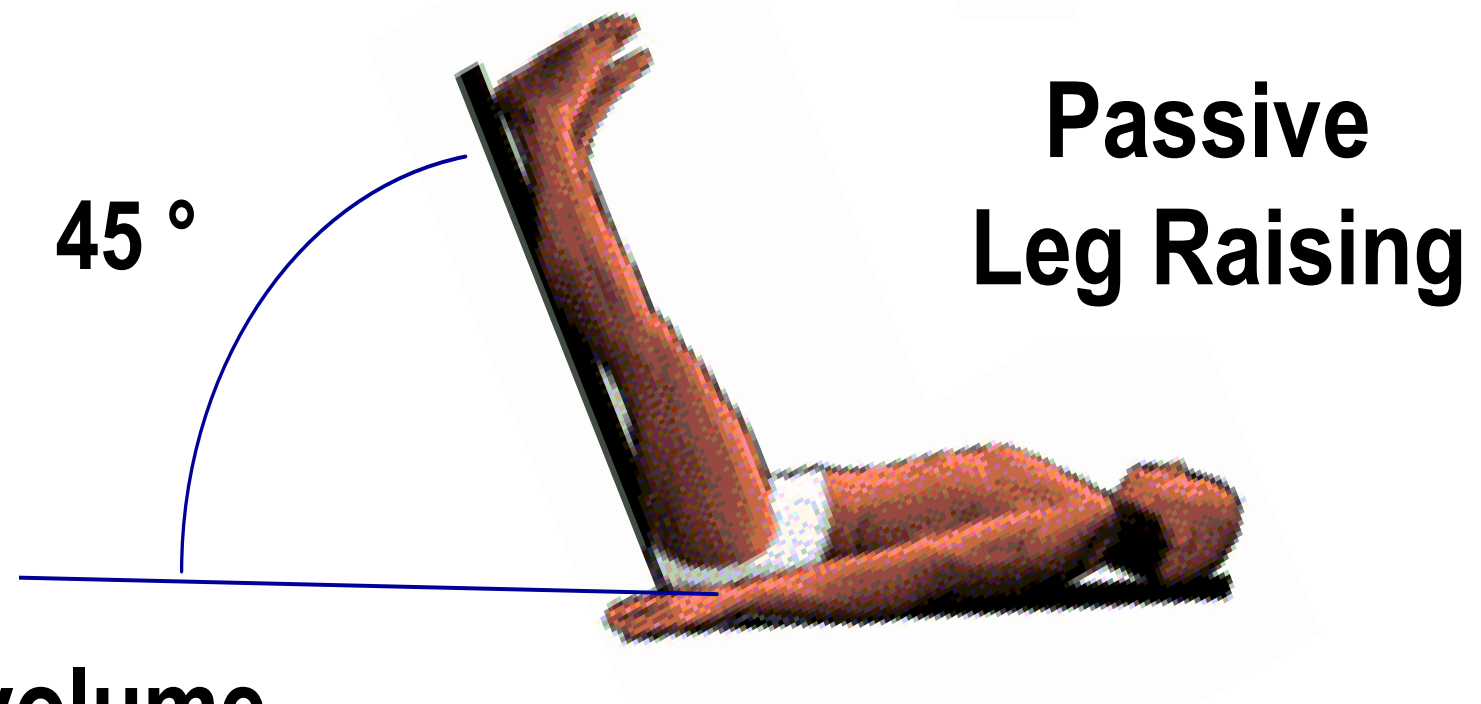
- Measure CVP
- Measure ScvO₂
- Bedside cardiovascular ultrasound
- Dynamic assessment of fluid responsiveness with passive leg raise or fluid challenge

Of note, the 6-hour bundle has been updated; the 3-hour SSC bundle is not affected.

While no suggestion of harm was indicated with use of a central line in any trial, and published evidence shows significant mortality reduction using the original SSC bundles (5), the committee has taken a prudent look at all current data and, despite weaknesses as in all studies, determined the above bundles to be the appropriate approach at this time.



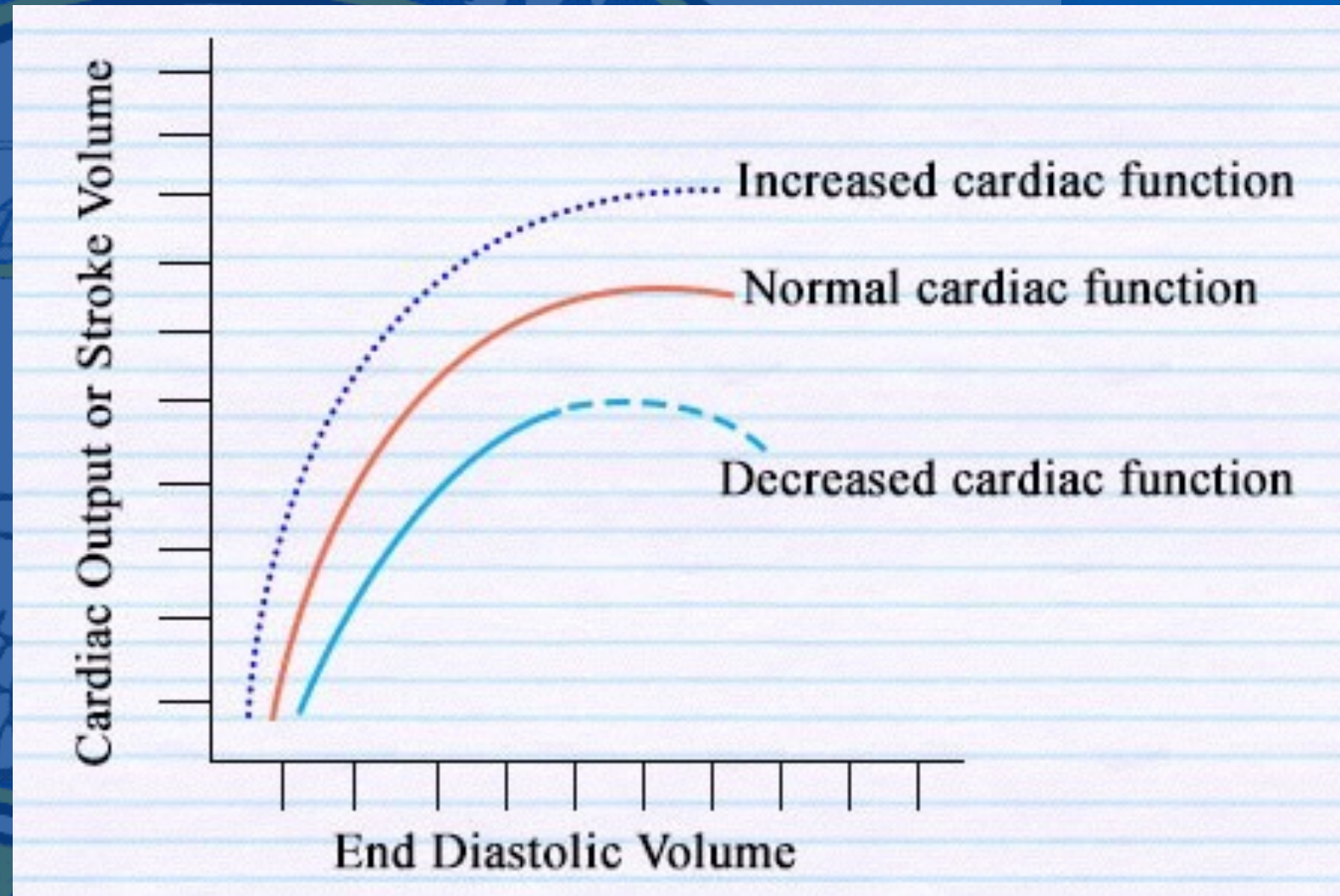
PLR??



- > 150 – 300 ml volume
- > Effects < 30 sec., not > than 4 minutes
- > Self-volume challenge
- > Reversible

Ultrasound

LV FUNCTION and Vena Cava Compression



WAVEFORM CAPNOGRAPHY

(EtCO₂ = Perfusion and pH)

- **Capnography Reflects Perfusion**

↓ Cardiac Output = ↓ EtCO₂

- **CO₂ is Transported in the blood as bicarbonate**

↓ HCO₃ = ↓ EtCO₂

Sepsis?

- > **EtCO₂ reflects lactate & mortality**
- > **Inverse, linear relationship**
 - **↓ EtCO₂ = ↑ lactate**
- > **Lactate requires blood testing**
 - 172 minutes lab, 21 minutes POC
- > **Capnography is instantaneous**

Hunter CL, Silvestri S, Dean M, Falk JL, Papa L. End-tidal carbon dioxide is associated with mortality and lactate in patients with suspected sepsis. Am J Emer Med. 2013;31:64-71.

Mean Values (n=201)

	Lactate mmol/L	EtCO ₂	Criteria
Suspected Sepsis	1.79	33	2 SIRS criteria
Severe Sepsis	6.20	28	Sepsis + end organ dysfunction
Septic Shock	4.90	30	Sepsis + refractory hypotension

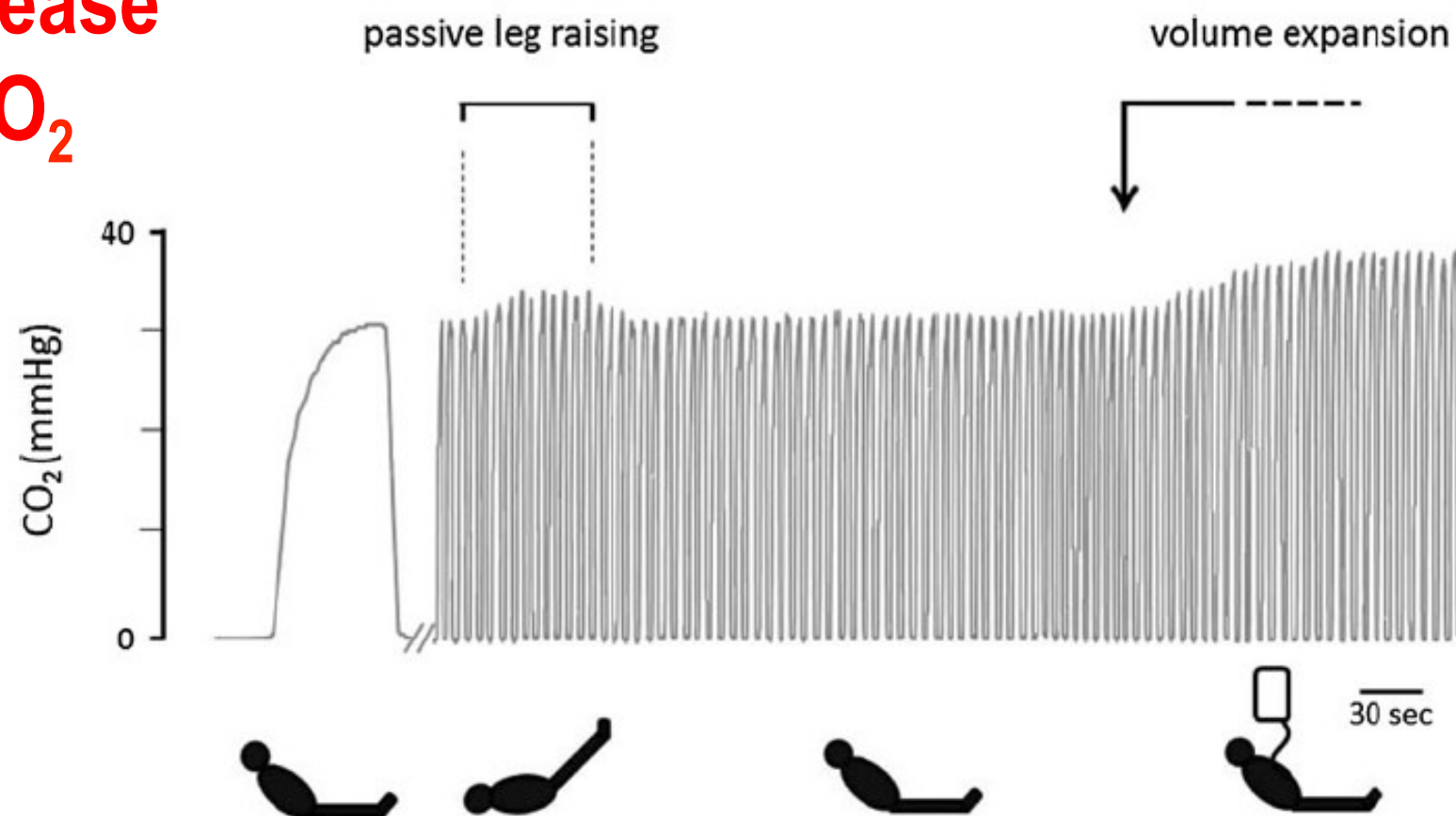
Hunter CL, Silvestri S, Dean M, Falk JL, Papa L. End-tidal carbon dioxide is associated with mortality and lactate in patients with suspected sepsis. Am J Emer Med. 2013;31:64-71.

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End-tidal carbon dioxide is better than arterial pressure for predicting volume responsiveness by the passive leg raising test

Intensive Care Med. 2013 Jan;39(1):93-100

> 5% increase
in EtCO₂



“Perfectly Imperfect”

- Serial Lactates
- Urine Output
- Mental Status
- Vital Signs
- ScvO₂ Trending



Summary...

- Sepsis is common; the incidence is increasing and lots of people are still dying
- Recognition and rapid treatment (particularly, antimicrobials) improve survival
 - Procalcitonin (PCT) Level can be a key marker for bacterial infection
- Pressors early
 - Norepinephrine
 - Vasopressin
- Minimally and non invasive hemodynamic monitoring can help
 - Helps you to locate what part of the Starling curve your patient is currently on
- Don't underestimate the importance of waveform capnography.



References

<http://www.mazededucation.com>



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