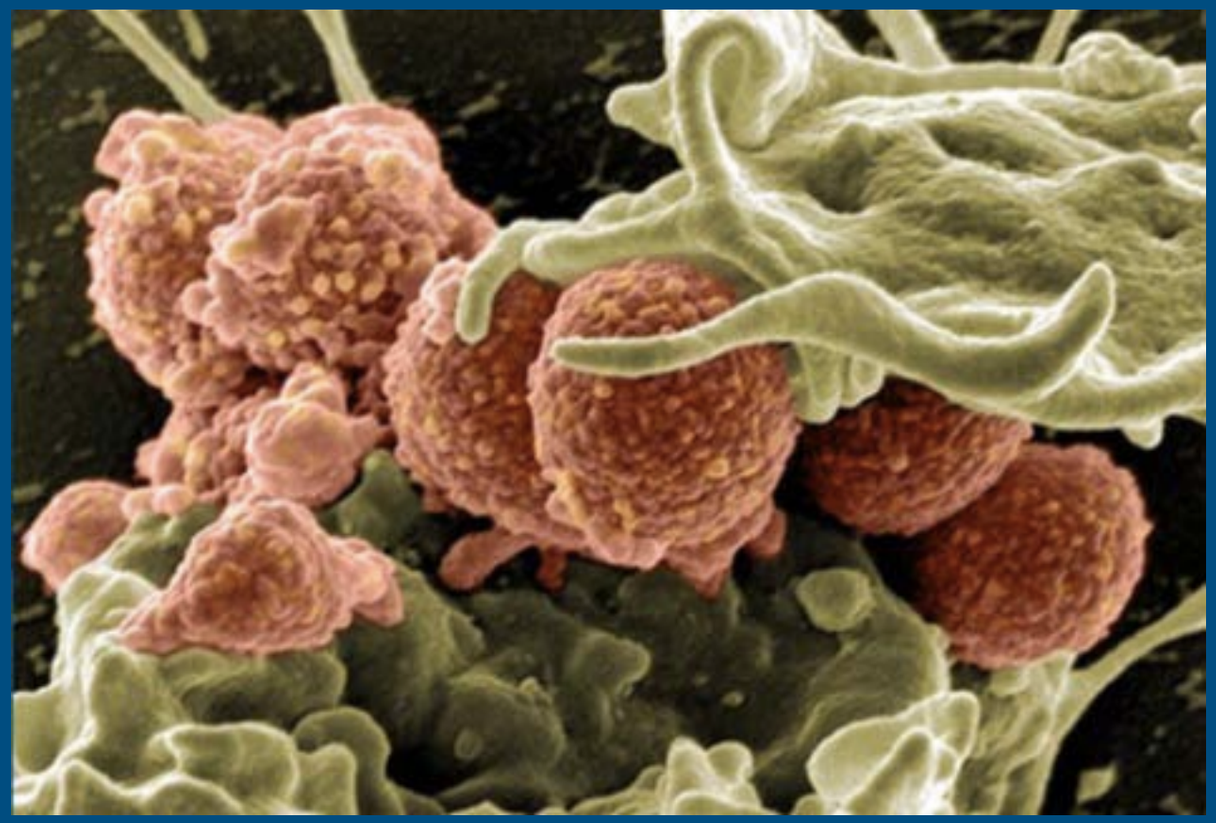
ΚΑΥΤΑ ΘΕΜΑΤΑ ΣΤΗΝ ΕΝΤΑΤΙΚΗ ΘΕΡΑΠΕΙΑ



Βαριά σήψη και σηπτική καταπληξία: τι τελικά πρέπει να κάνουμε;

Ευαγγελία Δούκα, MD.
Α΄Κ.Ε.Θ. Ε.Κ.Π.Α.
Γ.Ν. Ο ΕΥΑΓΓΕΛΙΣΜΟΣ

2-3 Φεβρουαρίου 2018

- Ασθενής 73 χρονών με ιστορικό μη-ινσουλινοεξαρτώμενου ΣΔ (type II), αρτηριακής υπέρτασης, υποβλήθηκε 4 μέρες πριν σε ΔΕ ημικολεκτομή για καρκίνο.

- Σας καλούν στην χειρουργική κλινική να τον εκτιμήσετε λόγω σύγχυσης και πυρετού. Στην φυσική εξέταση ο ασθενής έχει γενικευμένο κοιλιακό άλγος.

- Η αρτηριακή πίεση είναι 70/40 mmHg, οι σφύξεις 136 bpm, η αναπνευστική συχνότητα 28/min, και η θερμοκρασία 38.6 °C.

- Τίθεται ουροκαθετήρας (Foley), που παροχετεύει μικρή ποσότητα συμπυκνωμένων ούρων, ο SaO2 είναι 98%.

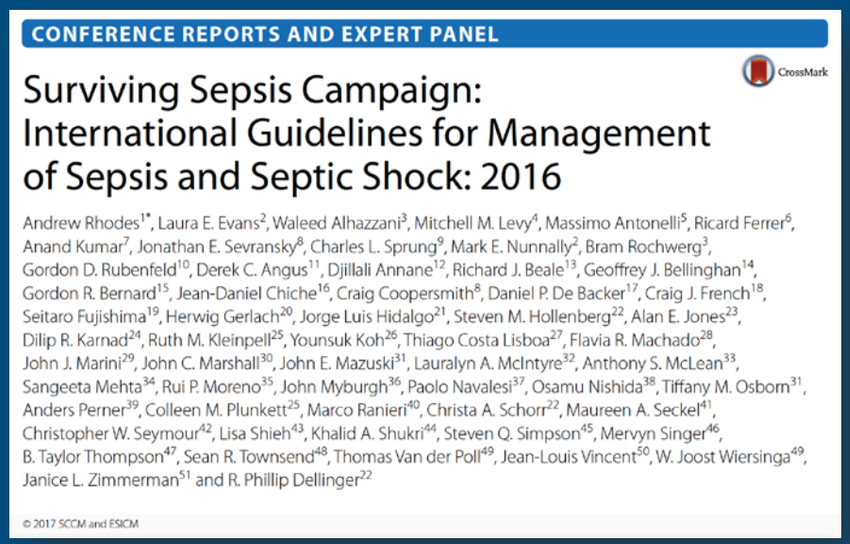
- **Είναι ο ασθενής σηπτικός?**

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

- ***Sepsis***: Life-threatening organ dysfunction caused by dysregulated host response to infection

- ***Septic Shock***: Subset of sepsis with circulatory and cellular/metabolic dysfunction associated with higher risk of mortality

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



CONFERENCE REPORTS AND EXPERT PANEL

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

Andrew Rhodes[1*], Laura E. Evans[2], Waleed Alhazzani[3], Mitchell M. Levy[4], Massimo Antonelli[5], Ricard Ferrer[6], Anand Kumar[7], Jonathan E. Sevransky[8], Charles L. Sprung[9], Mark E. Nunnally[2], Bram Rochwerg[3], Gordon D. Rubenfeld[10], Derek C. Angus[11], Djillali Annane[12], Richard J. Beale[13], Geoffrey J. Bellinghan[14], Gordon R. Bernard[15], Jean-Daniel Chiche[16], Craig Coopersmith[8], Daniel P. De Backer[17], Craig J. French[18], Seitaro Fujishima[19], Herwig Gerlach[20], Jorge Luis Hidalgo[21], Steven M. Hollenberg[22], Alan E. Jones[23], Dilip R. Karnad[24], Ruth M. Kleinpell[25], Younsuk Koh[26], Thiago Costa Lisboa[27], Flavia R. Machado[28], John J. Marini[29], John C. Marshall[30], John E. Mazuski[31], Lauralyn A. McIntyre[32], Anthony S. McLean[33], Sangeeta Mehta[34], Rui P. Moreno[35], John Myburgh[36], Paolo Navalesi[37], Osamu Nishida[38], Tiffany M. Osborn[31], Anders Perner[39], Colleen M. Plunkett[25], Marco Ranieri[40], Christa A. Schorr[22], Maureen A. Seckel[41], Christopher W. Seymour[42], Lisa Shieh[43], Khalid A. Shukri[44], Steven Q. Simpson[45], Mervyn Singer[46], B. Taylor Thompson[47], Sean R. Townsend[48], Thomas Van der Poll[49], Jean-Louis Vincent[50], W. Joost Wiersinga[49], Janice L. Zimmerman[51] and R. Phillip Dellinger[22]

- ***Organ dysfunction*** *can be represented by an increase in the Sequential (sepsis-related) Organ Failure Assessment* ***(SOFA)*** *score of 2 points or more*

- ***Septic shock*** *should be defined as a subset of sepsis and should be clinically identified by a vasopressor requirement to maintain a* ***mean arterial pressure of 65 mm Hg or greater*** *in the absence of hypovolemia.*

Table 2 SOFA Score

PaO_2/FIO_2 (mmHg)	SOFA score
<400	1
<300	2
<200 and mechanically ventilated	3
<100 and mechanically ventilated	4
Glasgow coma scale	
13–14	1
10–12	2
6–9	3
<6	4
Mean arterial pressure OR administration of vasopressors required	SOFA score
MAP <70 mm/Hg	1
dop ≤5 or dob (any dose)	2
dop >5 OR epi ≤0.1 OR nor ≤0.1	3
dop >15 OR epi >0.1 OR nor >0.1	4
Bilirubin (mg/dl) [μmol/L]	
1.2–1.9 [>20–32]	1
2.0–5.9 [33–101]	2
6.0–11.9 [102–204]	3
>12.0 [>204]	4
Platelets x 10^3/μl	
<150	1
<100	2
<50	3
<20	4
Creatinine (mg/dl) [μmol/L] (or urine output)	
1.2–1.9 [110–170]	1
2.0–3.4 [171–298, 305]	2
3.5–4.9 [300–440] (or <500 ml/d)	3
>5.0 [>440] (or <200 ml/d)	4

SOFA score (Table 2). The SOFA score (Table 2) was proposed in 1996 by the Working Group on Sepsis-Related Problems of the European Society of Intensive Care Medicine [19] to objectively describe the degree of organ dysfunction over time and to evaluate morbidity in intensive care unit (ICU) in patients with sepsis. It was demonstrated to be a good indicator of prognosis in critically ill patients during the first few days of ICU admission [20].

The new definition of sepsis suggests that patients with at least 2 of these 3 clinical variables **(quick SOFA - qSOFA)**:

- **G**lasgow **C**oma **S**cale score of **13** or less,

- **S**ystolic **B**lood **P**ressure of **100 mm Hg** or less, and

- **R**espiratory **R**ate **22/min** or greater

may be prone to a poor outcome typical of sepsis and patients with positive qSOFA should be clinically characterized as septic by SOFA score (Table 2).

- Ασθενής 73 χρονών με ιστορικό μη-ινσουλινοεξαρτώμενου ΣΔ (type II), αρτηριακής υπέρτασης, υποβλήθηκε 4 μέρες πριν σε ΔΕ ημικολεκτομή για καρκίνο.

- Σας καλούν στην χειρουργική κλινική να τον εκτιμήσετε λόγω **σύγχυσης** και πυρετού. Στην φυσική εξέταση ο ασθενής έχει γενικευμένο κοιλιακό άλγος.

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Sepsis-3 Definition changes

- *The **"Severe Sepsis"** nomenclature has been eliminated*
- ***"Sepsis"*** in place of ***"Severe Sepsis"***
- ***organ failure*** *must be present to define sepsis and septic shock*
- ***qSOFA*** *was proposed for the non-ICU setting*
- ***SIRS criteria*** *have been deleted altogether*

American Journal of Respiratory and Critical Care Medicine
Volume 194 Number 1 | July 1 2016

Sepsis-3 Definitions Debate

- *Sepsis-3 clinical criteria (i.e. qSOFA)* ***were not used in studies*** *that informed the recommendations in this revision*
- ***arbitrary cutoffs for SOFA and qSOFA*** *can be potentially misleading by imposing a false image of homogeneity onto a heterogeneous disorder*
- *requiring the presence of organ failure, may hinder general awareness of the importance of early recognition and treatment*

American Journal of Respiratory and Critical Care Medicine
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Sepsis-3 Definitions Debate

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- ***arbitra** ially misleac ty onto a heterog*
- *requirir general awaren d treatme*

Με βάση τον καινούργιο ορισμό της σήψης
έναν ασθενή με λοίμωξη και υπόταση
που απάντησε στην χορήγηση υγρών
θα τον χαρακτηρίζατε σαν
“ανεπίπλεκτη λοίμωξη” ???

American Journal of Respiratory and Critical Care Medicine
Volume 194 Number 1 | July 1 2016

Sepsis-3 Definitions Debate

- *Ideally, patients at risk for sepsis should be **identified before organ dysfunction** is established **to prevent organ injury from occurring.***

- ***The therapeutic triad** of*
  1. *early initiation of appropriate antibiotics,*
  2. *source control, and*
  3. *supportive treatments (fluid resuscitation etc.)*

remains the cornerstone of sepsis care.

American Journal of Respiratory and Critical Care Medicine
Volume 194 Number 1 | July 1 2016

Sepsis and septic shock are medical emergencies and we recommend that treatment and resuscitation begin immediately.

Best Practice Statement

- Ξεκινά η χορήγηση υγρών και παράλληλα εισάγεται υποκλείδιος ΚΦΚ και γίνεται μέτρηση της CVP 2 mmHg, και το ScvO2 είναι 52%. Οι τιμές σακχάρου αίματος είναι μέσα στα φυσιολογικά επίπεδα.

- Συνεχίζεται η χορήγηση υγρών, στέλνονται καλλιέργειες αίματος και ξεκινά συστηματική αντιβιοτική θεραπεία με καρβαπενέμη.

Diagnosis

- **1. We recommend that appropriate routine microbiologic cultures (including blood) be obtained before starting antimicrobial therapy in patients with suspected sepsis and septic shock if doing so results in no substantial delay in the start of antimicrobials. (BPS)**
  - **Remarks: Appropriate routine microbiologic cultures always include at least two sets of blood cultures (aerobic and anaerobic).**

Antibiotics

- **We recommend that administration of IV antimicrobials be initiated as soon as possible after recognition and within 1 h for both sepsis and septic shock.**

(strong recommendation, moderate quality of evidence).

- **We recommend empiric broad-spectrum therapy with one or more antimicrobials to cover all likely pathogens.**

(strong recommendation, moderate quality of evidence).

Για την **σωστή επιλογή της κατάλληλης εμπειρικής αντιμικροβιακής αγωγής** είναι απαραίτητο να γνωρίζεις την τοπική μικροβιακή οικολογία, αλλά και τις αντοχές των μικροβίων στις διάφορες κατηγορίες αντιβιοτικών.

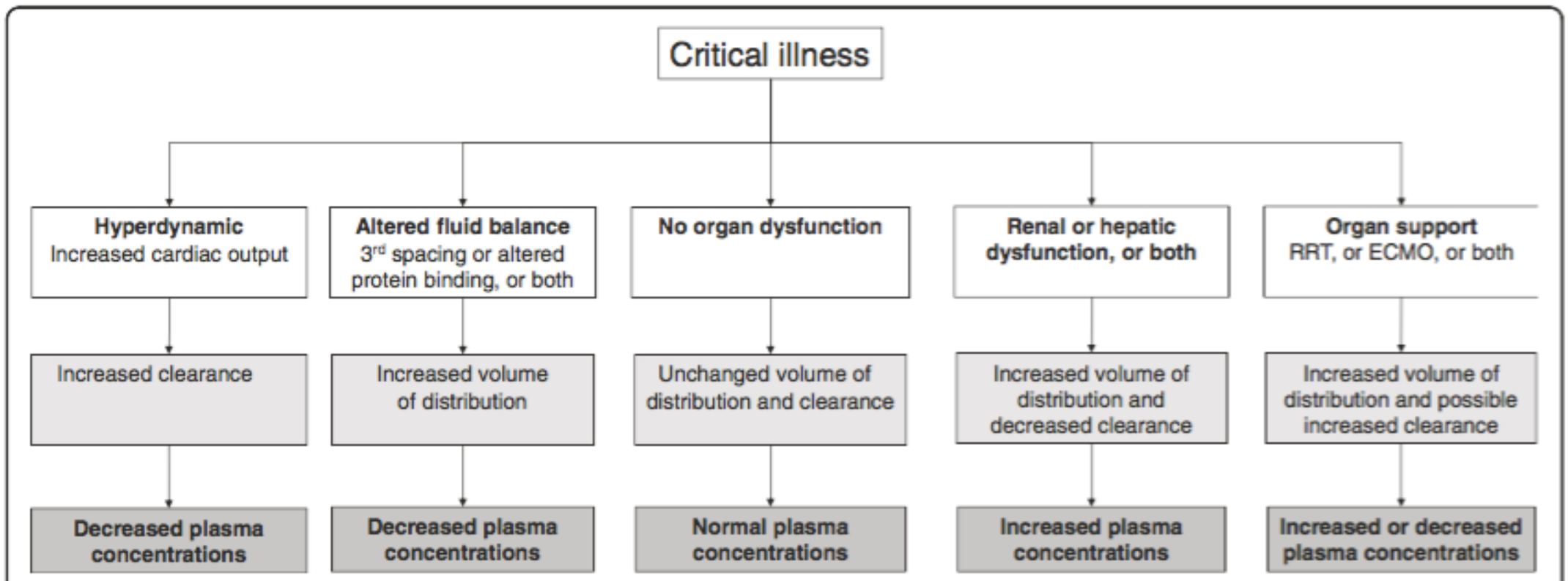


Figure 1 Pathophysiological changes commonly observed in critically ill patients and their effects on drug concentrations. Reproduced with permission from Elsevier Limited [75]. ECMO, extracorporeal membrane oxygenation; RRT, renal replacement therapy.

Dosing strategies of antimicrobials should be based on accepted **pharmacokinetic/pharmacodynamic** principles

aggressive fluid resuscitation—> rapid expansion of extracellular volume—> increased volume of distribution—> suboptimal drug levels

fluoroquinolones, aminoglycosides, vancomycin

- higher peak blood levels in relation to pathogen MIC
- Once-daily dosing
- equivalent dose in impaired renal function !!
- loading dose of 25–30 mg/kg (based on actual body weight)—> trough target of 15–20 mg/L

β-lactams

- longer duration of plasma concentration above the pathogen MIC
- loading dose (not affected by alterations of renal function)/rapid infusion !!
- T > MIC (60%-100%)/extended infusion !!

- Την ώρα που ο ασθενής φτάνει στην ΜΕΘ, έχει λάβει 3.5lt κρυσταλλοειδών διαλυμάτων και οι σφύξεις του έχουν πέσει στις 100, η αρτηριακή πίεση έχει αυξηθεί σε 110/80 mmHg και η CVP είναι τώρα 9 mmHg.

Ποιές είναι οι προτεραιότητες στην ΜΕΘ?

The **VIP** rule:

- **V**entilate (O2 administration)
- **I**nfuse (fluide resuscitation)
- **P**ump (administration of vasoactive agents)

N Engl J Med 2013;369:1726-34

- **Fluid therapy** to improve **microvascular blood flow** and **increase cardiac output** is an essential part of the treatment of patients with sepsis.

- **Microvascular dysfunction** can lead to **global tissue hypoxia**, **direct tissue damage**, and ultimately, **organ failure**.

- **Crystalloid solutions** should be the first choice because they are well tolerated and cheap. Albumin to correct severe hypoalbuminemia may be reasonable in some pts.

N Engl J Med 2013;369:1726-34

Crit Care Med 2011;39:386-91

Fluid Therapy

- **We recommend crystalloids as the fluid of choice for initial resuscitation and subsequent intravascular volume replacement in patients with sepsis and septic shock**

(Strong recommendation, moderate quality of evidence).

- **We suggest using albumin in addition to crystalloids when patients require substantial amounts of crystalloids**

(weak recommendation, low quality of evidence).

- **We recommend an initial target mean arterial pressure of 65 mmHg in patients with septic shock requiring vasopressors.**

  (Strong recommendation; moderate quality of evidence)

Hypotension is the most common indicator of inadequate perfusion…

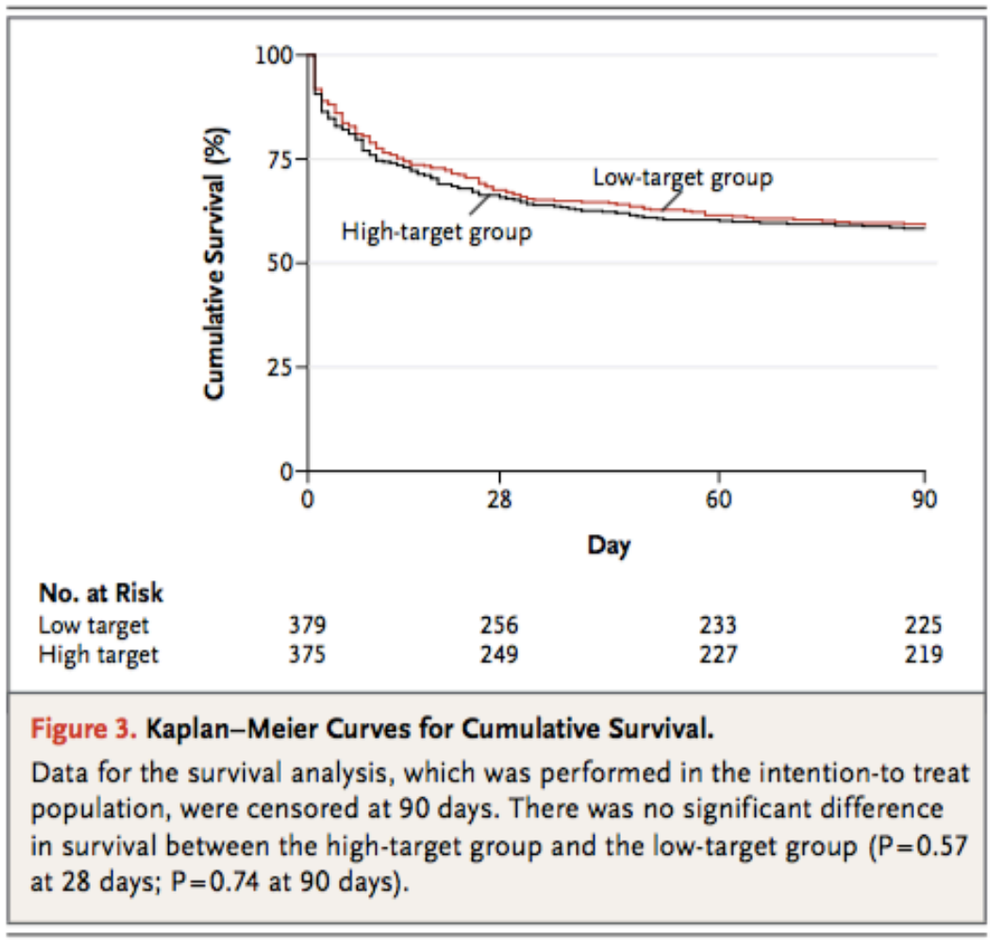


Figure 3. Kaplan–Meier Curves for Cumulative Survival.
Data for the survival analysis, which was performed in the intention-to treat population, were censored at 90 days. There was no significant difference in survival between the high-target group and the low-target group (P=0.57 at 28 days; P=0.74 at 90 days).

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 APRIL 24, 2014 VOL. 370 NO. 17

High versus Low Blood-Pressure Target in Patients with Septic Shock

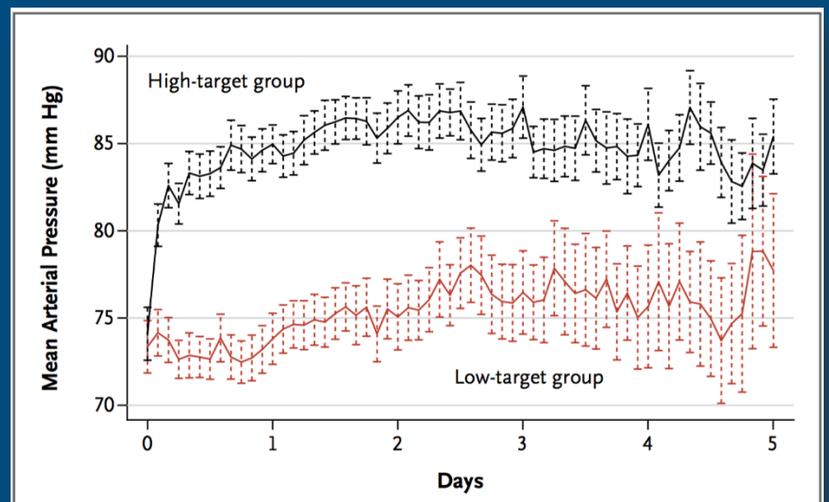


Figure 2. Mean Arterial Pressure during the 5-Day Study Period.

SEPSISPAM trial demonstrated that targeting a mean arterial pressure of 80–85 mm Hg, as compared with **65–70 mm Hg**, in patients with septic shock undergoing resuscitation **did not result in significant differences in mortality at either 28 or 90 days**

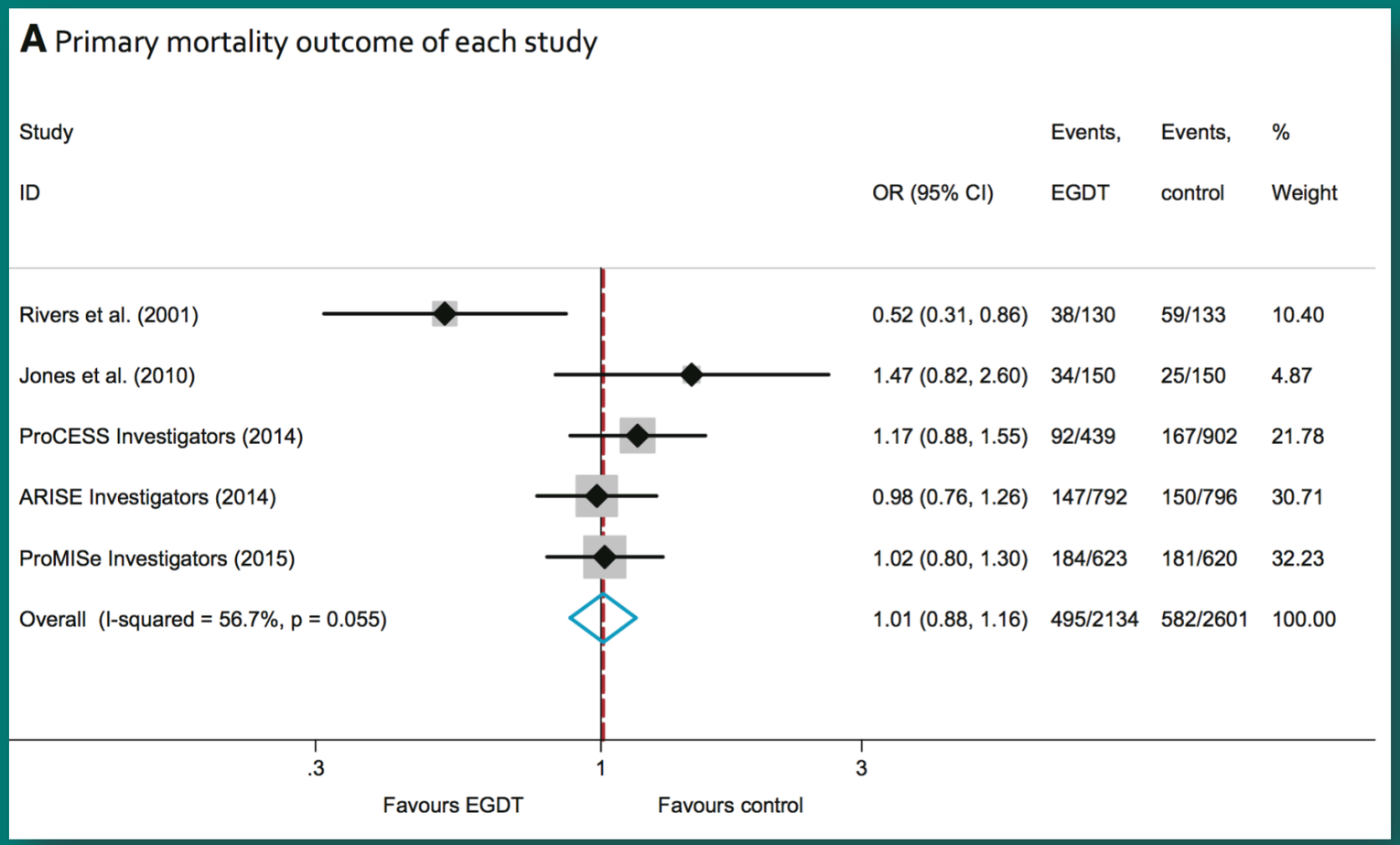
- **Παρά την συνεχιζόμενη ανάνηψη συνολικά 5 litres κρυσταλλοειδών,** ο ασθενής γίνεται ταχύκαρδος ξανά με 120 σφ/min και υποτασικός με ΑΠ 80/50, η ωριαία διούρηση μέσα στην προηγούμενη ώρα είναι μόλις 30 ml. Η CVP τώρα έχει αυξηθεί στο 12, και το SaO2 μετά από χορήγηση O2 με μάσκα είναι 93%. Το ScvO2 είναι 58%.

Sepsis-2 (2003) guidelines *aimed to treat the early hypovolemic phase of sepsis by providing appropriate high volume resuscitation* ***(EGDT described by Rivers in 2001)****, targeting:*

- central venous pressure 8–12 mm Hg
- mean arterial pressure (MAP) >65 mm Hg
- urine output >0.5 mL/kg/h
- central venous (superior vena cava) or
- mixed venous oxygen saturation >70 or >65%

The basic concept: patients with severe sepsis and septic shock presenting to the emergency department had a lower mortality rate, if they received a specific 6-h resuscitation bundle of EGDT

A systematic review and meta-analysis of early goal-directed therapy for septic shock: the ARISE, ProCESS and ProMISe Investigators



Recent randomized controlled trials (ProCESS, ARISE, and ProMISe trials) results have questioned River's resuscitation protocol results demonstrating that use of EGDT for patients presenting to the emergency department with early septic shock did not reduce mortality compared with usual care.

Limitations of ProCESS, ARISE & ProMISe

- The overall management of sepsis has changed…
  - In all three studies patients had early antibiotics, > 30ml/kg of intravenous fluid prior to randomization.
- We need therefore to be very careful about over interpreting the results in areas where this paradgim is not valid.

The River's work was useful….

- As it provided us a construct on how to understand resuscitation:
  - Start early- (give antibiotics)
  - Correct hypovolaemia
  - Restore perfusion pressure
  - And in some cases a little more may be required..!
- These concepts are as important today as they ever were.

Initial Resuscitation

- **We recommend that in the resuscitation from sepsis-induced hypoperfusion, at least 30ml/kg of intravenous crystalloid fluid be given within the first 3 hours.**

(Strong recommendation; low quality of evidence)

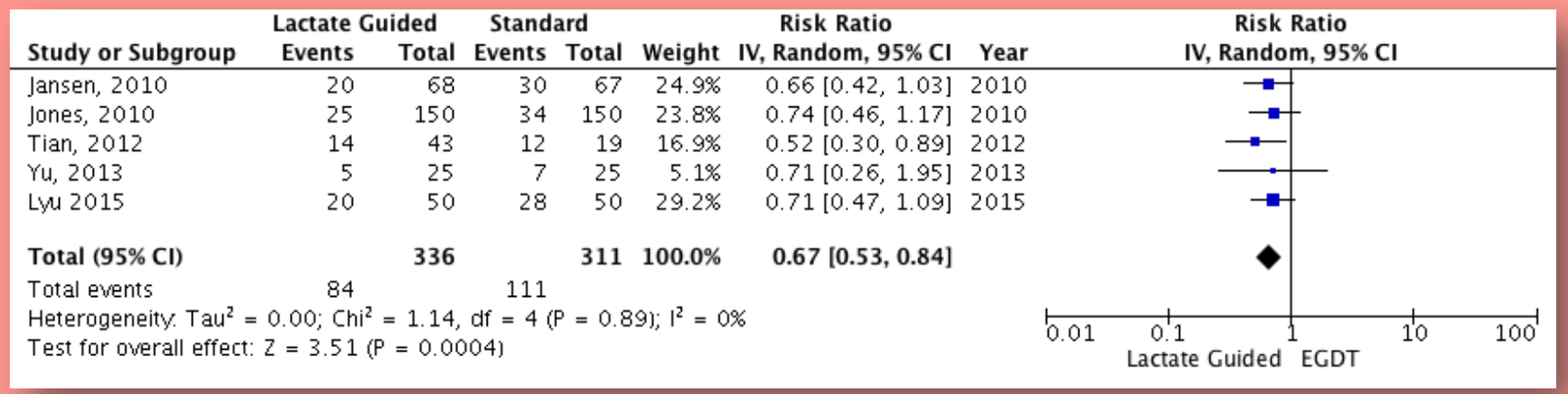
- **We recommend that following initial fluid resuscitation, additional fluids be guided by frequent reassessment of hemodynamic status.**

(Best Practice Statement)

Lactate can help guide resuscitation

- **We suggest guiding resuscitation to normalize lactate in patients with elevated lactate levels as a marker of tissue hypoperfusion.**

(Weak recommendation; low quality of evidence)



Ο ασθενής είναι ακόμα αιμοδυναμικά ασταθής, έχει χαμηλό SaO2, και περαιτέρω επιδείνωσης του επιπέδου συνείδησης.
Θα χορηγούσατε περισσότερα υγρά ενδοφλεβίως?
Ποιά θα είναι η επόμενη κίνησή σας?

crucial therapeutic dilemma…

Fluid administration should be discontinued when the response to fluids is no longer beneficial….

Fluid overload

- prolongs mechanical ventilation and
- increases the mortality of critically ill patients in general and, more specifically, in patients with sepsis,
- acute respiratory distress syndrome (ARDS),
- intra-abdominal hypertension and
- acute kidney injury
- aggravate lung and tissue oedema

Crit Care Med. 2011;39:259–65.

Crit Care. 2013;17:R246.

Crit Care Med. 2013;41:472–80.

Intensive Care Med. 2013;39:1190–206.

CVP (a static marker of cardiac preload)

- does **not** predict fluid responsiveness
- is a good marker of preload (not preload respon/ness) and
- a key determinant of cardiac function
- is also one of the determinants of the pressure gradient for organ perfusion (mean arterial pressure - CVP).
- High CVP values, because they impair renal perfusion, are associated with acute kidney injury

Monnet *et al. Ann. Intensive Care (2016) 6:111*

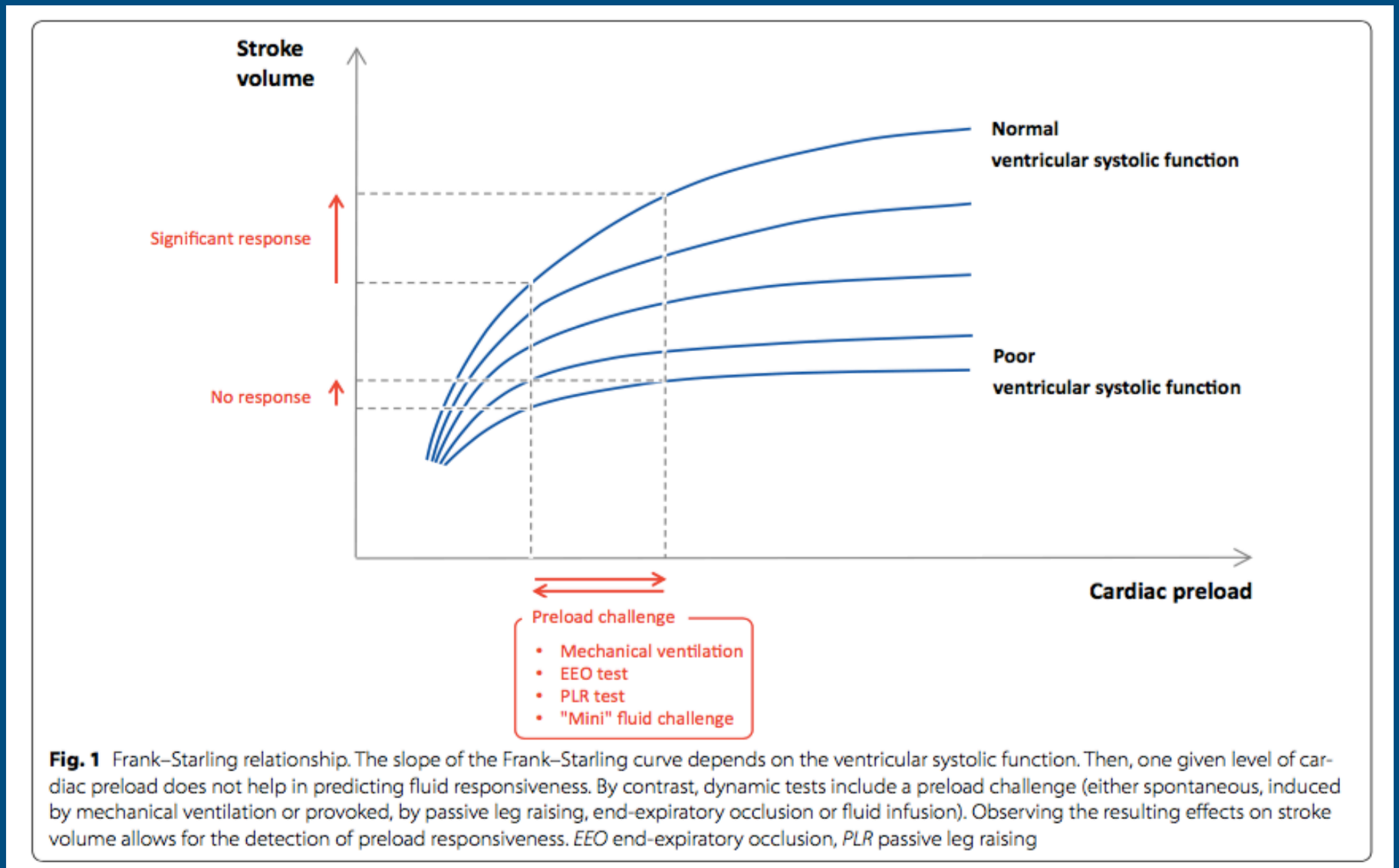


Fig. 1 Frank–Starling relationship. The slope of the Frank–Starling curve depends on the ventricular systolic function. Then, one given level of cardiac preload does not help in predicting fluid responsiveness. By contrast, dynamic tests include a preload challenge (either spontaneous, induced by mechanical ventilation or provoked, by passive leg raising, end-expiratory occlusion or fluid infusion). Observing the resulting effects on stroke volume allows for the detection of preload responsiveness. *EEO* end-expiratory occlusion, *PLR* passive leg raising

Are there Pragmatic end points for fluid resuscitation ?

- objective—>cardiac output to become preload-independent (i.e., on the plateau portion of the Frank–Starling curve)
- recommend dynamic over static variables—>Pulse or Stroke Volume Variations induced by Mechanical Ventilation or Passive Leg Raise Test

If shock is not resolving quickly…..

- **We recommend further hemodynamic assessment (such as assessing cardiac function) to determine the type of shock if the clinical examination does not lead to a clear diagnosis.**

(Best Practice Statement)

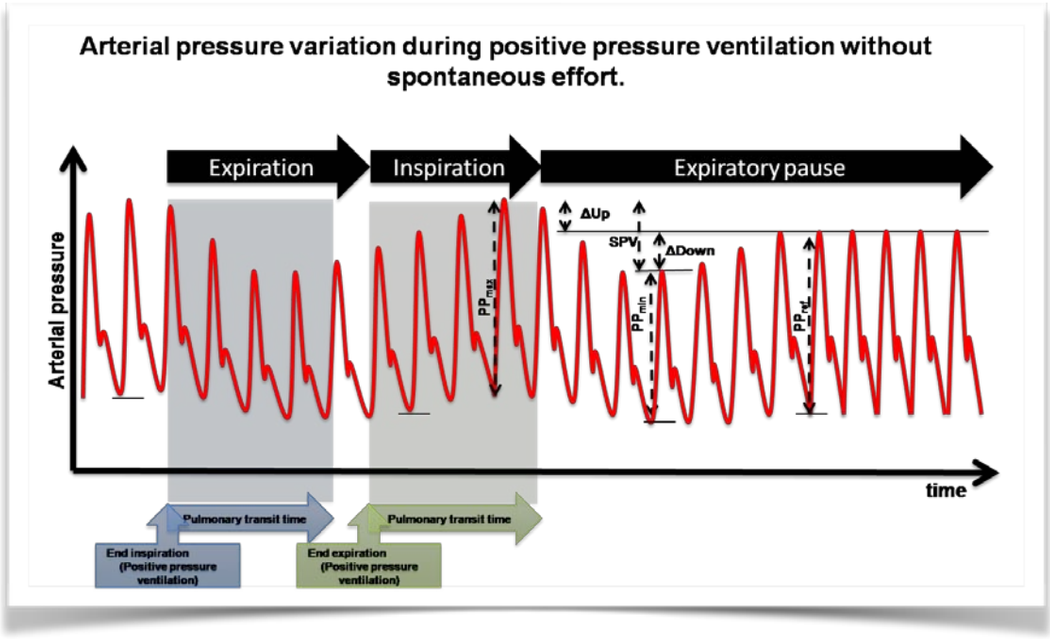
- **We suggest that dynamic over static variables be used to predict fluid responsiveness, where available.**

(Weak recommendation; low quality of evidence)

Λόγω της πτώσης του SaO2, της περαιτέρω επιδείνωσης του επιπέδου συνείδησης, και της ανάγκης για συνέχιση της ανάνηψης, ο ασθενής **διασωληνώνεται και τίθεται σε μηχανικό αερισμό.**
Ξεκινά νοραδρεναλίνη σε δόση (0.4 μg/kg/min). Προστίθεται κολμικίνη.
Προγραμματίζεται επείγουσα αξονική τομογραφία κοιλίας.

Ο ασθενής είναι σε TV 6 ml/kg, με 12 cmH2O PEEP και FiO2 0.6, και τα αέρια αίματος δείχνουν ένα PaO2 στα 70 mmHg, SaO2 95%. Τα εργαστηριακά:

- Hb 14.0 g/dl
- WBC 18 400
- PLTs 140 000
- Lactate 4.2 mmol/l
- Σάκχαρο 335 mg/dl
- Κρεατινίνη 2.5 mg/dl
- Χολερυθρίνη 1.2 mg/dl



PPV=7%
σε TV 8 ml/kg, φλεβόκομβο
PLRT(-)

Vasoactive agents

- **We recommend norepinephrine as the first choice vasopressor**

(strong recommendation, moderate quality of evidence).

- **We suggest adding either vasopressin (up to 0.03 U/min) or epinephrine to norepinephrine with the intent of raising MAP to target, or adding vasopressin (up to 0.03 U/min) to decrease norepinephrine dosage.**

(weak recommendation, low quality of evidence)

Antibiotics

- **We suggest empiric combination therapy (using at least two antibiotics of different antimicrobial classes) aimed at the most likely bacterial pathogen(s) for the initial management of septic shock.**
  - **(Weak recommendation; low quality of evidence)**

CORTICOSTEROIDS

1. **We suggest against using intravenous hydrocortisone to treat septic shock patients if adequate fluid resuscitation and vasopressor therapy are able to restore hemodynamic stability. If this is not achievable, we suggest intravenous hydrocortisone at a dose of 200 mg per day.**

(Weak recommendation; low quality of evidence)

Mechanical Ventilation

- **We suggest using lower tidal volumes over higher tidal volumes in adult patients with sepsis-induced respiratory failure without ARDS.**
  - **(Weak recommendation; low quality of evidence)**

Mechanical Ventilation

- **We suggest using higher PEEP over lower PEEP in adult patients with sepsis-induced moderate to severe ARDS.**
  - **Weak recommendation; moderate quality of evidence**
- **We recommend using prone over supine position in adult patients with sepsis-induced ARDS and a PaO_2/FIO_2 ratio <150.**
  - **(Strong recommendation; moderate quality of evidence)**

- Ο ασθενής μεταφέρεται στο χ/ο, για **ερευνητική λαπαροτομία** (second look) και ανευρίσκεται διαφυγή από την αναστόμωση, και διάχυτη πυώδης περιτονίτιδα (Ilγενής).

- Γίνεται ειλεοστομία, πλύσιμο της περιτοναικής κοιλότητας και σύγκλειση των κοιλιακών τοιχωμάτων. Λαμβάνονται καλλιέργιες διεγχειρητικά, προτιμάμαι:

  - 1ml υγρού τουλάχιστον
  - >1 gr ιστού
  - **οχι** επιφανειακά swabs
  - **οχι κ/ες από παροχετεύσεις μετά το πρώτο 24ωρο**

- **Διεγχειρητικά λαμβάνει άλλα 6.5 lt υγρών, και νοραδρεναλίνη στάγδην.**

Source Control

- **We recommend that a specific anatomic diagnosis of infection requiring emergent source control be identified or excluded as rapidly as possible in patients with sepsis or septic shock, and that any required source control intervention be implemented as soon as medically and logistically practical after the diagnosis is made.**

(Best Practice Statement).

Τις επόμενες 6 ώρες μετά την επιστροφή του στην ΜΕΘ,

- η διούρηση μειώνεται,
- η κρεατινίνη αυξάνεται σε 3.1 mg/dl, και
- Το alarm του αναπνευστήρα χτυπά γιατί η PIP (και η pPlat) είναι αυξημένες.
- Η χορηγούμενη δόση norepinephrine έχει αυξηθεί 0.8 μg/kg/min, και οι αιμοδυναμικοί παράμετροι είναι ΑΠ 80/50, σφύξεις 140, CVP 22 mmHg, και ScvO2 62%.

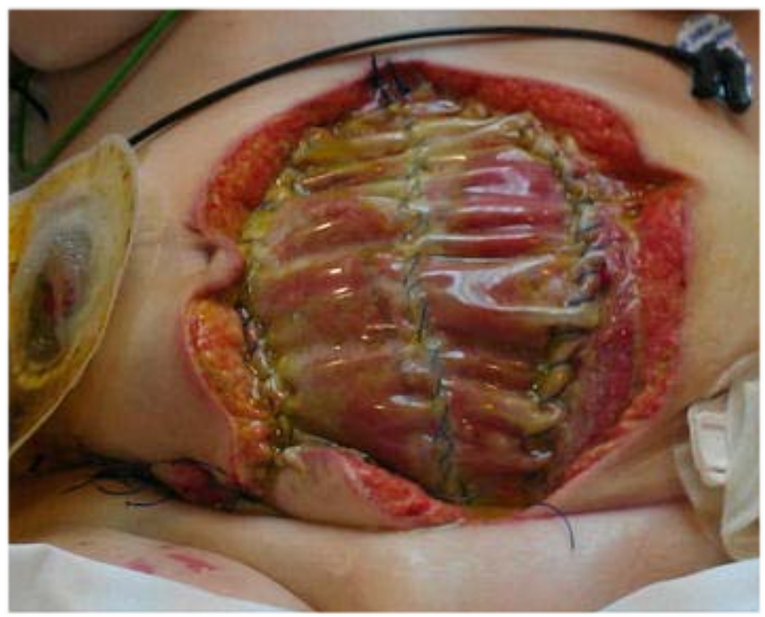
Πώς εξηγείται η επιδείνωση?
Τι πρέπει να γίνει?
Θα ξεκινούσατε CVVHDF?

Renal Replacement Therapy

- **We suggest against the use of renal replacement therapy in patients with sepsis and acute kidney injury for increase in creatinine or oliguria without other definitive indications for dialysis.**
  - **(Weak recommendation; low quality of evidence)**

Πώς εξηγείται η επιδείνωση?
Τι πρέπει να γίνει?

- Μέσω του Foley γίνεται μέτρηση της ενδοκοιλιακής πίεσης στα 42 mmHg (>20mmHg).
- Ο ασθενής οδηγείται ξανά στο χ/ο, γίνεται διάνοιξη της χειρουργικής τομής, το κοιλιακό τοίχωμα παραμένει ανοικτό και τοποθετείται Bogota bag.



Πώς εξηγείται η επιδείνωση?
Τι πρέπει να γίνει?

Το επόμενο πρωί παραμένει σε norepinephrine 0.3 μg/kg/min

- το ScVO2 είναι τώρα 74%,
- είναι σε FiO2 0.5, με PaO2 80mmHg
- οι σφύξεις είναι102 και
- η πίεση έχει σταθεροποιηθεί στα 110/74.
- τρεις μέρες μετά γίνεται σύγκλειση του χειρουργικού τραύματος με επιτυχία.

- Ο ασθενής παραμένει διασωληνωμένος και σε ήπια καταστολή για τις επόμενες 7 ημέρες.
- Εξακολουθεί να είναι εμπύρετος εως 38.5 °C.
- Υποστηρίζεται από χαμηλή δόση νορεπινεφρίνης.
- Στην προσπάθεια αφύπνισης γίνεται ταχύκαρδος και ταχυπνοικός.
- Από τις κ/ες του χειρουργίου απομονώθηκε E.coli ESBL(+), που καλύπτεται από το τρέχων αντιβιοτικό σχήμα. Από τις κ/ες των ΒΕ απομονώνεται Acinetobacter b. ευαίσθητο στην κολιστίνη αλλά από την α/α θώρακος δεν υπάρχουν ενδείξεις πνευμονίας του αναπνευστήρα.

- Γίνεται νέα αξονική τομογραφία κοιλίας που επιβεβαιώνει την ύπαρξη ενός μεγάλου πυελικού αποστήματος το οποίο παροχετεύεται υπό καθοδήγηση στον αξονικό.

- 24 ώρες μετά την παροχέτευση, ο ασθενής βελτιώνεται.

- Προοδευτικά φεύγει από τα αγγειοσυσπαστικά και προγραμματίζεται τραχειοστομία. Σταματά η κολμυκίνη.

- Τις επόμενες μέρες κινητοποιεί τον τρίτο χώρο μέσω τις διούρησης και βελτιώνει θεαματικά το επίπεδο συνείδησης.

- Ο ασθενής απογαλακτίζεται από τον μηχανικό αερισμό μία εβδομάδα μετά και φεύγει για την Μονάδα Αυξημένης Φροντίδας.

Antimicrobial Therapy

Antibiotic Stewardship

- We recommend that empiric antimicrobial therapy be narrowed once pathogen identification and sensitivities are established and/or adequate clinical improvement is noted.
  - (BPS)
- We suggest that an antimicrobial treatment duration of 7-10 days is adequate for most serious infections associated with sepsis and septic shock.
  - (Weak recommendation; low quality of evidence)
- We recommend daily assessment for de-escalation of antimicrobial therapy in patients with sepsis and septic shock.
  - (BPS)
- We suggest that measurement of procalcitonin levels can be used to support shortening the duration of antimicrobial therapy in sepsis patients.
  - (Weak recommendation; low quality of evidence)

Nutrition

- **We recommend against the administration of parenteral nutrition alone or in combination with enteral feeds (but rather to initiate IV glucose and advance enteral feeds as tolerated) over the first 7 days in critically ill patients with sepsis or septic shock in whom early enteral feeding is not feasible.**
  (Strong recommendation; moderate quality of evidence).

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 ≥4mmol/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) ≥65mmHg
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.

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 $ScvO_2$
- 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.

βιβλιογραφία

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