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Kurs 3: Intenzivno lečenje, urgentna medicina i transfuzija

Naziv teme: **Septički šok**

Datum: 10-12.03.2017.

Jezik: Srpski

Grad: Kopaonik

Zemlja: Srbija

Predavač: Vojislava Nesković

European Society of Anaesthesiology ESA

World Federation of Societies of Anaesthesiologists

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The New Sepsis Definition

Sepsis - 3

ESCIM, SCCM

- **Diskriminacija nekomplikovane infekcije i sepse**
- **Odsustvo standardnog dijagnostičkog testa**
- Klinički kriterijumi treba da obuhvate sve elemente (infekcija, odgovor domaćina i disfunkcija organa)
- Značajna biološka i klinička **heterogenost** bolesnika
- SIRS kriterijumi su nedovoljno specifični

European Society of Anaesthesiology ESA

Singer M et al. JAMA 2016;315:801-10

World Federation of Societies of Anaesthesiologists

The New Sepsis Definition

Sepsis - 3 ***ESCIM, SCCM***

- **Neregularni imunološki odgovor domaćina** povezan sa životno ugrožavajućom **disfunkcijom organa** koja je povezana sa **infekcijom**
- **Septični šok:** podgrupa kliničkih stanja sepse sa **cirkulatornim i metaboličkim poremećajima** koji uvećavaju **mortalitet**
- Nova definicija se poziva na korišćenje **SOFA** (ICU) i **qSOFA** (odeljenje) skora

Singer M et al. JAMA 2016;315:801-10

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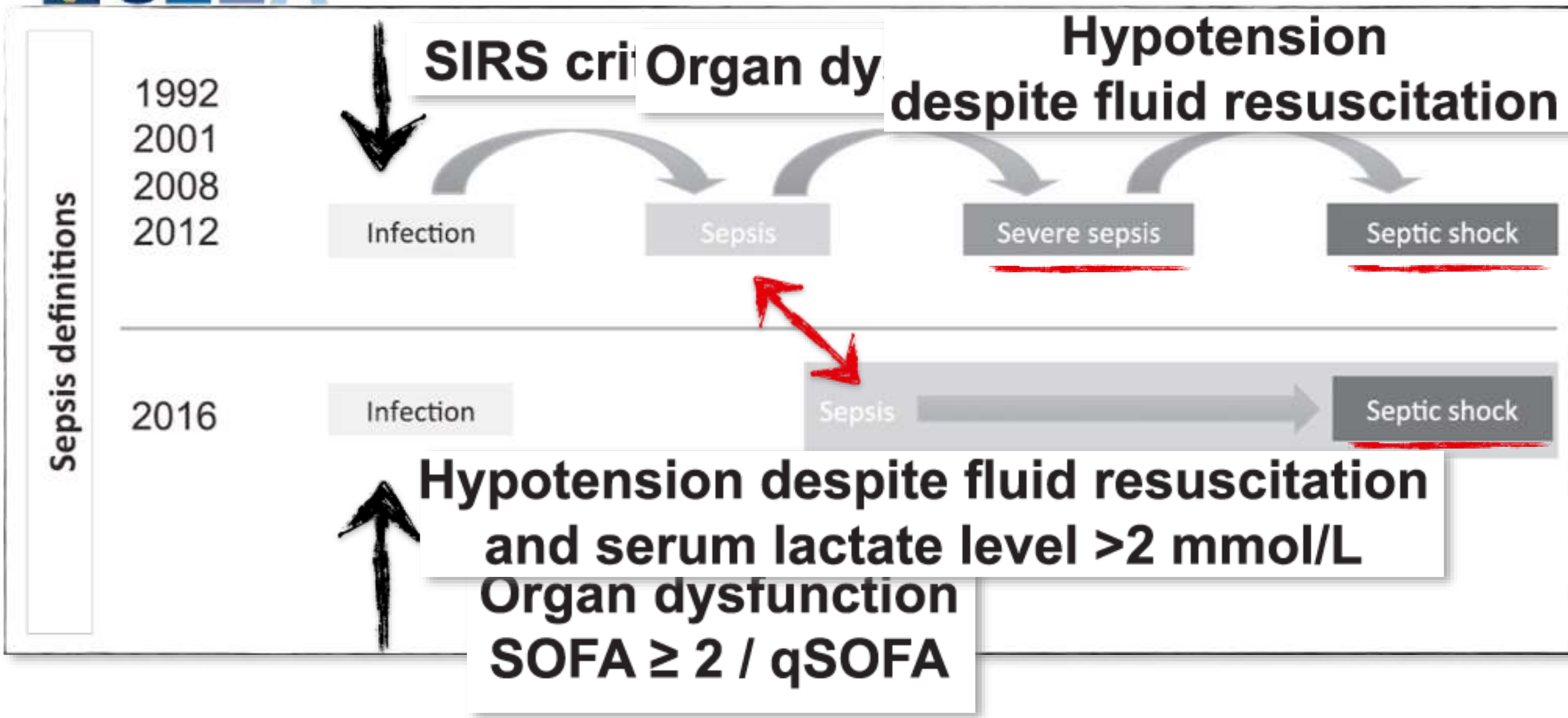

Infekcija i umerena organska disfunkcija:

mortalitet > 10%

Verdonk F et al. Curr Opin Anesthesiol 2017

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SIRS

TT	> 38 °C < 35 °C
HR	> 90 /min
Tahipneja ili hiperventilacija	RR > 20/min PCO2 < 32 mmHg
Leukociti	> 12 000 < 4000 >10 % nezrelih

SOFA

Respiratorna f-ja (broj respiracija)
Koagulacija (broj trombocita)
F-ja jetre (bilirubin)
KVS (MAP)
CNS (GCS)
Bubreg (kreatinin + diureza)

Šta je qSOFA?

GCS<15

RR≥22/min

BP≤100 mmHg

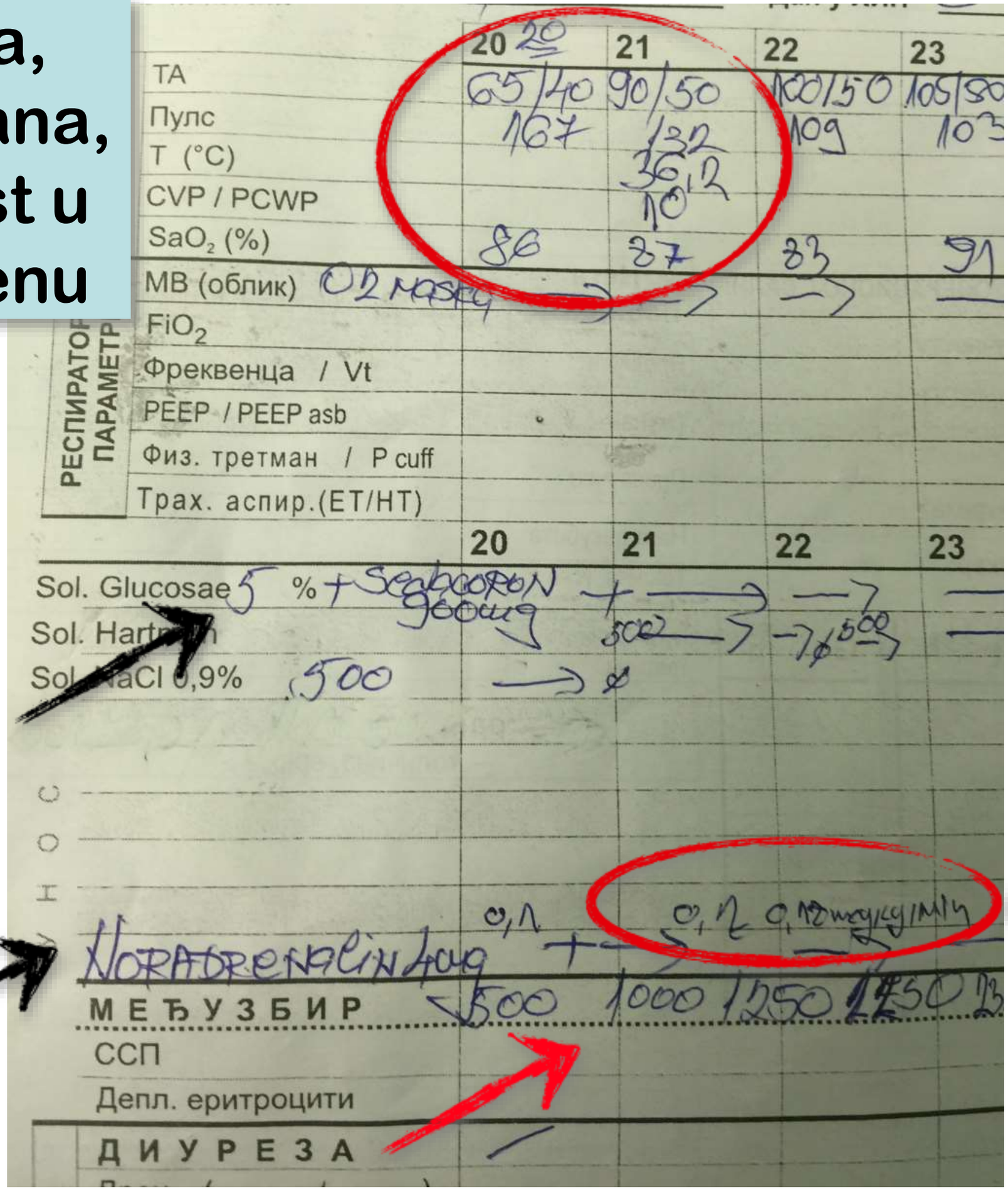
Score: 0-3;

Score: ≥ 2 + infekcija = veći rizik (smrt i ICU lečenje)

Prikaz slučaja

- Žena, 61 g
- Hitan slučaj
- Hemicolectomia lat sin, T-T anastomosis, a.d.X
- Mučnina, povraćanje
- Poremećaj opšeg stanja
- Na odeljenju: terapija bez uspeha
- **4 L kristaloida**

Svesna, orjentisana, napetost u abdomenu



	20 20	21	22	23
TA	65/40	90/50	100/50	105/80
Пулс	167	132	109	103
T (°C)		36,2		
CVP / PCWP		10		
SaO_2 (%)	86	87	83	91
МВ (облик)	O2 maska →	→	→	—
FiO_2				
Фреквенца / Vt				
PEEP / PEEP asb				
Физ. третман / P cuff				
Трах. аспир.(ET/HT)				

РЕСПИРАТОРНИ ПАРАМЕТРИ

	20	21	22	23
Sol. Glucosae 5 % + Seabcoron 900mg	+ →	+ →	→	—
Sol. Hartmann		500 →	→ 500 →	—
Sol. NaCl 0,9% 500	→ ∅			
Noradrenalin 4mg	0,1 +	0,2	0,12 mcg/kg/min →	—
МЕЂУЗБИР	500	1000	1250	1250
ССП				
Депл. еритроцити				
ДИУРЕЗА	—			

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BPEME	20 49
Le	3,15
Er	3,52
Hgb	80
Ht	27
Tr	250
Na	137
K	3,5
Cl	104
Ca	1,74
Mg	/
P	/
Glu	4,6
Urea	18,5
Kre	140
Osm	287
Tot. prot	38
Alb	24
Bilirubin	36
Bil. dir.	
AST	31

BPEME	20 49	
PV INR	1,44	
aPTT	52,42	
II f.		
V f.		
VII f.		
VIII f.		
IX f.		
X f.		
AT III		
D-dimer	4,97	
pH	7,37	7,31
PaO_2	52,5	[illegible]
$PaCO_2$	28,6	34,2
HCO_3	15,9	18,0
BE	-10,5	-7,9
Laktati	6,4	6,3
CK	565	
CK - MB	26	

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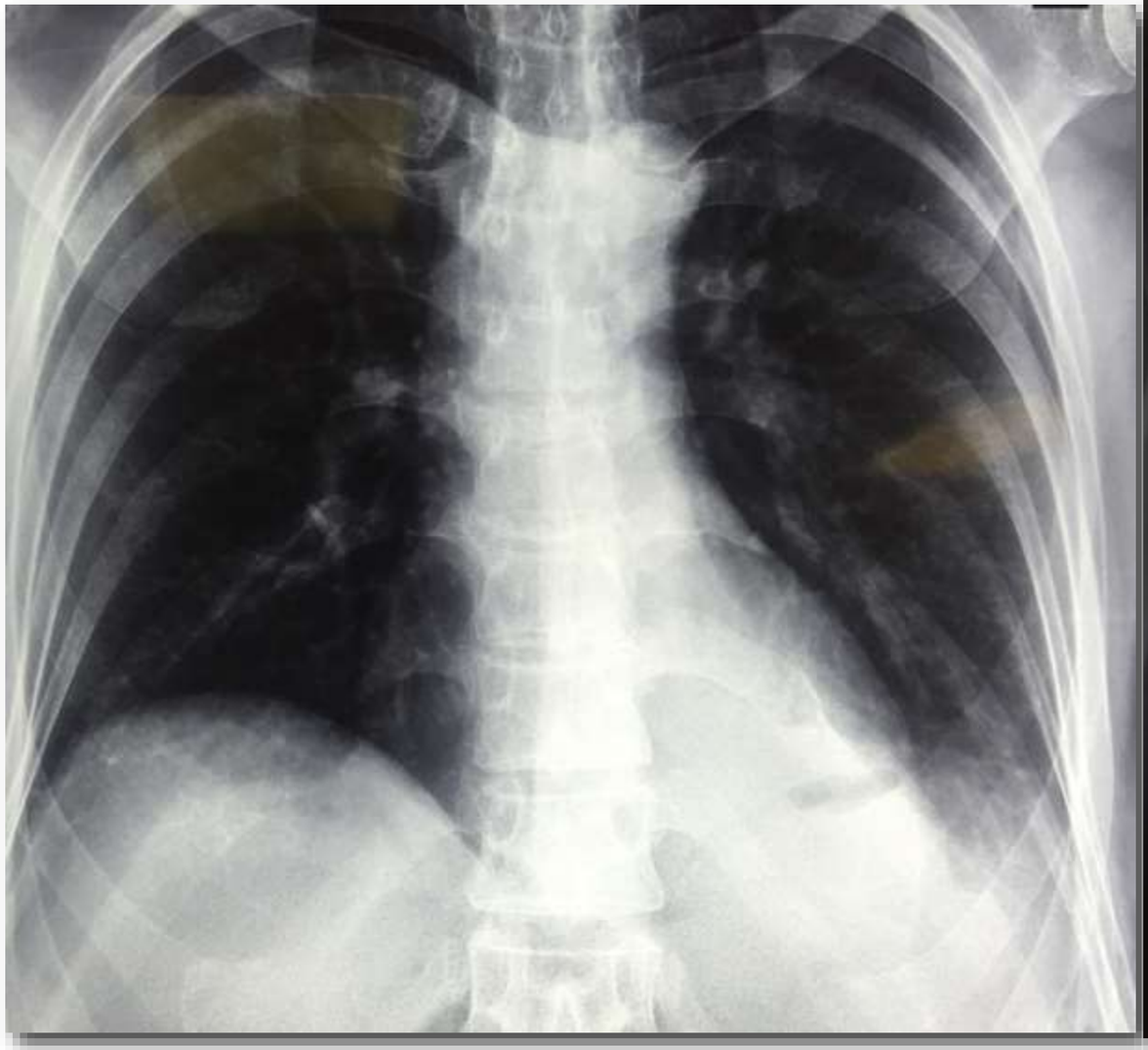
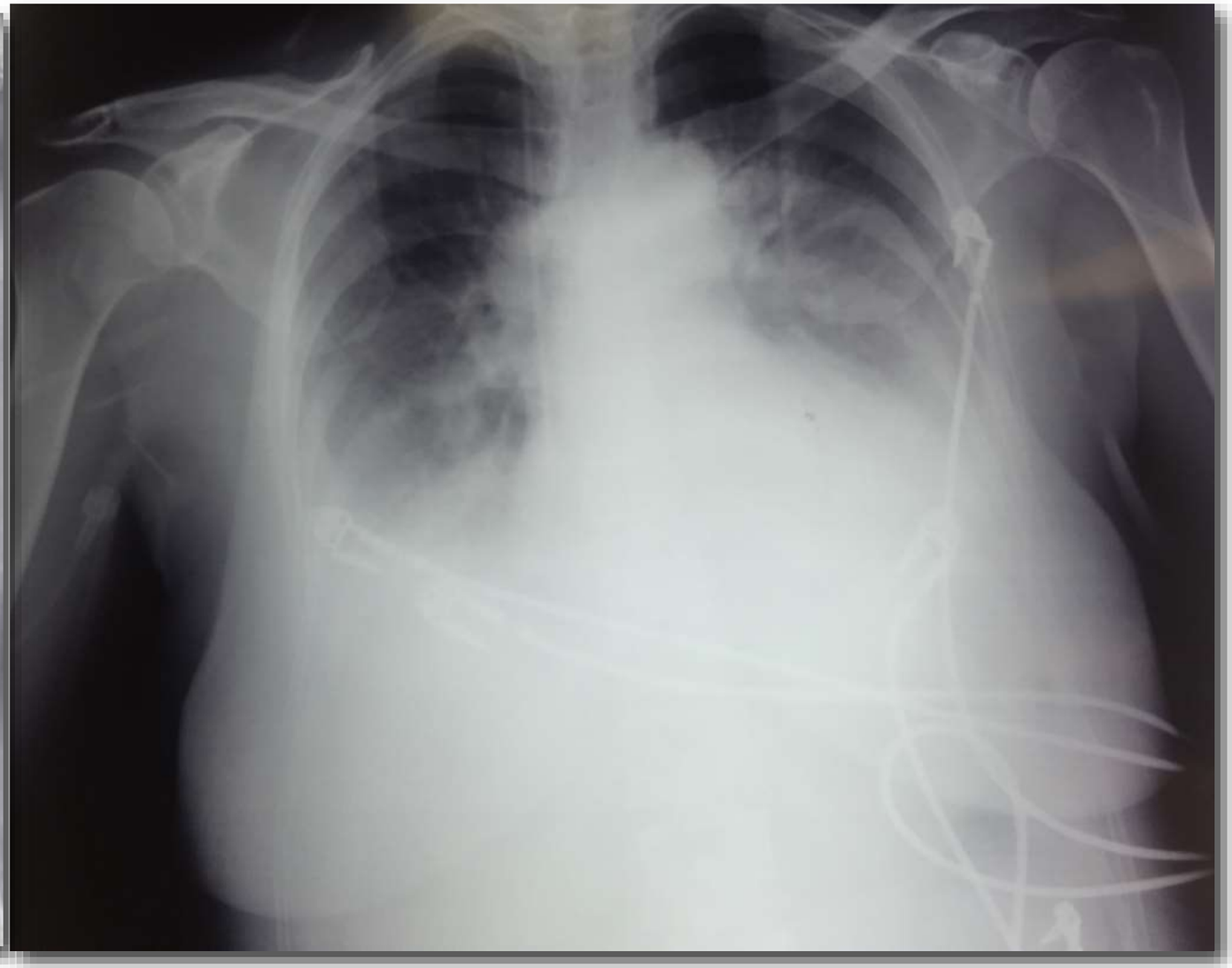
qSOFA = 2! Mortalitet > 50%!!!

SOFA = 14!

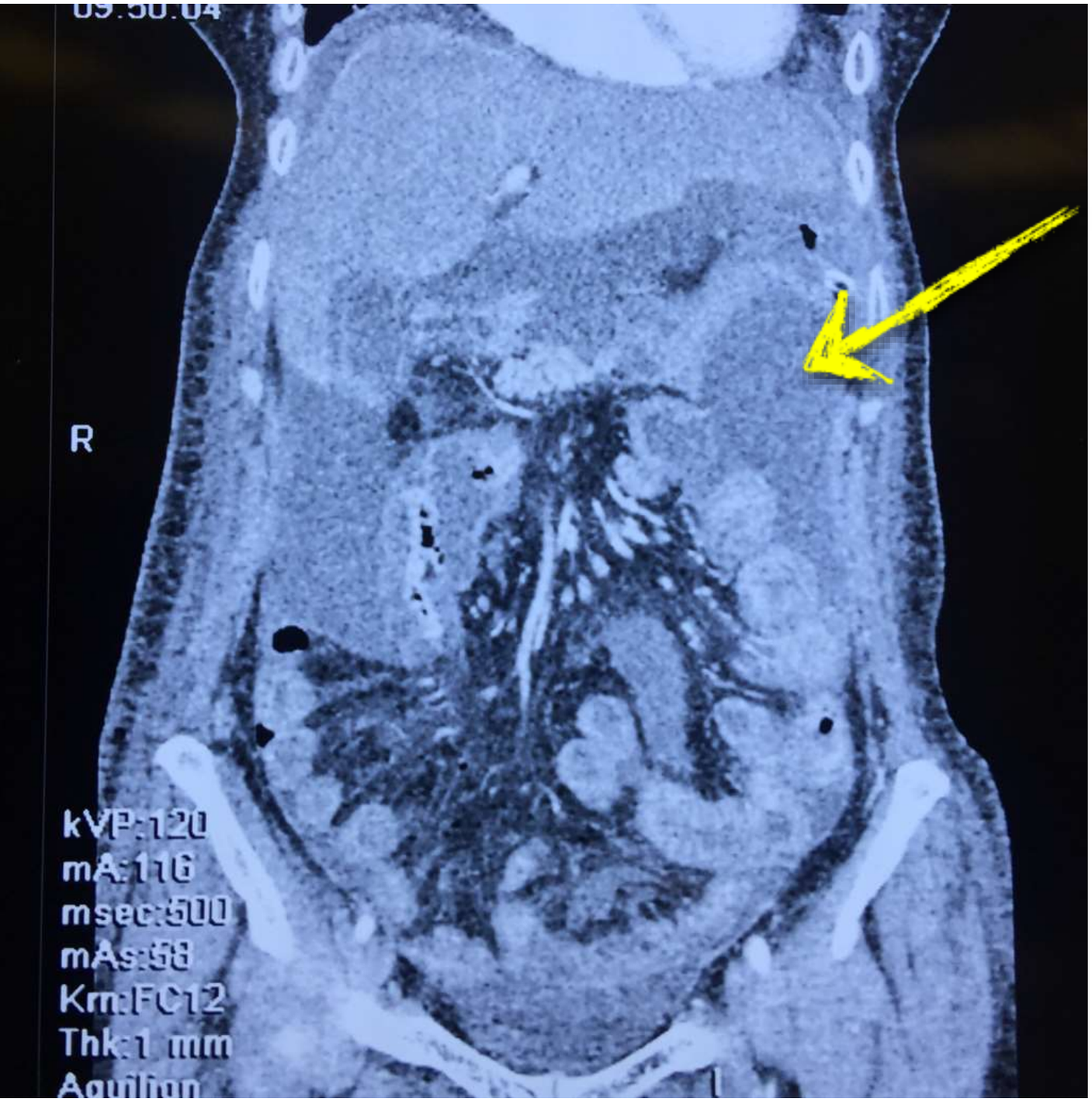
			2	3	4
PaO_2/FIO_2, mm Hg (kPa)	≥400 (53.3)	<400 (53.3)	<300 (40)	<200 (26.7) with respiratory support	<100 (13.3) with respiratory support
Coagulation					
Platelets, $\times 10^3/\mu L$	≥150	<150	<100	<50	<20
Liver					
Bilirubin, mg/dL (μmol/L)	<1.2 (20)	1.2–1.9 (20–32)	2.0–5.9 (33–101)	6.0–11.9 (102–204)	>12.0 (204)
Cardiovascular	MAP ≥70 mm Hg	MAP <70 mm Hg	Dopamine <5 or dobutamine (any dose)[b]	Dopamine 5.1–15 or epinephrine ≤0.1 or norepinephrine ≤0.1[b]	Dopamine >15 or epinephrine >0.1 or norepinephrine >0.1[b]
Central nervous system					
Glasgow Coma Scale score[c]	15	13–14	10–12	6–9	<6
Renal					
Creatinine, mg/dL (μmol/L)	<1.2 (110)	1.2–1.9 (110–170)	2.0–3.4 (171–299)	3.5–4.9 (300–440)	>5.0 (440)
Urine output, mL/d				<500	<200

Obostrani pleuralni izlivi (24h)





Gram (-) sepsa Abdomen!

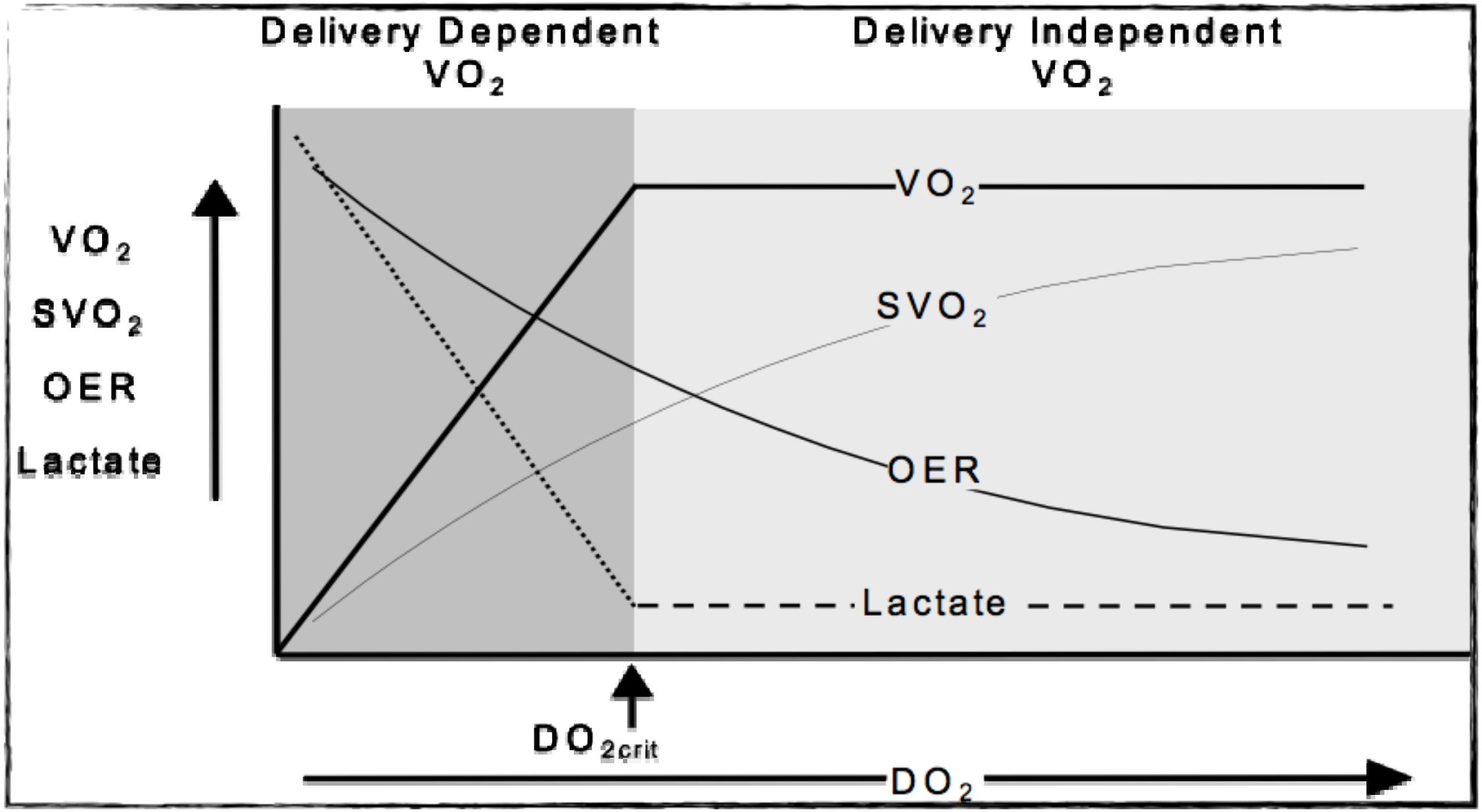


| | | |

Septični šok - cirkulatorni kolaps

* Hypovolemični
  - Kapilarna propustljivost (apsolutna)
  - Venodilatacija (relativna)
* Kardiogeni
  - kontraktilnost
* Opstruktivni
  - Plućna vaskularna rezistencija ⬆
* Distributivni
  - Makrovaskularni-Splanhični protok ⬇
  - Microvaskularni - Šant
  - Citotoksični
  - Iskorišćenje O2⬇

Nadoknada tečnosti i vazoaktivni lekovi: Inicijalno lečenje



Dopremanje i potrošnja kiseonika

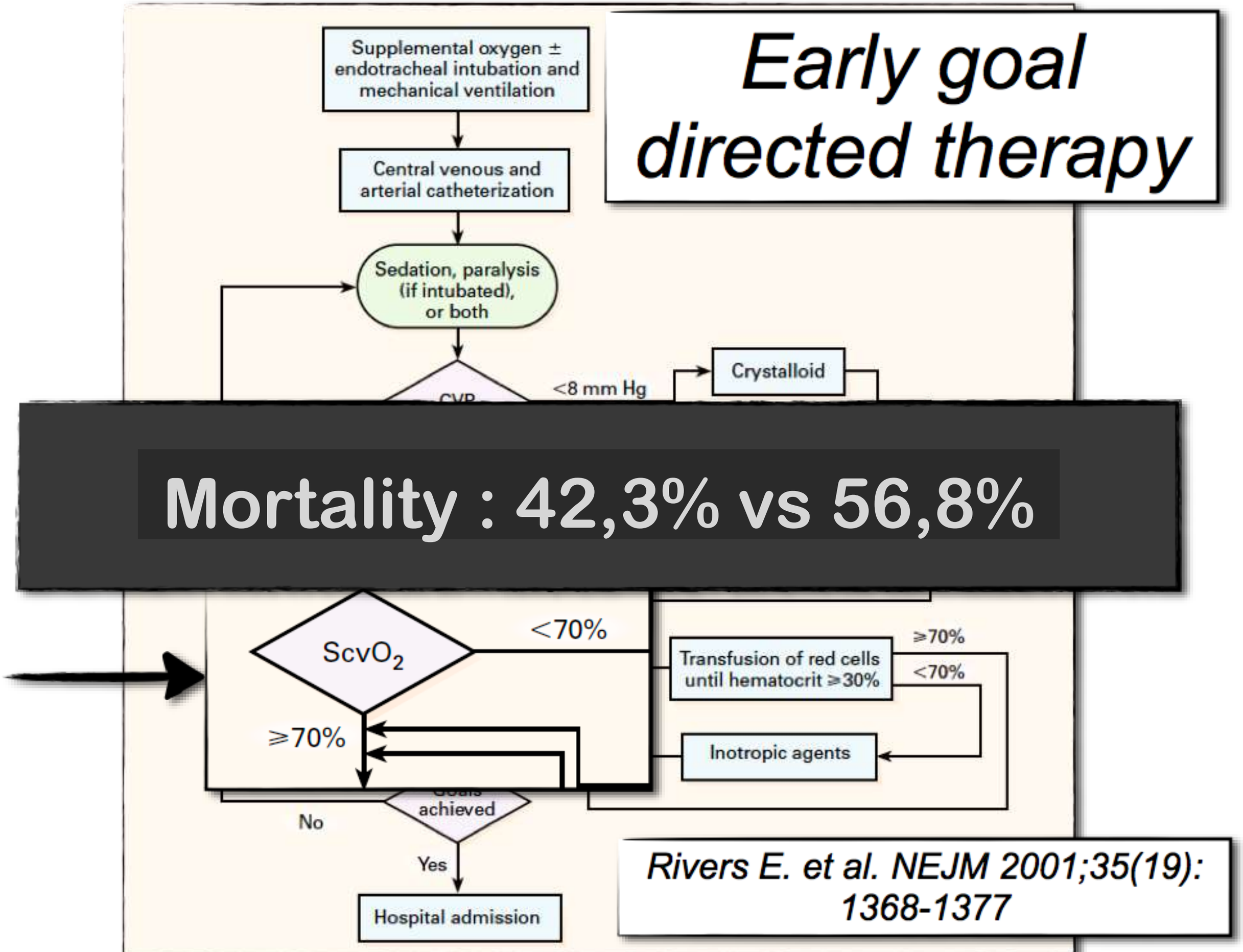
Različite faze šoka

- **Rana faza:** Snižen volumen i nizak CO
- Kasnije: visok CO
- Hladni šok: organska disfunkcija, globalna tkivna hipoksija, smrt

Različite faze - različita terapija

Zlatni sati

Early goal directed therapy



Mortality : 42,3% vs 56,8%

Rivers E. et al. NEJM 2001;35(19): 1368-1377

Early goal directed therapy

Resuscitate *immediately* if hypotension or serum lactate ≥4mol/L

Bezbedna, ne superiorna!

Surviving Sepsis Campaign. Crit Care 2008.

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Trio of trials

REVIEW Open Access

CrossMark

Early goal-directed therapy in severe sepsis and septic shock: insights and comparisons to ProCESS, ProMISe, and ARISE

H. Bryant Nguyen[1,2], Anja Kathrin Jaehne[3,22], Namita Jayaprakash[4], Matthew W. Semler[5], Sara Hegab[6], Angel Coz Yataco[7], Geneva Tatem[6], Dhafer Salem[8], Steven Moore[3], Kamran Boka[9], Jasreen Kaur Gill[3], Jayna Gardner-Gray[3,6], Jacqueline Pflaum[3,6], Juan Pablo Domecq[10,11], Gina Hurst[3,6], Justin B. Belsky[12], Raymond Fowkes[3], Ronald B. Elkin[13], Steven Q. Simpson[14], Jay L. Falk[15,16,17,18,19], Daniel J. Singer[20] and Emanuel P. Rivers[3,21*]

ProCESS - Protocol Based Care for Early Septic Shock

ProMISe - Protocolized Management in Sepsis

ARISE - Australasian Resuscitation in Sepsis Evaluation

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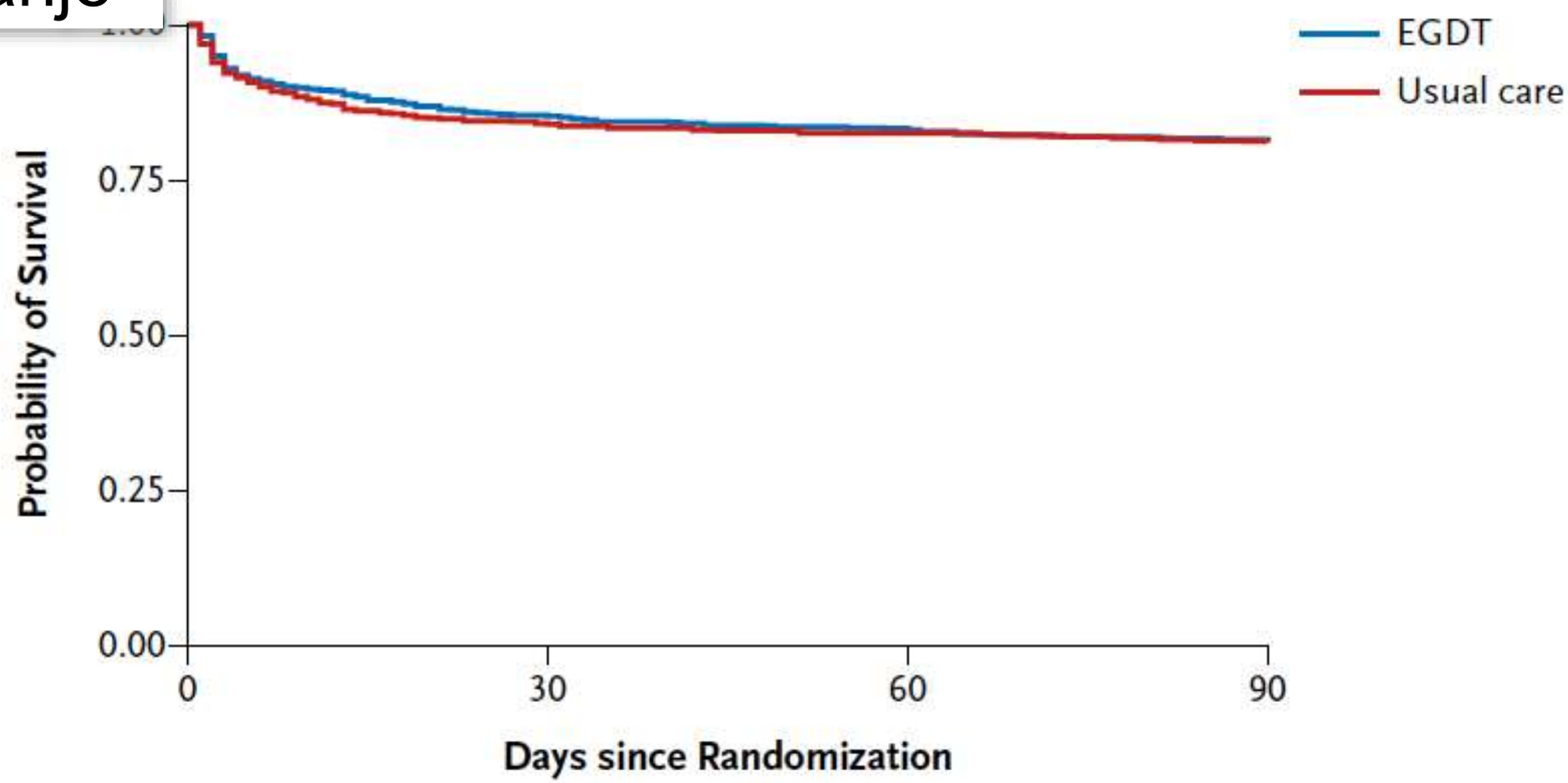
ARISE trial

1600 bolesnika, tercijarne i ruralne bolnice
EGDT vs Standard

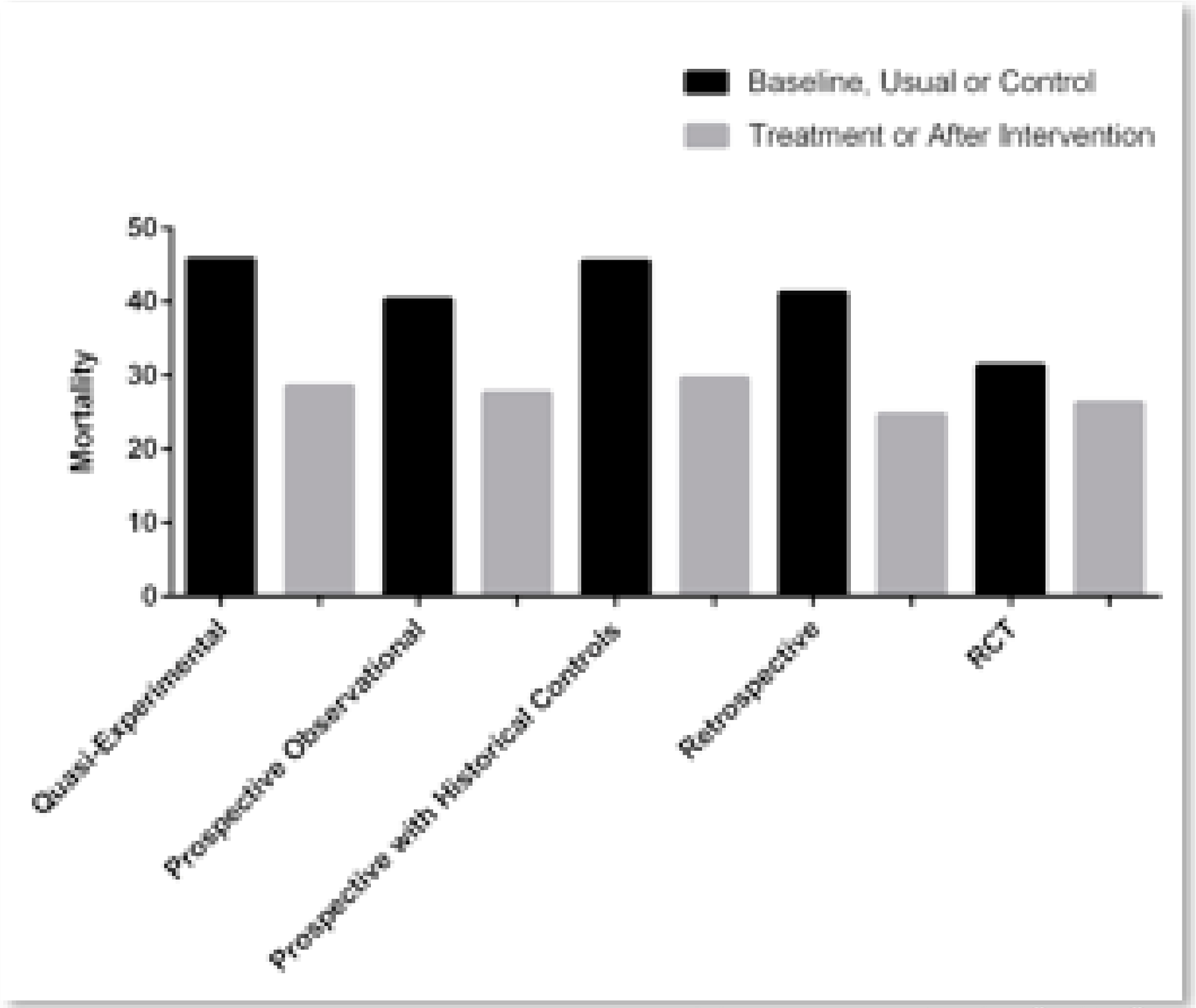
Preživljavanje



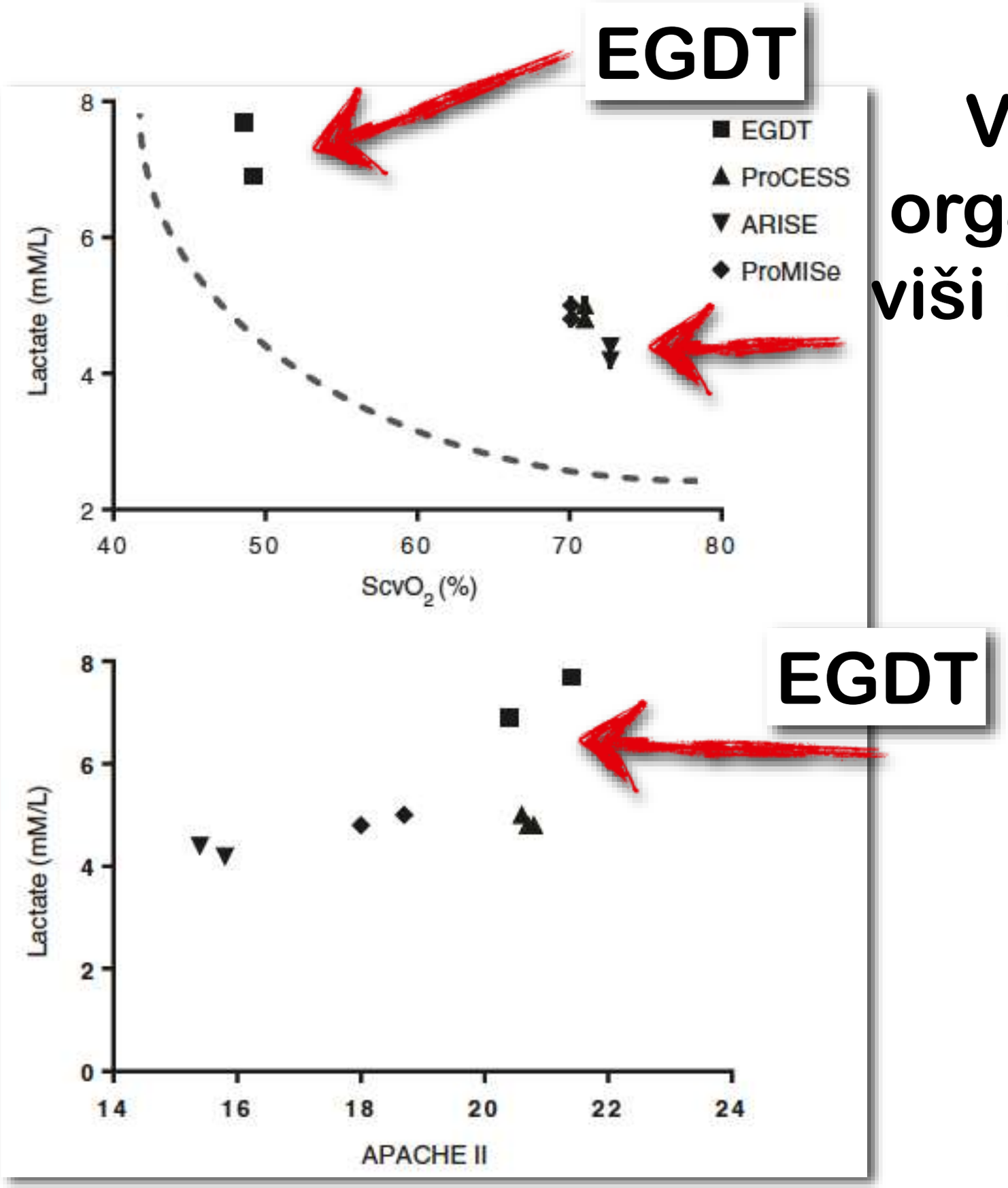
No. at Risk				
EGDT	792	677	660	646
Usual care	796	670	657	646

ARISE. NEJM 2014.

Mortalitet pre i posle implementacije EGDT



Nguyen et al. Crit Care 2016



Više inflamacije, organske disfunkcije viši mortalitet u EGDT

Nguyen et al. Crit Care 2016

Table 5 Summary of Methodological Comparisons

	The trio of EGDT trials	EGDT study
Requisite for enrollment and defined as usual care	Screening using SIRS Fluid challenge Lactate screening for cryptic shock Early antibiotic administration within 6 h encouraged (ProCESS)	
	Exclusion rate of 43 to 67 %	
Fluid challenge	Fluid challenge—1 liter or surrogate	20–30 mL/kg
Trial duration and timing	Trials began 7–8 years after EGDT (2008–2015) Duration ranging between 4 and 8 years SSC guidelines were published in 2004, 2008, and 2012	
Trial conduct	Duration of ED stay less than 3 h Majority of care provided in ICU Delayed resuscitation bundle completion after 6 h not tested High volume and tertiary care centers CVP placement over 50 % of control groups in trio of EGDT trials A reduction in sample size after interim analysis low mortality	Performed in ED only 6–8 h in the ED Delayed care improves outcomes
Co-morbidities	Fewer	Increased cardiovascular, liver, neurologic and
Hemodynamic phenotype	Normal $ScvO_2$ and CVP at baseline (all groups received similar fluids as the original EGDT treatment group from hospital arrival to 6 hours) 50 % more vasopressors (vasodilatory) in the trio of EGDT trials Steroid use 8–37 %	
Hemodynamic phenotype	Normal $ScvO_2$ and CVP at baseline (all groups received similar	Lower $ScvO_2$
Sources of improved care	Pre-existing sepsis protocols, pre-hospital care, sepsis alerts and screens, rapid response systems, telemedicine, glucose control, ventilator strategies, hemoglobin strategies, palliative care, national limits on ED length of stay (Australia and United Kingdom), ultrasound	
	control, ventilator strategies, hemoglobin strategies, palliative care, national limits on ED length of stay (Australia and United Kingdom), ultrasound	
Generalizability and external validity	Performed in academic centers in industrialized countries Specialized care delivery	EGDT replicated in community and academic centers worldwide

Special Article

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

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Guidelines 2016.

Izmene:

- **Bez standardnih hemodinamskih ciljeva (goals)**
- **30 ml/kg** kristaloida, **unutar 3h**
- Dinamički hemodinamski parametri
- Česta procena i reevaluacija
- Lečenje infekcije **(Source control)**

Koji je najbolji pristup optimizaciji hemodinamike ??

Guidelines 2016.

AB terapija i Source control!!

- IV antibioltska terapija **odmah** po dijagnozi
- **Septični šok:** unutar **prvog sata**
- Specifična anatomska **dijagnoza** mesta infekcije i **intervencija** za njenu eliminaciju u **najkraćem** vremenu

Mortalitet: ***↑8,5%*** *posle 6h;*

↑7,6%/h *u septičnom šoku*

Zaključci

- Revidirana definicija sepse **Sepsis 3**
- **Diskriminacija n**ekomplikovane infekcije i sepse
- Prepoznavanje **organske disfunkcije** koja direktno utiče na mortalitet **(SOFA I qSOFA)**
- Revidirane preporuke za inicijalno zbrinjavanje **SSC 2016**
- **Vreme!**

Vreme za razmišljanje:
Srbija i sepsa?