Sepsis-3 - conn

Yonsei University College of Medicine

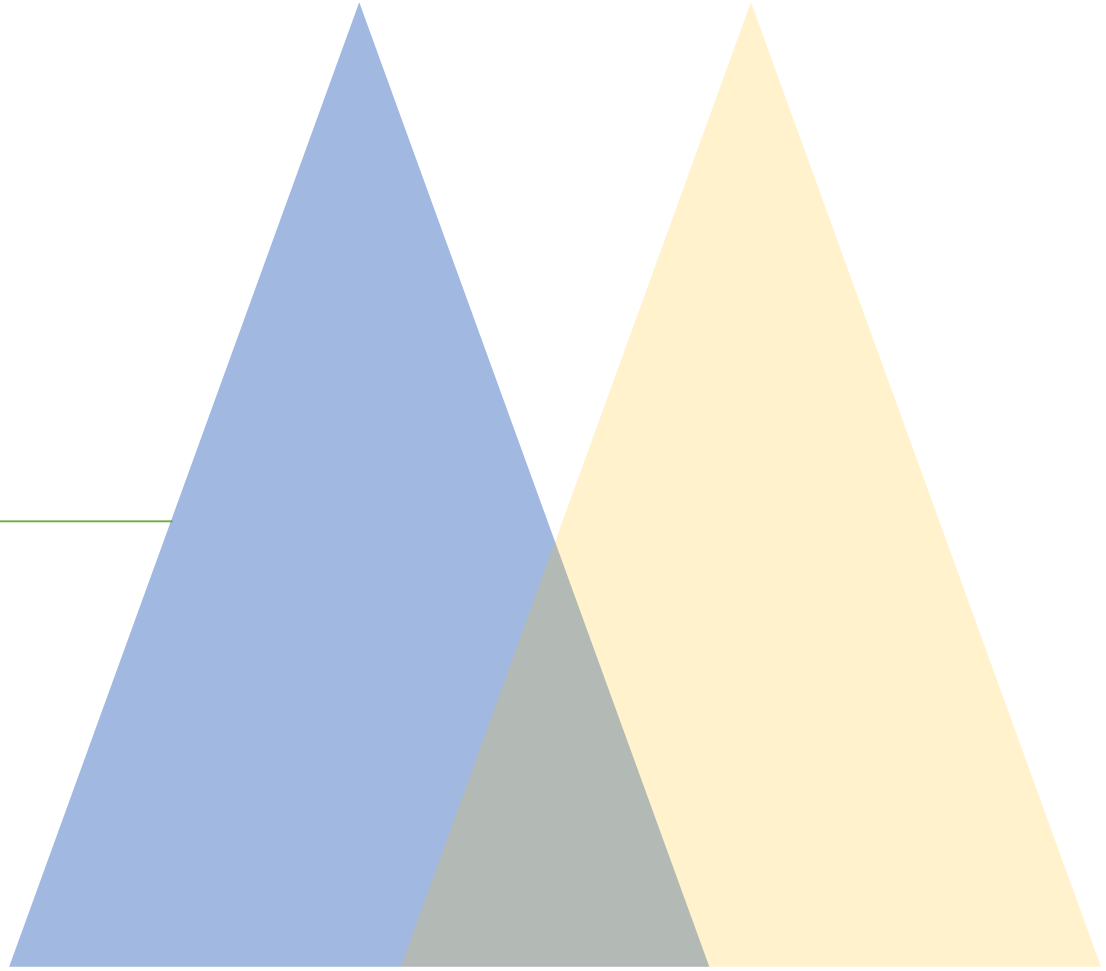
Division of Pulmonology

Assistant professor

Chung Kyung Soo

001

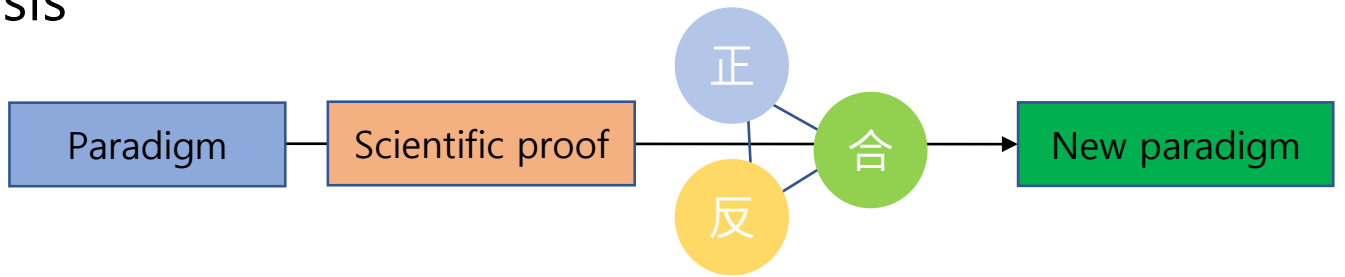
Sepsis History



1

Sepsis History

Major valuable studies about sepsis



Roger C. Bone et al. published the first definition of sepsis in CHEST

Delinger et al. Surviving Sepsis Campaign in CCM

River et al. published EGDT in NEJM

- **TRISS trial ; restrictive trasnfusions**
- **ProCESS, ProMISE, ARISE trial : no EGDT!**
- **VASST trial : vasopressin use**
- **SEPSISPAM trial : BP target**
- **SPLIT trial ; Fluid choice - colloid/crystalloid**

SSCG 2004 | SSCG 2008 | SSCG 2012 | SSCG 2016

1992 | 2001 | 2004 | 2008 ~ 2010 | 2013-2015 | 2016~2018 | 2019 ???

ESICM/ACCP/ATS/SIS International Sepsis Consensus Conference "Sepsis-2" defined

- **Bernard et al. ; activated protein C in NEJM**
- **Van den Gerge et al. ; Intensive Insulin in NEJM**
- **Annane et al. ; Steroid in JAMA**

- **ADDRESS/PROWESS SHOCK ; APC (Xigris) - gone**
- **CORTICUS ; steroid in a limited population**
- **NICE-SUGAR ; intensive insulin has a limited role**
- **Jones, EMShockNET ; Lactate clearance in JAMA**
- **John et al ; Hydroxyethyl starch - out**

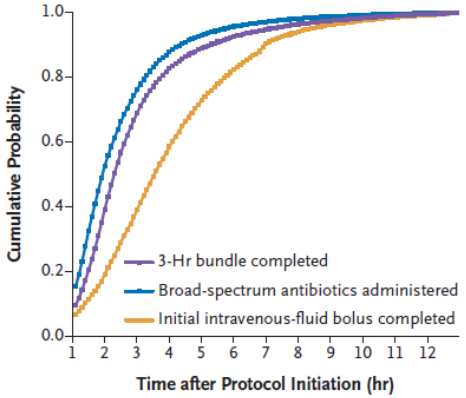
Singer et at "Sepsis-3" published In JAMA

- **APROCCHSS/ADRENAL trial ; steroid in a limited population**
- **IDEAL-ICU trial : delaying RRT in AKI from sepsis**
- **ANDROMEDA-SHOCK trial ; lactate measurement vs CRT**

1

Sepsis History

General agreements in sepsis

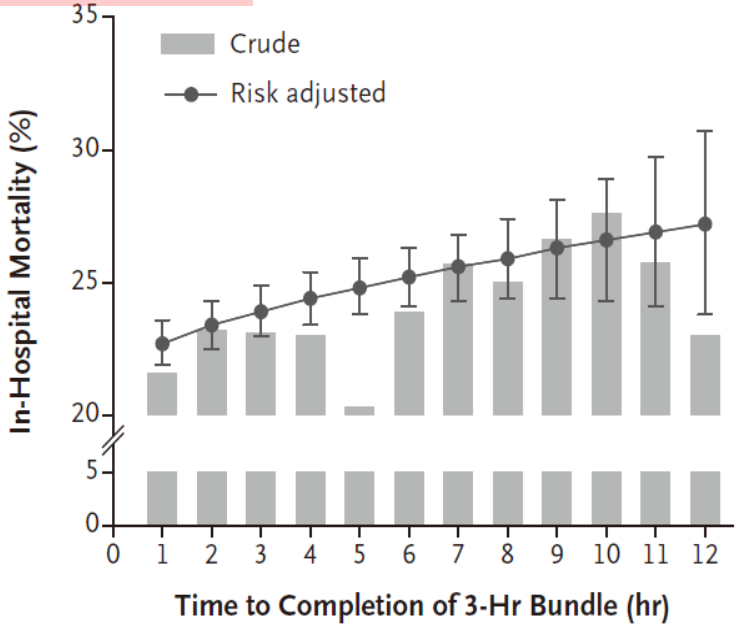


The NEW ENGLAND JOURNAL of MEDICINE

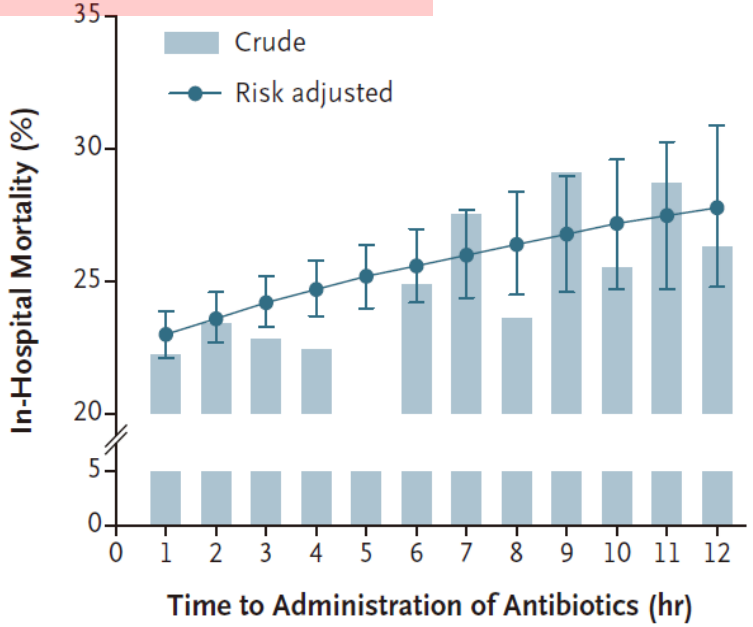
ORIGINAL ARTICLE

Time to Treatment and Mortality during Mandated Emergency Care for Sepsis

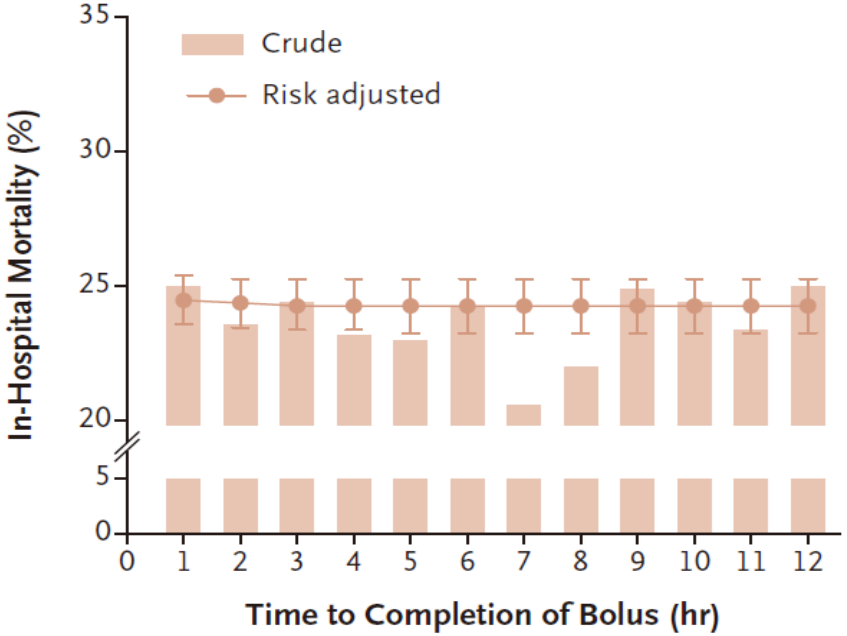
3-Hr Bundle



Administration of Antibiotics



Initial Bolus of Intravenous Fluids



N Engl J Med 2017;376:2235-44

1

Sepsis History

Changes of sepsis definition

Infection
Bacteremia
SIRS
Sepsis
Septicemia
Severe sepsis
Septic shock
Sepsis induced hypotension
MODS
.....

Sepsis-1

ACCP/SCCM (1992)

"Sepsis is the systemic inflammatory response to infection"

SIRS

(systemic inflammatory response syndrome)

One of 4 findings:

- Temp>38℃ or <36 ℃
- HR>90/min
- RR>20/min
- WBC>12,000/mm^3 or < 4,000/mm^3 or > 10% band

Sepsis
2 ≥ SIRS with presumed or confirmed infectious process

Severe Sepsis
Sepsis associated with organ dysfunction, hypo-perfusion, or hypotension

Septic shock
Sepsis-induced hypotension despite adequate fluid resuscitation

Sepsis-2

SCCM/ESICM/ACCP/ATS/SIS (2001)

"Sepsis spectrum"

PIRO system

Sepsis
Documented or suspected Infection plus general/inflammatory/hemodynamic/organ dysfunction/tissue perfusion parameters

Severe Sepsis

Septic shock
Sepsis-induced hypotension despite adequate fluid resuscitation

Sepsis-3

32 scientific societies except ACCP/IDSA/EM society (2016)

"Sepsis is defined as life-threatening organ dysfunction caused by a dys-regulated host response to infection"

2 ≥ qSOFA

- **RR ≥ 22/min**
- **Altered mentation (GCS < 14)**
- **SBP ≤ 100mmHg**

Sepsis
Suspected or documented infection + rise in SOFA by≥2

Septic shock
Sepsis + vasopressor need for MAP≥65 + lactate≥2mmol/L after adequate fluid resuscitation

1

Sepsis History

Publications about "Sepsis-3"

Special Communication | CARING FOR THE CRITICALLY ILL PATIENT

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

Mervyn Singer, MD, FRCP; Clifford S. Deutschman, MD, MS; Christopher Warren Seymour, MD, MSc; Manu Shankar-Hari, MSc, MD, FFICM; Djillali Annane, MD, PhD; Michael Bauer, MD; Rinaldo Bellomo, MD; Gordon R. Bernard, MD; Jean-Daniel Chiche, MD, PhD; Craig M. Coopersmith, MD; Richard S. Hotchkiss, MD; Mitchell M. Levy, MD; John C. Marshall, MD; Greg S. Martin, MD, MSc; Steven M. Opal, MD; Gordon D. Rubenfeld, MD, MS; Tom van der Poll, MD, PhD; Jean-Louis Vincent, MD, PhD; Derek C. Angus, MD, MPH

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

Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Assessment of Clinical Criteria for Sepsis

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

JAMA. 2016;315(8):762-774

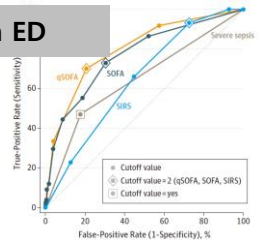
Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Developing a New Definition and Assessing New Clinical Criteria for Septic Shock

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

JAMA. 2016;315(8):775-787

Prospective validation in ED



	In-Hospital Mortality
SIRS	0.65
Severe sepsis	0.65
qSOFA	0.80
SOFA	0.77

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Prognostic Accuracy of Sepsis-3 Criteria for In-Hospital Mortality Among Patients With Suspected Infection Presenting to the Emergency Department

JAMA. 2017;317(3):301-308

Retrospective cohort analysis

	SIRS	qSOFA	SOFA	Between-Group Difference: SOFA vs SIRS	Between-Group Difference: SOFA vs qSOFA	*P* Value
In-Hospital Mortality (Primary Outcome)						
Crude AUROC (99% CI)	0.589 (0.585-0.593)	0.607 (0.603-0.611)	0.753 (0.750-0.757)	0.164 (0.159-0.169)	0.146 (0.142-0.151)	<.001
In-Hospital Mortality or ICU Stay ≥3 Days (Secondary Outcome)						
Crude AUROC (99% CI)	0.609 (0.606-0.612)	0.606 (0.602-0.609)	0.736 (0.733-0.739)	0.127 (0.123-0.131)	0.131 (0.127-0.134)	<.001

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Prognostic Accuracy of the SOFA Score, SIRS Criteria, and qSOFA Score for In-Hospital Mortality Among Adults With Suspected Infection Admitted to the Intensive Care Unit

JAMA. 2017;317(3):390-300

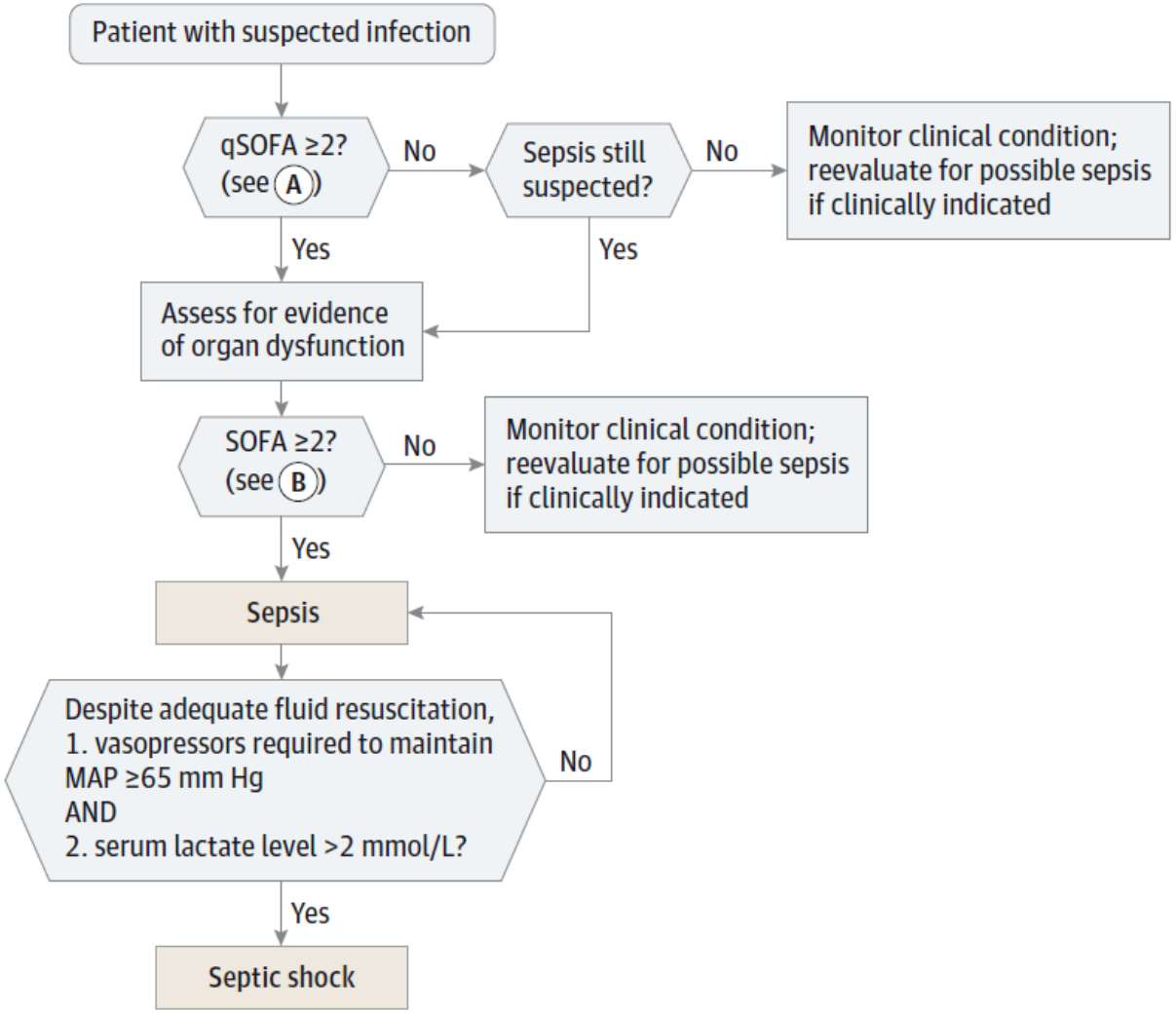
Sepsis History

Definition of "Sepsis-3"

Terminology	Definition
Sepsis	Life-threatening organ dysfunction caused by a dys-regulated host response to infection
Sepsis-induced organ dysfunction	An acute change in total SOFA score ≥ 2 points consequent to infection, reflecting an overall morality rate of approximately 10%
Septic shock	A subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities are profound enough to substantially increase mortality

Sepsis History

Clinical use of qSOFA and SOFA for sepsis diagnosis



A qSOFA Variables

- Respiratory rate
- Mental status
- Systolic blood pressure

B SOFA Variables

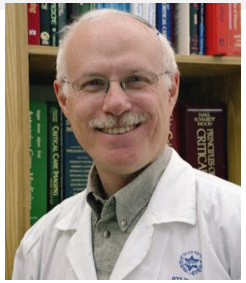
- PaO_2/FiO_2 ratio
- Glasgow Coma Scale score
- Mean arterial pressure
- Administration of vasopressors with type and dose rate of infusion
- Serum creatinine or urine output
- Bilirubin
- Platelet count

1

Sepsis History

Dispute

Charles L Sprung



Intensive Care Med (2016) 42:2024–2026
DOI 10.1007/s00134-016-4604-0

EDITORIAL

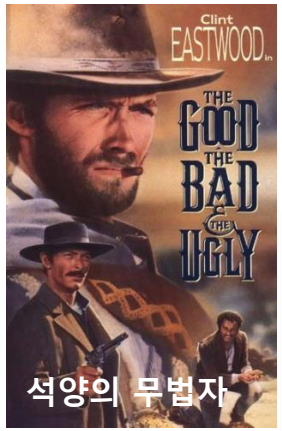
The new sepsis consensus definitions: the good, the bad and the ugly

Charles L. Sprung[1,2,3*], Roland M. H. Schein[1,2,3] and Robert A. Balk[1,2,3]

Introduction

Despite improvements in diagnosis and management, sepsis and septic shock remain frequent causes of morbidity and mortality. Singer and colleagues [1–3] recently updated the consensus definitions of sepsis and septic

sensitive tool for the early recognition of risk for mortality and morbidity [6], identifying patients with increased prevalence of infections [7, 8] severity of disease [5, 8], organ failure [5] and mortality [5, 7, 9]. SIRS has been incorporated as inclusion criteria in many sepsis tri-



석양의 무법자

VS

Mervyn Singer

Intensive Care Med (2016) 42:2027–2029
DOI 10.1007/s00134-016-4600-4

EDITORIAL

The new sepsis consensus definitions (Sepsis-3): the good, the not-so-bad, and the actually-quite-pretty

Mervyn Singer*

I thank Drs. Sprung, Schein and Balk [1] for airing their concerns and encouraging debate; hopefully I can offer a persuasive rebuttal.

the sick septic patient. Outcome benefit from manual or automated SIRS-based screening tools is unproved [6]; despite increasing delivery of management bundles, rates

- SIRS는 여전히 중요해!
- SOFA와 qSOFA는 문제있어!
- Severe sepsis (sepsis spectrum)을 버리고 어떻게 early recognition이 가능해?
- 지금 정의는 어떤 과학적 발전을 기대하기 어려워!

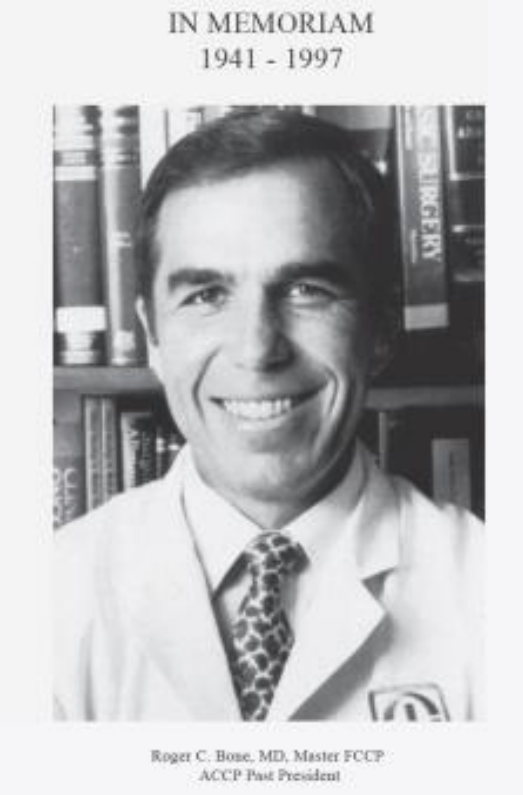
- SIRS보다 더 과학적으로 SOFA와 qSOFA를 정의했어요!
- SIRS도 그다지 sepsis screening 안되니 이제 필요없어요!
- SOFA와 qSOFA는 쓸만해요!
- Low income nation에는 "SOFA-lite"를 개발하면 되요

1

Sepsis History

An initial researchers

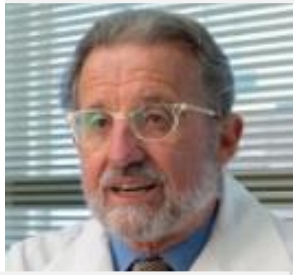
Two goals - to provide a rapid screening test and to render a definitive diagnosis



William J Sibbald
1946 - 2006

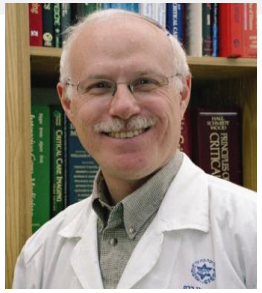
Creator of the SIRS

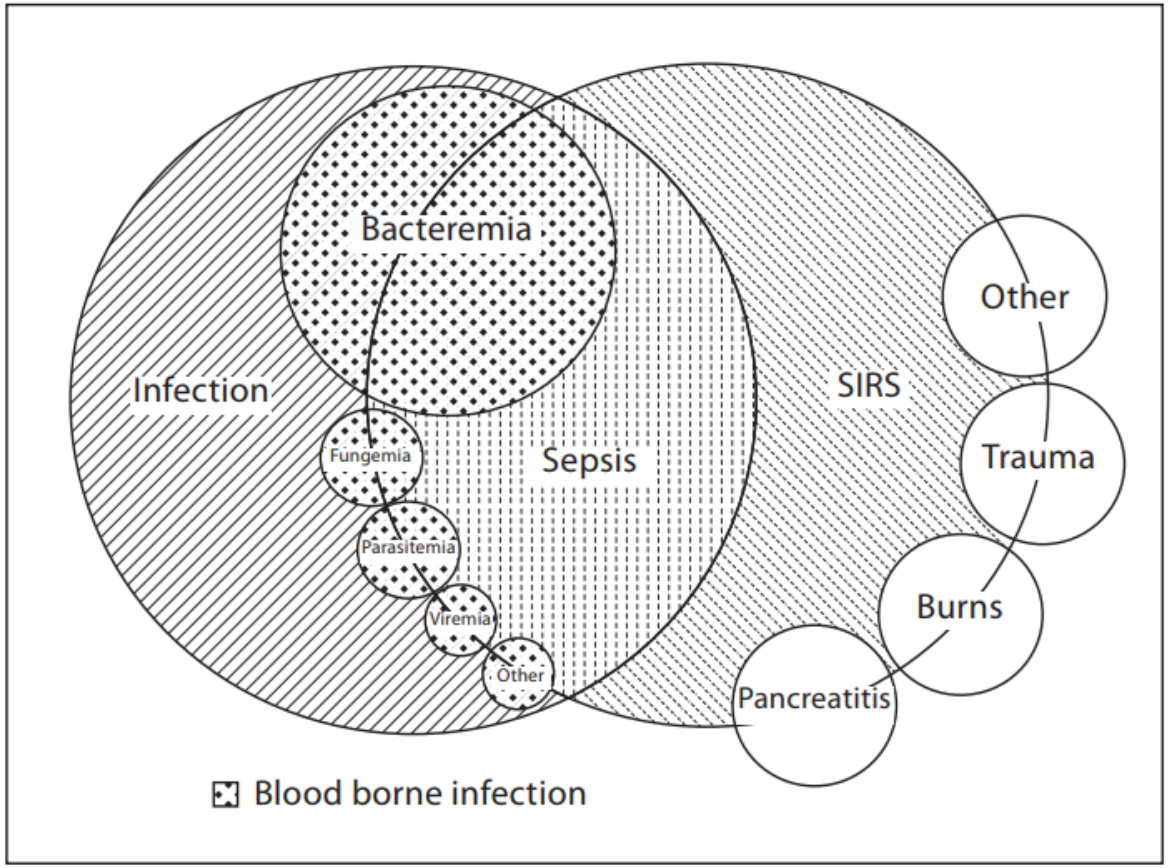
William A Knaus



Creator of the APACHE II score

Charles L Sprung



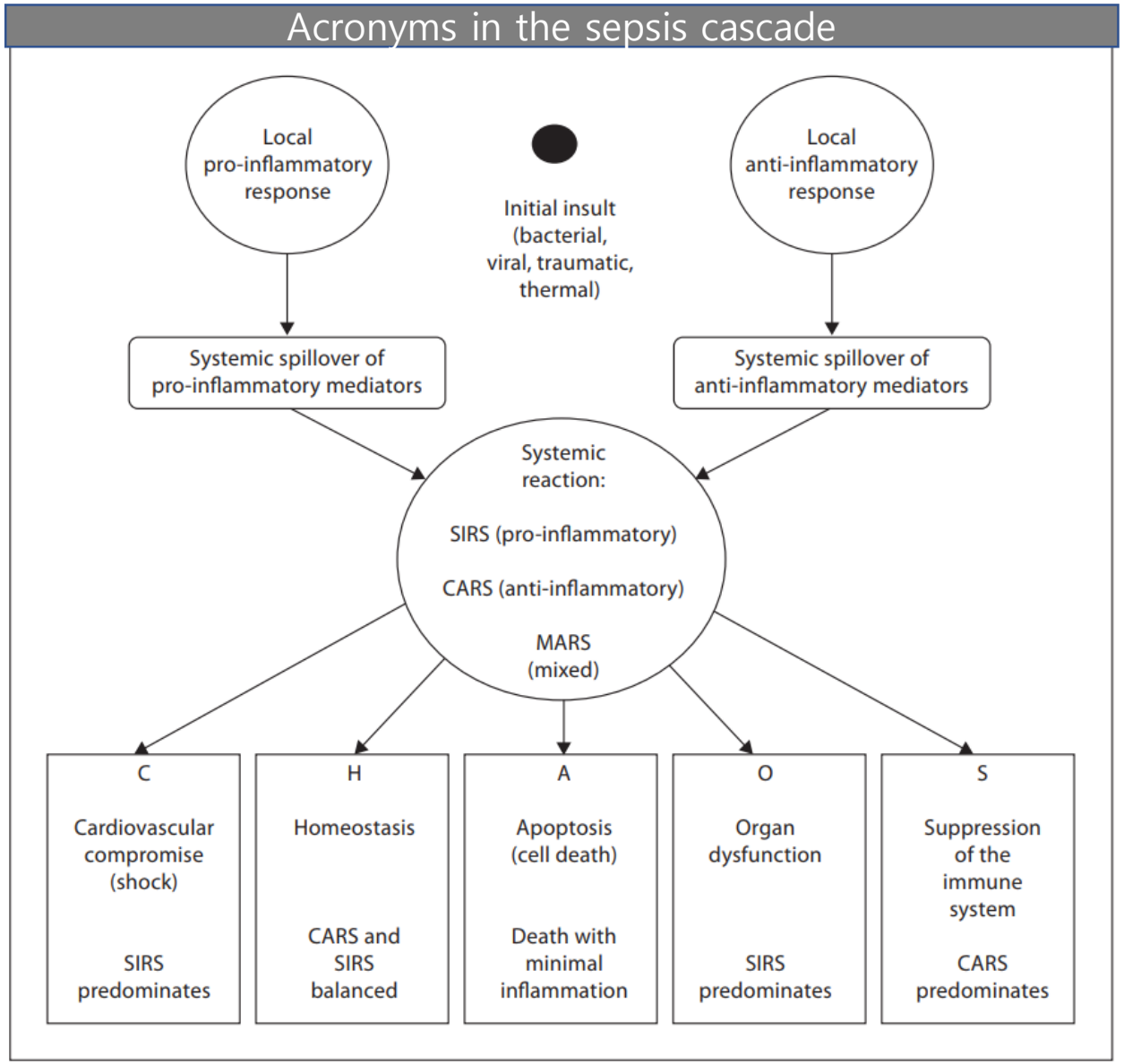


ACCP/SCCM consensus conference 1991

1

Sepsis History

Framework of pathophysiologic understandings

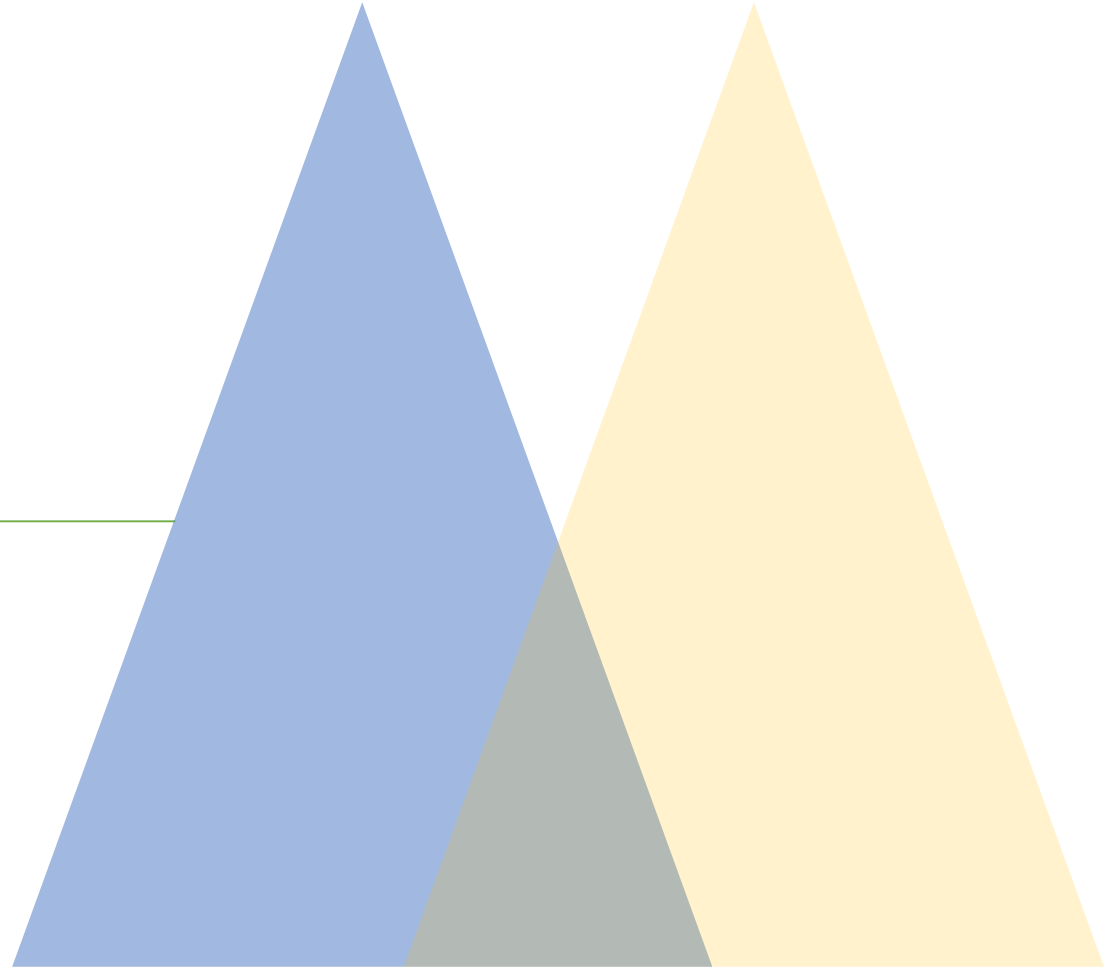


Pathogen-Associated Molecular Patterns (PAMP)

Damage-Associated Molecular Patterns (DAMP)

002

Traps of “Sepsis-3”?



2

Traps in "Sepsis-3"

(1) qSOFA & SOFA are mortality predictors, not tests for sepsis

Sepsis I-II : Sepsis = [Suspected infection] + [SIRS]

Sepsis III : Sepsis = [Suspected infection] + [qSOFA] + [SOFA]

Inflammatory response

Infection indicator

Organ dysfunction

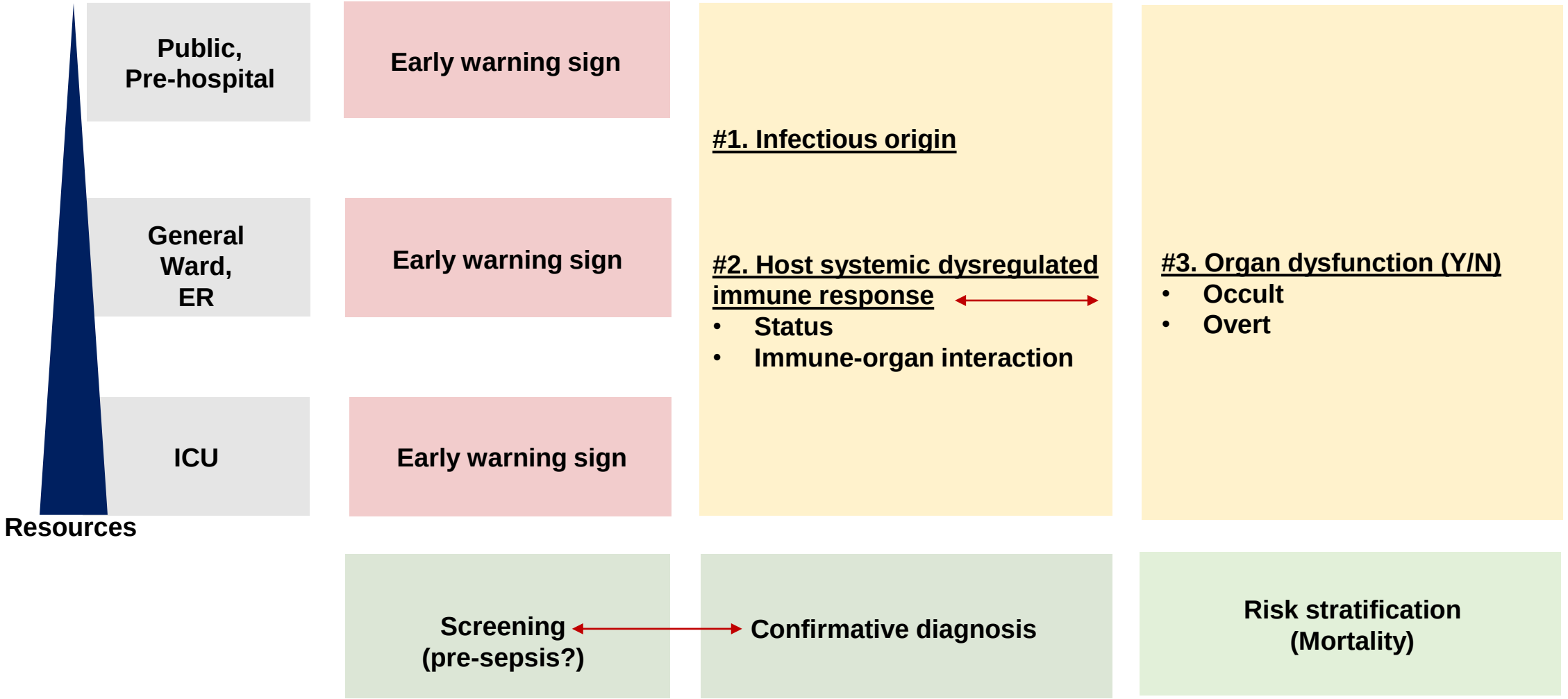
Mortality indicator

"Sepsis spectrum"

2

Traps in "Sepsis-3"

(1) qSOFA & SOFA are mortality predictors, not tests for sepsis



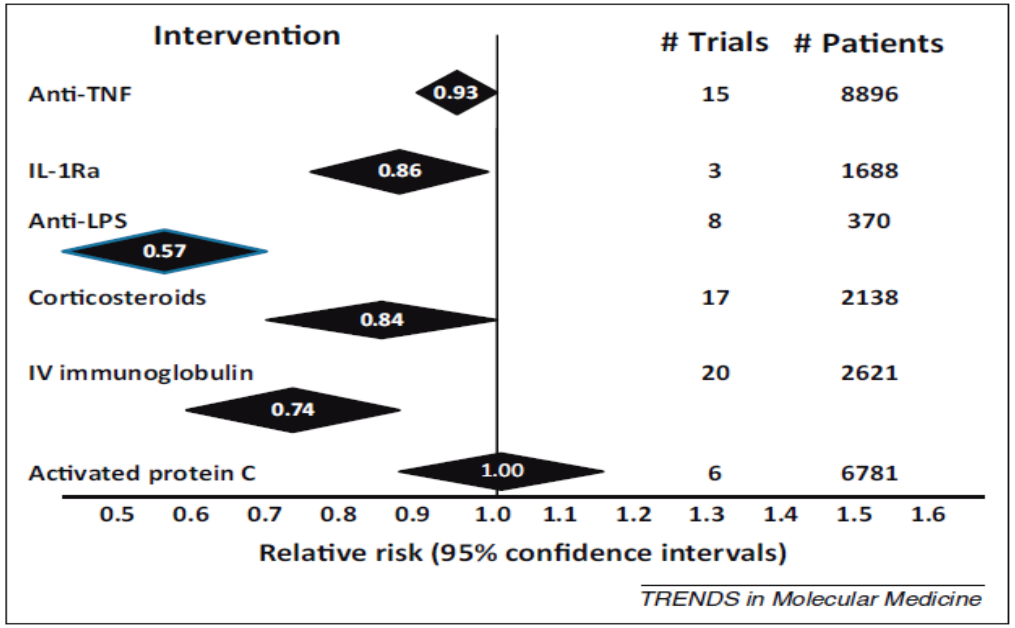
DOI:https://doi.org/10.1016/j.chest.2017.11.046
Chest 2017;151(4):898-907

2

Traps in "Sepsis-3"

- Sepsis-3 = sepsis pipeline drugs development platform?

Why have clinical trials in sepsis failed?



Company	Late stage pipeline drug
Asahi Kasei Pharma	ART-123 (Recomodulin®, recomminant human thrombomodulin alpha)
Altor Bioscience	anticoagulant ALT-836 (recomminant chimeric anti-tissue factor antibody)
AM-Pharma	recAP (recombinant human alkaline phosphatase)
Bioscience	LB-1148 (tranexamic acid)
Ferring Pharma	Selepressin (vasopressor)
InflaRx	IFX-1 (humanized anti-complement monoclonal antibody)
Spectral Diagnostic	Hemofiltration device Tobramycin
Bioseed	InnovoSep ; Cilengitide (a potent inhibitor of αVβ3 integrin signaling)

"InnovoSep stopped the infection from advancing to septic shock and organ failure by preventing damage to endothelial cells" ; target cell = endothelial cells

- Primary outcome = Mortality?
- Based on Sepsis-1 or Sepsis-2
- Miscoding related to clinicians' misclassification of the level of sepsis

→

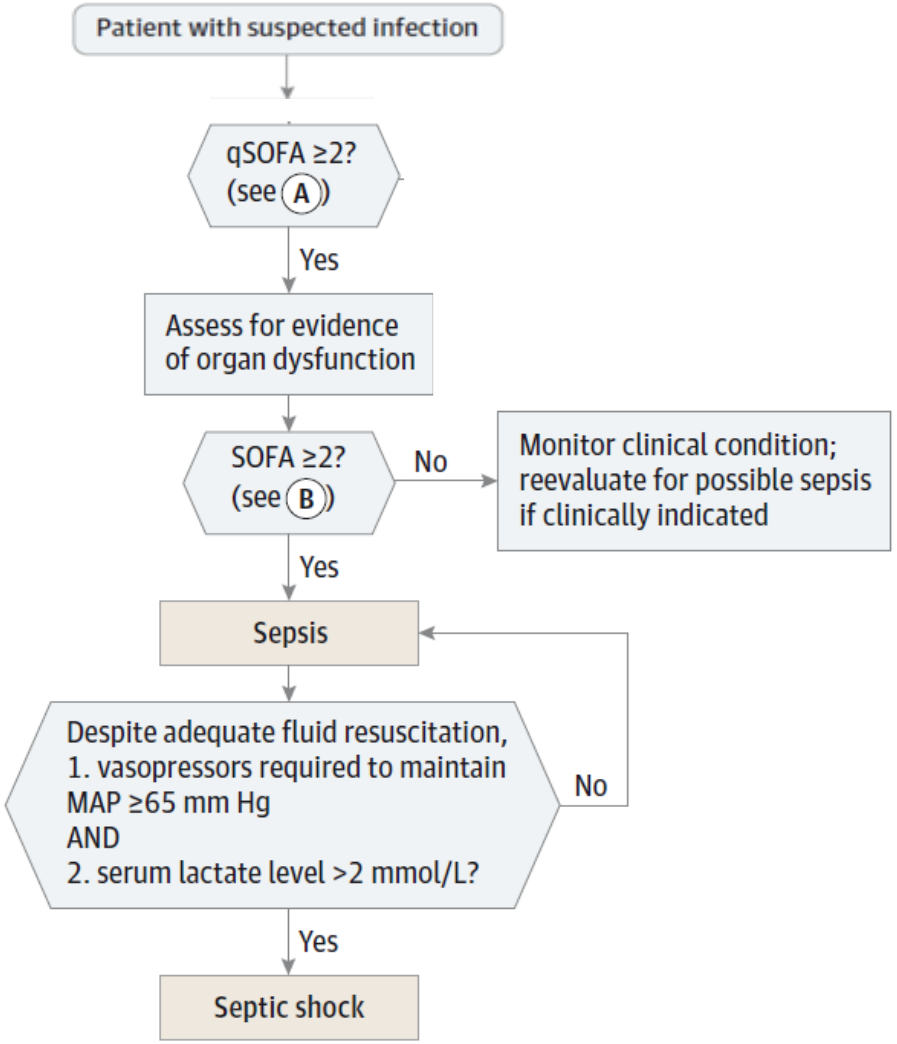
- Primary outcome = Mortality?
- Sepsis-3; Better grouping for mortality reduction
- Miscoding ↘
- Secondary data analysis

Trends in Molecular Medicine, April 2014, Vol. 20, No. 4
Journal of Critical Care 38 (2017) 259-262

2

Traps in "Sepsis-3"

(2) qSOFA as a sepsis screening tool?



A qSOFA Variables
- Respiratory rate
- Mental status
- Systolic blood pressure

B SOFA Variables
- PaO_2/FiO_2 ratio
- Glasgow Coma Scale score
- Mean arterial pressure
- Administration of vasopressors with type and dose rate of infusion
- Serum creatinine or urine output
- Bilirubin
- Platelet count

2

Traps in "Sepsis-3"

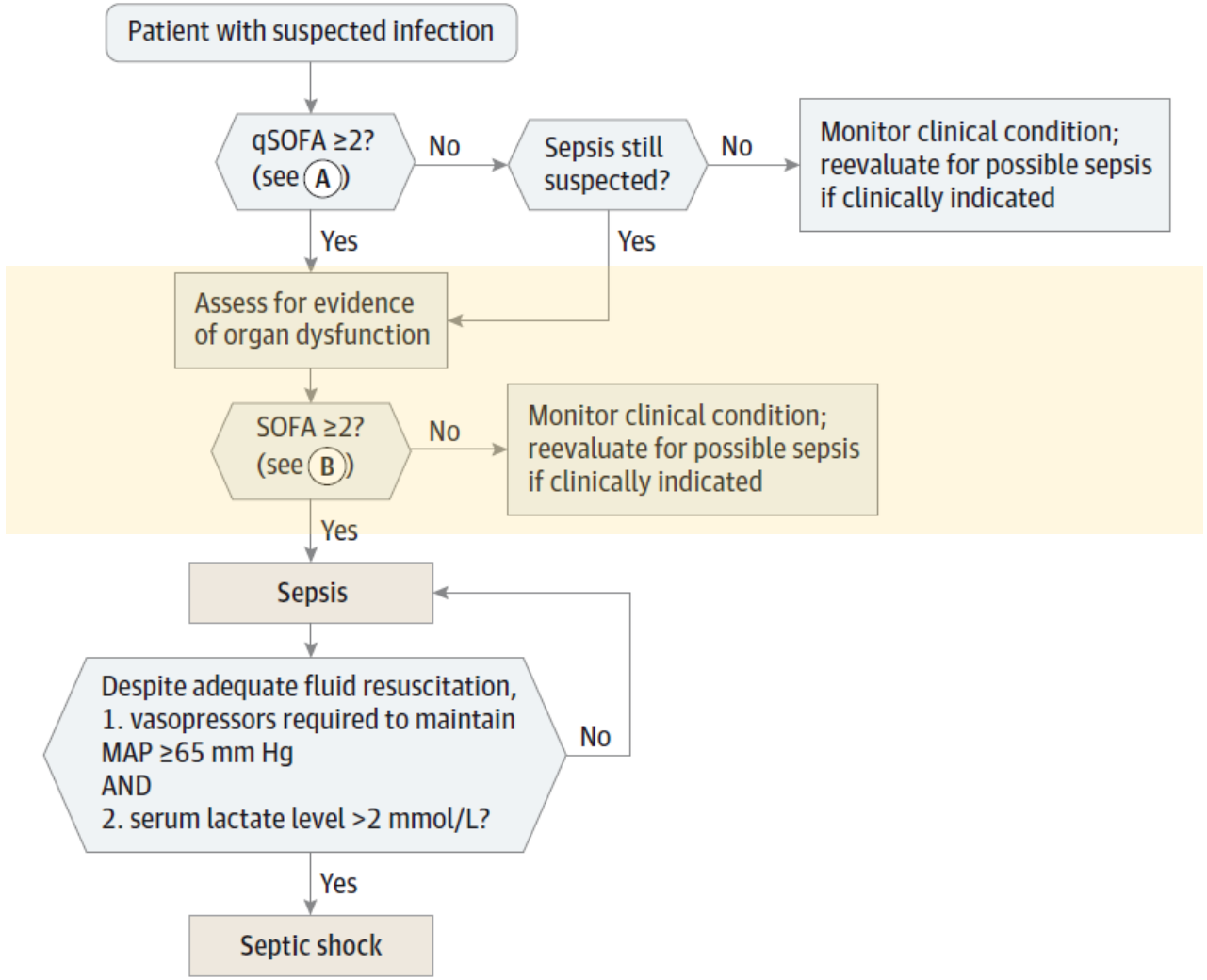
(2) qSOFA as a sepsis screening tool?

qSOFA criteria	Spurious abnormality	Primary abnormality	Secondary abnormality
SBP ≤ 100	• Low baseline BP (eq, quadriplegia)	• Spontaneous AF with RVR • Myocarditis • Myocardial infarction	• Septic shock • Hemorrhage
Altered mentation	• Dementia • Received procedural sedation	• Sedative intoxication • Stroke • Encephalitis	• Shock (any type) • Hypoxemia • Hypercapnia
RR ≥ 22	• Anxiety, Pain	• Pneumonia • Asthma • COPD	• Respiratory compensation for metabolic acidosis • Septic shock

2

Traps in "Sepsis-3"

(3) Problems of SOFA score



A qSOFA Variables

- Respiratory rate
- Mental status
- Systolic blood pressure

B SOFA Variables

- PaO_2/FiO_2 ratio
- Glasgow Coma Scale score
- Mean arterial pressure
- Administration of vasopressors with type and dose rate of infusion
- Serum creatinine or urine output
- Bilirubin
- Platelet count

2

Traps in "Sepsis-3"

(3) Problems of SOFA score

System	Score 0	1	2	3	4
Respiration					
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

2

Traps in "Sepsis-3"

- Provisional diagnosis of sepsis while SOFA labs cooking!

Shiraz E-Med J. 2016 April; 17(4-5):e37101. doi: 10.17795/semj37101.
Published online 2016 April 27. Research Article

Lab test → from 20 minute to 3 hours

- **Test turnaround time : 검사소요시간**
- 검체가 검사실에 도착해서 유효한 검사결과가 전달될 때까지의 시간

- **Request complete time :의뢰완료시간**
- 검사의뢰에서 결과가 임상의사에게 전달될 때까지의 시간

TAT for stat sample (emergency test) in UCSF

- ABGA (PaO2) : 30mins
- Platelet : 45mins
- Bilirubin : 1hour
- Creatinine : 1hour

http://labmed.ucsf.edu/sfghlab/test/StatServices.html

2

Traps in "Sepsis-3"

(3) Probler

- Update required; SOFA s
- SOFA is well-validated in
- Glasgow coma scale in p
- It is difficult to assess a le
- Triage decision-making s
- Some of medications liste
- It does not accurately pre

nic

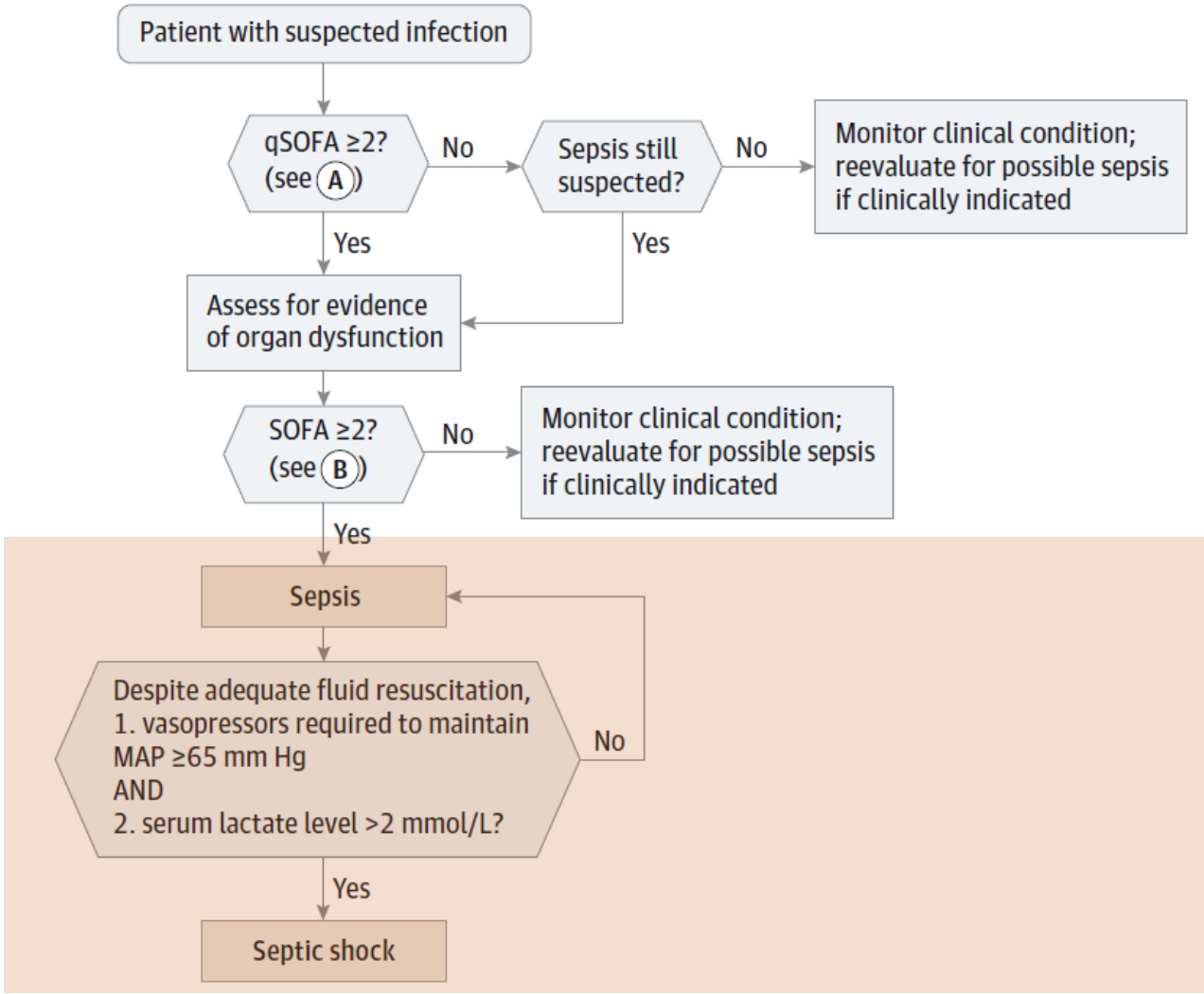
3)

Glasgow Coma Scale		
Response	Scale	Score
Eye Opening Response	Eyes open spontaneously	4 Points
	Eyes open to verbal command, speech, or shout	3 Points
	Eyes open to pain (not applied to face)	2 Points
	No eye opening	1 Point
Verbal Response	Oriented	5 Points
	Confused conversation, but able to answer questions	4 Points
	Inappropriate responses, words discernible	3 Points
	Incomprehensible sounds or speech	2 Points
	No verbal response	1 Point
Motor Response	Obeys commands for movement	6 Points
	Purposeful movement to painful stimulus	5 Points
	Withdraws from pain	4 Points
	Abnormal (spastic) flexion, decorticate posture	3 Points
	Extensor (rigid) response, decerebrate posture	2 Points
	No motor response	1 Point
Minor Brain Injury = 13-15 points; **Moderate Brain Injury** = 9-12 points; **Severe Brain Injury** = 3-8 points		

2

Traps in "Sepsis-3"

(4) Missing patients who would have improved if early resuscitation!



(A) qSOFA Variables
- Respiratory rate
- Mental status
- Systolic blood pressure

(B) SOFA Variables
- PaO_2/FiO_2 ratio
- Glasgow Coma Scale score
- Mean arterial pressure
- Administration of vasopressors with type and dose rate of infusion
- Serum creatinine or urine output
- Bilirubin
- Platelet count

2

Traps in "Sepsis-3

- Missing patients with sepsis

Predictive Factors	Criteria Score	Group 1	Group 2	Group 3
Sensitivity (95% CI), %	SIRS ≥ 2	95.6 (95.0-96.2)	96.0 (95.2-96.8)	95.1 (94.1-96.0)
	SOFA ≥ 2	94.2 (93.4-94.9)	91.0 (89.9-92.2)	97.6 (96.9-98.3)
	P value	.003	< .001	< .001
Specificity (95% CI), %	SIRS ≥ 2	9.3 (8.9-9.8)	8.3 (7.8-8.8)	11.1 (10.3-11.9)
	SOFA ≥ 2	16.9 (16.3-17.5)	21.9 (21.1-22.7)	7.2 (6.5-7.9)
	P value	< .001	< .001	< .001

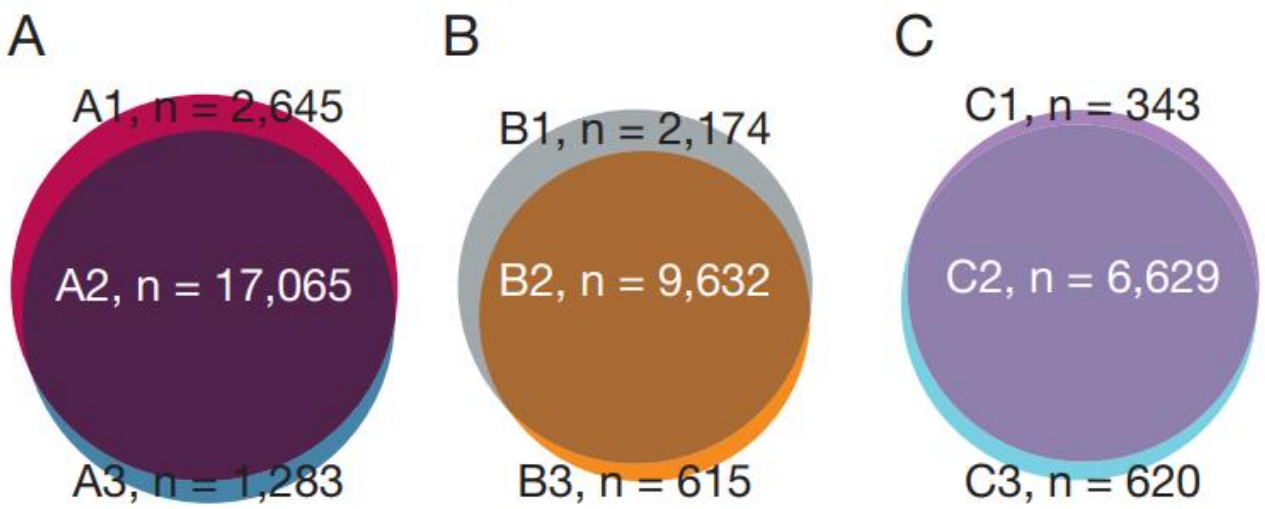
[Original Research **Critical Care**]

CHEST

Clinical Evaluation of Sepsis-1 and Sepsis-3 in the ICU

CrossMark

Xueling Fang, MM; Zhenzhen Wang, BM; Jun Yang, PhD; Hongliu Cai, MM; Zhengjie Yao, BE; Kun Li, MM; and Qiang Fang, MM



(N=21491), Retrospective using MIMIC-III

A (Group 1)
- Sepsis-1 (top circle)
- Sepsis-3 (bottom circle)
- A1 = sepsis-1으로만 진단된 패혈증 (13.4%) → 사망률 6.9%
- A2 = sepsis-1과 sepsis-3로 같이 진단된 패혈증 → 사망률 17.9%
- A3 = sepsis-3로만 진단된 패혈증 (7%) → 사망률 10.7%

B (Group 2)
- Sepsis-1 w/o chronic organ dysfunction (top circle)
- Sepsis-3 w/o chronic organ dysfunction (bottom circle)
- B1 = sepsis-1으로만 진단된 패혈증 (18.4%) → 사망률 6.4%
- B2 = sepsis-1과 sepsis-3로 같이 진단된 패혈증 → 사망률 14.5%
- B3 = sepsis-3로만 진단된 패혈증 (6%) → 사망률 9.1%

C (Group 3)
- Sepsis-1 w/ chronic organ dysfunction (top circle)
- Sepsis-3 w/ chronic organ dysfunction (bottom circle)
- C1 = sepsis-1으로만 진단된 패혈증 (4.9%) → 사망률 8.5%
- C2 = sepsis-1과 sepsis-3로 같이 진단된 패혈증 → 사망률 19.8%
- C3 = sepsis-3로만 진단된 패혈증 (8.5%) → 11.5%

Chest 2018; 153 (5):1169-1176

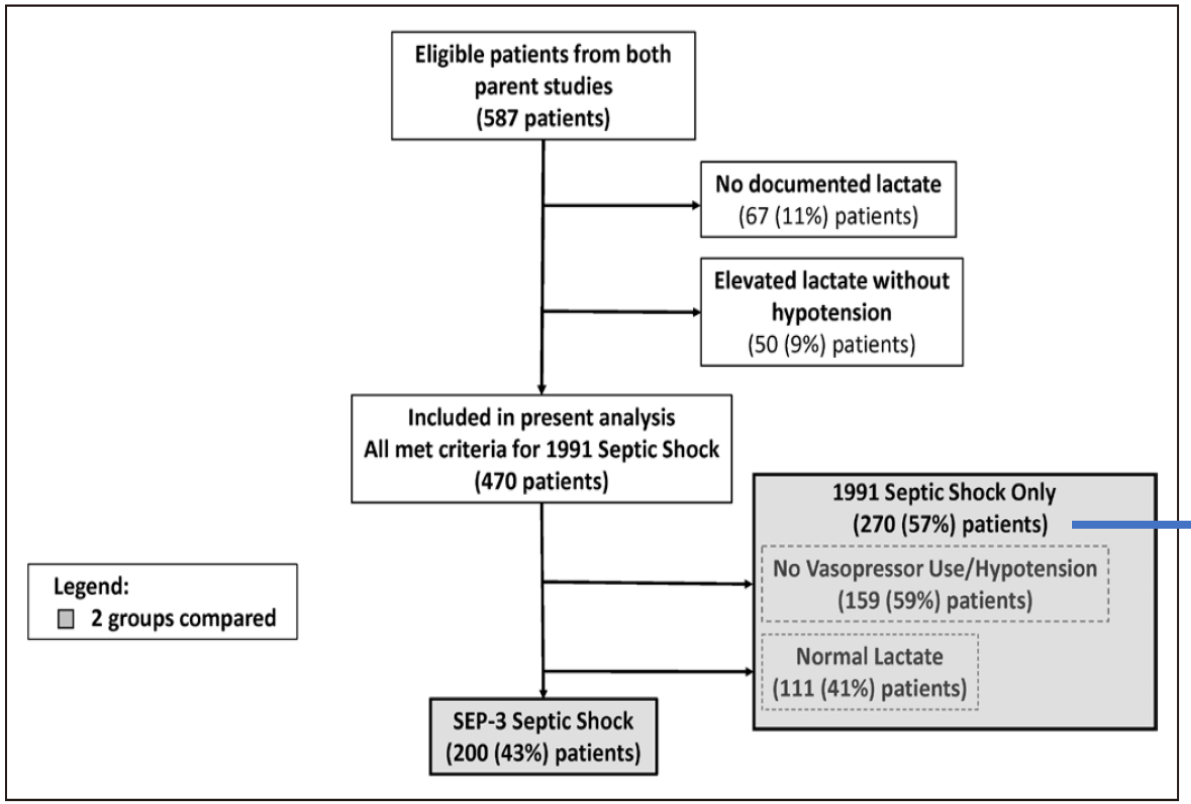
2

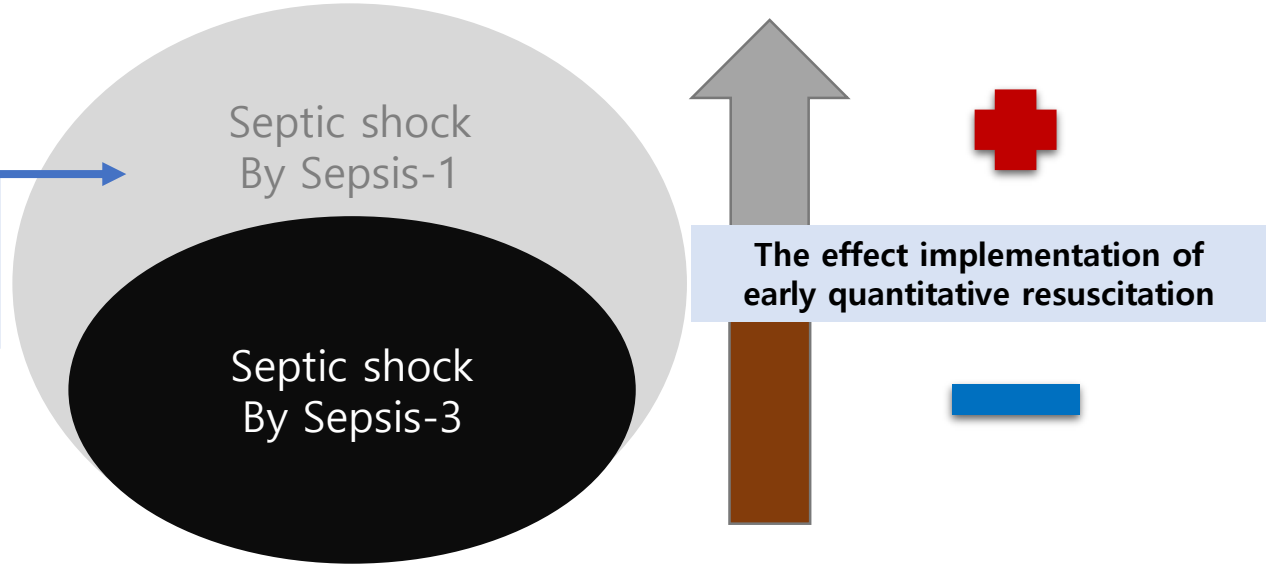
Traps in "Sepsis-3"

(4) Missing patients who would have improved if early resuscitation!

The Impact of the Sepsis-3 Septic Shock Definition on Previously Defined Septic Shock Patients*

Sarah A. Sterling, MD[1]; Michael A. Puskarich, MD[1]; Andrew F. Glass, MD[1];
Faheem Guirgis, MD[2]; Alan E. Jones, MD[1] [Secondary analysis of two clinical trials of early septic shock resuscitation on Emergency department]





Crit Care Med 2017; 45:1436–1442

2

Traps in "Sepsis-3"

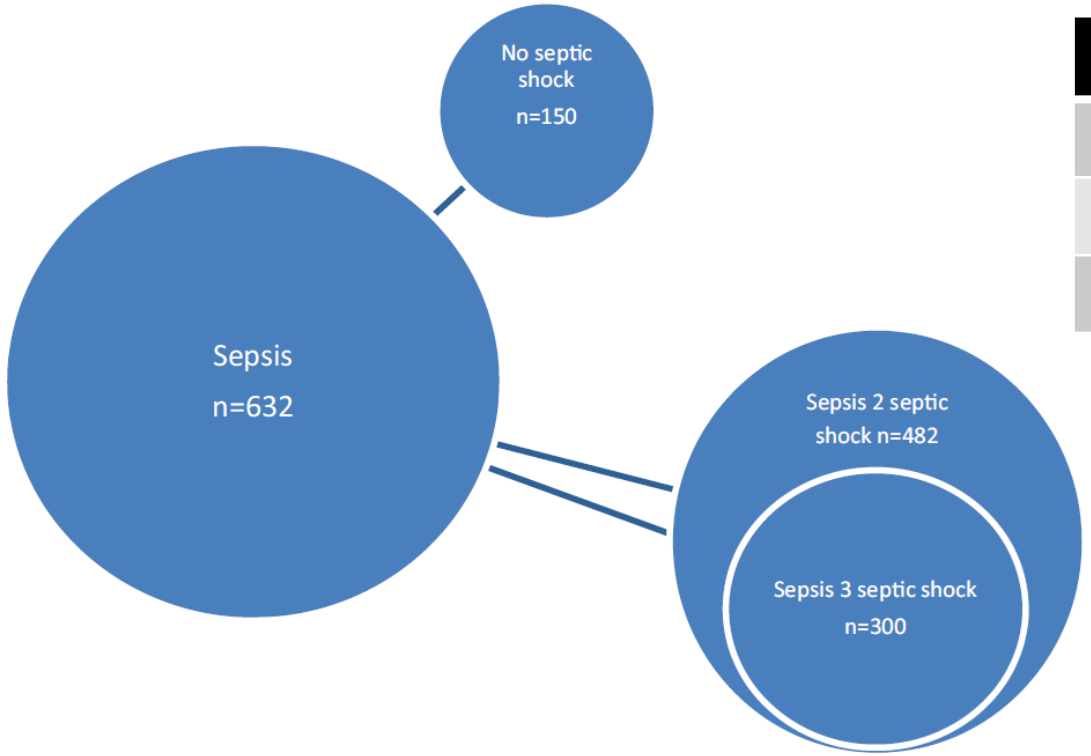
(4) Missing patients who would have improved if early resuscitation!

ORIGINAL ARTICLE

OPEN ACCESS Check for updates

The influence of a change in septic shock definitions on intensive care epidemiology and outcome: comparison of sepsis-2 and sepsis-3 definitions

Prospective cohort, 632 septic patients, Netherlands



Total sepsis (n=632)	No septic shock (n=150)	Septic shock sepsis-2 (n=482)	Septic shock Sepsis-3 (n=300)
APACHE II	25±8	26±8	27±8
ICU mortality	21%	34%	39%
In-hospital mortality	35%	43%	47%

Infectious disease, https://doi.org/10.1080/23744235.2017.1383630

Traps in "Sepsis-3"

(5) Problems to be verified

Systemic review/meta-analysis or validation in other cohorts or prospective validation ??

Question 1. Rapid response team/Hospitalist – general ward & Emergency care team – emergency department

- Should RRT use qSOFA? (outside the ICU) : qSOFA *vs.* MEWS or NEWS or NEWS2
- Screening power? in infected patients (outside the ICU) : qSOFA *vs.* SIRS

Question 2. Critical care team – different type intensive care unit

- Will Sepsis-3 work in other sites? (other countries, low income *vs.* high income)
- Will Sepsis-3 work in pediatric ICU?

2

Traps in "Sepsis-3"

(5) Problems to be verified

Retrospective analysis (n=30677)

ORIGINAL ARTICLE

AJRCCM **2016**

Quick Sepsis-related Organ Failure Assessment, Systemic Inflammatory Response Syndrome, and Early Warning Scores for Detecting Clinical Deterioration in Infected Patients outside the Intensive Care Unit

Matthew M. Churpek[1,2], Ashley Snyder[1], Xuan Han[1], Sarah Sokol[3], Natasha Pettit[3], Michael D. Howell[1,2], and Dana P. Edelson[1,2]

[1]Department of Medicine, [2]Center for Healthcare Delivery Science and Innovation, and [3]Department of Pharmacy, University of Chicago, Chicago, Illinois

Outside the ICU

NEWS or NEWS are more accurate than the qSOFA for predicting death and ICU transfer

RRT prospectively collected registry retrospective analysis (n=1708)

[Original Research **Critical Care**]

CHEST **2018**

Sepsis-3 Septic Shock Criteria and Associated Mortality Among Infected Hospitalized Patients Assessed by a Rapid Response Team

Check for updates

Outside the ICU

Sepsis-3 septic shock criteria more accurate than SIRS-based septic shock criteria in hospital mortality

Meta-analysis (n=146,551)

Finkelsztein *et al. Critical Care* (2017) 21:73
DOI 10.1186/s13054-017-1658-5

Critical Care **2017**

RESEARCH Open Access

CrossMark

Comparison of qSOFA and SIRS for predicting adverse outcomes of patients with suspicion of sepsis outside the intensive care unit

Outside the ICU

qSOFA had greater accuracy than SIRS for predicting mortality

Prospective analysis (n=152)

Song *et al. Critical Care* (2018) 22:28
DOI 10.1186/s13054-018-1952-x

Critical Care **2018**

RESEARCH Open Access

CrossMark

Performance of the quick Sequential (sepsis-related) Organ Failure Assessment score as a prognostic tool in infected patients outside the intensive care unit: a systematic review and meta-analysis

Jae-Uk Song[1†], Cheol Kyung Sin[2†], Hye Kyeong Park[3], Sung Ryul Shim[4] and Jonghoo Lee[5*]

Outside the ICU

qSOFA = High specificity but low sensitivity in early detection of in-hospital mortality etc.

2

Traps in "Sepsis-3"

(5) Problems to be verified

Acute and Critical Care

Acute and Critical Care 2019 February 34(1):30-37
https://doi.org/10.4266/acc.2018.00318

| pISSN 2586-6052 | eISSN 2586-6060

Application of Sepsis-3 Criteria to Korean Patients with Critical Illnesses

No use qSOFA in Korean ICU !

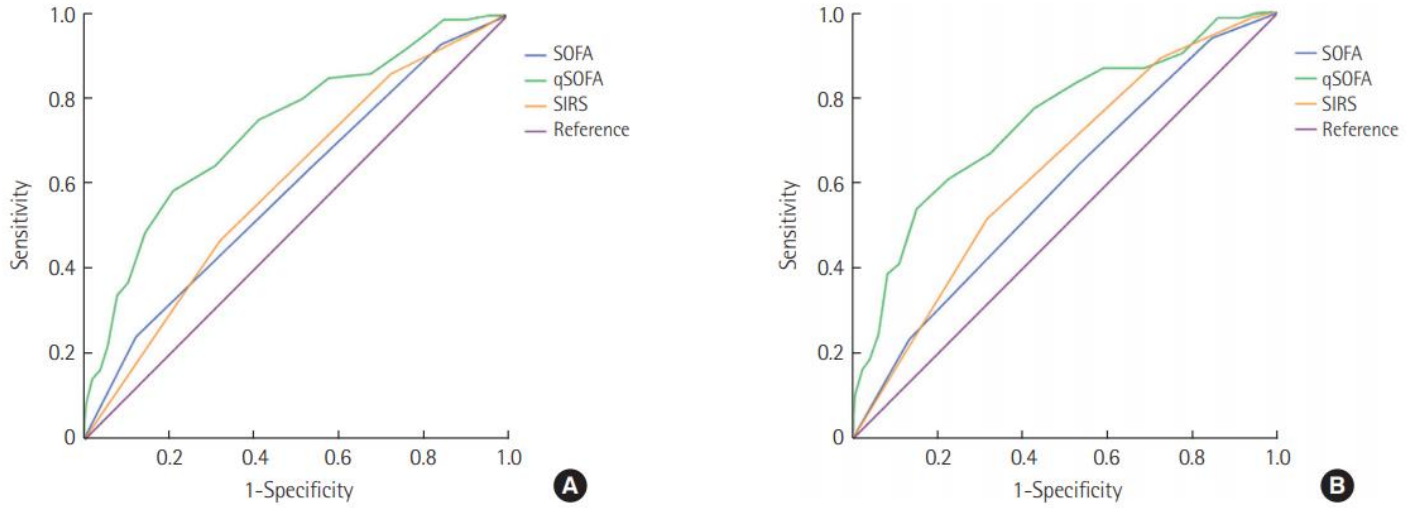
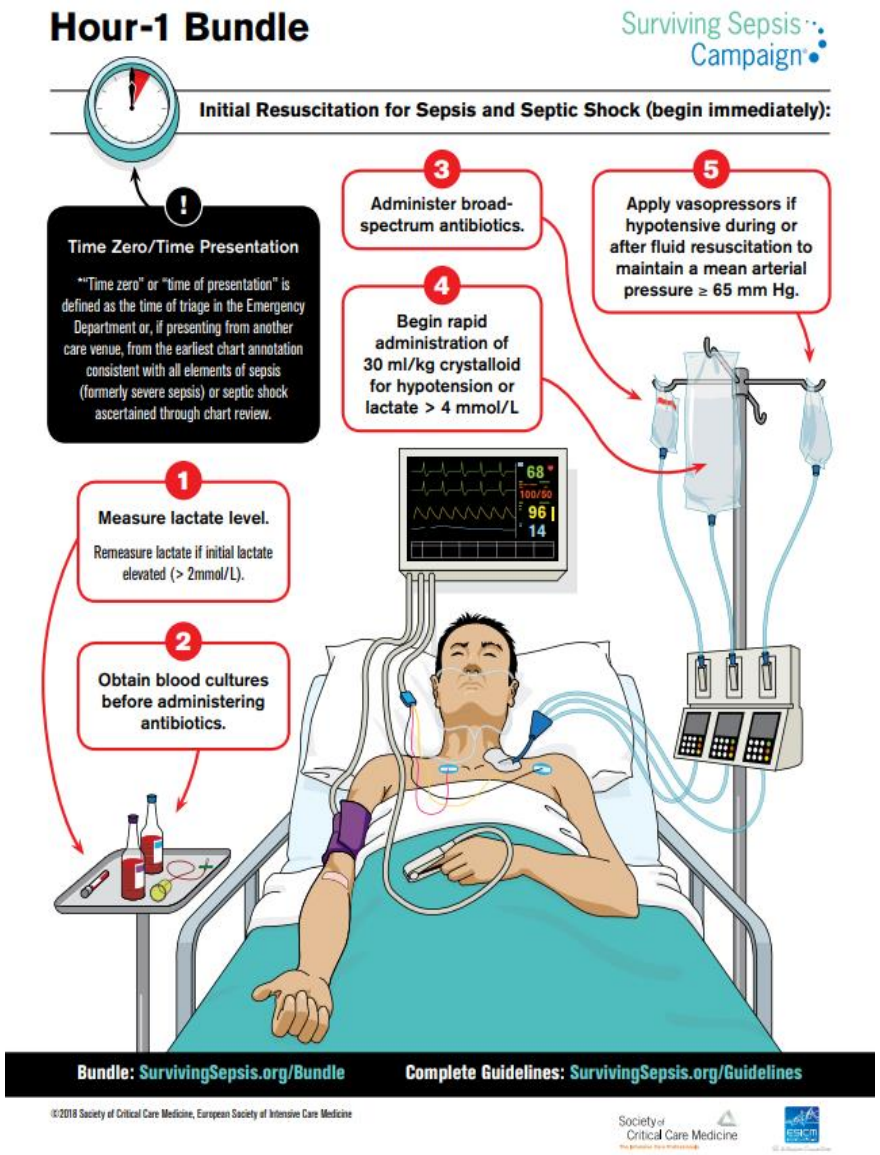


Figure 2. Area under the receiver operating characteristic curves (AUROCs) for discriminatory capacity for 28-day mortality and ICU mortality. (A) Twenty-eight-day mortality. AUROC: SOFA, 0.74 (95% CI, 0.68 to 0.79); qSOFA, 0.59 (95% CI, 0.53 to 0.66); SIRS, 0.60 (95% CI, 0.54 to 0.66). (B) ICU mortality. AUROC: SOFA, 0.74 (95% CI, 0.68 to 081); qSOFA, 0.59 (95% CI, 0.52 to 0.66); SIRS, 0.63 (95% CI, 0.57 to 0.70). SOFA: Sequential Organ Failure Assessment; qSOFA: quick SOFA; SIRS: systemic inflammatory response syndrome; CI: confidence interval; ICU: intensive care unit.

2

Traps in "Sepsis-3"

(6) 1hour Sepsis bundle approach using Sepsis-3?



Special Article

The Surviving Sepsis Campaign Bundle: 2018 Update

Mitchell M. Levy, MD, MCCM[1]; Laura E. Evans, MD, MSc, FCCM[2]; Andrew Rhodes, MBBS, FRCA, FRCP, FFICM, MD (res)[3]

Bundle Element	Grade of Recommendation and Level of Evidence
Measure lactate level. Re-measure if initial lactate is > 2 mmol/L	Weak recommendation, low quality of evidence
Obtain blood cultures prior to administration of antibiotics	Best practice statement
Administer broad-spectrum antibiotics	Strong recommendation, moderate quality of evidence
Rapidly administer 30 mL/kg crystalloid for hypotension or lactate ≥ 4 mmol/L	Strong recommendation, low quality of evidence
Apply vasopressors if patient is hypotensive during or after fluid resuscitation to maintain mean arterial pressure ≥ 65 mm Hg	Strong recommendation, moderate quality of evidence

No evidence for 1 hour bundle!

2

Traps in "Sepsis-3"

(7) Good promotion for public issues by "Sepsis-3"? **No!**

Global Sepsis Alliance

ABOUT US SEPSIS BECOME INVOLVED Donate

May 26, 2017

WHA Adopts Resolution on Sepsis

May 26, 2017

https://www.global-sepsis-alliance.org/news/2017/5/26/wha-adopts-resolution-on-sepsis

https://www.worldsepsisday.org/wsd2018

Kempker et al. Critical Care (2018) 22:116

2

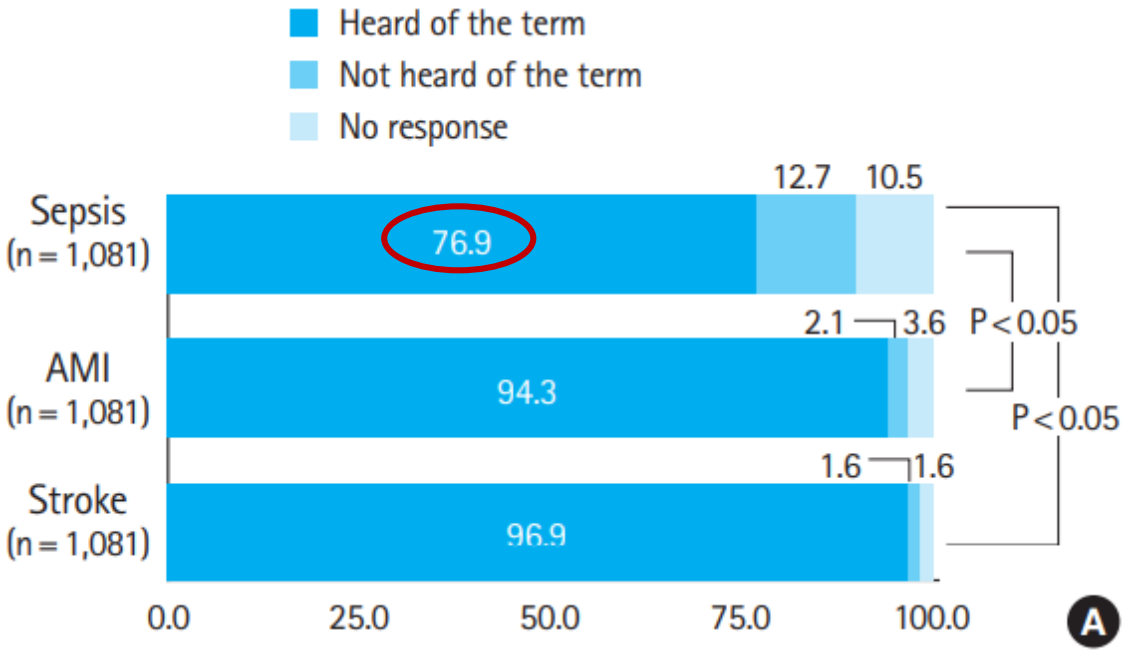
Traps in "Sepsis-3"

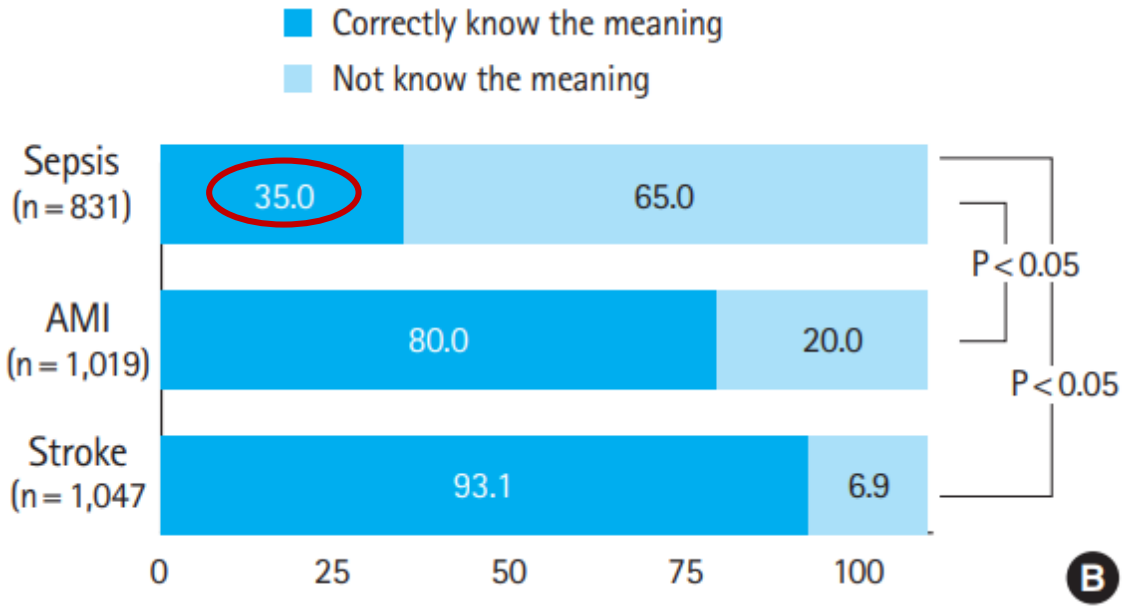
Public issues about sepsis in Korea

CEEM Clinical and Experimental Emergency Medicine
Clin Exp Emerg Med 2014;1(1):41-48
http://dx.doi.org/10.15441/ceem.14.014
CrossMark
eISSN: 2383-4625
Original Article
Received: 30 June 2014

Awareness and knowledge of sepsis in the general Korean population: comparison with the awareness and knowledge of acute myocardial infarction and stroke

2013년 18세 이상 성인 1081명에대한 설문 조사





2

Traps in "Sepsis-3"

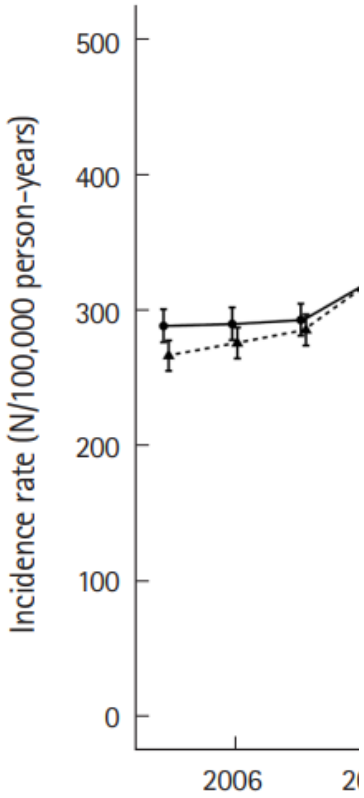
Public issues about sepsis in Korea

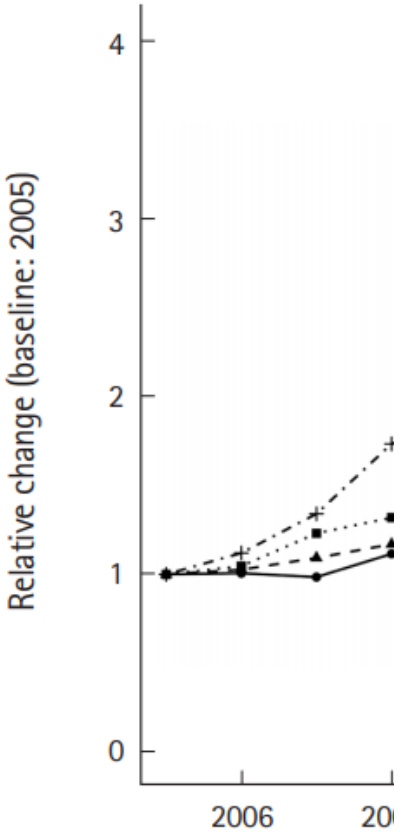
2005~2012

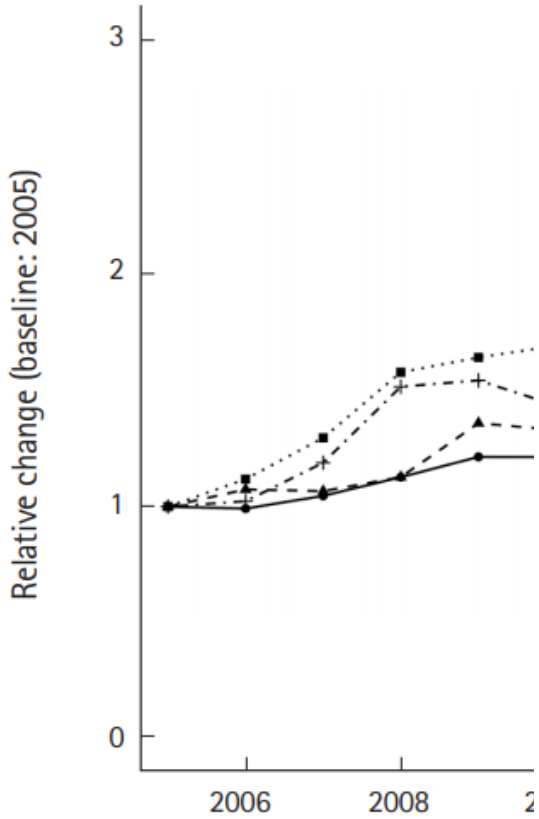
National Health Insurance Service-National Sample Cohort
a population-based cohort established by the Korean National Health Insurance Service

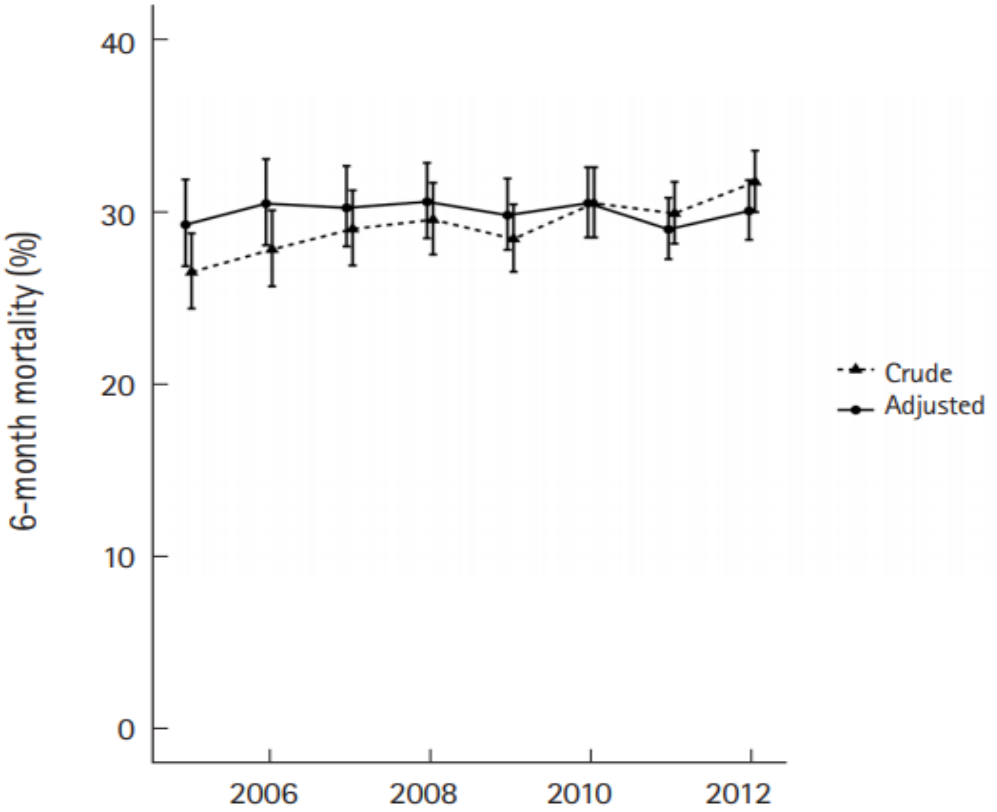
CEEM Clinical and Experimental Emergency Medicine
Clin Exp Emerg Med 2019 Feb 20
https://doi.org/10.15441/ceem.18.007
Epub ahead of print
eISSN: 2383-4625
Original Article

Epidemiology of sepsis in Korea: a population-based study of incidence, mortality, cost and risk factors for death in sepsis







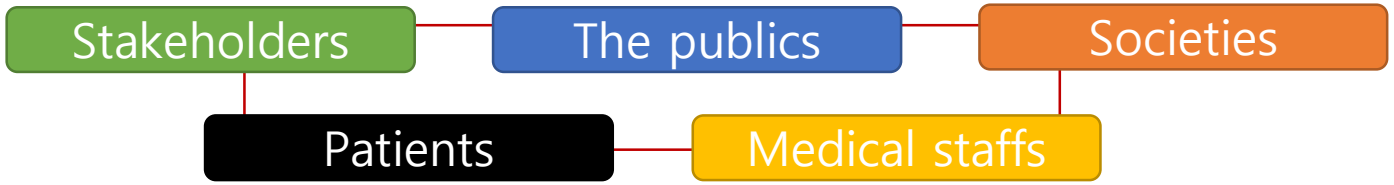


2

Traps in "Sepsis-3"

Public issues about sepsis in Korea

2017년 12월 15일



kha 병원신문

뉴스 칼럼 연재 문화 건강정보

홈 > 뉴스 > 뉴스 > 학술 뒤로가기

메일보내기 오류신고 프린트 가 가

대한중환자의학회, 패혈증 인식개선 나선다

패혈증 조기 진단 및 치료 위해 대국민 홍보 전개
중환자실 수가체계 개선 및 중환자실 등급화 추진

기사 보내기 트위터 미투데이 네이버 구글 페이스북 디그 딜리셔스 라이브 요즘

2018년 09월 13일 (목) 06:00:36 오민호 기자 omh@kha.or.kr

선진국과 비교해 여전히 2~3배 높은 국내 패혈증 사망률을 줄이기 위해 대한중환자의학회가 패혈증 인식개선에 적극 나선다.

대한중환자의학회(회장 홍성진, 여의도성모병원 마취통증의학과)는 9월13일 '패혈증의 날'을 맞아 패혈증 인식 개선과 조기 진단 및 치료를 위한 다양한 활동을 펼치겠다고 밝혔다.

학회는 9월12일 오후 서울 용산 학회사무실에서 기자간담회를 열고 구체적인 활동계획과 그 배경을 설명했다.

미국의 경우 2001년 패혈증으로 인한 사망률이 28.6%를 기록했지만 최근 사망률은 감소 추세다. 호주와 뉴질랜드 역학연구에서도 중증패혈증 사망률이 지난 13년 동안 35.0%에서 18.4%로 크게 감소한 것으로 나타났다.

반면 아시아는 여전히 패혈증 사망률이 매우 높은 것으로 확인됐다. 아시아 16개 국가를 대상으로 한 전향적 연구 결과 중증패혈증 환자의 사망률이 44.5%였고, 우리나라는 34.3%를 기록하고 있다.

대한중환자의학회에 따르면 우리나라의 패혈증 사망률은 아직 선진국의 2~3배에 달하고 있다. 국내 결핵 통계와 비교해봐도 패혈증 발생률은 결핵 신환 발생률과 비슷한 수준

9월 13일 = 세계 패혈증의 날

2

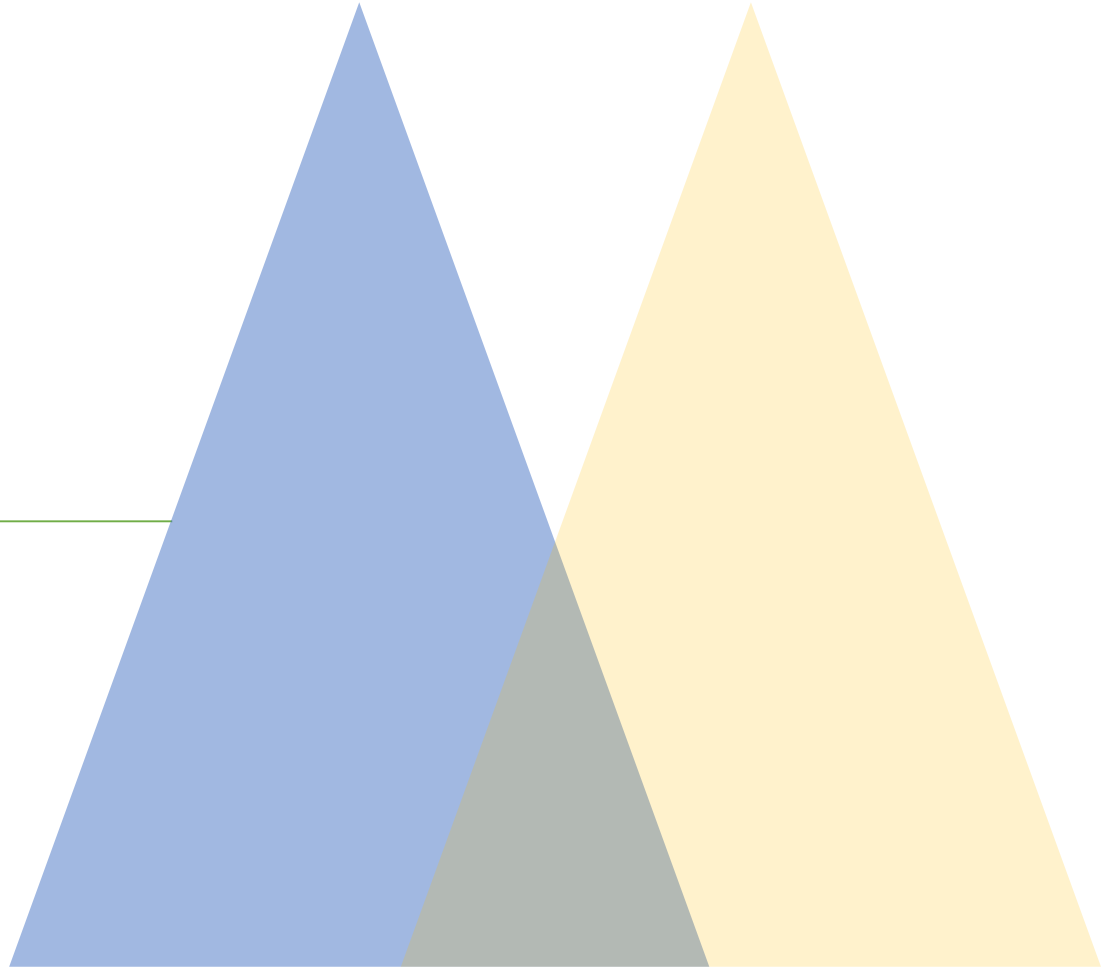
Traps in "Sepsis-3"

Public issues about sepsis in Korea

Paradigm shift가 아니어도 대중들에게 홍보할 방법은 있다!

003

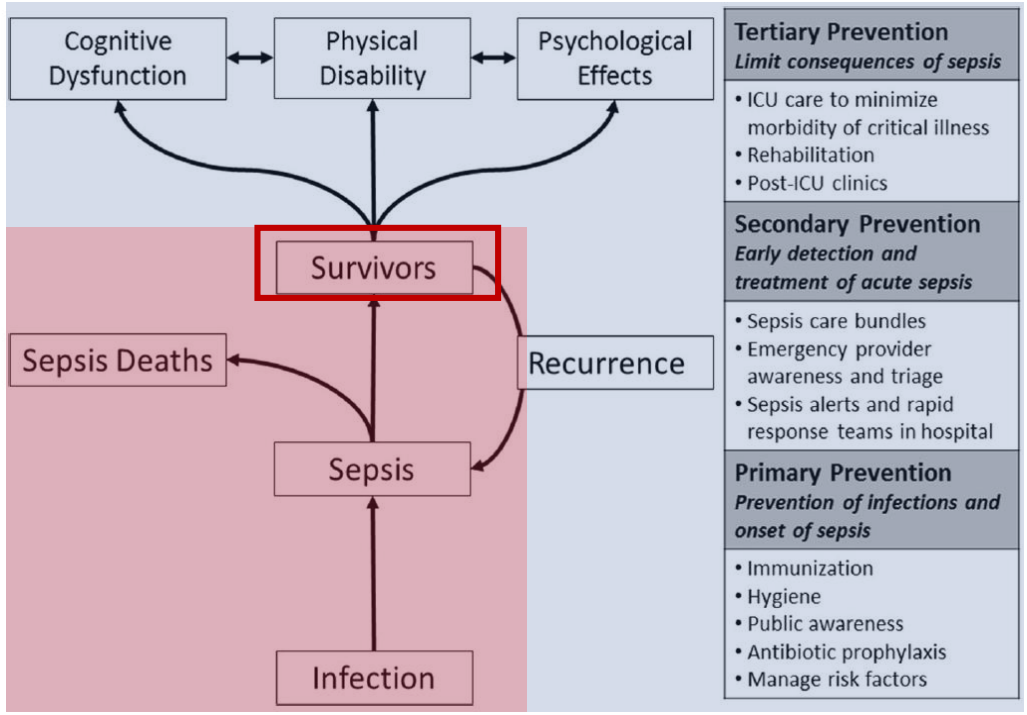
Sum up..



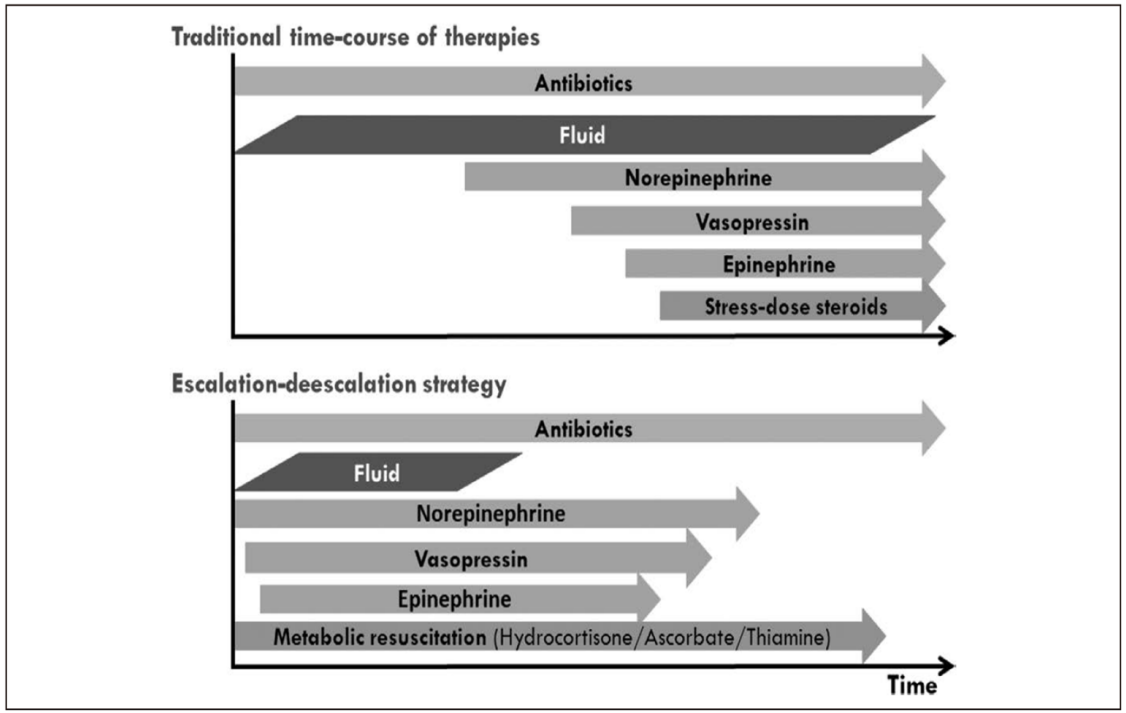
3

Sum up

We want a real new sepsis paradigm shift! **Not "Sepsis-3"**



Preventive strategies along the sepsis chain of events



The changing paradigm of Sepsis
– early diagnosis, early antibiotics, early pressors and early adjuvant treatment

New Sepsis Paradigm wants

- Suspected infection marker
- Host immune status ; dysregulated
- New organ failure definition
- Resource use based on mortality risk stratification
- Comprehensive support for sepsis survivors

Kempker et al. Critical Care (2018) 22:116
DOI: 10.1097/CCM.0000000000003310

3

Sum up

Conclusions

"Sepsis-3" - con

"Sepsis-3" 는...

① 사망예측에 대한 환자군 분류 체계는 치료제 개발 플랫폼을 효율적으로 제시할 수 있지만 패혈증 진단은 아님

② 결국, 가장 중요한 Suspected infection에 대한 과학적인 결론은 언급이 없음

③ ICU 입실 이 후 패혈증이 진단되는 경우는 많지 않고, 결국 병동/응급실에서 어떻게 조기진단을 하는 것이 중요한데 높은 사망률이 예상되는 환자 선별 방법은 다른 방법도 많음 (qSOFA, SOFA의 문제점)

④ Sepsis-3 발표 이 후 연구된 qSOFA & SOFA에 대한 논문은 모두 사망률 예측에 대한 내용이지 패혈증 진단에 대한 비교가 아님

⑤ 소아 & 신생아들에 대한 패혈증 진단에 근거가 없음

Thank you for your attention