

Sepsis

Tanımlar ve Semptomoloji

Uzm. Dr. A. Serra Özel

Ümraniye Eğitim ve Araştırma Hastanesi Enfeksiyon Hastalıkları Kliniği

Tarihçe

Hipokrat (MÖ 400)

- Sepo (Çürüme, kokuşma)
- Vücutta potansiyel tehlike oluşturan biyolojik bozunma
- Şarap ve sirke (alkol)

Galen (MS 129-199)

- Kan alma, apse drenajı
- Bataklıkların kurutulması; hijyen sağlanması

Tarihçe

Anthony van Leeuwenhoek (1632-1723)

- Mikroskop, bakterilerin tanımlanması

19. yüzyıl

- Bulaşıcı hastalığın kökeni ve bulaşma riski
- Hijyen koşulları

Semmelweiss (1818-1865)

- Kadın doğum servisinde ateş ve bebek ölümleri
- Ebe ve tıp öğrencileri; el yıkama?
- El hijyeni ile ölümlerde azalma

Tarihçe

➤ 1989'da, Bone ve arkadaşları

Sepsis sendromu tanımı

- ✓ Sepsiste konağın pasif olmadığı
- ✓ Endojen inflamatuvar medyatörler → organ hasarı
- ✓ infeksiyon eradike edilse bile klinik yanıtın devam edebileceği tespit edildi.

**1991
Sepsis-1**

Sepsis,
Septik şok,
Refrakter
şok



**2001
Sepsis-2**

Sepsis,
Şiddetli sepsis,
Septik şok,
MODY



**SSC-2016
Sepsis-3**

Sepsis =
Enfeksiyon
+
organ
disfonksiyonu



SSC-2021

Son rehber

1992

Sepsis-1

- **SIRS:** Kontrolsüz inflamatuvar yanıt
 - Ateş $>38.5C^{\circ}$ ya da hipotermi
 - Nabız $90/dk$
 - Solunum $>20/dk$ veya $PaCO_2 <32$ mmHg
 - Lökosit $>12.000/mm^3$ veya <4000 veya %10 çomak
- **Sepsis:** enfeksiyona sekonder SIRS (≥ 2 kriter)
- **Septik şok:** sepsis/ağır sepsis+ hidrasyona rağmen hipotansiyon
- **Ağır sepsis:** sepsis + organ disfonksiyonu bulguları

2001

Sepsis-2

Critical Care Medicine

MENU

Search

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SPECIAL ARTICLES

2001 SCCM/ESICM/ACCP/ATS/SIS International Sepsis Definitions Conference

Levy, Mitchell M. MD, FCCP; Fink, Mitchell P. MD, FCCP; Marshall, John C. MD; Abraham, Edward MD; Angus, Derek MD, MPH, FCCP; Cook, Deborah MD, FCCP; Cohen, Jonathan MD; Opal, Steven M. MD; Vincent, Jean-Louis MD, FCCP, PhD; Ramsay, Graham MD For the International Sepsis Definitions Conference

[Author Information](#)

Critical Care Medicine 31(4):p 1250-1256, April 2003. | DOI: 10.1097/01.CCM.0000050454.01978.3B

➤ **SIRS ? → Aşırı duyarlı; özgüllüğü düşük**

- Herhangi bir inflamasyonda olabilir
- Yanık, cerrahi, trombüs, pankreatit, travma vs

“Sepsis, Ağır Sepsis ve Septik Şok” kavramları daha faydalı olabilir...

Table 1 Diagnostic criteria for sepsis

Infection^a

Documented or suspected *and* some of the following^b:

General parameters

Fever (core temperature $>38.3^{\circ}\text{C}$)

Hypothermia (core temperature $<36^{\circ}\text{C}$)

Heart rate >90 bpm or >2 SD above the normal value for age

Tachypnea: >30 bpm

Altered mental status

Significant edema or positive fluid balance (>20 ml/kg over 24 h)

Hyperglycemia (plasma glucose >110 mg/dl or 7.7 mM/l) in the absence of diabetes

Inflammatory parameters

Leukocytosis (white blood cell count $>12,000/\mu\text{l}$)

Leukopenia (white blood cell count $<4,000/\mu\text{l}$)

Normal white blood cell count with $>10\%$ immature forms

Plasma C reactive protein >2 SD above the normal value

Plasma procalcitonin >2 SD above the normal value

Hemodynamic parameters

Arterial hypotension^b (systolic blood pressure <90 mmHg, mean arterial pressure <70 , or a systolic blood pressure decrease >40 mmHg in adults or <2 SD below normal for age)

Mixed venous oxygen saturation $>70\%$ ^b

Cardiac index >3.5 l min^{-1} m^{-2} ^{c,d}

Organ dysfunction parameters

Arterial hypoxemia ($\text{PaO}_2/\text{FIO}_2 <300$)

Acute oliguria (urine output <0.5 ml kg^{-1} h^{-1} or 45 mM/l for at least 2 h)

Creatinine increase ≥ 0.5 mg/dl

Coagulation abnormalities (international normalized ratio >1.5 or activated partial thromboplastin time >60 s)

Ileus (absent bowel sounds)

Thrombocytopenia (platelet count $<100,000/\mu\text{l}$)

Hyperbilirubinemia (plasma total bilirubin >4 mg/dl or 70 mmol/l)

Tissue perfusion parameters

Hyperlactatemia (>3 mmol/l)

Decreased capillary refill or mottling

^a Defined as a pathological process induced by a micro-organism

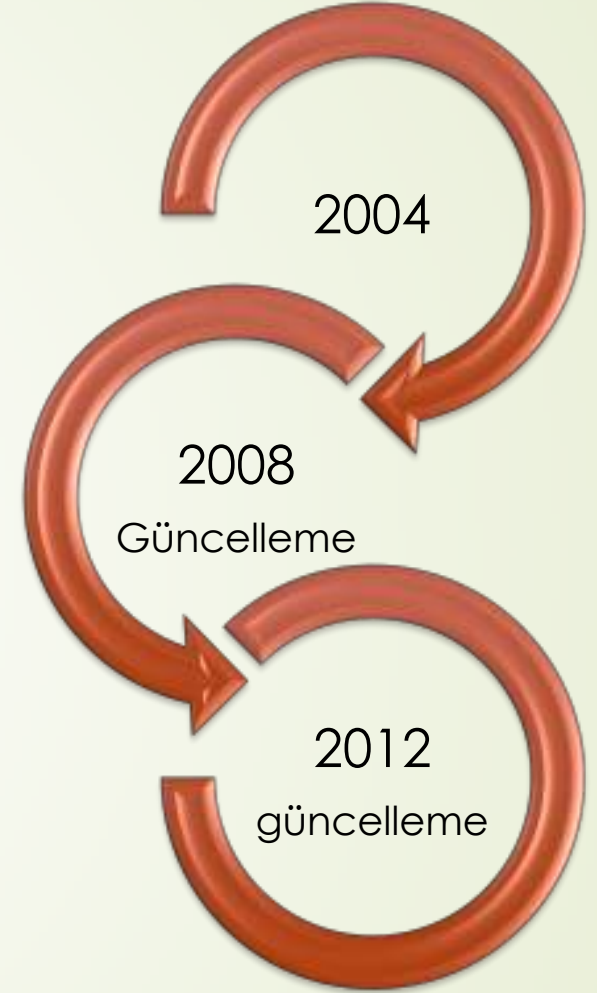
^b Values above 70% are normal in children (normally 75–80%) and should therefore not be used as a sign of sepsis in newborns or children

^c Values of 3.5–5.5 are normal in children and should therefore not be used as a sign of sepsis in newborns or children

^d Diagnostic criteria for sepsis in the pediatric population is signs and symptoms of inflammation plus infection with hyper- or hypothermia (rectal temperature $>38.5^{\circ}\text{C}$ or $<35^{\circ}\text{C}$), tachycardia (may be absent in hypothermic patients) and at least one of the following indications of altered organ function: altered mental status, hypoxemia, elevated serum lactate level, and bounding pulses

2002

Sepsisde sađ kalım kampanyası
(SSC)
bařlatıldı



Community-Acquired Infections (D Talan, Section Editor) | [Published: 03 July 2013](#)

The 2012 Surviving Sepsis Campaign: Management of Severe Sepsis and Septic Shock—An Update on the Guidelines for Initial Therapy

[Jeffrey P. Green](#) , [Jason Adams](#), [Edward A. Panacek](#) & [Timothy A. Albertson](#)

Current Emergency and Hospital Medicine Reports **1**, 154–171 (2013) | [Cite this article](#)

4251 Accesses | [Metrics](#)

2012

SSC Güncelleme

2012

Community-Acquired Infections (D Talan, Section Editor) | Published: 03 July 2013

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4251 Accesses | Metrics

Severe Sepsis Bundles:

Sepsis Resuscitation Bundle

(To be accomplished as soon as possible and scored over first 6 hours):

1. Serum lactate measured.
2. Blood cultures obtained prior to antibiotic administration.
3. From the time of presentation, broad-spectrum antibiotics administered within 3 hours for ED admissions and 1 hour for non-ED ICU admissions.
4. In the event of hypotension and/or lactate > 4 mmol/L (36 mg/dl): a) Deliver an initial minimum of 20 ml/kg of crystalloid (or colloid equivalent). b) Apply vasopressors for hypotension not responding to initial fluid resuscitation to maintain mean arterial pressure (MAP) > 65 mm Hg.
5. In the event of persistent hypotension despite fluid resuscitation (septic shock) and/or lactate > 4 mmol/L (36 mg/dl): a) Achieve central venous pressure (CVP) of > 8 mm Hg. b) Achieve central venous oxygen saturation (ScvO₂) of > 70%.*

Sepsis Management Bundle

(To be accomplished as soon as possible and scored over first 24 hours):

1. Low-dose steroids administered for septic shock in accordance with a standardized hospital policy.
2. Drotrecogin alfa (activated) administered in accordance with a standardized hospital policy.
3. Glucose control maintained > lower limit of normal, but < 150 mg/dl (8.3 mmol/L).
4. Inspiratory plateau pressures maintained < 30 cm H₂O for mechanically ventilated patients.

*Achieving a mixed venous oxygen saturation (SvO₂) of 65% is an acceptable alternative.

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- 165 bölge, 15.022 hasta
- SSC bundle
- Erken tanı
- **1 saat** içinde antibiyoterapi=> mortalite azalma
- **Laktat** ölçümü!

2012

The 2012 Surviving Sepsis Campaign: Management of Severe Sepsis and Septic Shock—An Update on the Guidelines for Initial Therapy

Jeffrey P. Green , Jason Adams, Edward A. Panacek & Timothy A. Albertson



Enfeksiyon:

Steril dokuların MO ile invazyonu



Bakteriyemi:

Kanda canlı bakteri varlığı



Sepsis:

Kesin/olası bir enfeksiyon + genel, enflamatuvar veya hemodinamik parametrelerden ≥ 1



Ağır Sepsis:

Sepsis +doku/organ perfüzyon bozukluğu



Septik Şok:

Sepsis+ sıvı replasmanına rağmen **hipotansiyon** veya **hiperlaktatemi**

2012

AĞIR SEPSİS TANIMLAMASI

- ❖ Hipotansiyon
- ❖ Akut oligüri
- ❖ Kr > 2mg/dL
- ❖ Bilirubin > 4 mg/dL
- ❖ Laktat yüksekliği
- ❖ aPTT > 60 sn veya INR > 1,5mg/dL
- ❖ Trombosit < 100.000
- ❖ Akut Akciğer hasarı, PaO₂/FIO₂

2016-Sepsis 3

SCCM (The Society of Critical Care Medicine)

EISCM (The European Society of Intensive Care Medicine)

Sepsis patofizyoloji
anlaşıldı

Çalışmalar sonucunda
Sepsis tanımı
ve sepsis **skorları**
güncellendi

Research

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

Christopher W. Seymour, MD, MSc; Vincent X. Liu, MD, MSc; Theodore J. Iwashyna, MD, PhD; Frank M. Brunkhorst, MD; Thomas D. Rea, MD, MPH; André Scherag, PhD; Gordon Rubenfeld, MD, MSc; Jeremy M. Kahn, MD, MSc; Manu Shankar-Hari, MD, MSc; Mervyn Singer, MD, FRCP; Clifford S. Deutschman, MD, MS; Gabriel J. Escobar, MD; Derek C. Angus, MD, MPH

EDITORIAL

Editorials represent the opinions of the authors and JAMA and not those of the American Medical Association

New Definitions for Sepsis and Septic Shock Continuing Evolution but With Much Still to Be Done

JAMA - 2016

Edward Abraham, MD

REVIEW: SPECIAL COMMUNICATION: CARING FOR THE CRITICALLY ILL PATIENT

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

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

Sepsis

- Enfeksiyon + Organ yetmezliđi
- (≥**SOFA** 2 puan)



SIRS, ağır sepsis, sepsisemi

Septik şok

- Sıvı tedavisine yanıtırsız **hipotansiyon**
- **Laktat** düzeyi >2 mmol/L
- **Vazopressör** ihtiyacı (**MAP** ≥65 mmHg)

2016 Sepsis 3

Sistemik
derlemeler

Meta-analizler

Kohort
çalışmaları

SOFA skoru

quick SOFA

(q-SOFA)

LODS

(Logistic Organ
Dysfunction
System) skoru

Sepsis

öngörü
değerleri?

Q-Sofa (Yatak başı SOFA)

- ❖ **Solunum sayısı** >22/dk (1puan)
- ❖ **Bilinç değişikliği** (1 puan)
- ❖ **Sistolik kan basıncı** <100 mmHg (1 puan)

Q-Sofa ≥ 2

- ***Ayaktan** başvurular
- ***Yoğun bakım dışı** hastalar
- *Sepsis → erken şüphe

SOFA (Sequential [Sepsis-Related] Organ Failure Assessment scor)

SOFA Kriteri				
Puan	1	2	3	4
Sistem				
Solunum			10)	<100 (13.3)
PaO ₂ /FiO ₂			10)	10 desteği ile solunum desteği ile
20				
>12.0				
Dopamin >15 veya epinefrin >0.1				
epinefrin ≤0.1 veya norepinefrin >0.1				
6-9				
1.2-1.9	2.0-2.9	3.5-4.9	>5.0	
		< 500	< 200	

≥2

❖ Sepsis **tanısında uygun değil !!**

❖ Enfeksiyöz/ non-enfeksiyöz?

❖ **YBÜ** hastalarında organ

yetmezliği öngörmek için



Sepsis → hastanede **mortalite %10** artış



Septik şok → **mortalite %40** artış



Acil serviste **Q-Sofa** ile hızlı tanı
mortalite riskinin öngörülmesi !!

A Comparison of the Quick-SOFA and Systemic Inflammatory Response Syndrome Criteria for the Diagnosis of Sepsis and Prediction of Mortality: A Systematic Review and Meta-Analysis

Rodrigo Serafim¹, José Andrade Gomes², Jorge Salluh³, Pedro Póvoa⁴

Affiliations + expand

PMID: 29289687 DOI: [10.1016/j.chest.2017.12.015](https://doi.org/10.1016/j.chest.2017.12.015)

- Q-Sofa? SIRS?
- 229.480 hasta meta-analiz
- Sepsis **tanısı** koymada **SIRS** > Q-Sofa
- Ayaktan hastalarda **mortalite tahmin gücü** **Q-SOFA** >SIRS

Table 1. Variables for Candidate Sepsis Criteria Among Encounters With Suspected Infection

Systemic Inflammatory Response Syndrome (SIRS) Criteria (Range, 0-4 Criteria)	Sequential [Sepsis-related] Organ Failure Assessment (SOFA) (Range, 0-24 Points) →	Logistic Organ Dysfunction System (LODS) (Range, 0-22 Points) ^a →	Quick Sequential [Sepsis-related] Organ Failure Assessment (qSOFA) (Range, 0-3 Points)
Respiratory rate, breaths per minute	PaO ₂ /FiO ₂ ratio	PaO ₂ /FiO ₂ ratio	Respiratory rate, breaths per minute
White blood cell count, 10 ⁹ /L	Glasgow Coma Scale score	Glasgow Coma Scale score	Glasgow Coma Scale score
Bands, %	Mean arterial pressure, mm Hg	Systolic blood pressure, mm Hg	Systolic blood pressure, mm Hg
Heart rate, beats per minute	Administration of vasopressors with type/dose/rate of infusion	Heart rate, beats per minute	
Temperature, °C	Serum creatinine, mg/dL, or urine output, mL/d	Serum creatinine, mg/dL	
Arterial carbon dioxide tension, mm Hg	Bilirubin, mg/dL	Bilirubin, mg/dL	
	Platelet count, 10 ⁹ /L →	Platelet count, 10 ⁹ /L	
		White blood cell count, 10 ⁹ /L	
		Urine output, L/d	
		Serum urea, mmol/L	
		Prothrombin time, % of standard	

A ICU encounters (n = 7932)

	SIRS	SOFA
SIRS	0.64 (0.62-0.66)	0.43 (0.41-0.46)
SOFA	<.001	0.74 (0.73-0.76)
LODS	<.001	0.20
qSOFA	.01	<.001

YBÜ
≥2
LODS ve SOFA
mortalite öngörüsü benzer;
SIRS'a göre yüksek

B Non-ICU encounters (n = 66522)

	SIRS	SOFA	LODS	qSOFA
SIRS	0.76 (0.75-0.77)	0.52 (0.51-0.53)	0.43 (0.42-0.44)	0.61 (0.61-0.62)
SOFA	<.001	0.79 (0.78-0.80)	<u>YBÜ dışı</u> ≥2 Q-Sofa LODS ve SOFA ile benzer	
LODS	<.001	<.001		
qSOFA	<.001	<.001		

NEWS

National Early Warning Score

Solunum hızı

Oksijen saturasyonu

Sistolik kan basıncı

Nabız

**Bilinç durumu
(yeni gelişen konfüzyon)**

Ateş

MEWS

Modified Early Warning Score

Solunum sayısı

İdrar çıkış miktarı

Sistolik kan basıncı

Nabız

Bilinç bozukluğu

Ateş

GUIDELINES

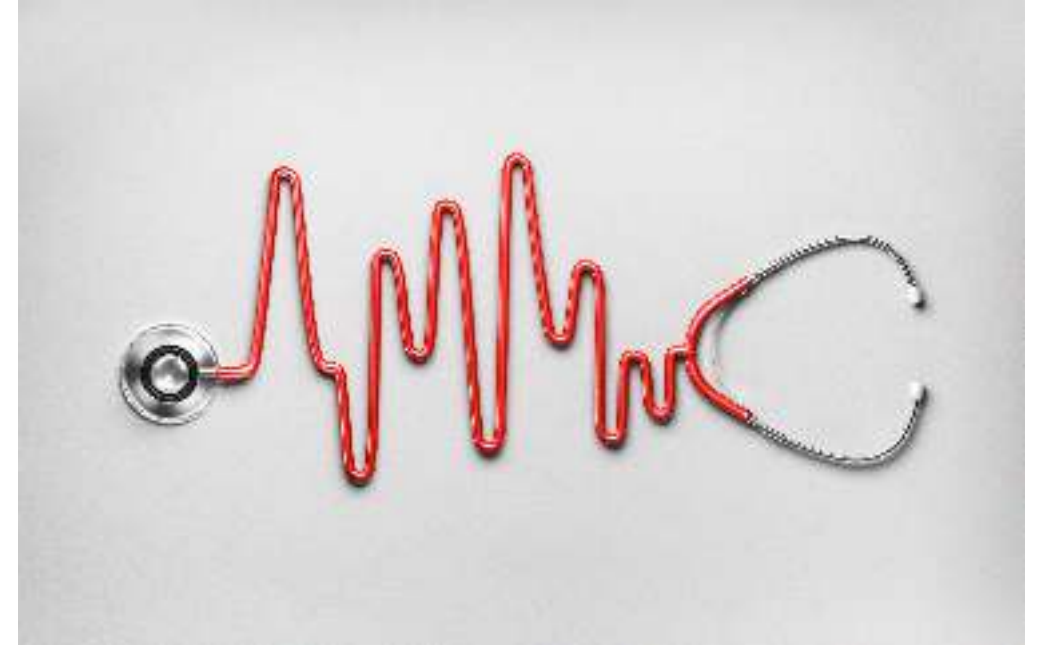
Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021



Laura Evans^{1*}, Andrew Rhodes², Waleed Alhazzani³, Massimo Antonelli⁴, Craig M. Coopersmith⁵,

2021 Yılı

Yeni tanı önerileri



1. For hospitals and health systems, we recommend using a performance improvement program for sepsis, including sepsis screening for acutely ill, high-risk patients and standard operating procedures for treatment.

Strong, moderate-quality
(for screening)

Strong, very low-quality
(for standard operating procedures)

**Her hastanenin
standardize edilmiş
performans programları**

gram for sepsis including sepsis screening for acutely ill, high-risk

2. We recommend against using qSOFA compared with SIRS, NEWS, or MEWS as a single-screening tool for sepsis or septic shock.

Strong, moderate-quality

**Sepsis taramasında Q-Sofa
MERS/NEWS**

3. For adults suspected of having sepsis, we suggest measuring blood lactate.

Weak, low quality of

Sepsis şüphesi → Laktat

GUIDELINES

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Laura Evans^{1*}, Andrew Rhodes², Waleed Alhazzani³, Massimo Antonelli⁴, Craig M. Cooper⁵,

Enfeksiyon şüphesinde

Güçlü öneri

→ **1 saat içinde** anti-mikrobiyal başa (anti-viral/AB/anti-fungal?)

→ Diğer hastalıklar açısından sık aralıklarla değerlendir

→ Enfeksiyon düşünülüyorsa → **Antimikrobiyali kes**

GUIDELINES

Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021

Laura Evans^{1*}, Andrew Rhodes², Waleed Alhazzani³, Massimo Antonelli⁴, Craig M. Coopersmith⁵,



(güçlü → düşük)

Sepsis + hipotansiyon/ Septik şok

→ **3 saat** içinde sıvı replasmanı

→ **6 saat** içinde YBÜ



Sabrınız için teşekkürler