

Laporan Kasus Besar

Seorang Wanita 62 th dengan Sepsis dan Syok Sepsis

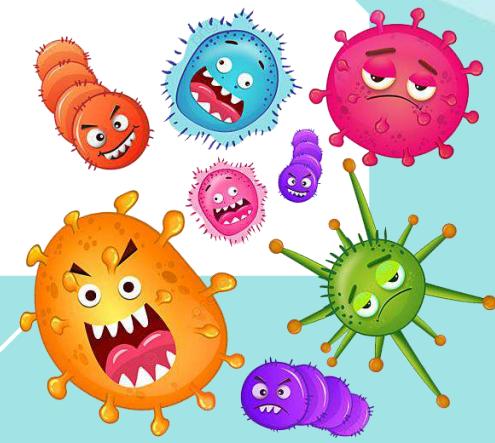


Disusun oleh:

dr. Christofer Sathya Wijaya B.

Dosen Pembimbing:

dr. Fina Hardina, Sp.PD



Identitas Pasien

- Nama : Ny.I
- Usia : 62 th
- TTL : Jember, 20 Des 1959
- JK : Perempuan
- Alamat : Dusun Krajan, Jember
- No. RM : 2211xxxxxx
- SMRS : 9 November 2022
- Tgl px : 9 November 2022

Status Pasien

Anamnesis secara alloanamnesis
pada tanggal 9 November 2022
jam 14.30 WIB di IGD RS
Bhayangkara Semarang

01



Anamnesis

▷ KU : lemas sejak 1 hari SMRS

▷ RPS :

Os datang ke IGD RSB tgl 9/11/22 pukul 14.30 WIB dengan keluhan lemas sejak 1 hari SMRS, lemas terus-menerus, tidak membaik dengan istirahat, lemas disertai demam sejak 1 hari SMRS. Demam terus-menerus tinggi, nyeri kepala + VAS 4, napsu makan berkurang +, mual -, muntah -, batuk -, pilek -, diare -, penurunan frekuensi BAK -, nyeri perut -, hilang indera penciuman -, perasa -, kontak pasien covid -. Pasien juga mengeluhkan kaki kiri terasa panas dan nyeri sejak 3 hari SMRS, kemerahan +, luka +, Bengkak -.

Anamnesis



RPD

Hipertensi +
DM -

Penyakit Jantung -



RPK

Tidak ada



Riw. alergi

Tidak ada



Riw. pengobatan

Tidak ada

Anamnesis

- Gaya Hidup:
 - Pasien merupakan seorang asisten rumah tangga.
 - Pasien mengaku makan 3-4x/hari dan pasien mengaku suka makan makanan bersantan, gorengan, kerupuk. Pasien jarang konsumsi buah dan sayur.
 - Pasien mengaku jarang melakukan olahraga (1-2x/bulan).
 - Merokok -, minum alkohol -.

Pemeriksaan Fisik

Pemeriksaan Fisik dilakukan pada tanggal 9 November 2022 jam 14.30 WIB di IGD RS Bhayangkara Semarang

02



Status Generalis

KU : sedang



Kesadaran : apatis
GCS: E3V4M5 (12)



TD : 176/128 mmHg



HR : 101 bpm
reguler, kuat



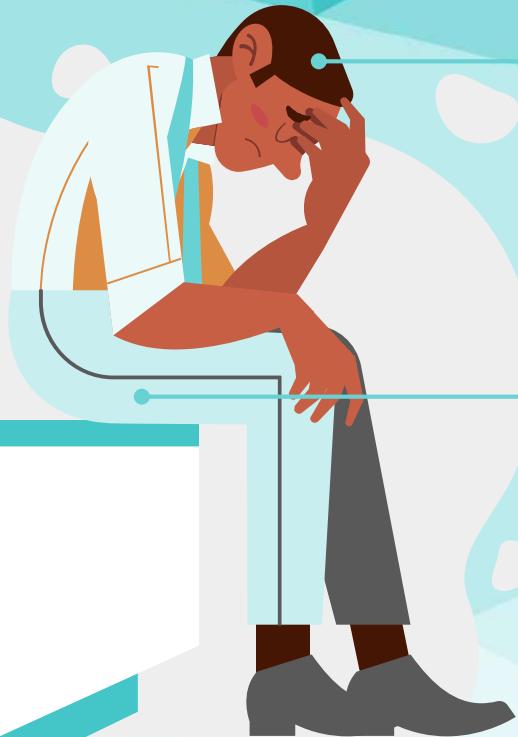
RR : 26x/mnt
Irama dan
kedalaman napas
dbn

T : 40,1 °C

Sat O₂ : 97%

BB : 75 kg
TB 165 cm
IMT 27,5 kg/m²
(overweight)

Status Generalis



KEPALA

normocephali, SI (-)/(-), CA (-)/(-),
mukosa bibir pucat -, bibir kering -,
sianosis -



LEHER

pembesaran kelenjar bening -,
vena jugular tak meningkat

Status Generalis

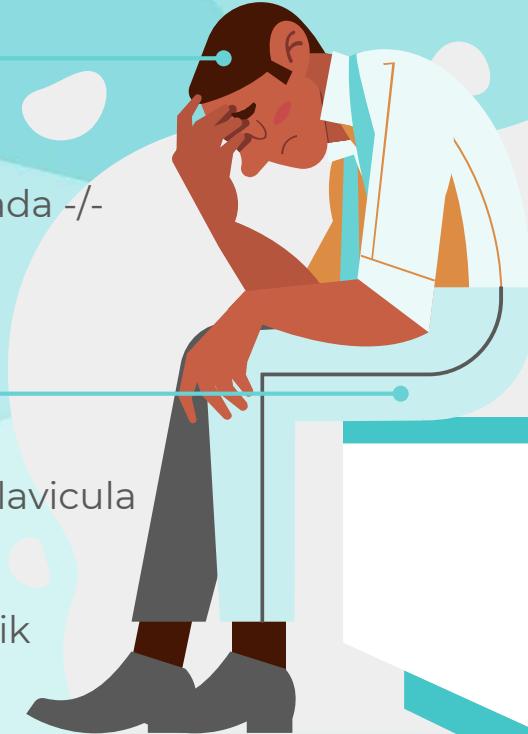
PULMO

Inspeksi : simetris, retraksi dinding dada -, luka -

Palpasi : fremitus dbn, ketinggalan gerak -, nyeri dada -/-

Perkusi : sonor +/+

Auskultasi: vesikuler +/+, rhonki -/-, wheezing SLP -/-



COR

Inspeksi

Palpasi

sinistra SIC V

Perkusi

Auskultasi

tricuspid +



: iktus kordis tak tampak

: iktus cordis teraba di linea midclavicular

: batas jantung melebar +

: S1 +, S2 + reguler , murmur sistolik

Status Generalis

ABDOMEN

Inspeksi : supel
Auskultasi : bising usus + 18 kali/menit
Perkusi : timpani seluruh lapang abdomen
Palpasi : nyeri tekan -, hepatosplenomegali -

EKSTREMITAS

edema tungkai bawah +/+, edem tungkai atas -/-, palmar pucat -, plantar pucat -, akral dingin -, CRT <2 detik, turgor kulit dgn, ruam kulit -.



Status Lokalis

Cruris Sinistra

Deskripsi UKK 1: tampak lesi di 1/2 distal cruris sinistra
Berbentuk patch eritem, batas tidak tegas,
Jumlah 1, bentuk irreguler, disertai nyeri +, hangat +,
Edem +

Deskripsi UKK 2: tampak lesi di 1/3 distal cruris sinistra
Berbentuk ulkus eritem, berjumlah 1, berbentuk bulat,
diameter 2 cm, batas tegas, dasar krusta coklat



Diagnosis Banding

- ✓ penkes
 - Sepsis
 - Hipoglikemi
 - Gangguan elektrolitik
- ✓ Eritem kulit
 - Selulitis
 - Erisipelas
- ✓ Hipertensi
 - Overweight
 - Bising jantung dd/
regurgitasi trikuspid





03

Pemeriksaan Penunjang

Pemeriksaan Darah Lengkap

9/11/22

	HASIL	SATUAN	NILAI RUJUKAN
Hematologi			
Hemoglobin	13.0	g/dL	13-18
Leukosit	23.85 (H)	/mm3	4-11
Hematokrit	39.1	%	40-54
Eritrosit	4.56	juta/mm3	4.6-6.2
Trombosit	304	/mm3	150-450
MCV	85.7	fL	80-100
MCH	28.4	pg	27-34
MCHC	33.2	g/dL	32-36
RDW	14.3	%	11.6-14.6
MPV	8.2	µm^3	7.2-11.1
PDW	16.0	dL	9.0-17.0
Kimia darah			
GDS	109	mg/dL	70-115
Ureum	29	mg/dL	17-43
Creatinin	0.74	mg/dL	0.67-1.17
COVID			
Rapid Antigen	negatif		negatif

Pemeriksaan Darah Lengkap

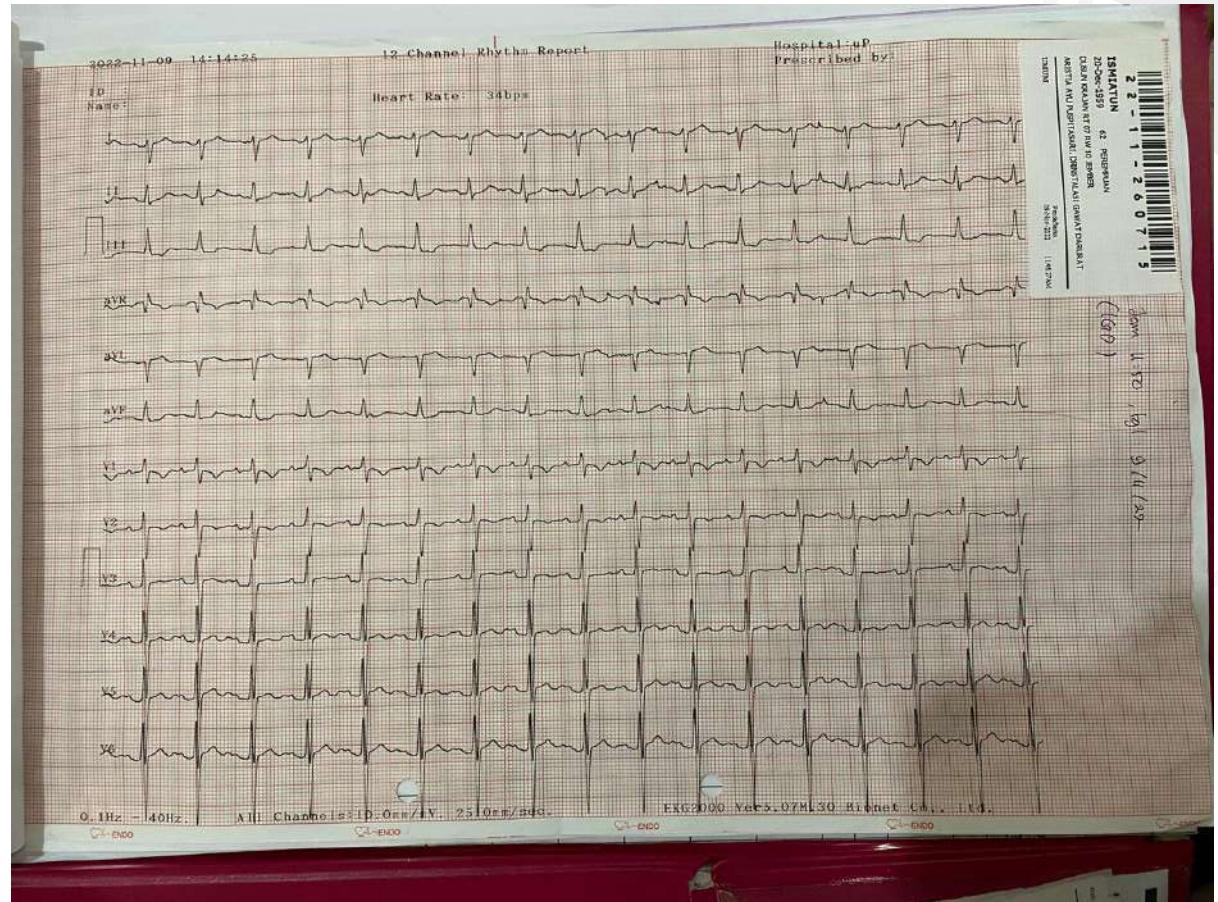
9/11/22

	HASIL	SATUAN	NILAI RUJUKAN
Elektrolit			
Natrium	132 (L)	mmol/L	135-148
Kalium	3.3 (L)	mmol/L	3.7-5.3
Clorida	100	mmol/L	98-109
Kalsium	10.2	mg/dl	8.6-10.3

EKG

9/11/22-saat datang
ke IGD

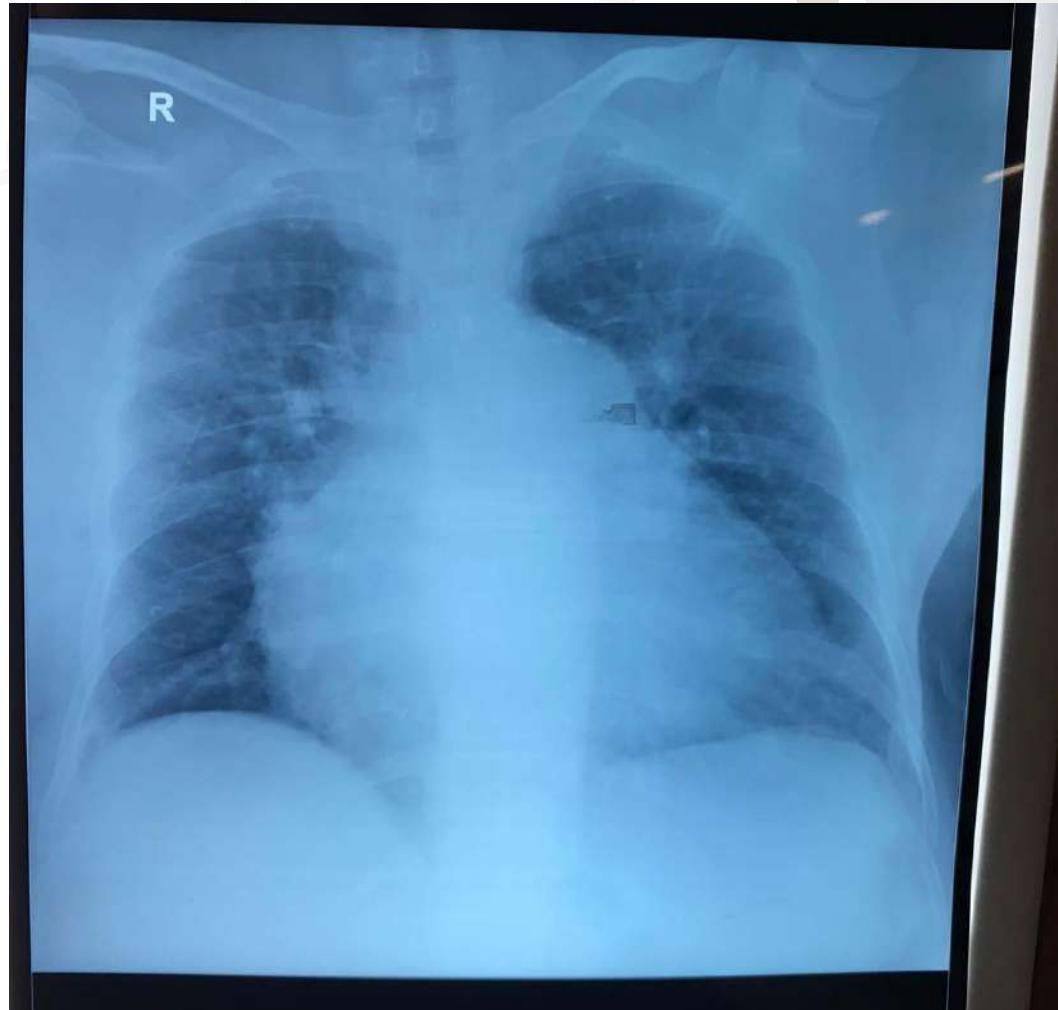
- Kesan: ST, HR 103, reguler, right axis deviation, R/S <1 di V6, P mitral di V3-V6, suspek RVH, LAE



Rontgen Thorax

9/11/22-saat datang
ke IGD

- Kesan: kardiomegali
LVH dan LAH.
Kalsifikasi arkus aorta,
gambaran
bronkopneumonia



Diagnosis Kerja

- ✓ Sepsis
- ✓ Selulitis ankle sinistra
- ✓ CHF
- ✓ Bising jantung dd/ regurgitasi trikuspid
- ✓ HT Urgency
- ✓ Overweight
- ✓ Hiponatremi ringan
- ✓ Hipokalemi ringan





Tatalaksana

Farmakologis dan non
farmakologis

TATALAKSANA FARMAKOLOGIS AWAL di IGD

- ▷ O2 NK 4 lpm
- ▷ Inf RL 20 tpm
- ▷ Inj PCT 1 gram iv
- ▷ Inj Ketorolac 30 mg iv
- ▷ Inj Omeprazol 40 mg iv
- ▷ Pasang DC -> urin inisial diselang

TATALAKSANA FARMAKOLOGIS LANJUTAN

- ▷ O2 NK 3 lpm
- ▷ Inf RL 20 tpm
- ▷ Inj. Ceftriaxon 2 gram / 24 jam
- ▷ Inj. Omeprazol 40 mg / 12 jam
- ▷ Inj. Ondansetron 8 mg / 24 jam
- ▷ PO Paracetamol 3x1
- ▷ PO NaCl caps 3x1
- ▷ PO KSR 3x1
- ▷ PO Clindamycin 300 mg 3x1
- ▷ Kompres NaCl pada selulitis 2x1

Planning



Pantau BC
Pantau TTV tiap 6 jam
Pantau tanda-tanda syok



Edukasi



echocardiography

S	Demam, penkes, nyeri kepala
O	<p>KU: gelisah GCS: E3V4M5 (12) TD : 176/128 mmHg N : 101 bpm, reguler, kuat R : 26 x/m S : 40,1 oC SatO2: 97% Cor: murmur sistolik apex + St lokal: selulitis ankle S</p>
A	Penkes dd/sepsis Cellulitis ankle sinistra HT Urgency
P	<ul style="list-style-type: none"> • O2 NK 4 lpm • Inf. RL 20 tpm • Inj. Paracetamol 1 gr IV • Inj. Ketorolac 30 mg IV • Inj. Omeprazole 40 mg IV • Pasang DC-> urin inisial di selang

Follow Up

IGD, 9/11/22, 11.40

S	Lemas
O	<p>KU: lemah</p> <p>GCS: E2V4M5 (11)</p> <p>TD : 87/40 mmHg</p> <p>MAP : 55</p> <p>N : 88 bpm, reguler, lemah</p> <p>R : 24 x/m</p> <p>S : 37,1 oC</p> <p>SatO2: 99%</p> <p>Akral dingin +/+, CRT<2" +/+, edem -/-</p> <p>Cor: murmur sistolik apex +</p> <p>St lokal: selulitis ankle S</p> <p>Radiologi : cardiomegaly</p>
A	<p>Syok dd/ syok sepsis, syok kardiogenik</p> <p>Cellulitis ankle sinistra</p> <p>CHF</p>
P	<ul style="list-style-type: none"> • Inf. RL Loading 250 cc -> urin tidak keluar • SP Vascon 0,05 mcg/kg/min (BB:75 kg), tap up target MAP >65-70 • Rawat ICU

Follow Up

IGD, 9/11/22, 13.15

Follow Up

ICU, 10/11/22, 08.00

S	Kontak +	
O	KU: sedang GCS: E3V5M6 (14) TD : 151/69 mmHg MAP : 96 N : 97 bpm, reguler, kuat	R : 20 x/m S : 36,7 oC SatO2: 99% Akral dingin -/-, CRT<2" +/+, edem -/- Na: 132 K: 3.3
A	<p>Syok perbaikan Sepsis Cellulitis ankle sinistra CHF Hiponatremia ringan Hipokalemi ringan</p>	
P	<ul style="list-style-type: none">• SP Vascon Stop• Inf RL 10 tpm• Inj Ceftriaxon 2 gr/24 jam• Inj Ciprofloxacin 400 mg/12 jam• Inj. Omeprazole 40 mg/ 12 jam• Inj. Ketorolac extra	

Edukasi

- Kompres kaki yang terkena selulitis dengan NS 3x1
- Jaga daerah lesi tetap bersih
- Minum obat pulang secara rutin, untuk antibiotik harus dihabiskan
- Turunkan BB dengan olahraga rutin 3-5 hari/minggu
- Kurangi makanan berlemak seperti gorengan, santan, kerupuk, dan asin
- Batasi air minum 1 liter per hari
- Kontrol 5 hari setelah pulang dari RS
- Kontrol ke poli jantung, saran: echo

Prognosis

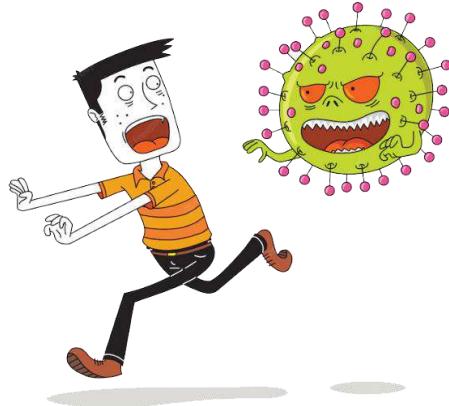
Quo ad vitam	: dubia
Quo ad functionam	: dubia
Quo ad sanationam	: dubia

A cartoon illustration of a female doctor with orange hair and glasses, wearing a white lab coat and a stethoscope. She is holding a magnifying glass over a large, stylized blue teardrop or blood drop. The background is light gray with faint, scattered pink ribbon symbols.

04

Tinjauan Pustaka

Pendahuluan



Definisi Sepsis dan Syok Sepsis

- **Sepsis** : A life-threatening organ dysfunction caused by a dysregulated host response to infection.
- **Syok Sepsis** : A subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities lead to substantially increased mortality risk.

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

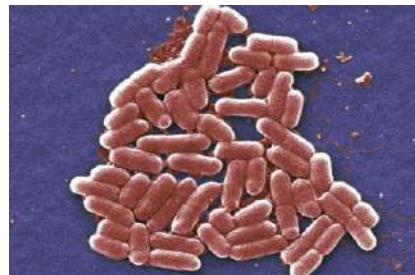
Epidemiologi

- ✓ Di Amerika Serikat : **750.000 kasus sepsis setiap tahun.**
- ✓ Angka kematian : **20-30% selama 2 dekade terakhir**
- ✓ RSUD Dr. Moewardi 2009 : **28.385 orang**
 - Total pasien meninggal 2.288 (**8,06%**) dari jumlah total pasien ranap.
 - Kematian akibat sepsis 409 orang (**17,87%**)
 - Kematian akibat syok sepsis 409 (**68,5%**)

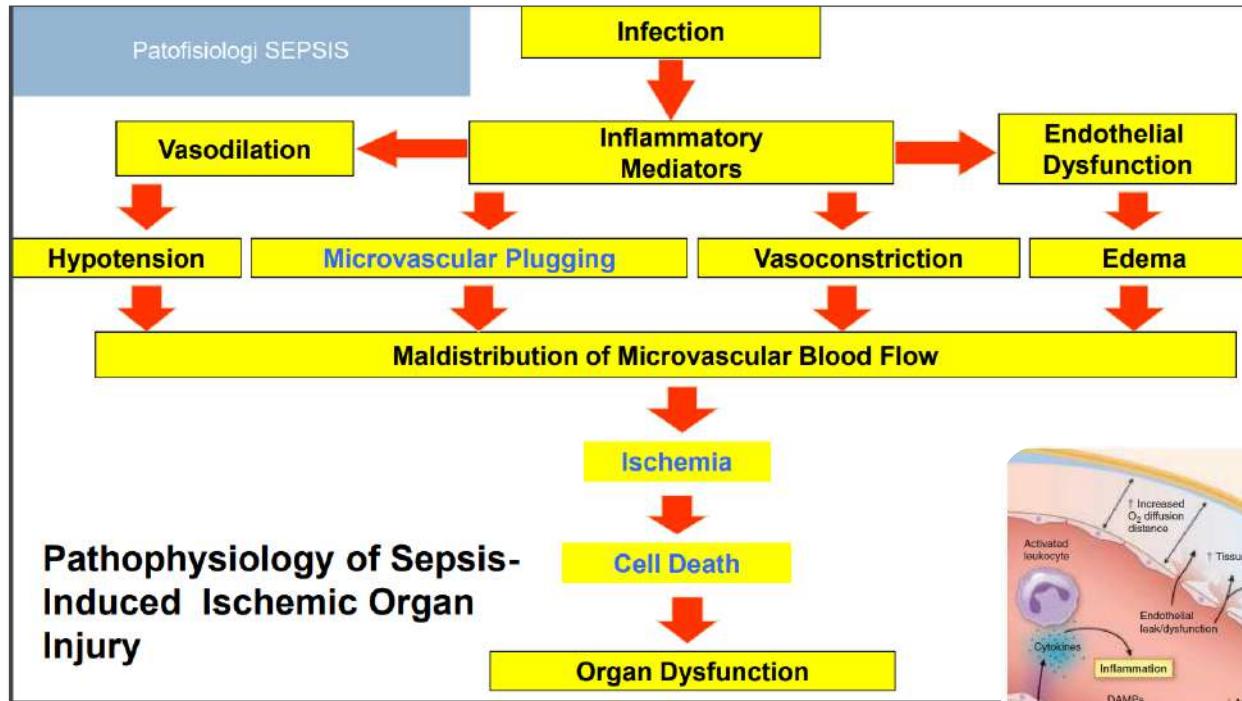


Etiologi

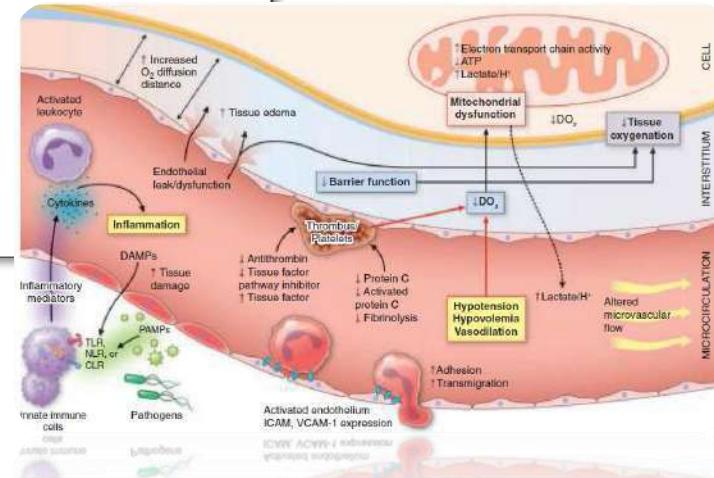
- **Asal** : Community acquired dan Hospital acquired
- **Sumber utama infeksi** : penumonia, intraabdomen, genitourinari
- **Agen penyebab:**
 - Bakteri gram (-) 67% : *E. coli*, *Klebsiella sp.*, *Pseudomonas aeruginosa*
 - Bakteri gram (+) 47% : *Streptococcus pneumoniai*, *Staphylococcus aureus*
 - Fungi 19%



Patofisiologi

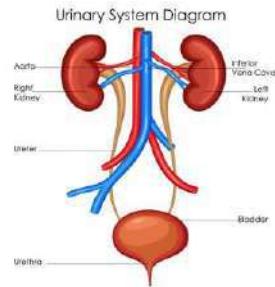
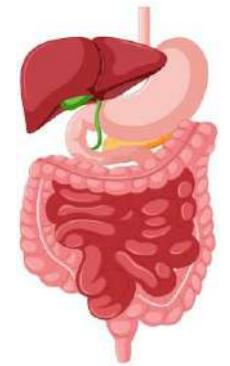
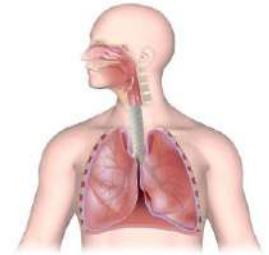


Harrison 20th ed., 2018.



Gejala klinis

- Gejala klinik sepsis biasanya tidak spesifik dan diawali dengan demam, menggil dan gejala konstitutif seperti lelah, malaise, gelisah atau kebingungan.
- Tempat infeksi paling sering : paru, traktus digesti, traktus urinaris, kulit, jaringan lunak dan saraf pusat.
- Gejala sepsis diperberat dengan usia lanjut, diabetes, kanker, gagal organ utama dan granulositopenia



Gejala klinis

▫ Tanda-tanda MODS dengan terjadinya komplikasi:

▫ ARDS pada dewasa

▫ Koagulasi intravaskular

▫ AKI

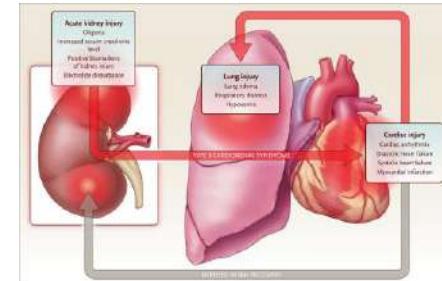
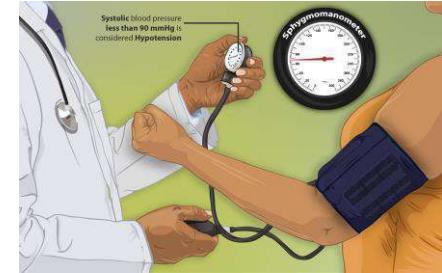
▫ Perdarahan usus

▫ Gagal hati

▫ Disfungsi sistem saraf pusat

▫ Gagal jantung

▫ kematian



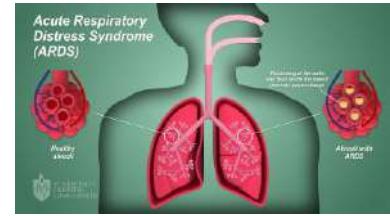
Diagnosis - Anamnesis

- ▷ Riwayat : membedakan komunitas/nosokomial, atau pasien dengan imunokompremise
- ▷ Paparan hewan, perjalanan, gigitan tungau, bahaya tempat kerja, penggunaan alkohol, seizure, penkes, medikasi dan penyakit dasar yang mengarahkan pasien pada agen infeksius
- ▷ Tanda sepsis:
 - ▽ Demam atau tanda yang tak terjelaskan
 - ▽ Hipotensi, oligouria atau anuria
 - ▽ Takipneia atau hiperpnea, hipotermia tanpa penyebab jelas
 - ▽ Perdarahan



Pemeriksaan Fisik

- ▷ Pemeriksaan fisik perlu dilakukan secara menyeluruh. Pemeriksaan fisik dapat dilakukan untuk menentukan adanya MODS
 - ▷ Respiratori : dapat ditemukan gambaran yang mengarah pada ARDS
 - ▷ Cardiovascular : hipotensi
 - ▷ Ginjal : AKI -> oligouri tanpa tanda syok, azotemia, peningkatan CrCl
 - ▷ Neurologik : delirium, koma namun imaging/EEG dbn.

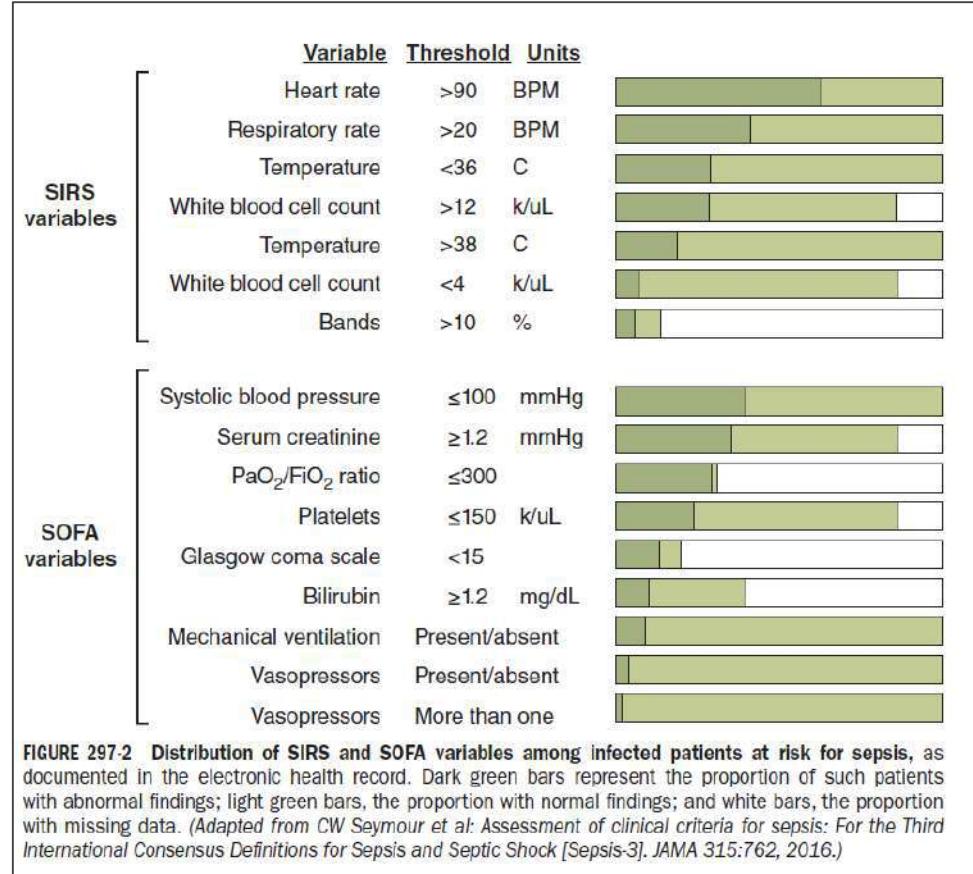


Guntur H., 2014.

Harrison 20th ed., 2018.

Pemeriksaan Penunjang

- ▷ Tabel disamping menunjukan bahwa tidak ada pemeriksaan fisik dan pemeriksaan penunjang yang menjadi gold standar dalam menegakan sepsis karena hasilnya bervariasi.



Criteria Diagnosis Sepsis dan Syok Sepsis

Criteria in 2016 (Sepsis-3)

- ✓ **Sepsis :** Suspected (or documented) infection and an acute increase in ≥ 2 sepsis-related organ failure assessment (SOFA) points.
- ✓ **Syok Sepsis :** Suspected (or documented) infection plus vasopressor therapy needed to maintain mean arterial pressure at ≥ 65 mmHg and serum lactate >2.0 mmol/L despite adequate fluid resuscitation

TABLE 297-1 Definitions and Criteria for Sepsis and Septic Shock

CONDITION	DEFINITION	COMMON CLINICAL FEATURES	CRITERIA IN 1991/2003 ("SEPSIS-1"/"SEPSIS-2")	CRITERIA IN 2016 ("SEPSIS-3")
Sepsis	A life-threatening organ dysfunction caused by a dysregulated host response to infection	Include signs of infection, with organ dysfunction, plus altered mentation; tachypnea; hypotension; hepatic, renal, or hematologic dysfunction	Suspected (or documented) infection plus ≥ 2 systemic inflammatory response syndrome (SIRS) criteria ^a	Suspected (or documented) infection and an acute increase in ≥ 2 sepsis-related organ failure assessment (SOFA) points ^b
Septic shock	A subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities lead to substantially increased mortality risk	Signs of infection, plus altered mentation, oliguria, cool peripheries, hyperlactemia	Suspected (or documented) infection plus persistent arterial hypotension (systolic arterial pressure, <90 mmHg; mean arterial pressure, <60 mmHg; or change in systolic by >40 mmHg from baseline)	Suspected (or documented) infection plus vasopressor therapy needed to maintain mean arterial pressure at ≥ 65 mmHg and serum lactate >2.0 mmol/L despite adequate fluid resuscitation

Singer et al., 2016

Harrison 20th ed., 2018.

^aSIRS criteria include 1 point for each of the following (score range, 0–4): fever $>38^\circ\text{C}$ ($>100.4^\circ\text{F}$) or $<36^\circ\text{C}$ ($<96.8^\circ\text{F}$); tachypnea with >20 breaths per min; tachycardia with heart rate >90 beats per min; leukocytosis with white blood cell count $>12,000/\mu\text{L}$; leukopenia ($<4000/\mu\text{L}$) or $>10\%$ bands. ^bSOFA score is a 24-point measure of organ dysfunction that uses six organ systems (renal, cardiovascular, pulmonary, hepatic, neurologic, hematologic), where 0–4 points are assigned per organ system.

SOFA SCORE

System	Score				
	0	1	2	3	4
Respiration					
PaO ₂ /FIO ₂ , mmHg (kPa)	≥400 (53.3)	<400 (53.3)	<300 (40)	<200 (26.7) with respiratory support	<100 (13.3) with respiratory support
Coagulation					
Platelets, ×10 ³ µL ⁻¹	≥150	<150	<100	<50	<20
Liver					
Bilirubin, mg dL ⁻¹ (µmol L ⁻¹)	<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 mmHg	MAP < 70 mmHg	Dopamine < 5 or dobutamine (any dose) ^a	Dopamine 5.1–15 or epinephrine ≤ 0.1 or norepinephrine ≤ 0.1 ^a	Dopamine > 15 or epinephrine > 0.1 or norepinephrine > 0.1 ^a
Central Nervous System (CNS)					
Glasgow Coma Scale score ^b	15	13–14	10–12	6–9	<6
Renal					
Creatinine, mg dL ⁻¹ (µmol L ⁻¹)	<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 per day				<500	<200

FIO₂: fraction of inspired oxygen; MAP: mean arterial pressure; PaO₂: partial pressure of oxygen.
^aCatecholamine doses are given as µg kg⁻¹ min⁻¹ for at least 1 h.
^bGlasgow Coma Scale scores range from 3 to 15; higher score indicates better neurological function.

Singer et al., 2016

- ✓ The score is calculated at admission and every 24 hours until discharge
- ✓ The SOFA score is not designed to influence medical management
- ✓ An initial SOFA score of < 9 predicted a mortality of < 33%, SOFA > 11 predicted mortality of 95%

Quick Sepsis-related Organ Failure Assessment Versus Systemic Inflammatory Response Syndrome Criteria for Predicting Organ Dysfunction and Mortality

Punnavit Harimtepathip ¹, James R. Lee ², Elliot Griffith ¹, Gabriel Williams ³, Ravi V. Patel ¹, David Lebowitz ⁴, Sina Koochakzadeh ²

¹. University of Central Florida College of Medicine, Orlando, USA ². College of Medicine, University of Central Florida , Orlando, USA ³. College of Medicine, University of Central Florida, Orlando, USA ⁴. Office of Faculty and Academic Affairs, University of Central Florida College of Medicine, Orlando, USA

Due to the need for a protocol in choosing the correct evaluation system for patients with sepsis-like symptoms, Raith et al. sought to assess the discriminatory capacity of SOFA, qSOFA and SIRS criteria in patients who were suspected to have an infection and were observed to have an increase by two or more criteria/points within the first 24 hours of admission [7]. The primary outcome measured was in-hospital mortality. This was a retrospective cohort study consisting of 184,875 adults at least 17 years of age who were admitted to the intensive care units at 182 Australian and New Zealand intensive care units with suspected infection. The data used was gathered from the Australian and New Zealand Intensive Care Society (ANZICS) Adult Patient Database and included records from 2000 to 2015. SOFA, qSOFA and SIRS criteria were calculated using lab and physiological parameters recorded from the first 24 hours of intensive care unit (ICU) admission. Patients that were repeat ICU admissions and those that were transferred were excluded from the study [7].

The discrimination of in-hospital mortality for SOFA (75.3% AUROC; 99% confidence interval (CI): 0.750–0.757) was significantly higher than that of qSOFA (60.7% AUROC; 99% CI: 0.603–0.611) or SIRS (58.9% AUROC; 99% CI: 0.585–0.593). Of the study population, 90.1% (165,103 patients) had an increase in SOFA score from baseline to at least two points; 86.7% (158,710 patients) met two or more SIRS criteria, and 54.4% (99,611 patients) had a qSOFA score of at least two points [7]. In adults admitted to the ICU with suspected infection, an increase in SOFA score of at least two points had superior prognostic accuracy for in-hospital mortality followed by qSOFA and finally SIRS criteria. With SOFA score demonstrating significantly greater discrimination for in-hospital mortality, the authors highlight that this may suggest that SIRS criteria and qSOFA may have limited utility in predicting mortality in an ICU setting [7].

SOFA lebih superior dari qSOFA dan SIRS

Harimtepathip P. et al., 2018



Identification of developing multiple organ failure in sepsis patients with low or moderate SOFA scores

Gunnar Elke^{1*} , Frank Bloos^{2,3}, Darius Cameron Wilson⁴, Patrick Meybohm⁵ and the SepNet Critical Care Trials Group

An early identification of sepsis patients likely to progress towards multiple organ failure is crucial in order to initiate targeted therapeutic strategies to decrease mortality. Our recent publication highlighted the greater accuracy of mid-regional proadrenomedullin (MR-proADM) compared with conventional biomarkers and clinical scores in predicting 28-day mortality in patients with initially low (≤ 7 points; $N = 240$) or moderate (8–13 points; $N = 653$) Sepsis-related Organ Failure Assessment (SOFA) scores [1], thus confirming results from smaller investigations [2, 3]. This additional post hoc analysis aimed to further describe the non-surviving patient population of both subgroups and identify those likely to progress towards sepsis-related multiple organ failure.

In our study, patients with low SOFA scores had a lower 28-day mortality rate ($N = 35$; 14.6% vs. $N = 181$; 27.7%) and incidence of septic shock [4] ($N = 87$; 36.7% vs. $N = 399$; 61.5%) compared to those with moderate values. Nevertheless, multiple organ failure was the most common cause of death irrespective of initial SOFA classification (low vs. moderate SOFA: $N = 16$; 45.7% vs. $N = 79$; 43.6%). Patients with low SOFA scores tended to take longer to progress towards multiple organ failure (10 [6–18] vs. 7 [3–11] days) and had an increasing number of dysfunctional organs (identified by organ-specific SOFA scores ≥ 2) and an increasing overall SOFA score (e.g. diagnosis to day 7: 2 [1–2]

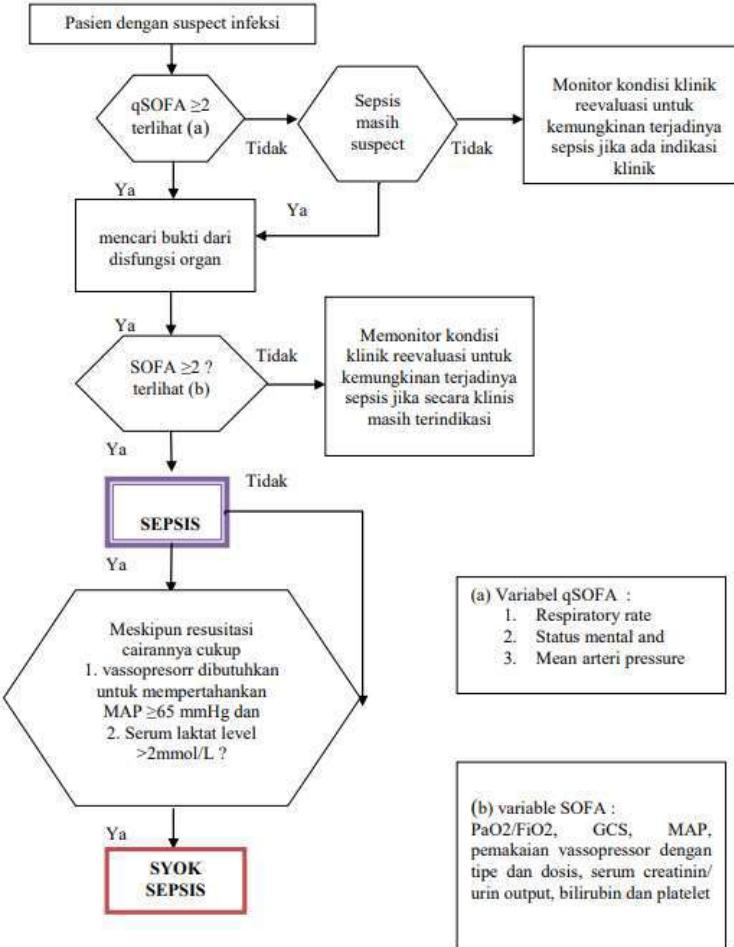
vs. 4 [3–5] dysfunctional organs; $P < 0.01$; 6.3 ± 1.3 vs. 10.2 ± 4.7 points; $P < 0.01$).

Area under the receiver operating characteristic curve (AUROC) and Cox regression analysis indicated that MR-proADM had the highest accuracy in predicting progression towards sepsis-related multiple organ failure mortality in both groups (Fig. 1). High initial concentrations in non-surviving patients with low or moderate SOFA scores resulted in a high progression rate towards multiple organ failure ($N = 6$; 100.0% and $N = 25$; 52.1%), with similar results found in patients with increasing concentrations over the first 24 h (e.g. moderate SOFA population: $N = 15$; 57.8%). Conversely, mortality in patients with low MR-proADM concentrations was predominantly due to non-sepsis-related causes ($N = 14$; 60.9%), with a low subsequent progression rate towards sepsis-related multiple organ failure in the total patient population with continuously low concentrations over the first 24 h ($N = 3$; 1.4%).

Results suggest that initially high or increasing MR-proADM concentrations may help to identify patients with a high risk of progression towards sepsis-related multiple organ failure. Elevated microcirculation dysfunction and endothelial permeability may therefore play a significant role in driving the development of further organ dysfunction, as described previously [5]. Further studies in larger patient populations are essential to confirm these hypotheses.

- ▷ Pasien dengan SOFA score <8 memiliki 28 hari mortalitas lebih rendah daripada SOFA score 8-13

Algoritma Diagnosis Sepsis dan Syok Sepsis



Singer et al., 2016

Tatalaksana

- ▷ Ada 2 manajemen sepsis : initial management (<3 jam onset) dan management (<6 jam)
 - ▽ Initial management (<3 jam)
 - △ Cek laktat serum
 - △ Kultur darah sebelum administrasi antibiotik
 - △ Antibiotik broad spektrum; sepsis <3 jam, syok sepsis <1 jam
 - △ Drug of choice untuk empirical antibiotic therapy sesuai dengan site of infection.

Tatalaksana

- ▽ Management (<6 jam)
 - △ IV fluid bolus 30 ml/kg kristaloid dalam 3 jam pertama
 - △ Vasopressor untuk syok atau hipotensi persisten. Disarankan menggunakan norepinefrin. Target MAP>65 mmHg.
 - △ Cek ulang laktat serum

Antibiotic Timing

Sepsis is definite or probable	Administer antimicrobials Immediately , ideally within 1 hour of recognition.	Administer antimicrobials Immediately , ideally within 1 hour of recognition.
Sepsis is possible	Administer antimicrobials immediately , ideally within 1 hour of recognition.	Rapid assessment* of infectious vs. noninfectious causes of acute illness. Administer antimicrobials within 3 hours if concern for infection persists.

**Rapid assessment includes history and clinical examination, tests for both infectious and noninfectious causes of acute illness, and immediate treatment of acute conditions that can mimic sepsis. Whenever possible, this should be completed within 3 hours of presentation so that a decision can be made as to the likelihood of an infectious cause of the patient's presentation and timely antimicrobial therapy provided if the likelihood is thought to be high.*

Vasoactive Agent Management

	Use norepinephrine as first-line vasopressor.
For patients with septic shock on vasopressors	Target a MAP of 65 mm Hg. Consider invasive monitoring of arterial blood pressure.
If central access is not yet available	Consider initiating vasopressors peripherally.*
If MAP is inadequate despite low-to-moderate norepinephrine	Consider adding vasopressin.
	Consider adding dobutamine or switching to epinephrine.

● Strong recommendations are displayed in green

● Weak recommendations are displayed in yellow.

*When vasopressors are used peripherally, they should be administered only for a short period of time and in a vein proximal to the antecubital fossa.

DOC untuk severe sepsis

tanpa sumber infeksi yang jelas disertai fungsi renal normal

- ▷ Syok sepsis

- piperacillin-tazobactam 3.375-4.5 gram q6h
- Cefepim 2 g q12h
- Meropenem 1 g q8h

Jika alergi golongan beta laktam, dapat menggunakan

- Aztreonam 2 g q8h
- Ciprofloxacin 400 mg q12h
- Levofloxacin 750 mg q24h
- Tambah vancomycin loading dose 25-30 mg/kg, lanjut 15-20 mg/kg q8-12h

DOC untuk severe sepsis

tanpa sumber infeksi yang jelas disertai fungsi renal normal

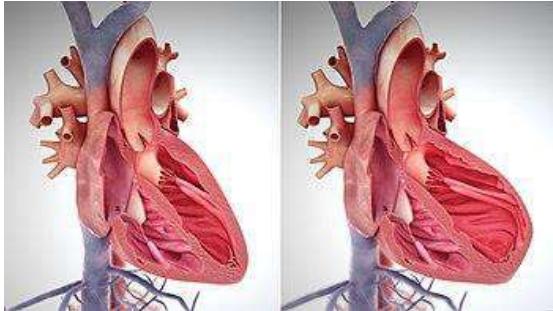
- Neutropenia
 - Cefepim 1 g q8h
 - Meropenem 1 g q8h
 - piperacillin-tazobactam 3.375 gram q4h
 - Tambah vancomycin loading dose 25-30 mg/kg, lanjut 15-20 mg/kg q8-12h untuk suspek infeksi kulit / soft tissue, hipotensi, severe mucositis, bakteremia
 - Tambah tobramycin (5-7 mg/kg q24h) + vancomycin + caspofungin (dosis awal 70 mg lanjut 50 mg q24h) jika severe sepsis/syok sepsis.

Vassopressor

- Target MAP 65 mmHg
 - Norephineprine
 - ephinephrine jika target tidak mencapai MAP atau vasopressin untuk mengurangi kebutuhan norephineprin
 - menghindari penggunaan dopamine pada pasien

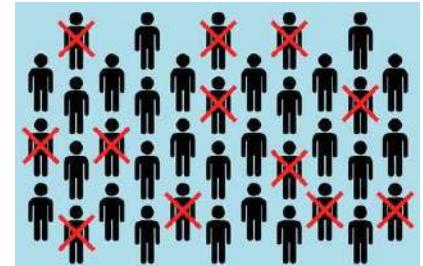
Komplikasi

- Respiratori : ARDS
- Cardiovascular : hipotensi, gagal jantung
- Ginjal : AKI
- Neurologik : delirium, koma
- DIC
- Asidosis metabolik
- Gagal hati
- Kematian



Prognosis

- ✓ Meski pasien dirawat di iCU, **mortalitas nosokomial** untuk syok sepsis mencapai **80%** dalam 30 tahun terakhir.
- ✓ Dengan adanya pelatihan, **surveillance, monitoring dan terapi inisiasi yang cepat dan tepat** untuk disfungsi organ, mortalitas sepsis dan syok sepsis turun mendekati **20%**
- ✓ Dari beberapa pasien yang bertahan dari penyakit, **kejadian readmisi RS dalam 90 hari sebesar 40%**



Daftar Pustaka

- ☒ Elke, G., Bloos, F., Wilson, D.C. et al. Identification of developing multiple organ failure in sepsis patients with low or moderate SOFA scores. *Crit Care* **22**, 147 (2018).
<https://doi.org/10.1186/s13054-018-2084-z>
- ☒ Guntur H. (2011). *Sepsis in Elderly*. Simposium Geriatri Semarang.
- ☒ Guntur H. (2014). *Buku Ajar Ilmu Penyakit Dalam Edisi Keenam Jilid I*. Jakarta: Internal Publishing.
- ☒ Gyawali, B., Ramakrishna, K., & Dhamoon, A. S. (2019). Sepsis: The evolution in definition, pathophysiology, and management. *SAGE Open Medicine*, 7, 205031211983504. doi:10.1177/2050312119835043
- ☒ Harimtepathip P, Lee JR, Griffith E, Williams G, Patel RV, Lebowitz D, Koochakzadeh S. Quick Sepsis-related Organ Failure Assessment Versus Systemic Inflammatory Response Syndrome Criteria for Predicting Organ Dysfunction and Mortality. *Cureus*. 2018 Oct 29;10(10):e3511. doi: 10.7759/cureus.3511. PMID: 30613455; PMCID: PMC6314391.
- ☒ Loscalzo, J., Kasper, D. L., Longo, D. L., Fauci, A. S., Hauser, S. L., Jameson, J. L., & Harrison, T. R. (2018). *Harrison's® principles of internal medicine*. New York: McGraw Hill.
- ☒ Singer M, Deutschman CS, Seymour CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA*. 2016;315(8):801–810. doi:10.1001/jama.2016.0287



04

Terima Kasih