Pomen odstranitve vira okužbe pri bolnikih s sepso – kdaj in kdo?

Fedja Pavlovec, dr. med.

KOAIT, CIT

Svetovni dan sepse 2025

Razkritja

- Brez

Zgodovina

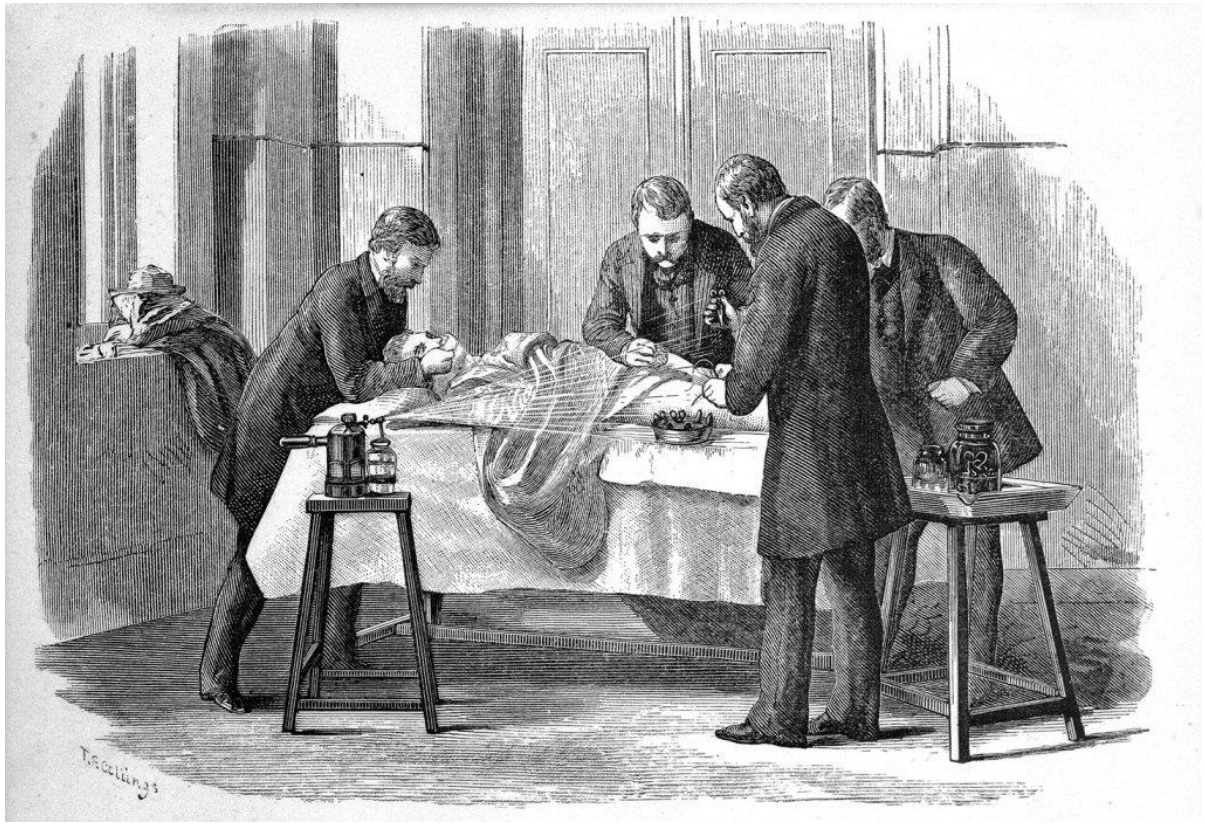


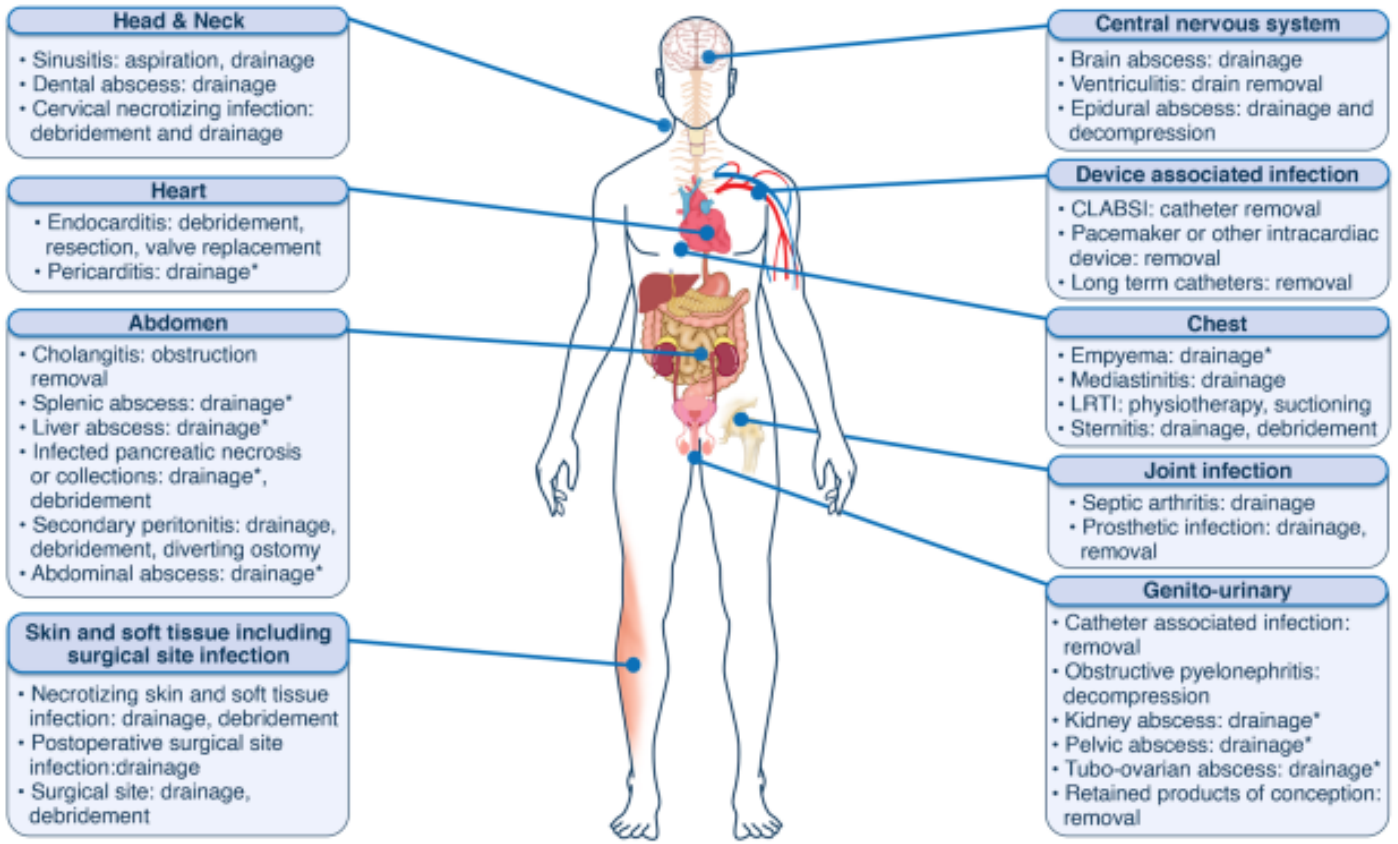
Fig 2. Amputation of arm, circa 1800.

P.W. Smith et al. / American Journal of Infection Control 40 (2012) 35-42

Kaj pomeni odstranitev vira okužbe – source control?

- Vsi ukrepi za:
  - Odstranitev vira okužbe
  - Nadzor nadaljnje kontaminacije
  - Povrnitev anatomije in funkcije organa kot je bila pred okužbo

Kaj je vir okužbe?



Intensive Care Med (2022) 48:1799–1802
https://doi.org/10.1007/s00134-022-06852-5

Okužbe v enoti intenzivne terapije

- In the European Prevalence of Infections in Intensive Care (EPIC)-II study, about *two thirds of the infected patients were considered surgical patients*
- Severe intra-abdominal infection (IAI) represents the *second most common cause of sepsis in critically ill patients*
- In a large study from China, *abdominal infections accounted for 72% of the infections in SICU* patients diagnosed with severe sepsis, with acute pancreatitis and GI as the leading sources of infection
- Hospital mortality associated with IAI varies between settings and disease entities, but is generally high at *23–38%*

Odstranitev vira okužbe

- *45% of patients* with sepsis and septic shock require some form of source control
- *42% of patients* with septic shock required source control. In this study, the majority of these procedures was surgical (85%) (Bloos et al. 2017)

Odstranitev vira okužbe – kirurški principi

Intervention	Drainage	Debridement	Restoration of anatomy and function
Open surgery	+++	+++	+++
Percutaneous drainage	++	+	0
Device removal	+	0	0
Desobstruction	++	0	++
Open abdomen management	++	0	0

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Intensive Care Med (2021) 47:1181–1247
https://doi.org/10.1007/s00134-021-06506-y

GUIDELINES

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

Laura Evans[1*], Andrew Rhodes[2], Waleed Alhazzani[3], Massimo Antonelli[4], Craig M. Coopersmith[5], Craig French[6], Flávia R. Machado[7], Lauralyn Mcintyre[8], Marlies Ostermann[9], Hallie C. Prescott[10], Christa Schorr[11], Steven Simpson[12], W. Joost Wiersinga[13], Fayez Alshamsi[14], Derek C. Angus[15], Yaseen Arabi[16], Luciano Azevedo[17], Richard Beale[9], Gregory Beilman[18], Emilie Belley-Cote[19], Lisa Burry[20], Maurizio Cecconi[21,22], John Centofanti[23], Angel Coz Yataco[24], Jan De Waele[25], R. Phillip Dellinger[11], Kent Doi[26], Bin Du[27], Elisa Estenssoro[28], Ricard Ferrer[29], Charles Gomersall[30], Carol Hodgson[31], Morten Hylander Møller[32], Theodore Iwashyna[33], Shevin Jacob[34], Ruth Kleinpell[35], Michael Klompas[36,37], Younsuck Koh[38], Anand Kumar[39], Arthur Kwizera[40], Suzana Lobo[41], Henry Masur[42], Steven McGloughlin[43], Sangeeta Mehta[44], Yatin Mehta[45], Mervyn Mer[46], Mark Nunnally[47], Simon Oczkowski[3], Tiffany Osborn[48], Elizabeth Papathanassoglou[49], Anders Perner[50], Michael Puskarich[51], Jason Roberts[52,53,54,55], William Schweickert[56], Maureen Seckel[57], Jonathan Sevransky[5], Charles L. Sprung[58,59], Tobias Welte[60], Janice Zimmerman[61] and Mitchell Levy[62]

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Source control

Recommendation

27. For adults with sepsis or septic shock, we **recommend** rapidly identifying or excluding a specific anatomical diagnosis of infection that requires emergent source control and implementing any required source control intervention as soon as medically and logistically practical

Best Practice Statement

smaller studies suggest that source control within 6–12 h

Time to antibiotics

Recommendations

12. For adults with possible septic shock or a high likelihood for sepsis, we **recommend** administering antimicrobials immediately, ideally within 1 h of recognition

Strong recommendation, low quality of evidence (Septic shock)

Strong recommendation, very low quality of evidence (Sepsis without shock)

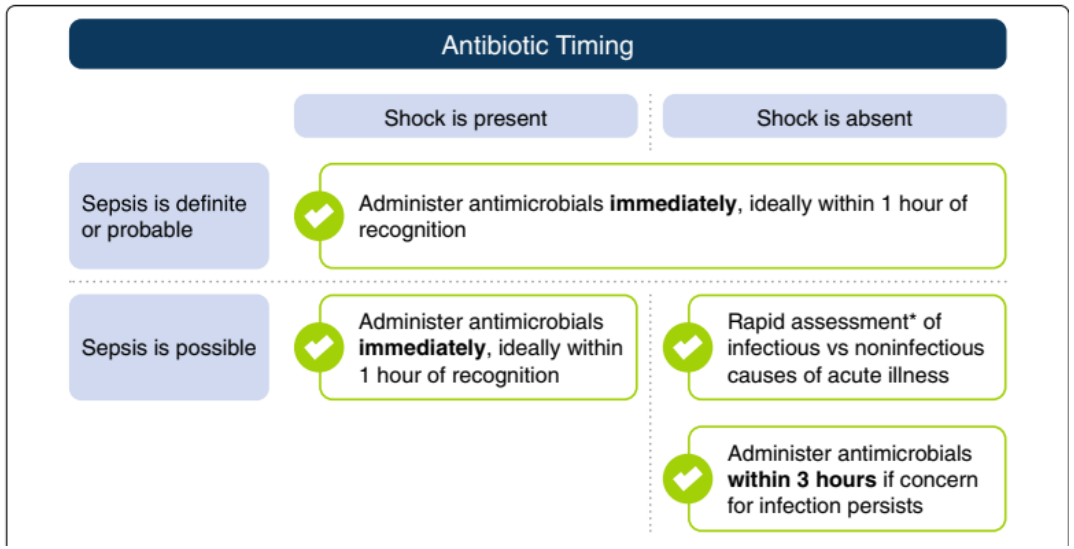
13. For adults with possible sepsis without shock, we **recommend** rapid assessment of the likelihood of infectious versus non-infectious causes of acute illness

Source control

Recommendation

27. For adults with sepsis or septic shock, we **recommend** rapidly identifying or excluding a specific anatomical diagnosis of infection that requires emergent source control and implementing any required source control intervention as soon as medically and logistically practical

Best Practice Statement



Nadzor vira okužbe – kdaj?

Langenbecks Arch Surg (2010) 395:489–494
DOI 10.1007/s00423-010-0650-1

OVERVIEW

Early source control in sepsis

Jan J. De Waele

- Klasifikacija glede na nujnost:
  - 1. nivo – znotraj 1 – 2h
    - Nekrotizirajoče okužbe mehkih tkiv in kože, IAI, IACS
  - 2. nivo – znotraj 2 – 24h
    - Po vsaj delni korekciji homeostaze
    - Večina okužb – lokaliziran peritonitis, empiem, holecistitis, apendicitis…
  - 3. nivo – odloženo
    - Po demarkaciji vnetnega procesa – pankreatična nekroza..

Table 1 Urgency of source control intervention (after [23])

Level of urgency	Timing of intervention	Context
1	<1-2 h after diagnosis	Rapidly progressive disease e.g. necrotizing fasciitis, intra-abdominal infection with abdominal compartment syndrome
2	As soon as patient physiology allows	Limited deferral is acceptable provided antibiotics are administered and patient is not deteriorating e.g. peritonitis
3	As soon as infectious process has demarcated	Adequate source control is facilitated and probability of collateral damage lower e.g. infected pancreatic necrosis in a stable patient

De Waele and De Bus *BMC Infectious Diseases* 2014, **14**:193
http://www.biomedcentral.com/1471-2334/14/193

Nadzor vira okužbe?

Bloos et al. (2017) found that source control was significantly related to 28-day mortality and reported a 1% increase in mortality per hour delay of surgical source control.

Immediate goals
Prevent further contamination
Eliminate as much of the bacterial inoculum as feasible
Restore anatomic and physiological integrity

But...
Avoid undue compromise of the patient's physiological status
Diagnostic approach to confirm abdominal infection source in septic patients depends on the haemodynamic stability of the patient

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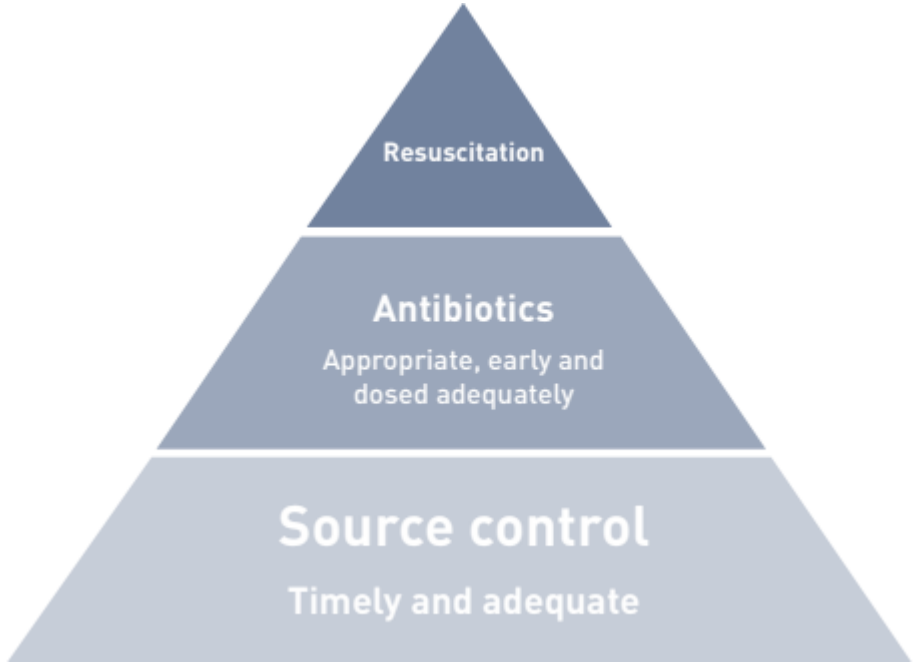

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Journal of Critical Care
Volume 53, October 2019, Pages 176-182

Impact of timing to source control in patients with septic shock: A prospective multi-center observational study

Hongjung Kim MD [a 1], Sung Phil Chung MD, PhD [b 1], Sung-Hyuk Choi MD, P
Gu Hyun Kang MD, PhD [d], Tae Gun Shin MD, PhD [e], Kyuseok Kim MD, PhD [f]
PhD [g] ✉, Kap Su Han MD, PhD [h], Han Sung Choi MD, PhD [i], Gil Joon Suh M
Young Kim MD, PhD [k], Tae Ho Lim MD, PhD [a 2] ✉, Byuk Sung Ko MD, Ph
for the Korean Shock Society (KoSS) Investigators

FEATURE ARTICLES

Impact of Source Control in Patients With Severe Sepsis and Septic Shock*

Martínez, María Luisa MD[1]; Ferrer, Ricard MD, PhD[2,3]; Torrents, Eva MD[1]; Guillamat-Prats, Raquel PhD[3]; Gomà, Gemma RN[1]; Suárez, David MSc, PhD[4]; Álvarez-Rocha, Luis MD[5]; Pozo Laderas, Juan Carlos MD, PhD[6]; Martín-Loeches, Ignacio MD, PhD[7]; Levy, Mitchell M. MD, FCCP, FCCM[8]; Artigas, Antonio MD, PhD[1,3]

Author Information

Critical Care Medicine 45(1):p 11-19, January 2017. | *DOI:* 10.1097/CCM.0000000000002011

- **Obe študiji pokažeta zmanjšanje smrtnosti po odstranitvi vira okužbe vendar neodvisno od časa do odstranitve**

Outcomes of Patients With Sepsis and Septic Shock Requiring Source Control: A Prospective Observational Single-Center Study

Critical Care Explorations

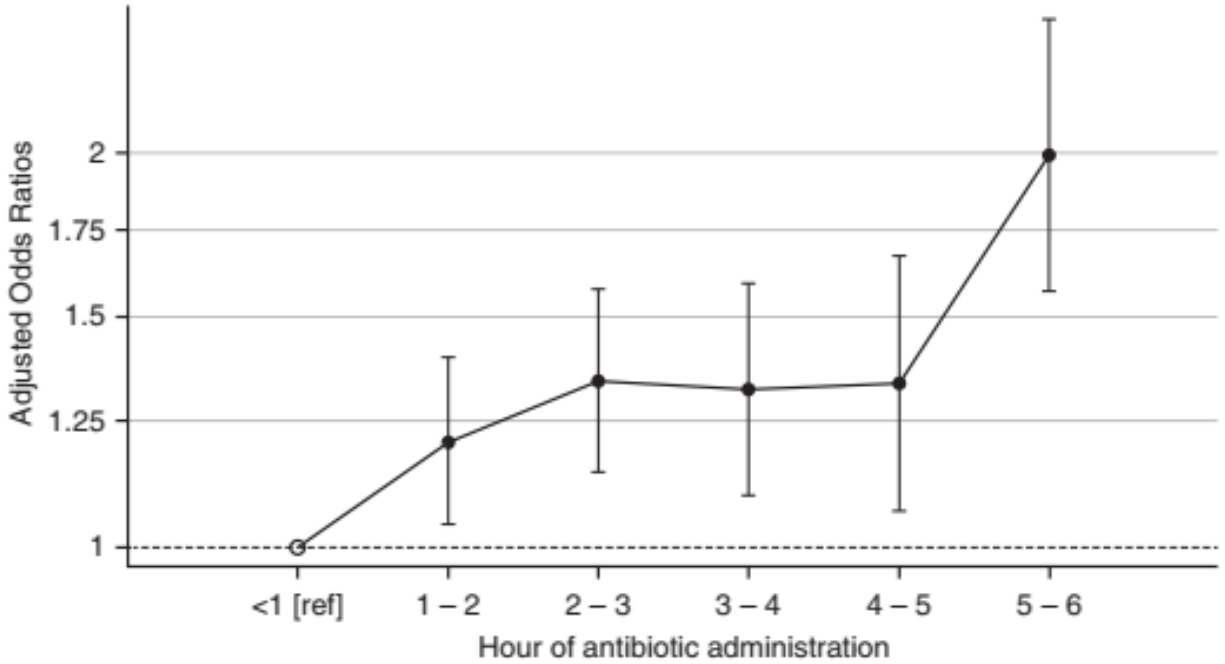
Fatima Naqvi, MD[1]
Pranav Jain, MD[2]
Amna Umer, PhD[3]
Bilal Rana, MD[4]
Sarah Hadique, MD[1]

Differences in Outcomes in the Early and Late Interventions in Source Control Group

Outcome Measures	Intervention Group ($n = 94$)	Intervention Group: Time < 24 hr ($n = 42$)	Intervention Group: Time ≥ 24 hr ($n = 52$)	p
30-d mortality (n [%])	30 (31.9)	10 (23.8)	20 (38.5)	0.13
ICU mortality (n [%])	17 (18.1)	7 (16.7)	10 (19.2)	0.75
Hospital LOS (mean ± SD)[1]	17.4 (15.2)	12.5 (10.9)	21.4 (16.9)	< 0.01
ICU LOS (mean ± SD)[2]	7.7 (6.9)	5.2 (5.5)	9.7 (7.4)	< 0.01
Days on mechanical ventilation (mean ± SD)	6.8 (7.5)	6.3 (7.9)	7.2 (7.3)	0.70
Acute kidney injury needing renal replacement therapy (n [%])	18 (19.2)	5 (11.9)	13 (25.0)	0.11

The Timing of Early Antibiotics and Hospital Mortality in Sepsis

Vincent X. Liu[1], Vikram Fielding-Singh[2], John D. Greene[1], Jennifer M. Baker[1], Theodore J. Iwashyna[3,4], Jay Bhattacharya[5], and Gabriel J. Escobar[1]



Model	Odds Ratio for Hospital Mortality, per Elapsed Hour until Antibiotic Administration	95% CI	*P* Value
Unadjusted	0.89	0.86–0.91	<0.001
+ Sepsis severity strata	0.96	0.93–0.99	0.013
+ Severity of illness	1.08	1.04–1.12	<0.001
+ Demographics	1.09	1.05–1.13	<0.001
Fully adjusted model, in each subgroup			
Sepsis only	1.09	1.00–1.19	0.046
Severe sepsis only	1.07	1.01–1.24	0.014
Septic shock only	1.14	1.06–1.23	0.001

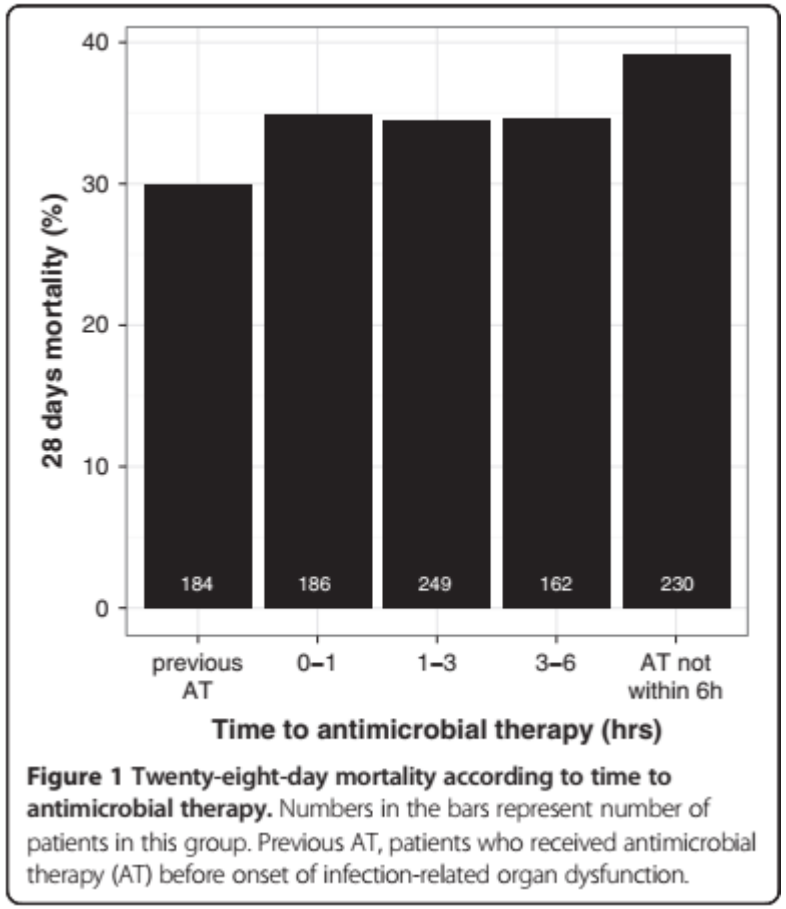


Figure 1 Twenty-eight-day mortality according to time to antimicrobial therapy. Numbers in the bars represent number of patients in this group. Previous AT, patients who received antimicrobial therapy (AT) before onset of infection-related organ dysfunction.

Bloos *et al. Critical Care* 2014, **18**:R42
http://ccforum.com/content/18/2/R42

CRITICAL CARE

RESEARCH Open Access

Impact of compliance with infection management guidelines on outcome in patients with severe sepsis: a prospective observational multi-center study

Table 3 Time to antimicrobial therapy and source control according to survival

	Survivors	Nonsurvivors	*P* value
Time to antimicrobial therapy (hours)			
28-day survival	2.0 (0.6 to 5.6) ($n = 659$)	2.5 (1.0 to 6.6) ($n = 352$)	0.112
ICU survival	2.0 (0.7 to 5.4) ($n = 667$)	2.8 (0.9 to 7.0) ($n = 329$)	0.023
Hospital survival	2.0 (0.6 to 5.1) ($n = 581$)	2.8 (0.9 to 7.0) ($n = 329$)	0.020
Time to source control (hours)			
28-day survival	2.0 (−0.5 to 10.1) ($n = 286$)	5.7 (0.4 to 18.0) ($n = 139$)	0.004
ICU survival	2.0 (−0.6 to 9.1) ($n = 286$)	6.0 (0.5 to 19.9) ($n = 132$)	<0.001
Hospital survival	2.0 (−0.5 to 9.3) ($n = 249$)	5.5 (0.4 to 18.9) ($n = 166$)	0.001

Key messages

- A delay of surgical or interventional source control of more than 6 hours was associated with increased mortality.
- Although survivors had a shorter time to AT than nonsurvivors, there was no significant association or linear relationship between time to AT and survival.
- An inadequate empiric AT was associated with an increased mortality.

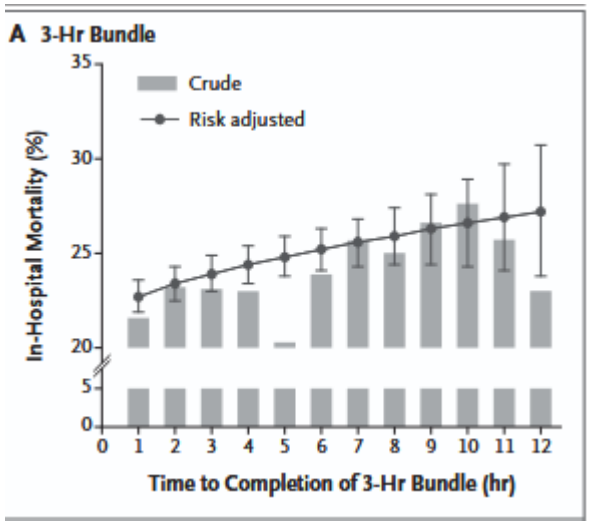
The NEW ENGLAND JOURNAL of MEDICINE

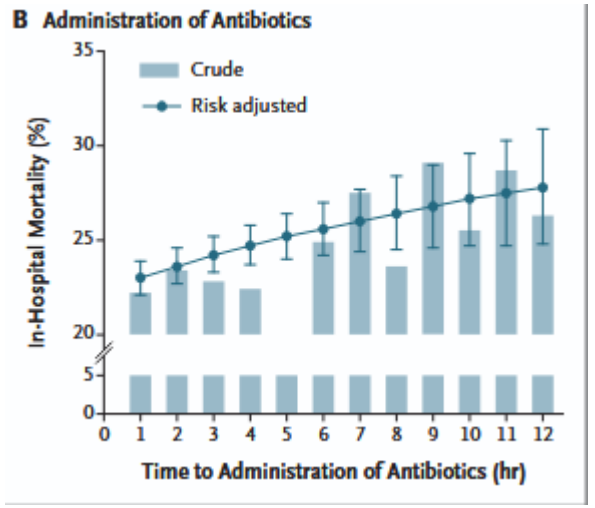
ORIGINAL ARTICLE

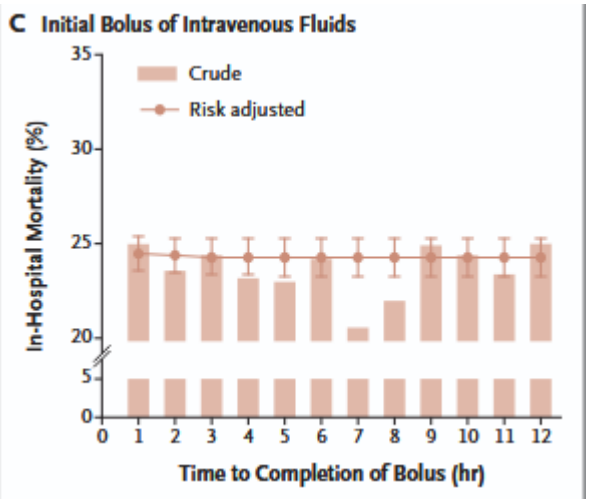
Time to Treatment and Mortality during Mandated Emergency Care for Sepsis

Christopher W. Seymour, M.D., Foster Gesten, M.D., Hallie C. Prescott, M.D., Marcus E. Friedrich, M.D., Theodore J. Iwashyna, M.D., Ph.D., Gary S. Phillips, M.A.S., Stanley Lemeshow, Ph.D., Tiffany Osborn, M.D., M.P.H., Kathleen M. Terry, Ph.D., and Mitchell M. Levy, M.D.

Hemokulture + laktat + atb + bolus tekočin +/- vazopresor







Rüddel *et al. Critical Care* (2022) 26:51
https://doi.org/10.1186/s13054-022-03901-9

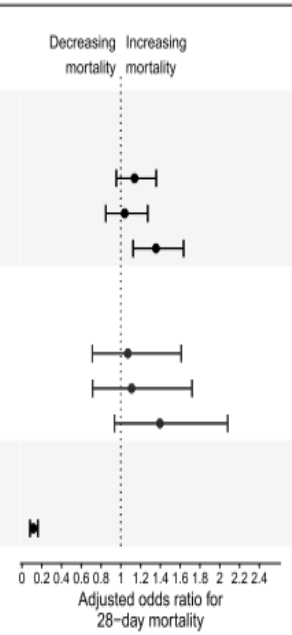
Critical Care

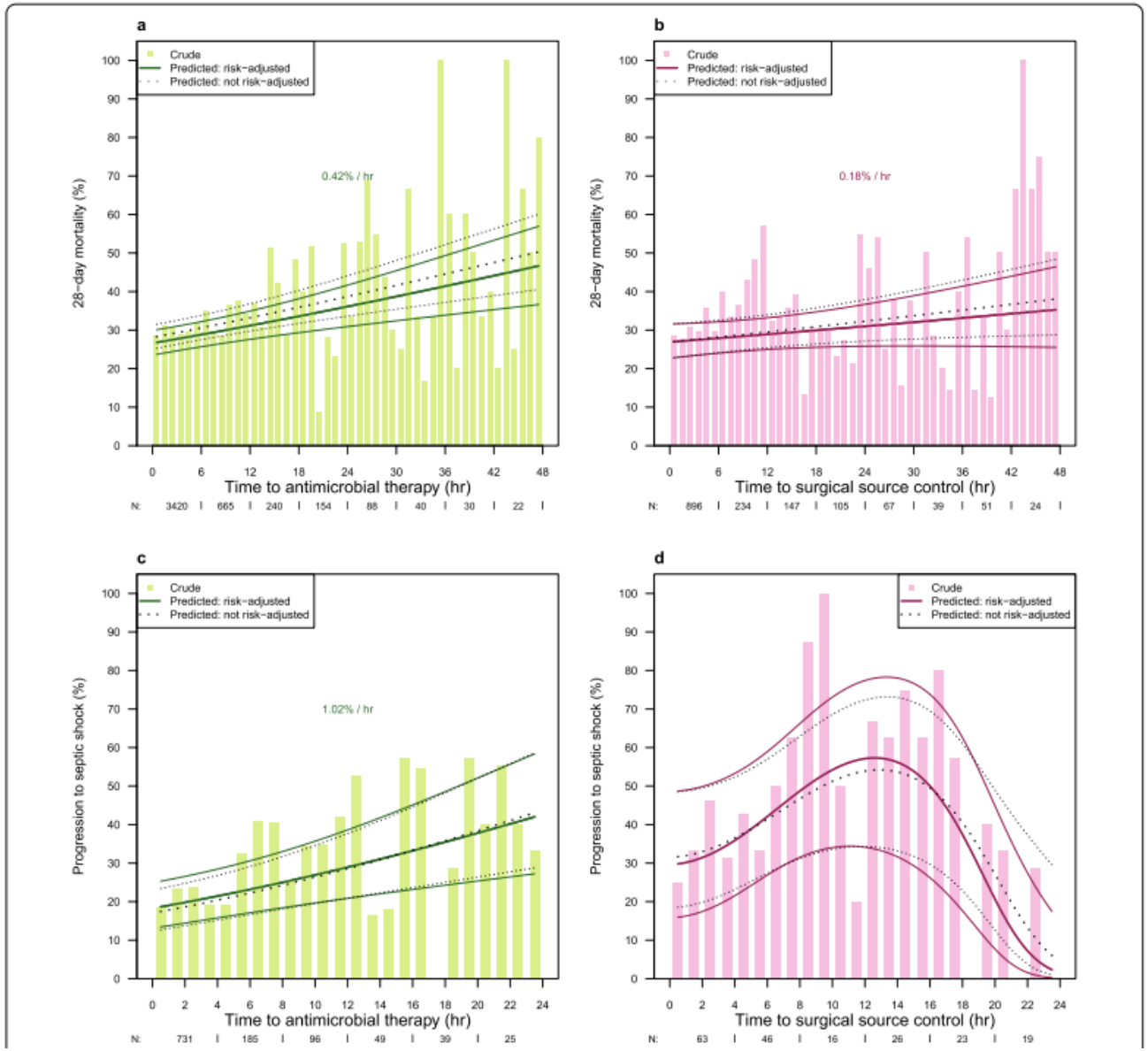
RESEARCH Open Access

Adverse effects of delayed antimicrobial treatment and surgical source control in adults with sepsis: results of a planned secondary analysis of a cluster-randomized controlled trial

Hendrik Rüddel[1,2], Daniel O. Thomas-Rüddel[1,2], Konrad Reinhart[3,4], Friedhelm Bach[5], Herwig Gerlach[6], Matthias Lindner[7], John C. Marshall[8], Philipp Simon[9], Manfred Weiss[10], Frank Bloos[1,2], Daniel Schwarzkopf[1,2,11*] and the MEDUSA study group

Predictor	No. of patients	Observed mortality	Risk-adjusted mortality	OR (95% CI)	P-value
Timing of antimicrobial therapy	4659/4792				0.008*
0–1 hr		364/1270 (28.7)	25.3 (22, 28.9)	1	
1–3 hrs		418/1352 (30.9)	27.8 (24.4, 31.6)	1.14 (0.95, 1.36)	0.149
3–6 hrs		255/836 (30.5)	26 (22.3, 30.2)	1.04 (0.85, 1.27)	0.715
>6 hrs		437/1201 (36.4)	31.5 (27.5, 35.7)	1.36 (1.12, 1.63)	0.001
Timing of surgical source control	1563/1595				0.22*
0–1 hr		92/327 (28.1)	25.1 (19.1, 32.3)	1	
1–3 hrs		85/287 (29.6)	26.4 (20.8, 32.9)	1.07 (0.71, 1.61)	0.743
3–6 hrs		93/293 (31.7)	27.1 (21.3, 33.8)	1.11 (0.71, 1.72)	0.646
>6 hrs		240/656 (36.6)	31.9 (26.7, 37.5)	1.4 (0.94, 2.08)	0.102
Success of source control	1563/1595				
Not successful		179/262 (68.3)	68.7 (60.7, 75.7)	1	
Successful		331/1301 (25.4)	20.2 (16.5, 24.5)	0.12 (0.08, 0.16)	<=0.001





From: **Association Between Time to Source Control in Sepsis and 90-Day Mortality**

JAMA Surg. 2022;157(9):817-826. doi:10.1001/jamasurg.2022.2761

- Reitz KM, Kennedy J, Li SR, et al. Association Between Time to Source Control in Sepsis and 90-Day Mortality. JAMA Surg. 2022;157(9):817–826. doi:10.1001/jamasurg.2022.2761

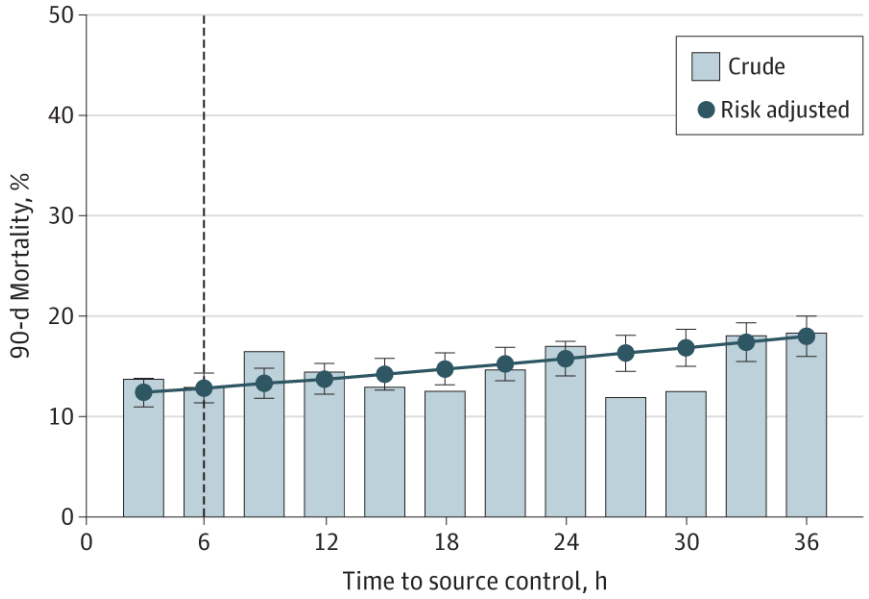
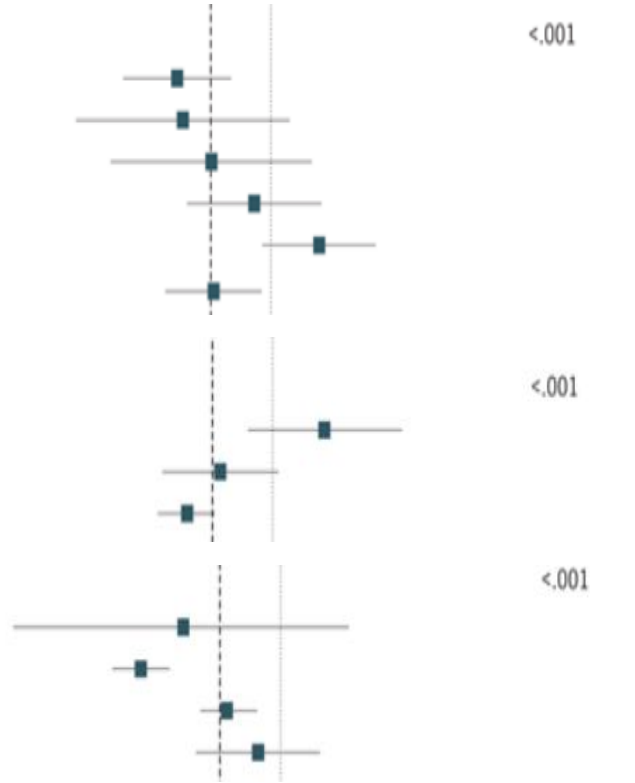


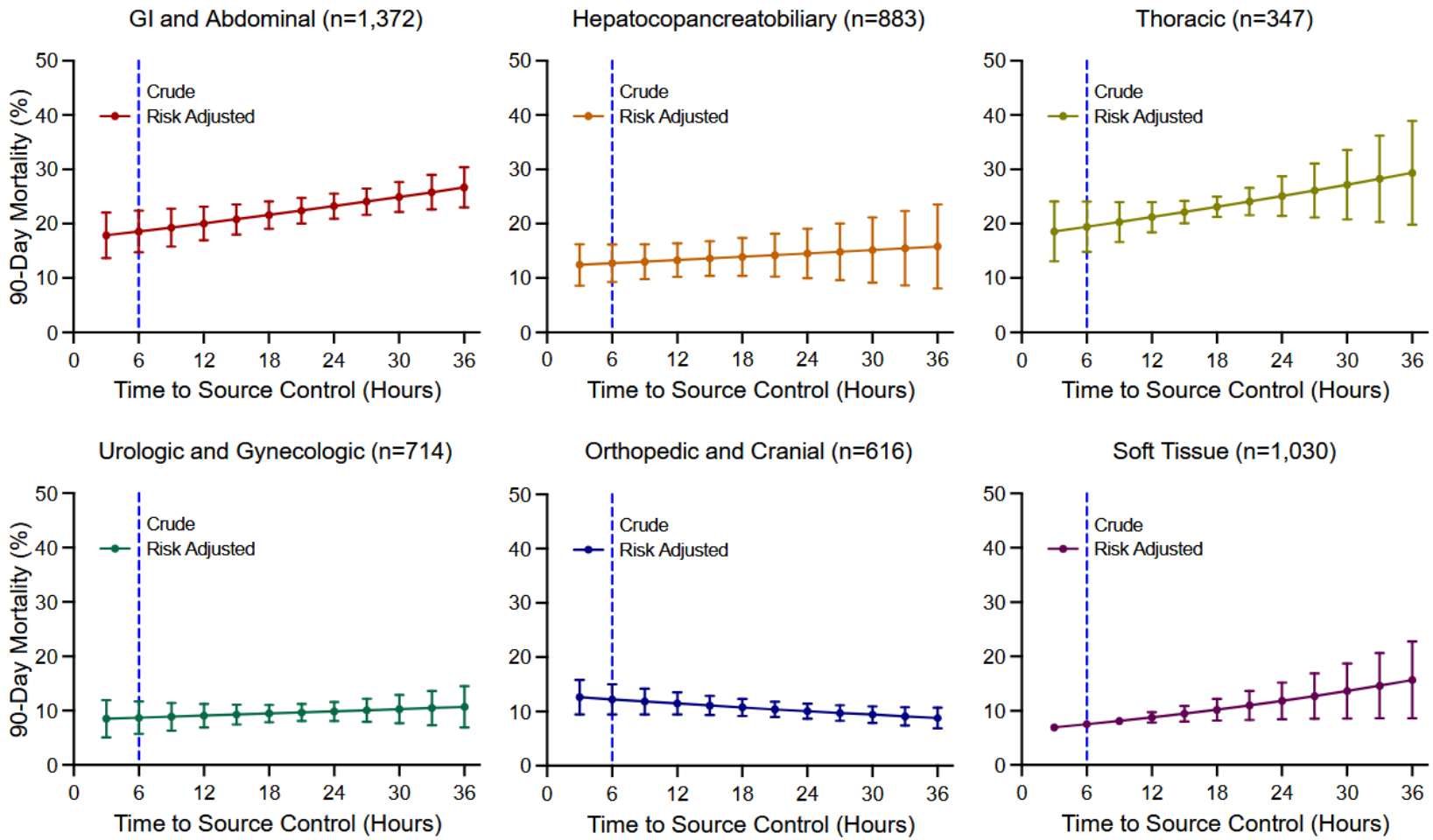
Figure 3. Association Between Early Source Control and 90-Day Mortality Across Prespecified Subgroups

Prespecified group	Early source control, No. (%)	Subgroup, No.	aOR (95% CI)	P value[a]
Anatomic site				<.001
Gastrointestinal and abdominal	482 (35.1)	1372	0.59 (0.43-0.80)	
Hepatopancreatobiliary	87 (9.9)	883	0.61 (0.33-1.12)	
Thoracic	139 (40.1)	347	0.71 (0.40-1.27)	
Urologic and gynecologic	127 (17.8)	714	0.91 (0.62-1.34)	
Orthopedic and cranial	129 (20.9)	616	1.33 (0.96-1.83)	
Soft tissue	351 (34.1)	1030	0.72 (0.55-0.95)	
Sequential Organ Failure Assessment score[c]				<.001
2	295 (16)	1839	1.35 (0.87-2.11)	
3-4	1246 (74.6)	1671	0.74 (0.53-1.04)	
≥5	857 (59)	1452	0.62 (0.52-0.72)	
Age, y				<.001
18-34	134 (38.2)	351	0.58 (0.22-1.48)	
35-54	360 (32.1)	1122	0.45 (0.39-0.53)	
55-74	581 (24.3)	2389	0.74 (0.64-0.88)	
≥75	240 (21.8)	1100	0.88 (0.62-1.26)	

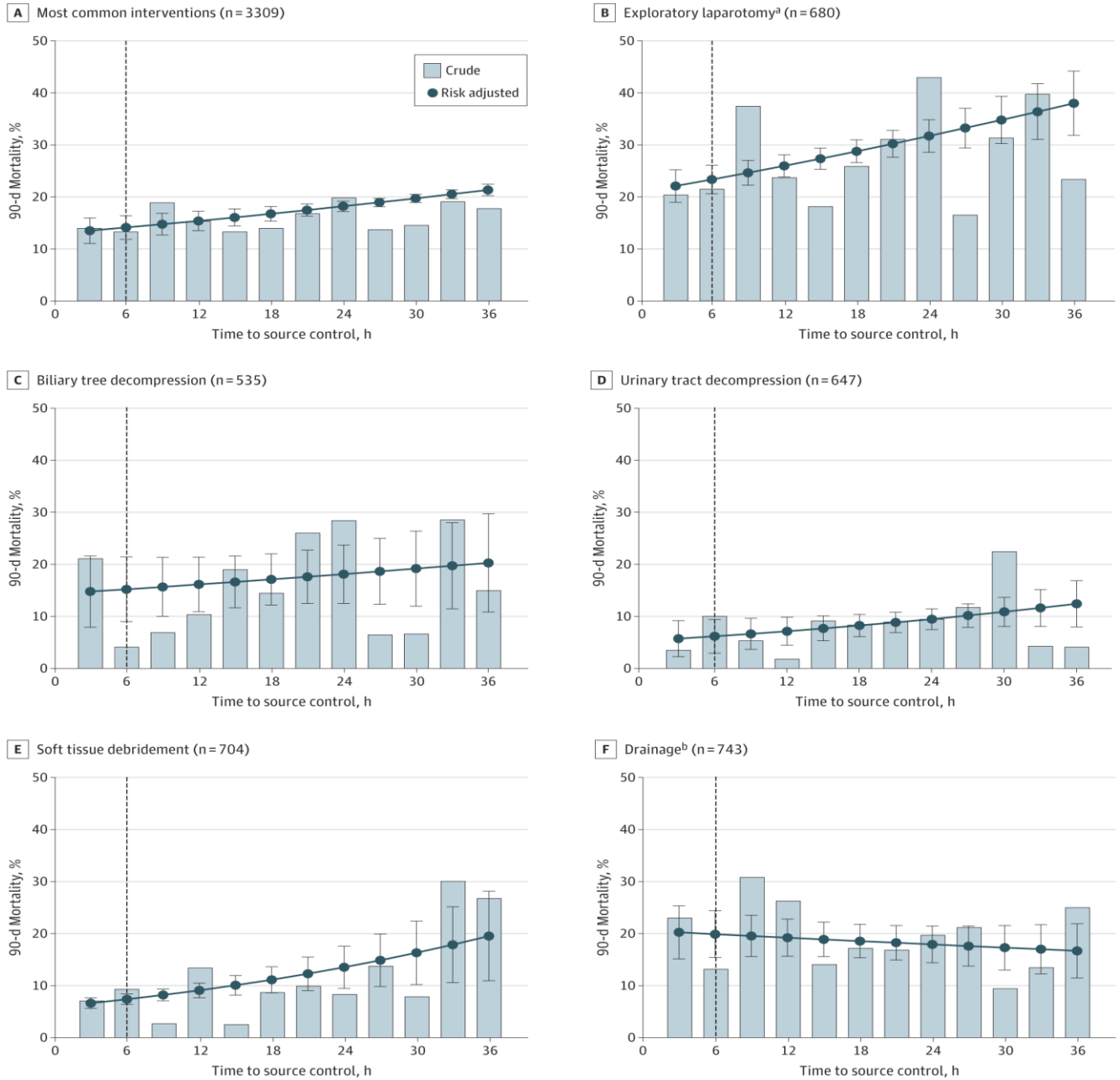


Observed and Risk-Adjusted 90-Day Mortality for the Primary CohortError bars indicate 95% CIs; dashed line, the 6-hour time point delineating early and late source control.

eFigure 3. Observed and adjusted risk of 90-day mortality by source control anatomic categories



From: **Association Between Time to Source Control in Sepsis and 90-Day Mortality**



Observed and Adjusted Risk of 90-Day Mortality Among the Most Common Interventions (n = 3309)The most common intervention families were determined by similar Current Procedural Terminology codes, defined in eTable 3 in the Supplement. Error bars indicate 95% CIs; dashed line, the 6-hour time point delineating early and late source control.

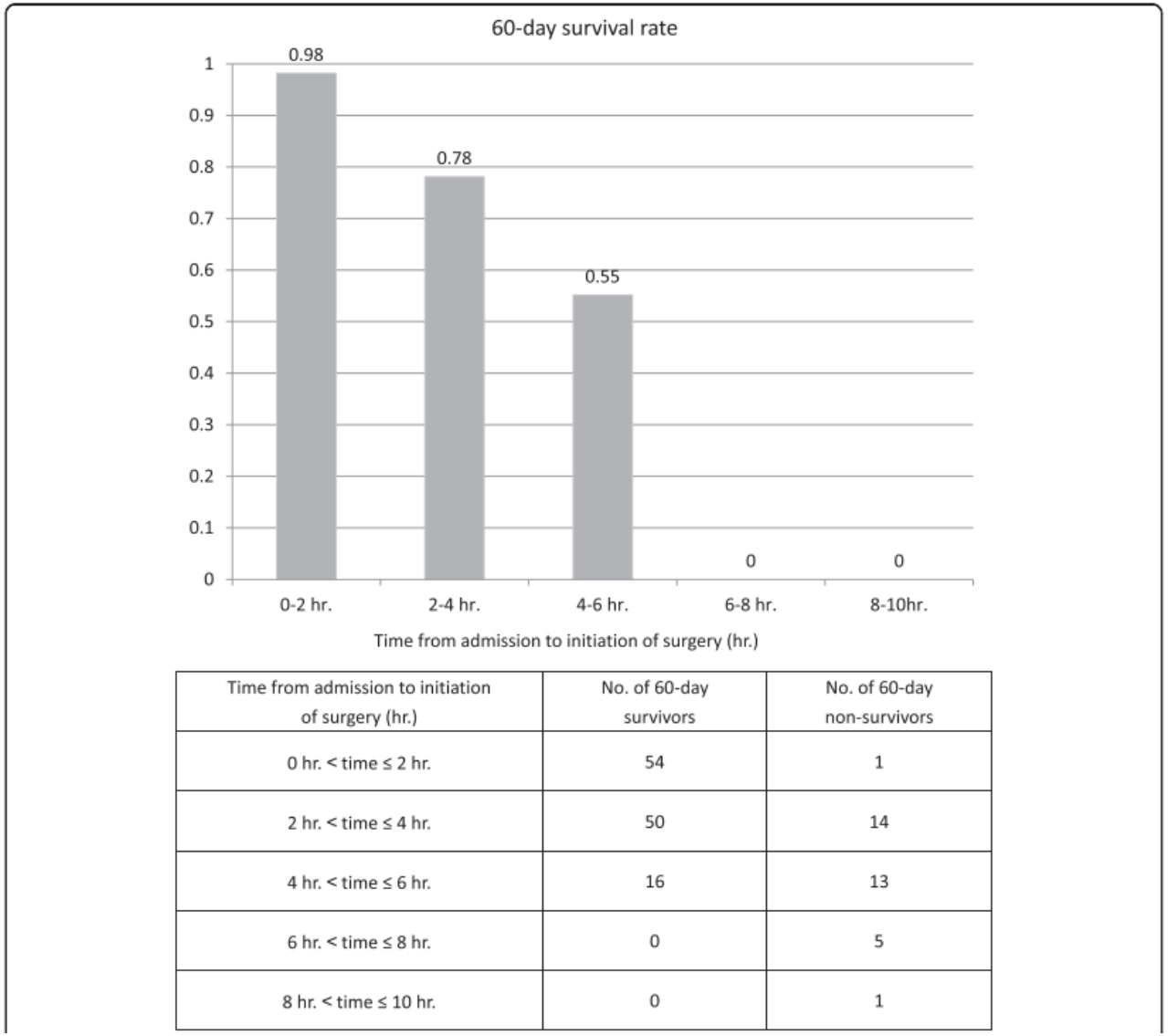
Azuhata et al. Critical Care 2014, 18:R87
http://ccforum.com/content/18/3/R87

CRITICAL CARE

RESEARCH Open Access

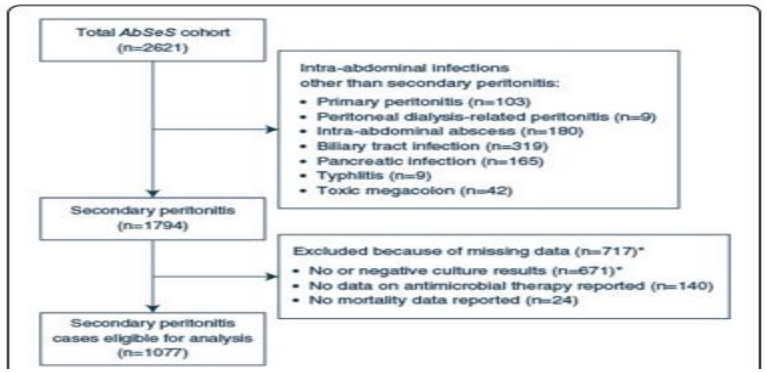
Time from admission to initiation of surgery for source control is a critical determinant of survival in patients with gastrointestinal perforation with associated septic shock

Takeo Azuhata[1*], Kosaku Kinoshita[1], Daisuke Kawano[1], Tomonori Komatsu[1], Atsushi Sakurai[1], Yasutaka Chiba[2] and Katsuhisa Tanjho[1]



Time from admission to initiation of surgery (hr.)	No. of 60-day survivors	No. of 60-day non-survivors
0 hr. < time ≤ 2 hr.	54	1
2 hr. < time ≤ 4 hr.	50	14
4 hr. < time ≤ 6 hr.	16	13
6 hr. < time ≤ 8 hr.	0	5
8 hr. < time ≤ 10 hr.	0	1

Sekundarni peritonitis



3 skupine:

- <2h – urgentno
- 2-6h – nujno
- >6h - odloženo

Take-home message

This multinational study including data from microbiologically documented secondary peritonitis showed that moderately postponed (2–6 h) and successful source control significantly predicted survival in the intensive care unit. Appropriate empirical antimicrobial treatment did not reduce mortality which was strongly increased by acquiring infection in the hospital setting, presence of diffuse peritoneal inflammation, and septic shock.

Intensive Care Med (2022) 48:1593–1606
https://doi.org/10.1007/s00134-022-06883-y

ORIGINAL

Poor timing and failure of source control are risk factors for mortality in critically ill patients with secondary peritonitis

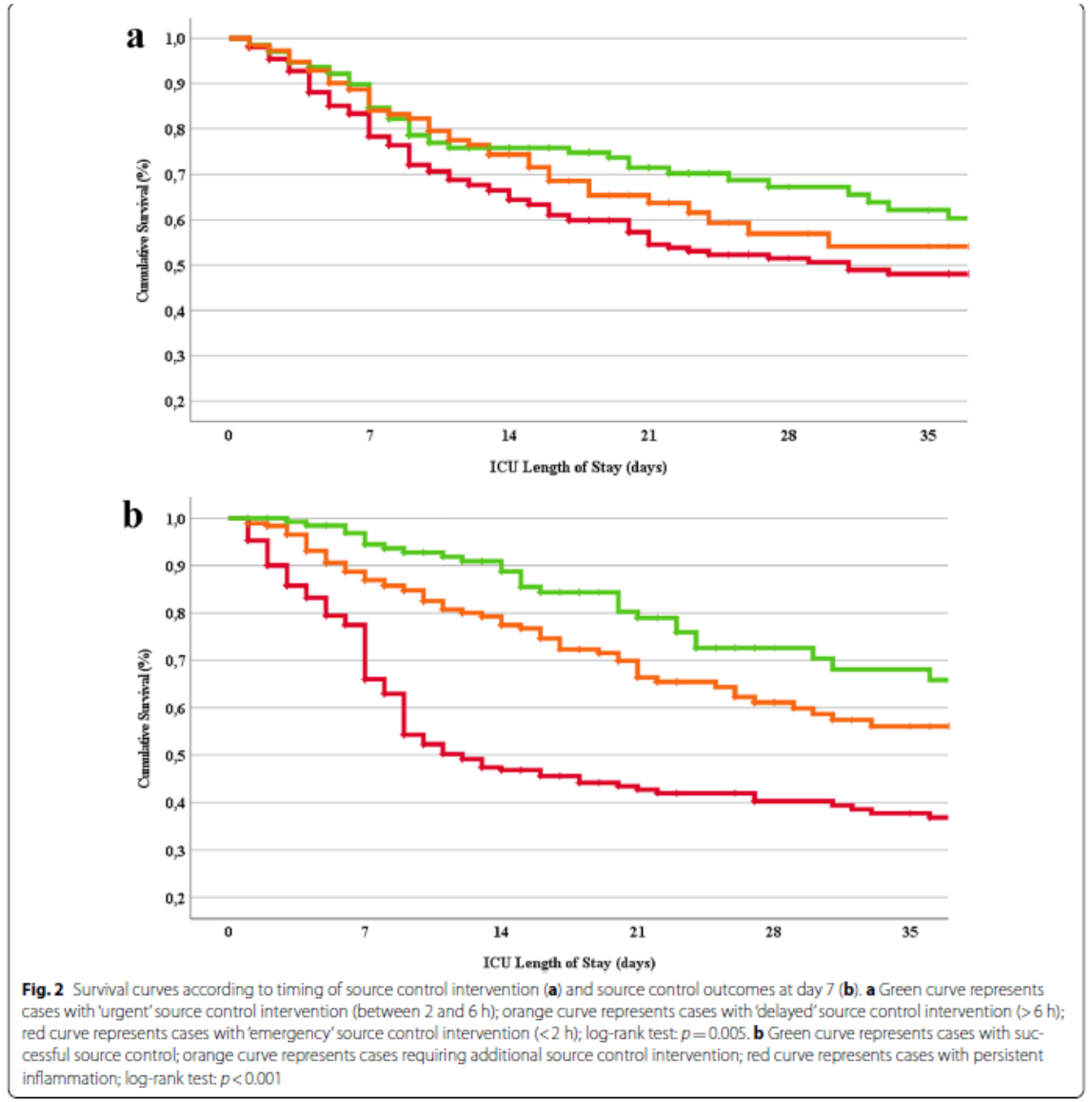


Fig. 2 Survival curves according to timing of source control intervention (**a**) and source control outcomes at day 7 (**b**). **a** Green curve represents cases with 'urgent' source control intervention (between 2 and 6 h); orange curve represents cases with 'delayed' source control intervention (> 6 h); red curve represents cases with 'emergency' source control intervention (< 2 h); log-rank test: $p = 0.005$. **b** Green curve represents cases with successful source control; orange curve represents cases requiring additional source control intervention; red curve represents cases with persistent inflammation; log-rank test: $p < 0.001$

Odstranitev vira okužbe pri kritično bolnih z IAI – kdaj ni učinkovita?

Epidemiology and outcomes of source control procedures in critically ill patients with intra-abdominal infection

Kirsten van de Groep [a,b,*], Tessa L. Verhoeff [c], Diana M. Verboom [a,b], Lieuwe D. Bos [d], Marcus J. Schultz [d], Marc J.M. Bonten [a,e], Olaf L. Cremer [b],on behalf of the MARS consortium

K. van de Groep et al. / Journal of Critical Care 52 (2019) 258–264

Immediate procedural adequacy (yes/no):
Source control was considered technically adequate, if the operative report and clinical chart mentioned a successful eradication or containment of the infectious source.

Adequacy of source control on day 14:

- *Adequate:* Review of both the clinical chart and all available imaging studies yielded no evidence for a remaining source of infection (of any clinical significance) on day 14, and no additional procedures had been performed.
- *Delayed adequate:* One or more additional interventions had been performed following the index procedure, yet no evidence for a remaining source of infection (of any clinical significance) remained on day 14.
- *Inadequate:* Patient died before day 14, or a residual or new anatomical source of infection was suspected on day 14 based on clinical chart review, which needed to be radiologically confirmed if imaging studies had been performed.

Adequacy on final assessment (yes/no):
The final assessment of source control was performed on day 14 after the last procedure during ICU stay and classified as adequate when review of both the clinical chart and all available imaging studies yielded no evidence for a remaining source of infection (of any clinical significance).

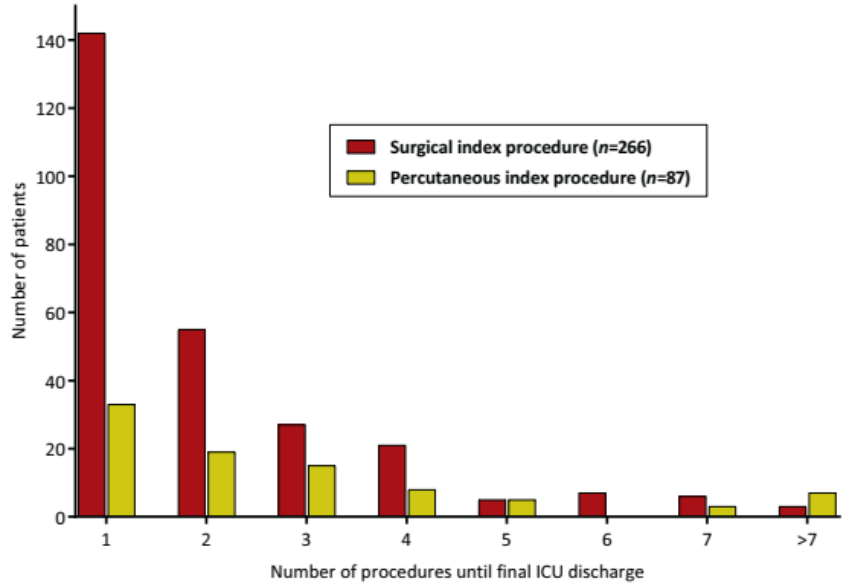
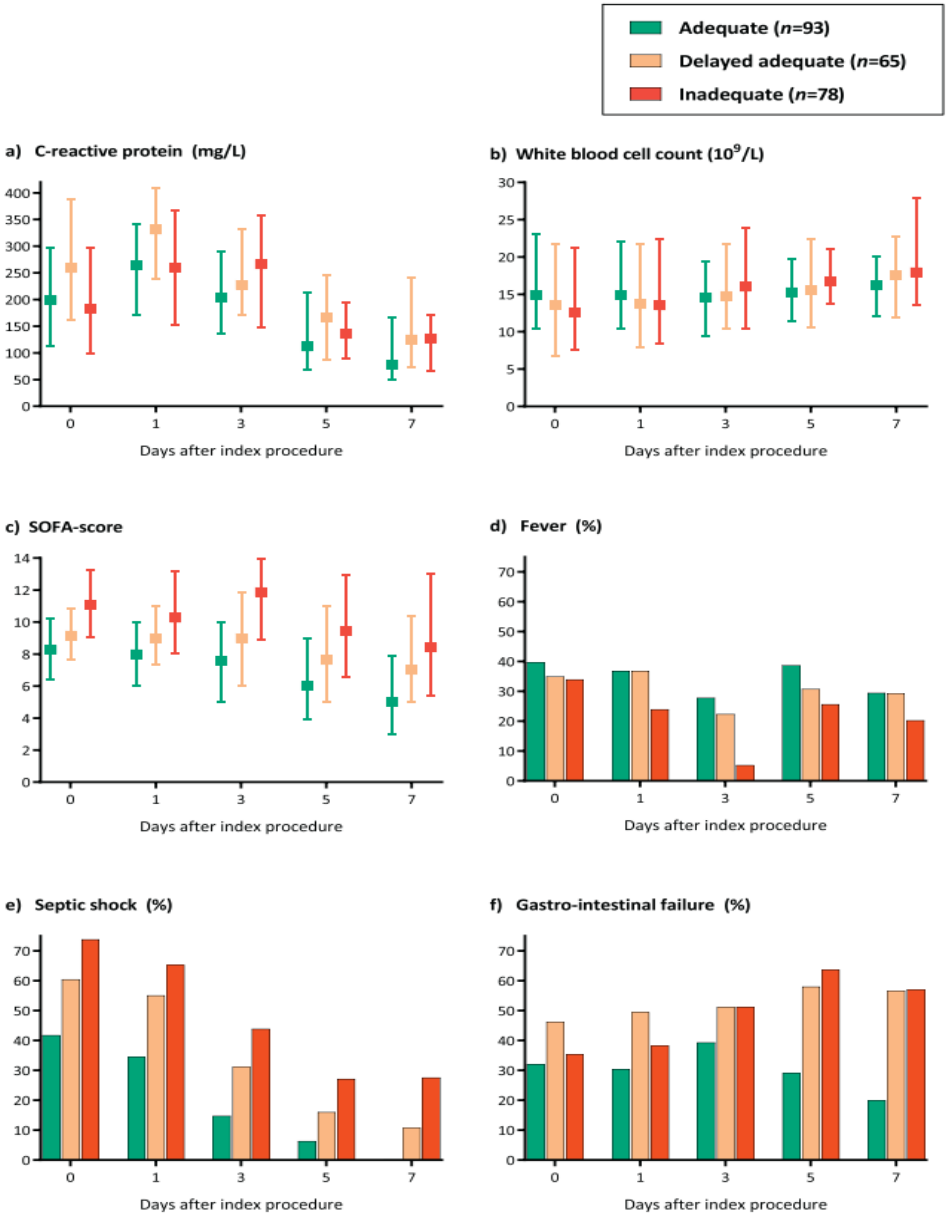


Table 2 Source control categorization

Source control-status	Description
S0	No residual infection
S1	Residual macroscopic infection, no ongoing contamination
S2	Residual macroscopic infection and ongoing contamination

Variable	Source control by day 14						
	Adequate		Delayed adequate		Inadequate[a]		p-value
	n = 93 (39%)		n = 65 (28%)		n = 78 (33%)		
Immediate procedural adequacy	93	(100)	60	(92)	75	(96)	0.14
Adequacy on final assessment[b]	91	(98)	55	(85)	13	[17]	<0.001



SCANDINAVIAN JOURNAL OF UROLOGY
2022, VOL. 56, NOS. 5–6, 414–420
https://doi.org/10.1080/21681805.2022.2123039

ARTICLE

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Community-onset urosepsis: incidence and risk factors for 30-day mortality – a retrospective cohort study

Martin Holmbom[a], Maria Andersson[b], Magnus Grabe[c], Ralph Peeker[d], Aus Saudi[a], Johan Styrke[e] and Firas Aljabery[a]

	Non-survivors ($n = 38$)	Survivors ($n = 244$)	p-value
Time to decompression from CT-scan or ultrasound[c] (SD)	455 (180) (n19)	305 (146) (n19)	<0.01*
Time to decompression from admission[c] (SD)	1212 (494) (n19)	837 (294) (n19)	<0.01*

Aliment Pharmacol Ther. 2016 Oct;44(7):755-66. doi: 10.1111/apt.13764. Epub 2016 Aug 10.

The impact of delayed biliary decompression and anti-microbial therapy in 260 patients with cholangitis-associated septic shock

C J Karvellas [1 2], J G Abraldes [2], S Zepeda-Gomez [2], D C Moffat [3], Y Mirzanejad [4], G Vazquez-Grande [5 6], E K Esfahani [6], A Kumar [5 7], Cooperative Antimicrobial Therapy of Septic Shock (CATSS) Database Research Group

Affiliations + expand

PMID: 27506331 DOI: 10.1111/apt.13764

Abstract

Background: Cholangitis-associated septic shock carries significant mortality. There is uncertainty regarding the most appropriate time to achieve biliary decompression.

Aim: To determine whether the timing of biliary decompression and anti-microbial therapy affect the survival in cholangitis patients with septic shock.

Methods: Nested retrospective cohort study of all cholangitis-associated septic shock patients (hypotension requiring vasopressors) from an international, multi-centre database between 1996 and 2011.

Results: Among 260 patients (mean age 69 years, 57% male), nonsurvivors (n = 96), survivors (n = 164) had lower mean adr Health Evaluation (APACHE) II (22 vs. 28, P < 0.001) and lower vs. 4.6 mmol/L, P < 0.001). Survivors were more likely to receiv earlier (median 2.6 vs. 6.8 h from shock, P < 0.001). Survivors v successful biliary decompression earlier (median 8.8 vs. 22 h, P variates, APACHE II (odds ratio, OR 1.21 per increment (1.11-1 microbial therapy [OR 1.15 per hour (1.07-1.25)] and delayed (1.12-10.31)] were all significantly associated with increased m 0.896).

Conclusions: Patients with septic shock secondary to acute ch Endoscopic biliary decompression >12 h after the onset of sh anti-microbial therapy were both significantly associated with suggest that early initiation of anti-microbial therapy and urg could potentially improve outcomes in this high-risk patient p

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SCIENTIFIC ARTICLE

Necrotizing Fasciitis: Clinical Presentation, Microbiology, and Determinants of Mortality

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Author Information

The Journal of Bone & Joint Surgery 85(8):p 1454-1460, August 2003.

BUY SDC

Abstract

Background: Necrotizing fasciitis is a life-threatening soft-tissue infection primarily involving the superficial fascia. The present report describes the clinical presentation and microbiological characteristics of this condition as well as the determinants of mortality associated with this uncommon surgical emergency.

Methods: The medical records of eighty-nine consecutive patients who had been admitted to our institution for necrotizing fasciitis from January 1997 to August 2002 were reviewed retrospectively.

Results: The paucity of cutaneous findings early in the course of the disease makes the diagnosis difficult, and only thirteen of the eighty-nine patients had a diagnosis of necrotizing fasciitis at the time of admission. Preadmission treatment with antibiotics modified the initial clinical picture and often masked the severity of the underlying infection. Polymicrobial synergistic infection was the most common cause (forty-eight patients; 53.9%), with streptococci and enterobacteriaceae being the most common isolates. Group-A streptococcus was the most common cause of monomicrobial necrotizing fasciitis. The most common associated comorbidity was diabetes mellitus (sixty-three patients; 70.8%). Advanced age, two or more associated comorbidities, and a delay in surgery of more than twenty-four hours adversely affected the outcome. Multivariate analysis showed that only a delay in surgery of more than twenty-four hours was correlated with increased mortality ($p < 0.05$; relative risk = 9.4).

Conclusions: Early operative débridement was demonstrated to reduce mortality among patients with this condition. A high index of suspicion is important in view of the paucity of specific cutaneous findings early in the course of the disease.

Level of Evidence: Prognostic study, Level II-1 (retrospective study). See Instructions to Authors for a complete description of levels of evidence.

Zaključki

- **Odstranitev vira okužbe – kdo?**
  - **Antibiotik – čimprej, če gre za okužbo!**
  - **Kirurg**
  - **Radiolog perkutano – ni razlike ob pravilni indikaciji**
- **Odstranitev vira okužbe – kdaj?**
  - **Čimprej? Antibiotik**
  - **Operativno/perkutano? Ja, vendar ne vedno**
    - **Optimizacija pred posegom**
    - **Starejši, krhki bolniki**
    - **Stopnja prizadetosti**
    - **Vir okužbe**
- **Nadzor učinkovitosti nadzora vira okužbe**
  - **CRP, L, TT niso povedni**
  - **Šok, SOFA in odpoved GIT**