# Trajanje antibiotičnega zdravljenja in biomarkerji

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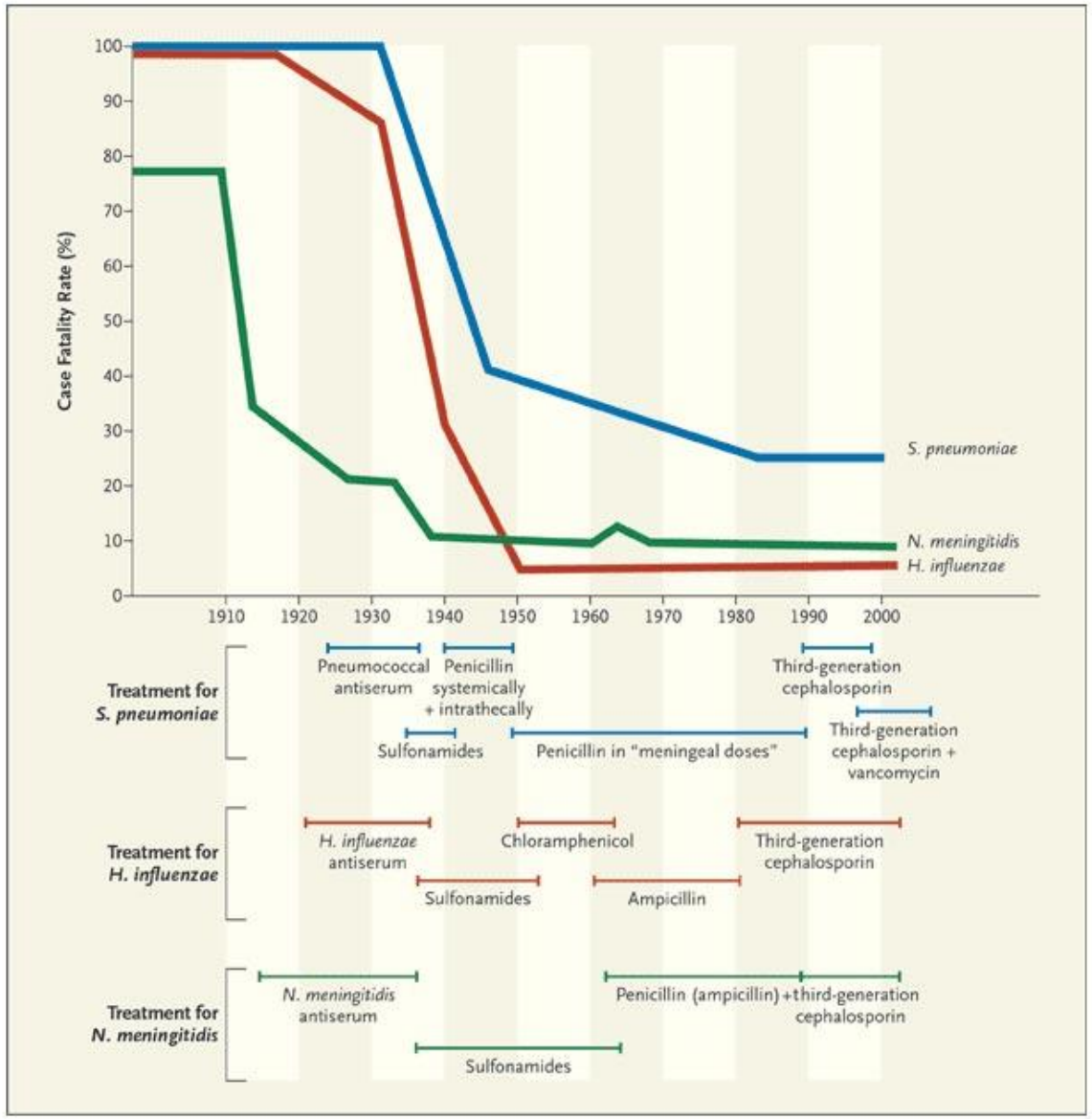
10% Human. 90% Bacteria.
Bacteria in the human body outnumber our own cells 10 to 1.

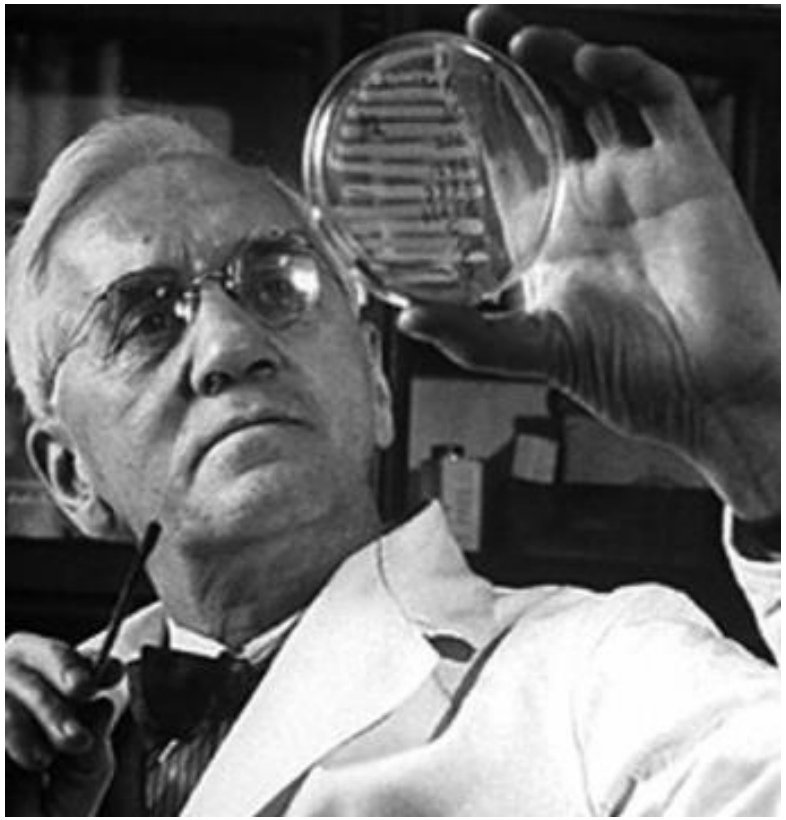
# Bakterijske okužbe in antibiotik

| bolezen | smrtnost pred antibiotiki ( %) | smrtnost po antibiotikih (%) | razlika v preživetju (%) |
|---|---|---|---|
| pljučnica od doma | ~35 | ~10 | ~25 |
| bolnišnična pljučnica | ~60 | ~30 | ~30 |
| infekcijski endokarditis | ~100 | ~25 | ~75 |
| okužbe kože in mehkih tkiv | ~11 | ~0,5 | ~10 |

Clin Infect Dis 2008;47: S249-65; Lancet 1935;226:383-4; Lancet 1938;231:733-4; Am J Med 1948;5:402-18; Clin Infect Dis 2009;49:383-91.

# Bakterijske okužbe in antibiotik



- **Bakterije se hitro prilagodijo in postajajo na antibiotike odporne**
- **Od leta 1990 razvoj novih antibiotikov strmo upade**
- **Odporni mikroorganizmi se širijo v domače okolje in znotraj bolnišnic**
- **Nevarnost, da se vrnemo v obdobje pred antibiotiki**

The Journal of Antibiotics (2023) 76:431–473
https://doi.org/10.1038/s41429-023-00629-8

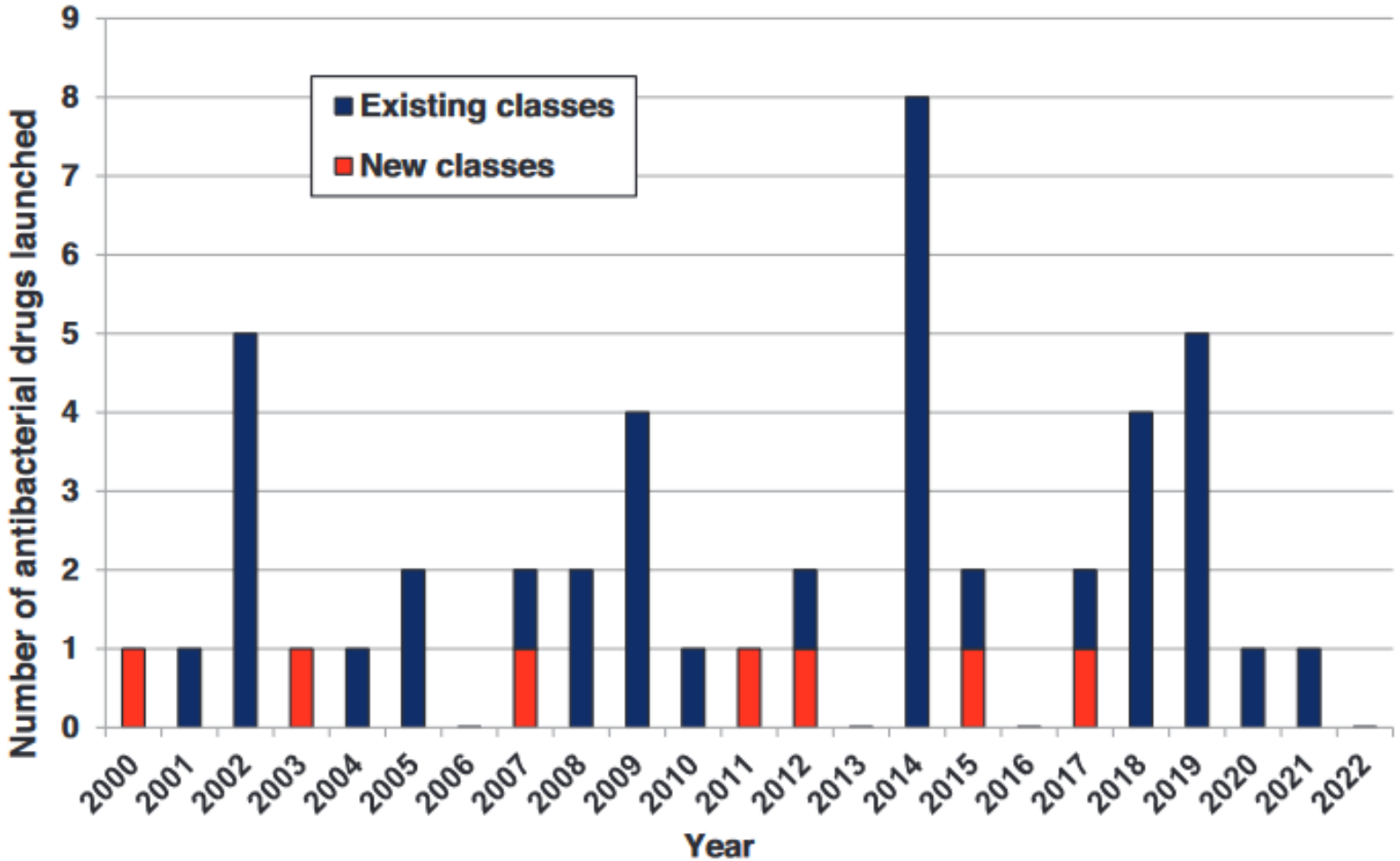
Japan Antibiotics Research Association
The Society for Actinomycetes Japan

REVIEW ARTICLE

# Antibiotics in the clinical pipeline as of December 2022

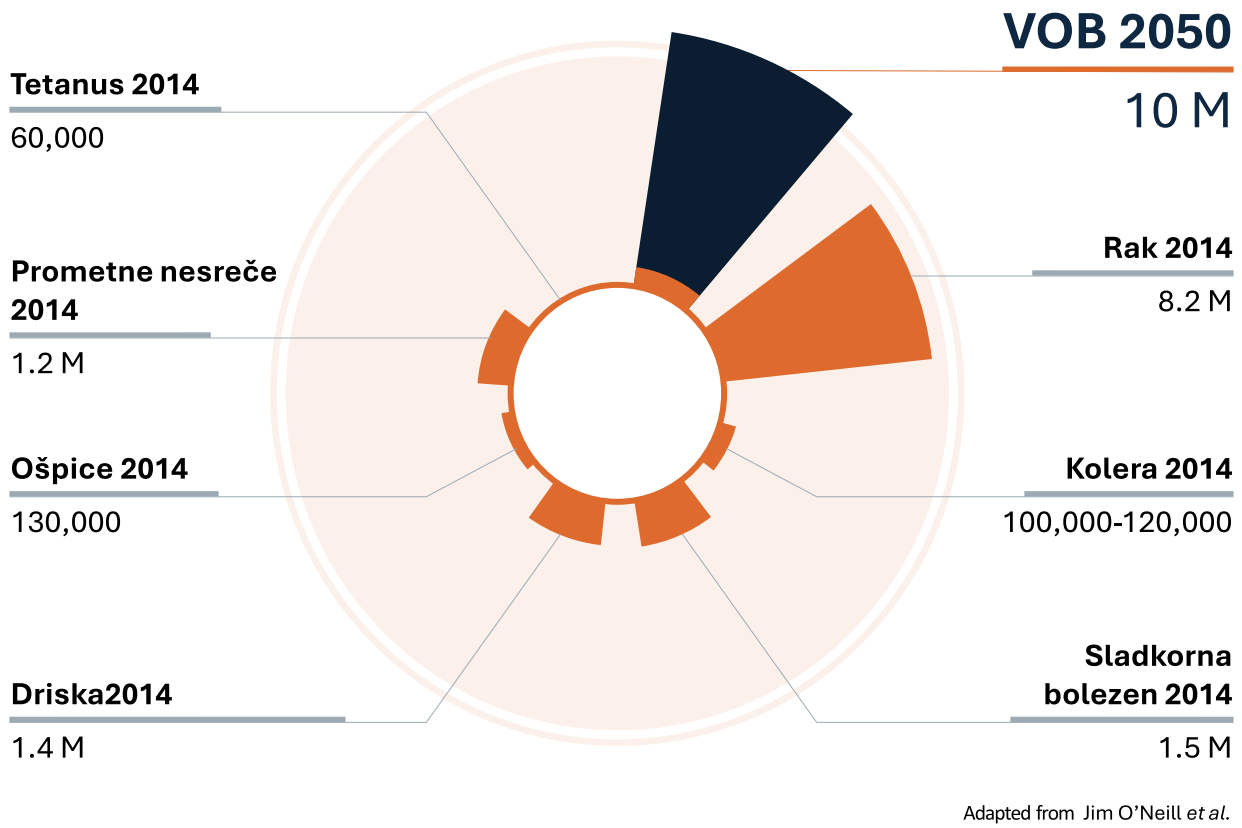
Mark S. Butler[1] · Ian R. Henderson[1] · Robert J. Capon[1] · Mark A. T. Blaskovich[1]

Received: 2 March 2023 / Revised: 20 April 2023 / Accepted: 25 April 2023 / Published online: 8 June 2023

# Okužbe z VOB

- **Atributivna smrtnost zaradi VOB v primerjavi z drugimi vzroki smrti**



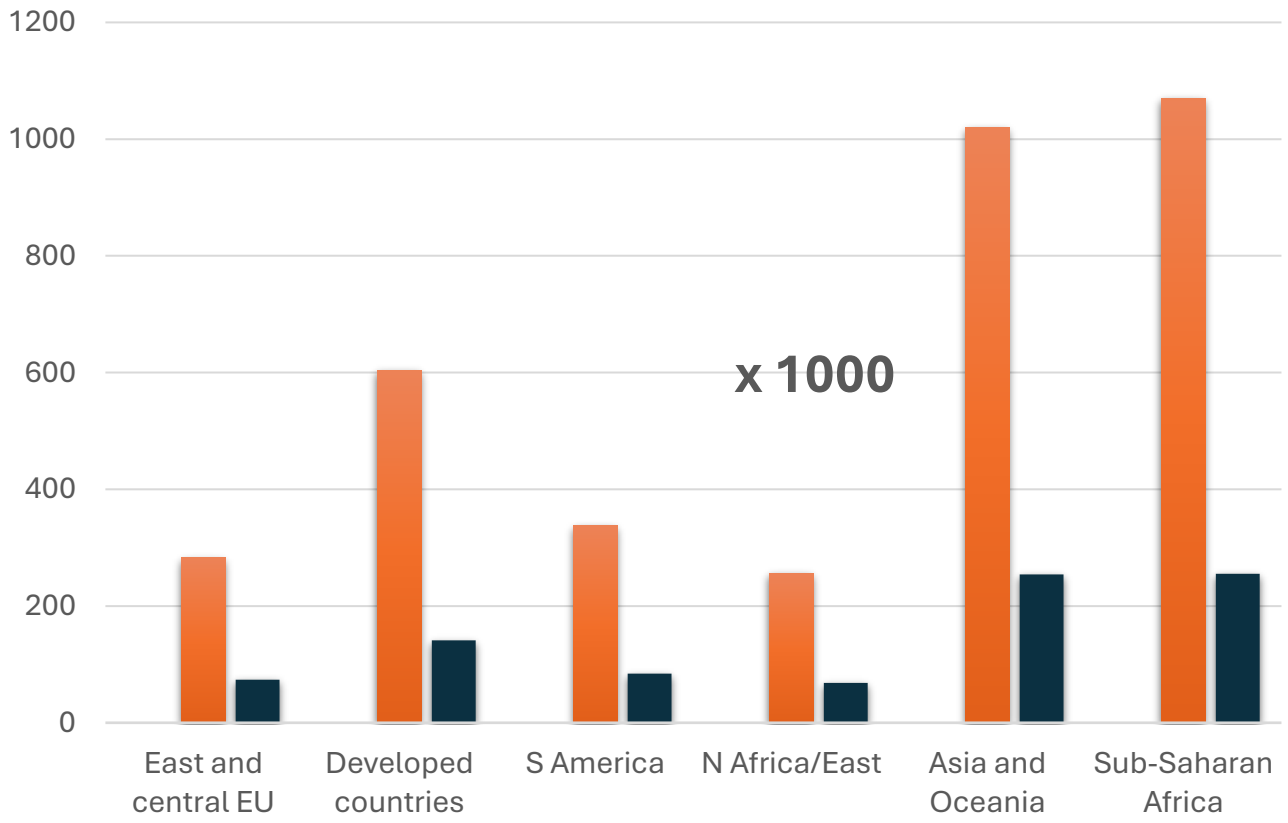

Adapted from Jim O'Neill *et al.*

- ***10 miljonov smrti zaradi VOB letno / 2050***

Jim O'Neill, *et al*. Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations. *Review on antimicrobial resistance*. 2014

# Odpornost na antibiotike in atributivna smrtnost

- 4,95 M umrlih zaradi okužb z VOB leta 2019
- Atributivna smrtnost 1,27 M




Murray CJL, et al. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. Lancet 2022.

# Pasti pri uporabi antibiotikov

- Ni dokazov bakterijske okužbe
- Ni jasne indikacije za antibiotik
- Ni mikrobioloških testov in drugih ustreznih diagnostičnih postopkov
- Načela strategije deeskalacije se ne upoštevajo
- **Predolgo predpisovanje antibiotikov**
- Zdravljenje kontaminacije/kolonizacije

# Trajanje antibiotičnega zdravljenja

| Diagnoza | Antibiotik izbire | Trajanje |
|---|---|---|
| tonzilofaringitis | penicilin V | 5 – 10 dni |
| akutno vnetje obnosnih votlin | amoksicilin | 5 – 7 dni |
| akutno vnetje srednjega ušesa | amoksicilin | 5 – 10 dni |
| pljučnica domačega okolja | amoksicilin<br>amoksicilin/klavulanska kislina | 3 – 7 dni |
| bolnišnična pljučnica | amoksicilin/klavulanska kislina<br>piperacilin/tazobaktam | 5 – 8 dni |
| nezapletene okužbe sečil | trimetoprim/sulfametoksazol<br>fosfomicin<br>amoksicilin/klavulanska kislina<br>cefadroksil | 1 – 7 dni |
| celulitis | flucloksacilin<br>penicilin V | 5 dni |

# Trajanje antibiotičnega zdravljenja

| Diagnoza | Antibiotik izbire | Trajanje |
|---|---|---|
| **erythema migrans** | **doksiciklin** | **7 dni** |
| **akutno poslabšanje KOPB** | **amoksicilin**<br>**amoksicilin/klavulanska kislina** | **5 – 7 dni** |
| **sepsa** | **ceftriakson**<br><br>**amoksicilin/klavulanska kislina**<br>**ampicilin/sulbaktam**<br>**+**<br>**gentamicin** | **7 – 14 dni** |
| | | |

# Pljučnica domačega okolja in trajanje antibiotičnega zdravljenja

| | |
|---|---|
| **amoksicilin**<br>**amoksicilin/klavulanska kislina** | **3 – 5 dni** |
| **amoksicilin/klavulanska kislina**<br>**+/- makrolid** | **3 – 7 dni** |
| **amoksicilin/klavulanska kislina**<br>**ampicilin/sulbaktam**<br>**ceftriakson**<br>**+ makrolid** | **5 – 7 dni** |

**3 dni**
TT ≤ 37,8st.C, pulz < 100, fr. dihanja < 24/min, sat. ≥ 90%, RR ≥ 90 mmHg

**5 dni**
TT ≤ 37,8st.C in ≤ 1 od kriterijev: pulz ≥ 100, fr. dihanja ≥ 24/min, sat. < 90%, RR < 90 mmHg

Dinh A, et al. Lancet. 2021;397(10280):1195-1203.
Valerie M, et al. JAMA. 2024;332(15):1282-1295

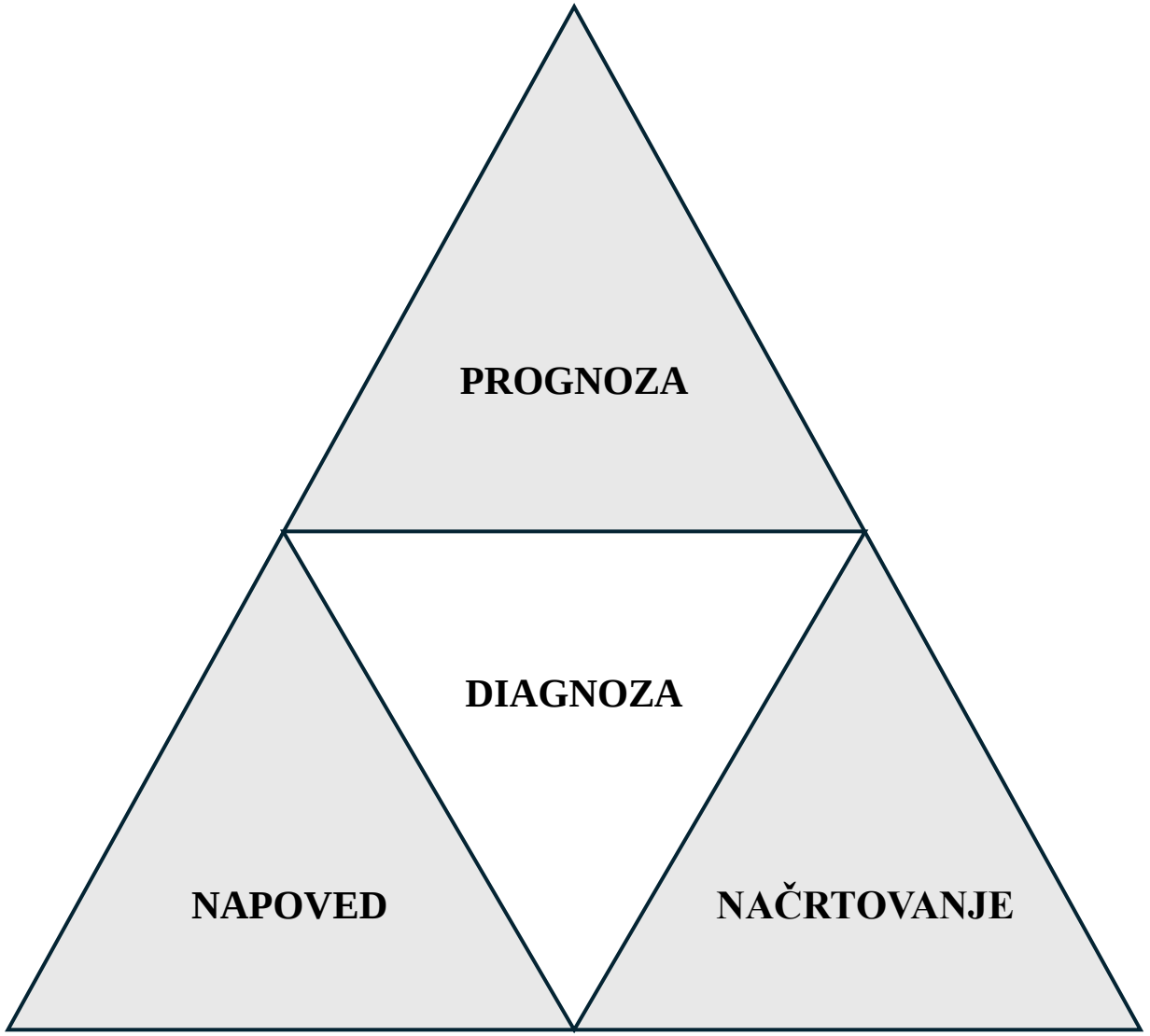
## Discontinuing β-lactam treatment after 3 days for patients with community-acquired pneumonia in non-critical care wards (PTC): a double-blind, randomised, placebo-controlled, non-inferiority trial

Dinh A, et al. Lancet. 2021;397(10280):1195-1203.

- n= 310 bolnikov (placebo 157, antibiotik še 5 dni 153 )

| | Placebo group | β-lactam group | Difference | p value |
|---|---|---|---|---|
| Cure at day 30 | | | | |
| ITT analysis | 109/152 (72%) | 109/151 (72%) | –0·47 (–11·31 to 9·98) | >0·99 |
| Per-protocol analysis | 105/141 (74%) | 107/141 (76%) | –1·42 (–12·08 to 9·20) | 0·89 |
| Mortality at day 30 | 3/152 (2%) | 2/151 (1%) | 0·60 (–3·50 to 4·40) | >0·99 |
| Patients with at least one adverse event related to treatment | 22/152 (14%) | 29/151 (19%) | –4·70 (–7·08 to 2·31) | 0·29 |
| Patients with at least one serious adverse event related to treatment | 1/152 (1%) | 1/151 (1%) | 0·00 (0·00 to 0·99) | >0·99 |
| Length of hospital stay, days, | 5·00 (4·00 to 9·00) | 6·00 (4·00 to 9·00) | –1·00 (–1·00 to 1·00) | 0·74 |
| Recovery time, days | 15·00 (9·00 to 21·50) | 15·50 (7·00 to 20·00) | –0·50 (–4·00 to 5·50) | 0·33 |

# Biomarkerji



# Biomarkerji

| Vrsta | Komentar |
|---|---|
| CRP | Vsakodnevna uporaba, omejena specifičnost, zapoznel porast |
| Levkociti | Vsakodnevna uporaba, zelo nizka specifičnost |
| PCT | Hiter porast, uporaben pri različnih bakterijskih okužbah – sepsa, pljučnica, meningitis, okužbe sečil |
| CD 14, CD 64, TREM-1, Pentrexin-3, pro ADM, kopeptin, suPAR,MDW, Syndecan-4… | Raziskave pri bolnikih s sepso, pljučnico… |
| Interleukins (IL1, IL6, IL-8, IL-10, IL-12, IL-17, and TNF-α…) | Hiter porast, kratek razpolovni čas… |
| mRNA transkriptomi /genomski biomarkerji / proteomski biomarkers | Obetavni biomarkerji, visoka občutljivost in specifičnost, algoritmi sočasne uporabe večih beljakovinskih biomarkerjev za oceno bakterijske okužbe, niso komercialno dostopni… |

# C-reaktivni protein

- CRP je protein akutne faze vnetja, ki nastaja v jetrih
- Tvorbo sprožijo posredniki vnetja: IL – 6, IL – 1 beta, TNF
- Njegova koncentracija se podvoji vsakih osem ur
- Razpolovni čas je 19 ur
- Neustrezen porast zaradi jetrne ciroze ali znižane koncentracije serumskih beljakovin
- Diagnostična vloga, prognostična vloga

# Prokalcitonin

- Prokalcitonin (PCT) nastaja v kalcitoninskih celicah v ščitnici.
- Pri zdravih osebah so koncentracije PCT v serumu nižje od 0,1 µg/L.
- Relativno nizke pa ostanejo tudi ob lokaliziranih bakterijskih in virusnih okužbah.
- Ob sistemskem bakterijskem vnetju začnejo PCT tvoriti tudi druga nevroendokrina tkiva, monociti in makrofagi.
- Razpolovni čas je od 22 do 35 ur.
- Jetrna okvara ne vpliva na njegovo koncentracijo.
- Pri bolnikih z ledvično okvaro so koncentracije višje.
- Z nadomestnim hemodializnim zdravljenjem ga odstranjujemo.

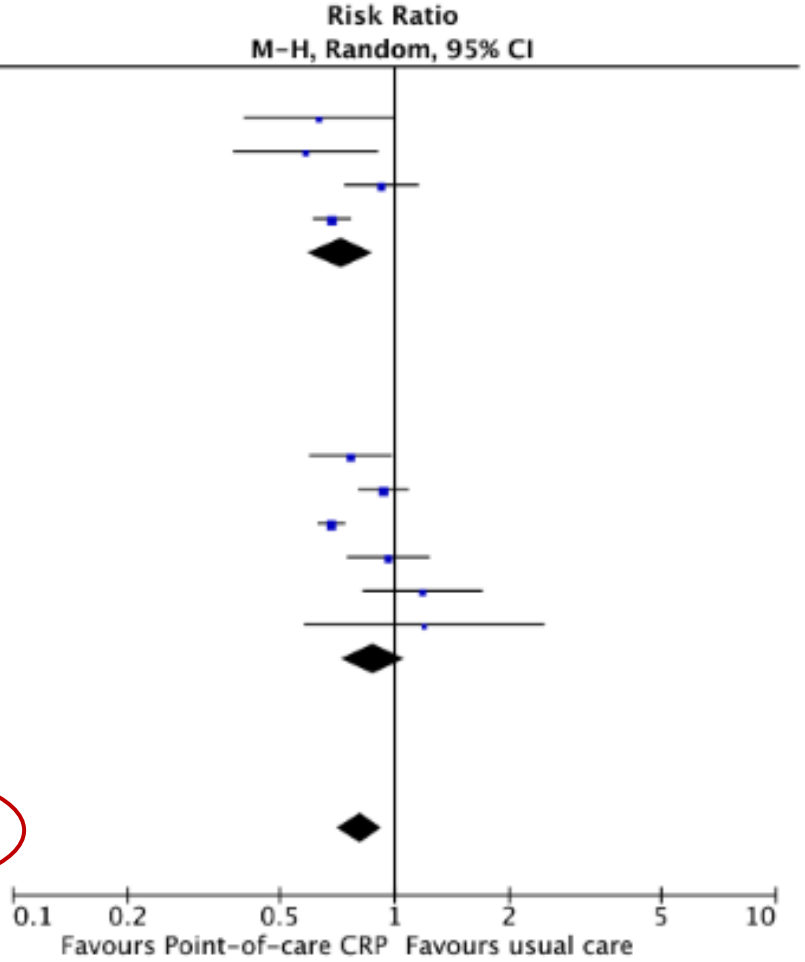
# Biomarkerji in zdravljenje pljučnice

## Impact of point-of-care C reactive protein in ambulatory care: a systematic review and meta-analysis

Verbakel JY, et al. BMJ 2019

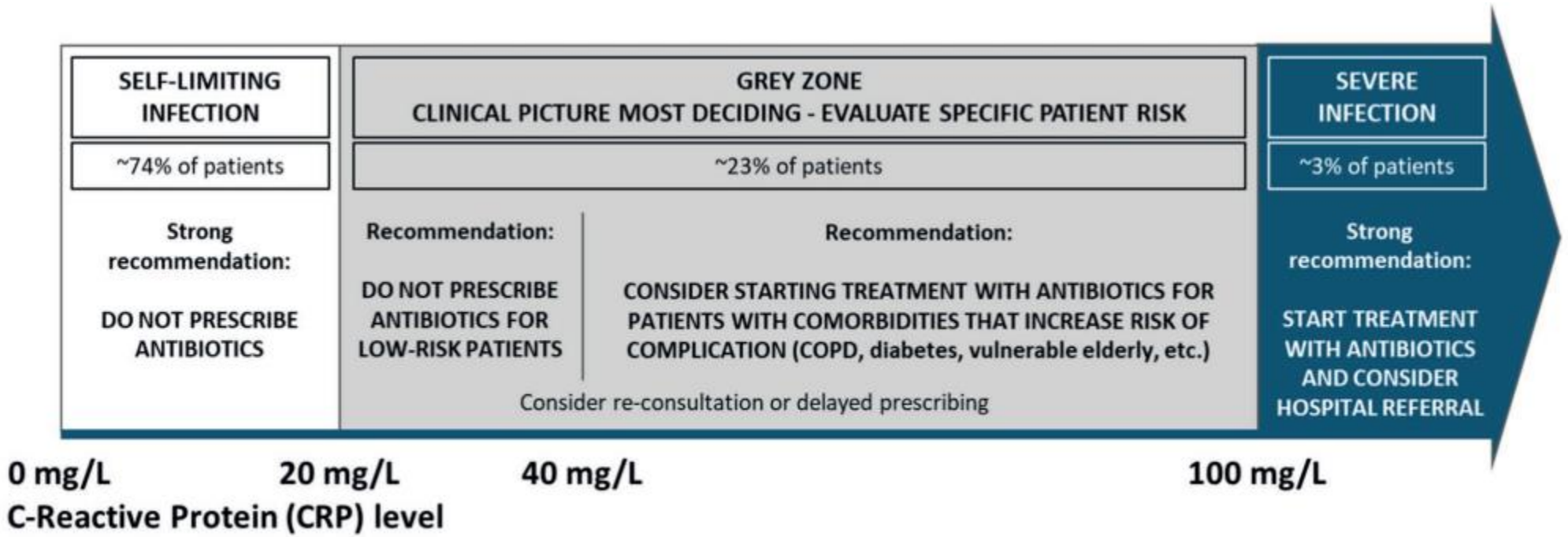
A

| Study or Subgroup | Point-of-care CRP Events | Total | usual care Events | Total | Weight | Risk Ratio M-H, Random, 95% CI |
|---|---|---|---|---|---|---|
| **cluster randomised trials** | | | | | | |
| Andreeva 2014 | 18 | 49 | 22 | 38 | 5.5% | 0.63 [0.40, 1.00] |
| Cals 2009 | 20 | 65 | 31 | 59 | 5.8% | 0.59 [0.38, 0.91] |
| Lemiengre 2014 | 117 | 455 | 106 | 381 | 11.5% | 0.92 [0.74, 1.16] |
| Little 2013 | 304 | 920 | 407 | 844 | 15.5% | 0.69 [0.61, 0.77] |
| **Subtotal (95% CI)** | | **1489** | | **1322** | **38.2%** | **0.73 [0.60, 0.88]** |
| Total events | 459 | | 566 | | | |
| Heterogeneity: $Tau^2 = 0.02$; $Chi^2 = 6.62$, df = 3 (P = 0.08); $I^2 = 55\%$ | | | | | | |
| Test for overall effect: Z = 3.21 (P = 0.001) | | | | | | |
| **individually randomised trials** | | | | | | |
| Cals 2010 | 56 | 129 | 73 | 129 | 10.6% | 0.77 [0.60, 0.98] |
| Diederichsen 2008 | 179 | 414 | 184 | 398 | 14.1% | 0.94 [0.80, 1.09] |
| Do 2016 | 441 | 1017 | 647 | 1019 | 16.4% | 0.68 [0.63, 0.74] |
| Melbye 1995 | 54 | 108 | 68 | 131 | 10.6% | 0.96 [0.75, 1.24] |
| Rebnord 2017 | 36 | 138 | 57 | 259 | 7.3% | 1.19 [0.82, 1.70] |
| Van den Bruel 2016 | 10 | 26 | 9 | 28 | 2.7% | 1.20 [0.58, 2.47] |
| **Subtotal (95% CI)** | | **1832** | | **1964** | **61.8%** | **0.88 [0.73, 1.07]** |
| Total events | 776 | | 1038 | | | |
| Heterogeneity: $Tau^2 = 0.04$; $Chi^2 = 24.04$, df = 5 (P = 0.0002); $I^2 = 79\%$ | | | | | | |
| Test for overall effect: Z = 1.28 (P = 0.20) | | | | | | |
| **Total (95% CI)** | | **3321** | | **3286** | **100.0%** | **0.81 [0.71, 0.92]** |
| Total events | 1235 | | 1604 | | | |
| Heterogeneity: $Tau^2 = 0.02$; $Chi^2 = 31.82$, df = 9 (P = 0.0002); $I^2 = 72\%$ | | | | | | |
| Test for overall effect: Z = 3.21 (P = 0.001) | | | | | | |
| Test for subgroup differences: $Chi^2 = 1.90$, df = 1 (P = 0.17), $I^2 = 47.5\%$ | | | | | | |



# Biomarkers in zdravljenje pljučnice

Guidance on C-reactive protein point-of-care testing and complementary strategies to improve antibiotic prescribing for adults with lower respiratory tract infections in primary care




Van Hecke O, et al. Frontiers Med 2023

# Biomarkerji in zdravljenje pljučnice

RESEARCH ARTICLE

Biomarker guided antibiotic stewardship in community acquired pneumonia: A randomized controlled trial

PLOS ONE | https://doi.org/10.1371/journal.pone.0307193 August 20, 2024

Ruud Duijkers[1]*, Hendrik J. Prins[1], Martijn Kross[2], Dominic Snijders[3], Jan W. K. van den Berg[4], Gwendolyn M. Werkman[4], Nynke van der Veen[4], Marianne Schoorl[5], Marc J. M. Bonten[6], Cornelis H. van Werkhoven[6], Wim G. Boersma[1]

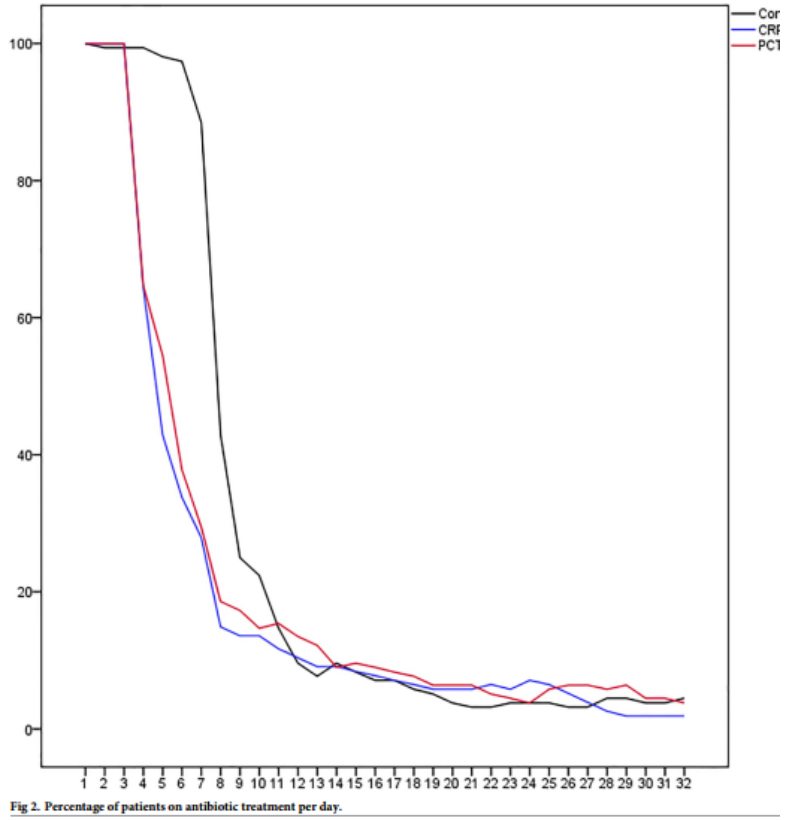



Fig 2. Percentage of patients on antibiotic treatment per day.

## Četrti dan

- CRP < 100 mg/l + 50 % nižja vrednost od začetne vrednosti
- PCT < 0.25 μg/L ali < 10 % začetne vrednosti

| | Control group, n = 156 | CRP group, n = 154[b] | PCT group, n = 156 |
|---|---|---|---|
| Days on antibiotic treatment | | | |
| Primary analysis | | | |
| Median (IQR) | 7 (7–10) | 4 (3–7) | 5,5 (3–9) |
| RR (95% CI) | Reference | 0.70 (0.61–0.82) | 0.78 (0.68–0.89) |

# Bolnišnična pljučnica – trajanje zdravljenja

- IDSA&ATS:
  - 7 dnevno zdravljenje za HAP in VAP
- Evropske smernice
  - 7-8 dnevno antibiotično zdravljenje za HAP in VAP( ne pri imunsko oslabljenih, bolniki s cistično fibrozo, empiemom, abscesom, nekrotizirajočo pljučnico) ob dobrem odgovoru na zdravljenje
  - Priporočilo velja tudi za okužbe z nefermentativnimi b.

Chastre J, et al. JAMA 2003;290:2588.
Torres A, et al. Eur Respir J. 2017 Sep 10;50(3).
Clin Infect Dis 2016; 63: e61-111.

# Bolnišnična pljučnica – trajanje zdravljenja

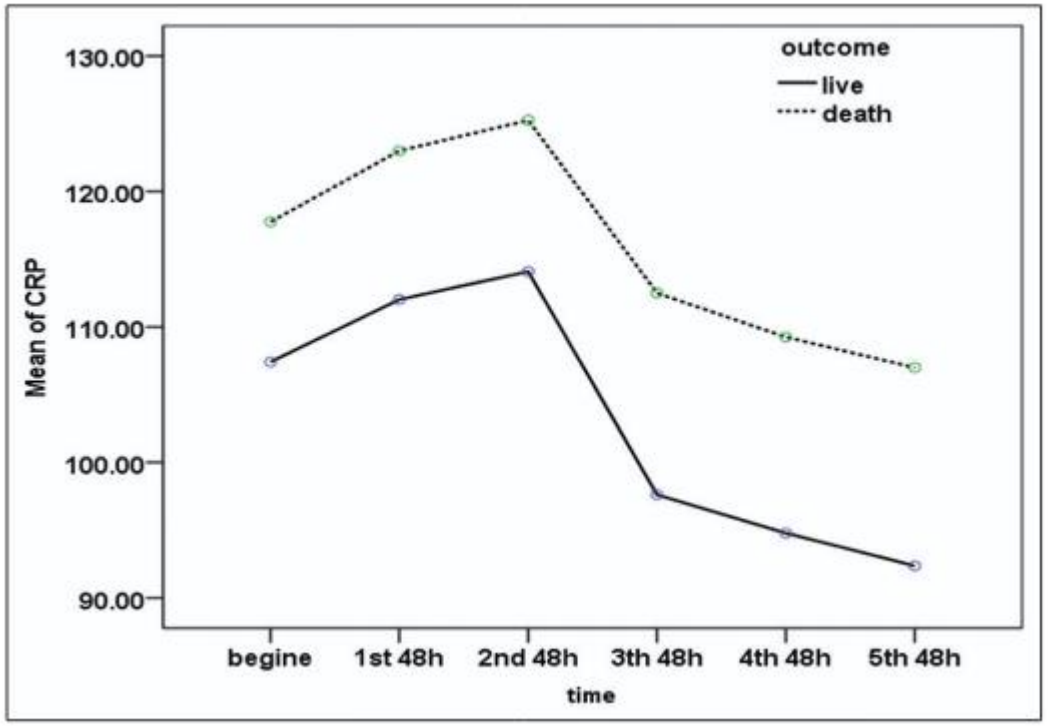
≥ 14 dnevno antibiotično zdravljenje za HAP in VAP

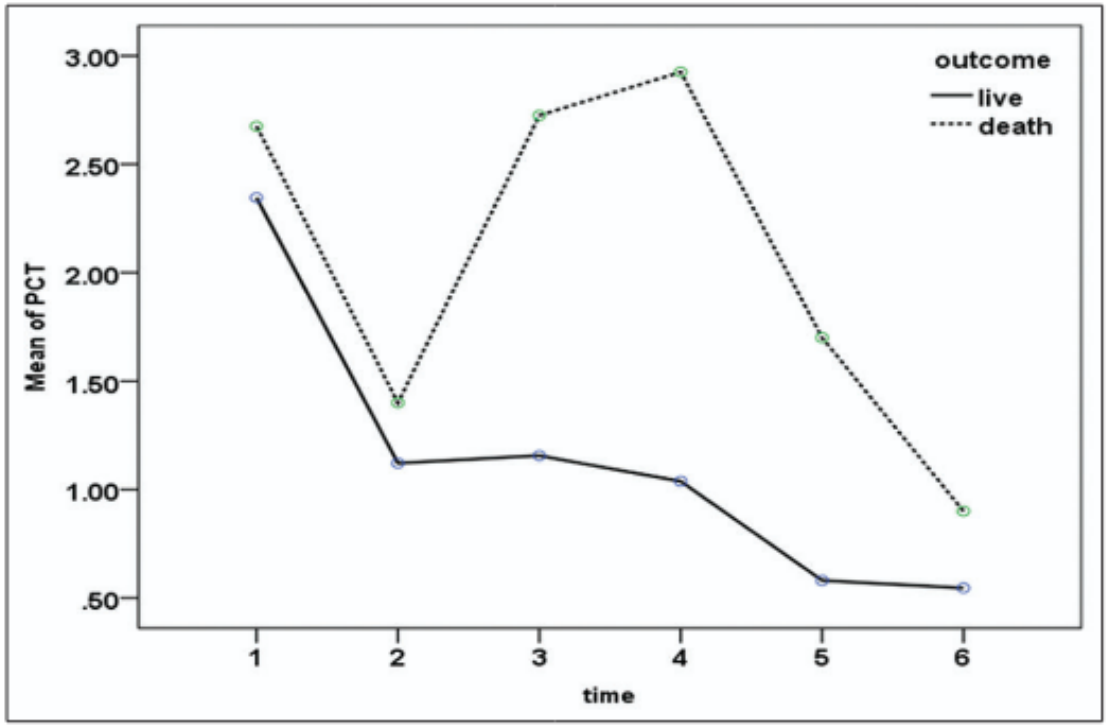
- Neustrezna izkustvena atb terapija
- Nevtropenija, po PMKC
- VOB (*Ps.aeruginosa*, CRAb, CRE)
- Ko zdravimo z atb druge linije

Torres A, et al. Eur Respir J. 2017 Sep 10;50(3).

# Precalcitonin and C-reactive protein as markers in response to antibiotic treatment in ventilator-associated pneumonia in intensive care unit-hospitalized patients

Kiaei BA, et al. Adv Biomed Res 2015;4:240.



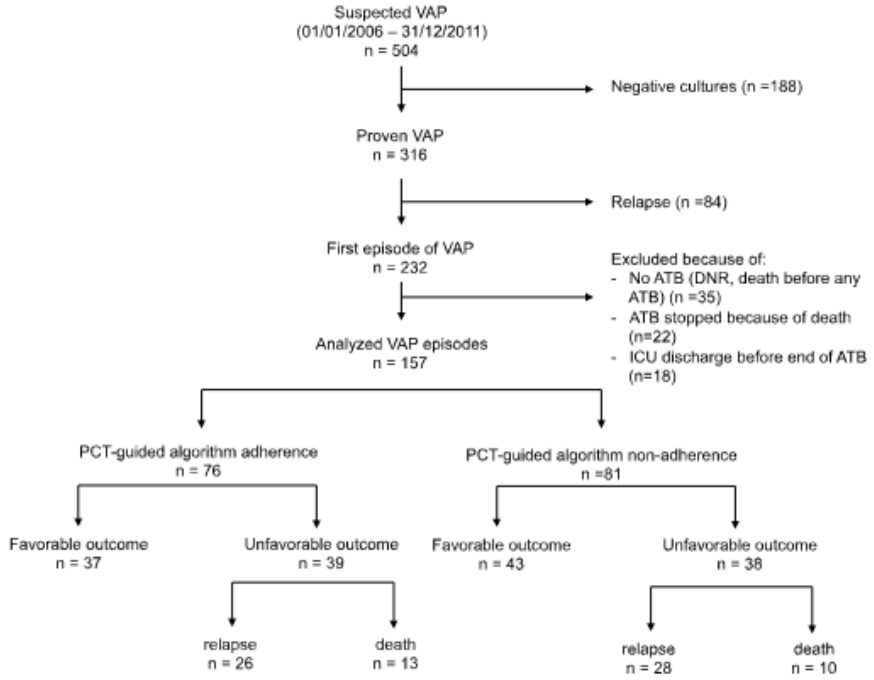
| | Control group[#] | Procalcitonin group[¶] | p-value |
|---|---|---|---|
| **MV-free days alive, days 1–28** | | | |
| All patients | 19 (8.5–22.5) | 21 (2–24) | 0.455 |
| Nonfermenting GNB | 15 (7–20) | 12 (0.3–23) | 0.867 |
| MRSA | 15 (0–22) | 14 (6–21) | 1 |
| Other bacteria | 19 (1.8–24.8) | 22 (15.5–24.5) | 0.284 |
| No bacteria | 21.5 (18.8–23.3) | 23 (3.5–27) | 0.563 |
| **ICU-free days alive, days 1–28** | | | |
| All patients | 8.5 (0–18) | 10 (0–18) | 0.526 |
| Nonfermenting GNB | 0 (0–11) | 4 (0–13.5) | 0.683 |
| MRSA | 15 (2–17) | 9 (1.5–15) | 0.548 |
| Other bacteria | 7.5 (1–17.8) | 14 (7.5–20) | 0.139 |
| No bacteria | 18 (1.5–20) | 10 (1.–19.5) | 0.554 |
| **Length of hospital stay days** | | | |
| All patients | 26 (16.8–22.3) | 26 (7–21) | 0.153 |
| Nonfermenting GNB | 34 (26–46) | 31 (13–35.5) | 0.130 |
| MRSA | 28 (17–41) | 26 (23.5–37.5) | 1.0 |
| Other bacteria | 24 (16.5–32.5) | 21.5 (14–28) | 0.442 |
| No bacteria | 28.5 (16–38) | 29 (9.5–33) | 0.343 |
| **VAP-related clinical deterioration days 1–28[+]** | 7 (14) | 5 (10) | 0.759 |
| **Discharge home days 1–28** | 3 (6) | 5 (10) | 0.479 |
| **Discharge to another institution days 1–28** | 32 (64) | 35 (69) | 0.509 |
| **Death from all causes days 1–28** | 12 (24) | 8 (16) | 0.327 |
| **In-hospital mortality** | 14 (28) | 10 (20) | 0.322 |

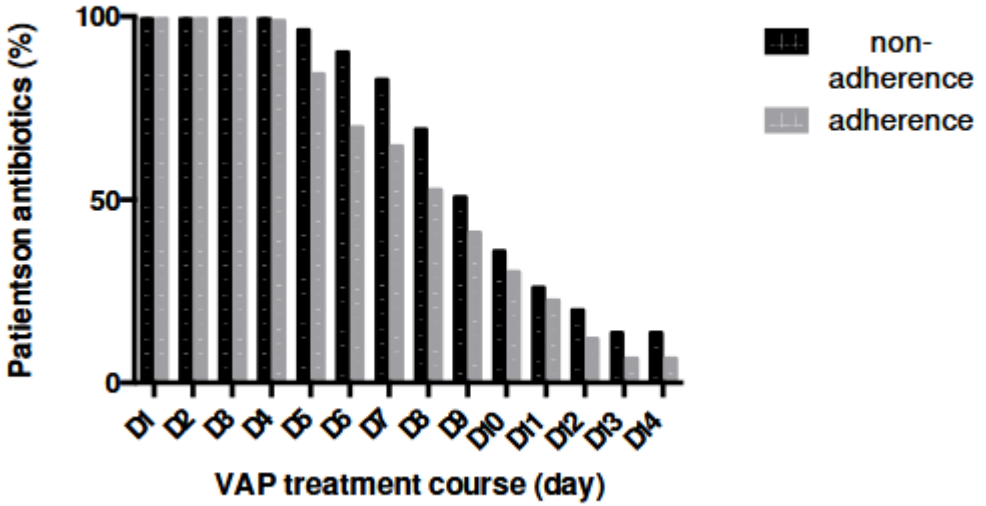
# Biomarkerji in zdravljenje bolnišnične pljučnice

## Adhering to the procalcitonin algorithm allows antibiotic therapy to be shortened in patients with ventilator-associated pneumonia

Beye F, et al. J Crit Care 2019;53:125-31.

- PCT < 0.5 µg/L ali ≥ 80% znižanje koncentracije PCT v kolikor je bila začetna vrednost PCT ≥ 5 µg/L = ukinitev antibiotika
- 8 dni PCT : 9,5 dni „SOC“ (p=0,02)



# PCT pri okužbah dihal

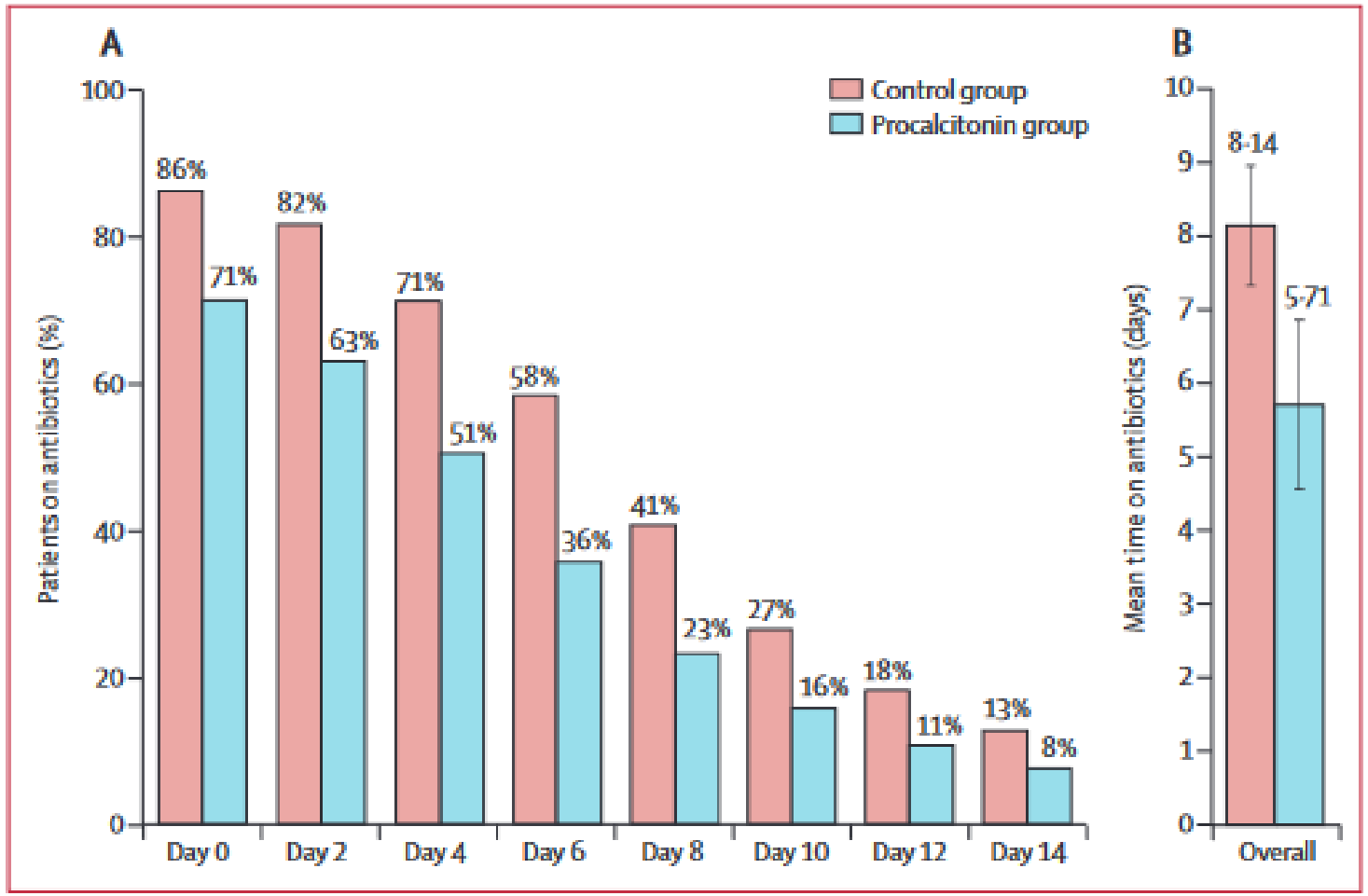
Schuetz P, et al. Lancet Infect 2018;18:95-106.

**Effect of procalcitonin-guided antibiotic treatment on mortality in acute respiratory infections: a patient level meta-analysis**

| | Control (n=3372) | Procalcitonin group (n=3336) | Adjusted OR or difference (95% CI), p value* | $p_{interaction}$ |
|---|---|---|---|---|
| Primary care | 501 | 507 | .. | .. |
| Initiation of antibiotics | 316 (63%) | 116 (23%) | 0·13 (0·09 to 0·18), p<0·0001 | <0·0001 |
| Duration of antibiotics, days† | 7·3 (2·5) | 7·0 (2·8) | −0·52 (−1·07 to 0·04), p=0·068 | 0·064 |
| Total exposure of antibiotics, days‡ | 4·6 (4·1) | 1·6 (3·2) | −3·02 (−3·45 to −2·58), p<0·0001 | 0·101 |
| Emergency department | 1638 | 1615 | .. | .. |
| Initiation of antibiotics | 1354 (83%) | 1119 (69%) | 0·49 (0·41 to 0·58), p<0·0001 | <0·0001 |
| Duration of antibiotics, days† | 9·8 (5·4) | 7·3 (5·1) | −2·45 (−2·86 to −2·05), p<0·0001 | <0·0001 |
| Total exposure of antibiotics, days‡ | 8·2 (6·2) | 5·2 (5·4) | −3·02 (−3·41 to −2·62), p<0·0001 | <0·0001 |
| Intensive care unit | 1233 | 1214 | .. | .. |
| Initiation of antibiotics | 1224 (99%) | 1116 (92%) | 0·02 (0·01 to 0·05), p<0·0001 | <0·0001 |
| Duration of antibiotics, days† | 9·5 (7·4) | 8·8 (7·8) | −1·23 (−1·82 to −0·65), p<0·0001 | <0·0001 |
| Total exposure of antibiotics, days‡ | 9·5 (7·4) | 8·1 (7·9) | −1·44 (−1·99 to −0·88), p<0·0001 | <0·0001 |

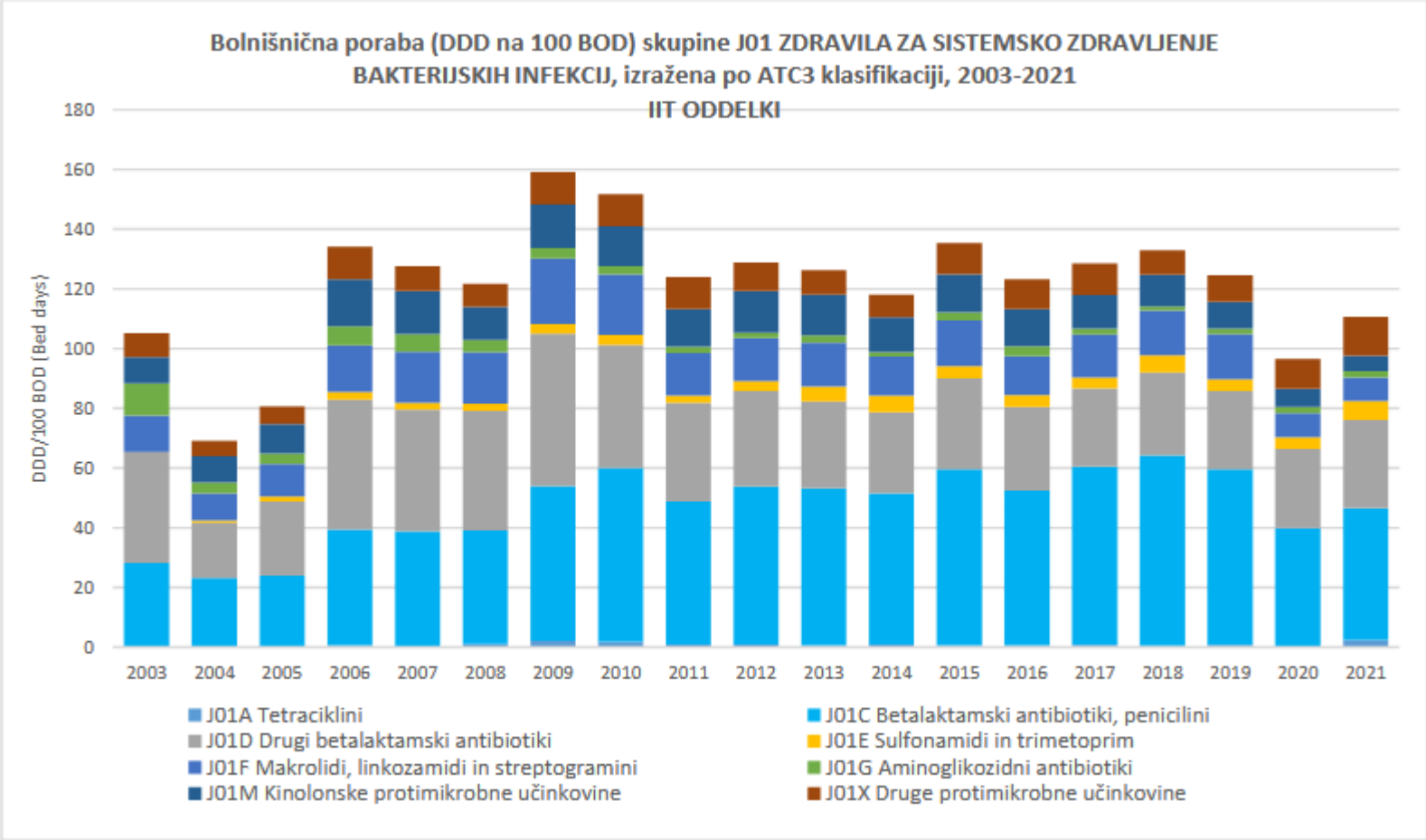
# PCT pri okužbah dihal

## Effect of procalcitonin-guided antibiotic treatment on mortality in acute respiratory infections: a patient level meta-analysis

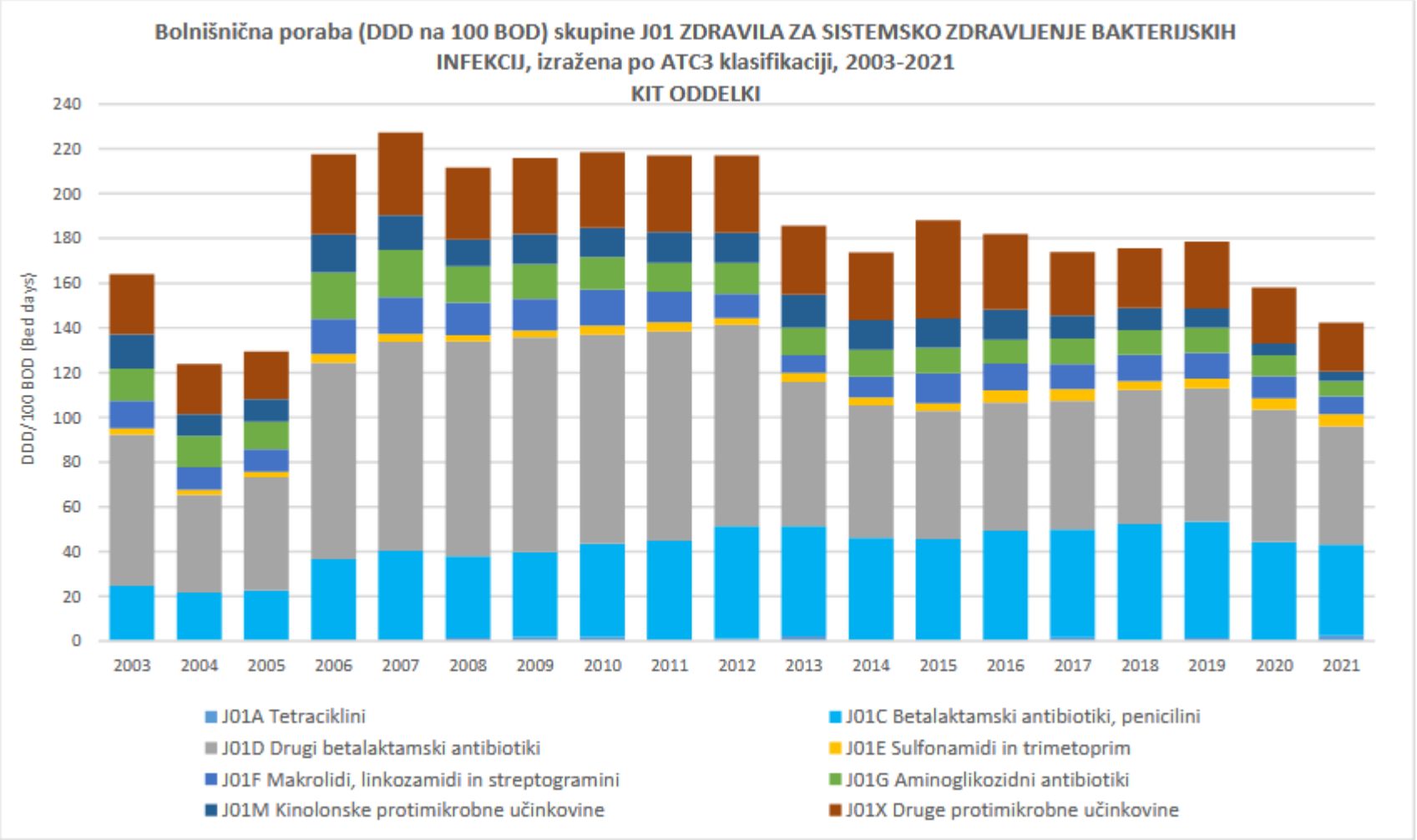



Schuetz P, et al. Lancet Infect 2018;18:95-106.

# Poraba antibiotikov v SLO EIT od 2003 do 2020 – EIT konzervativne stroke



# Poraba antibiotikov v SLO EIT od 2003 do 2020 – EIT kirurške stroke




NIJZ Nacionalni inštitut za javno zdravje

# Sepsa – trajanje zdravljenja

## Surviving Sepsis Campaign: International Guidelines for Managen *Critical Care Medicine* Septic Shock 2021


| Population/Syndrome | RCT/Systemic Review (Data Extracted From) | Shorter Duration | Longer Duration | Outcomes |
|---|---|---|---|---|
| Pneumonia | Capellier 2012 (301) | 8 days | 15 days | No difference |
| | Chastre 2003 (301, 302) | 8 days | 15 days | No difference |
| | El Moussaoui 2006 (302) | 3 days | 8 days | No difference |
| | Fekih Hassen 2009 (301–303) | 7 days | 10 days | No difference |
| | File 2007 (302, 303) | 5 days | 7 days | No difference |
| | Kollef 2012 (302, 303) | 7 days | 10 days | No difference |
| | Leophonte 2002 (302, 303) | 5 days | 10 days | No difference |
| | Medina 2007 (301) | 8 days | 12 days | No difference |
| | Siegel 1999 (302, 303) | 7 days | 10 days | No difference |
| | Tellier 2004 (302, 303) | 5 days | 7 days | No difference |
| Bacteremia | Chaudhry 2000 (302) | 5 days | 10 days | No difference |
| | Runyon 1991 (302) | 5 days | 10 days | No difference |
| | Yahav 2018 (304) | 7 days | 14 days | No difference |
| Intra-abdominal infection | Montravers 2018 (305) | 8 days | 15 days | No difference |
| | Sawyer 2015 (293) | Max. 5 days | Max. 10 days | No difference |
| Urinary tract infection | Peterson 2008 (290) | 5 days | 10 days | No difference |

# Biomarkerji in trajanje zdravljenja sepse

| Recommendation |
| --- |
| 31. For adults with an initial diagnosis of sepsis or septic shock and adequate source control where optimal duration of therapy is unclear, we **suggest** using procalcitonin AND clinical evaluation to decide when to discontinue antimicrobials over clinical evaluation alone. *Weak recommendation, low quality of evidence.* |

# Biomarkerji in trajanje zdravljenja sepse

## Efficacy and safety of procalcitonin guidance in reducing the duration of antibiotic treatment in critically ill patients: a randomised, controlled, open-label trial

De Jong E, et al. Lancet Infect Dis 2016;16:819-27.

| | Procalcitonin-guided group (n=761) | Standard-of-care group (n=785) | Between-group absolute difference in means (95% CI) | p value |
|---|---|---|---|---|
| Antibiotic consumption (days) | | | | |
| Daily defined doses in first 28 days | 7·5 (4·0 to 12·8) | 9·3 (5·0 to 16·5) | 2·69 (1·26 to 4·12) | <0·0001 |
| Duration of treatment | 5·0 (3·0 to 9·0) | 7·0 (4·0 to 11·0) | 1·22 (0·65 to 1·78) | <0·0001 |
| Antibiotic-free days in first 28 days | 7·0 (0·0 to 14·5) | 5·0 (0 to 13·0) | 1·31 (0·52 to 2·09) | 0·0016 |
| Mortality (%) | | | | |
| 28-day mortality | 149 (19·6%) | 196 (25·0%) | 5·4% (1·2 to 9·5) | 0·0122 |
| 1-year mortality | 265 (34·8%) | 321 (40·9%) | 6·1% (1·2 to 10·9) | 0·0158 |
| Adverse events | | | | |
| Reinfection | 38 (5·0) | 23 (2·9) | −2·1% (−4·1 to −0·1) | 0·0492 |
| Repeated course of antibiotics | 175 (23·0) | 173 (22·0) | −1·0% (−5·1 to 3·2) | 0·67 |
| Time (days) between stop and reinstitution of antibiotics | 4·0 (2·0 to 8·0) | 4·0 (2·0 to 8·0) | −0·22 (−1·31 to 0·88) | 0·96 |
| Costs | | | | |
| Total cumulative costs of antibiotics | €150 082 | €181 263 | NA | NA |
| Median cumulative costs antibiotics per patient | €107 (51 to 229) | €129 (66 to 273) | €33·6 (2·5 to 64·8) | 0·0006 |
| Length of stay (days) | | | | |
| On the intensive care unit | 8·5 (5·0 to 17·0) | 9·0 (4·0 to 17·0) | −0·21 (−0·92 to 1·60) | 0·56 |
| In hospital | 22·0 (13·0 to 39·3) | 22·0 (12·0 to 40·0) | 0·39 (−2·69 to 3·46) | 0·77 |

Data are median (IQR), n (%), or mean (95% CI). Between-group absolute differences were calculated using the mean values, percentage differences, and 95% CIs.
NA=not applicable.

PCT < 0.5 µg/L ali
≥ 80% znižanje

# Biomarkerji in trajanje zdravljenja sepse

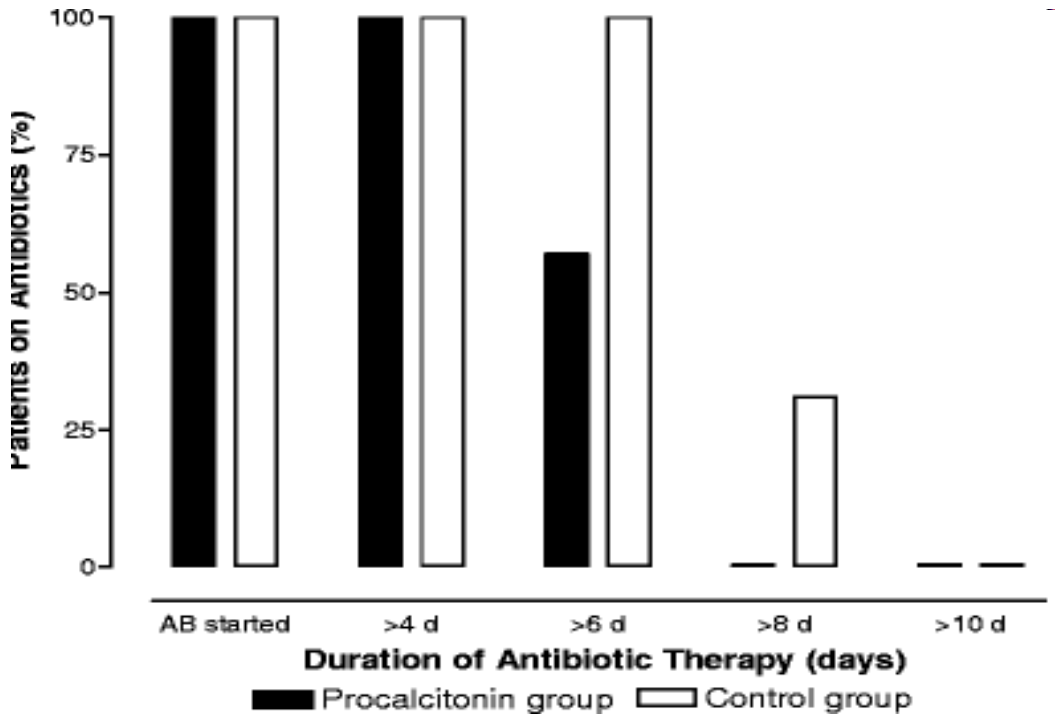
Langenbecks Arch Surg (2009) 394:221–226
DOI 10.1007/s00423-008-0432-1

CONTROLLED PROSPECTIVE CLINICAL TRIALS

**Procalcitonin (PCT)-guided algorithm reduces length of antibiotic treatment in surgical intensive care patients with severe sepsis: results of a prospective randomized study**

S. Schroeder · M. Hochreiter · T. Koehler · A.-M. Schweiger · B. Bein · F. S. Keck · T. von Spiegel

NAČRTOVANJE ZDRAVLJENJA




PCT vodena terapija =6,6 dni
Kontrolna skupina = 8,3 dni
Izhod enak
Stroški znižani za 17,8%

# Biomarkerji in trajanje zdravljenja sepse

*Clinical Infectious Diseases*
MAJOR ARTICLE

Procalcitonin-guided Antibiotic Treatment in Patients With Positive Blood Cultures: A Patient-level Meta-analysis of Randomized Trials

Meier MA, et al. Clin Infect Dis 2019;69:388-96.

- 13 raziskav („RCT“) in 523 bolnikov
- PCT <0.25 µg/L (oddelek) /< 0.5 µg/L (EIT).

| Endpoint | Control Group | PCT Group | Adjusted OR or Difference (95% CI)[a], *P* Value |
|---|---|---|---|
| Overall | 270 | 253 | |
| Antibiotic therapy | 15.6 ± 12.8 | 12.7 ± 10.9 | **–2.86 (–4.88 to –.84), *P* = .006** |
| 30-d mortality, No. (%) | 54 (20.0) | 42 (16.6) | 0.82 (.57–1.16), *P* = .263 |
| Length of hospital stay | 22.5 ± 21.9 | 21.2 ± 24.0 | –1.48 (–5.27 to 2.30), *P* = .443 |
| Length of ICU stay | 13.3 ± 14.6 | 13.6 ± 16.4 | 0.55 (–2.48 to 3.57), *P* = .723 |

# Zaključki

- Biomarkerji niso del splošno sprejetih smernic za opredelitev trajanja antibiotičnega zdravljenja
- Biomarkerji so nam lahko v pomoč pri odločitvi
- Na čas antibiotičnega zdravljenja vpliva mesto okužbe in vrsta povzročitelja
- Na čas antibiotičnega zdravljenja vpliva klinični potek okužbe in odgovor na protimikrobno zdravljenje