RESPIRATORY INFECTIONS:
Is there really something else than Covid?

# Antibioticabeleid bij pneumonie

Medische Kring 21/09/2021
Sarah Loof, pneumoloog

MARIA MIDDELARES

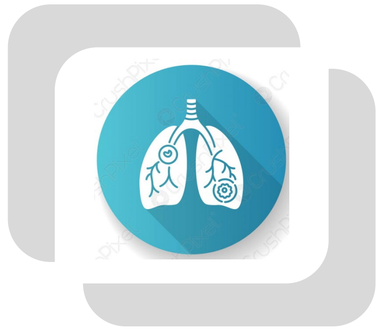
AZ Sint-Vincentius DEINZE

E17 ziekenhuis netwerk

# Overzicht

Antibioticaduur

Antibiotic stewardship



Scoresystemen

Community acquired pneumonie

Nosocomiaal

Empyeem

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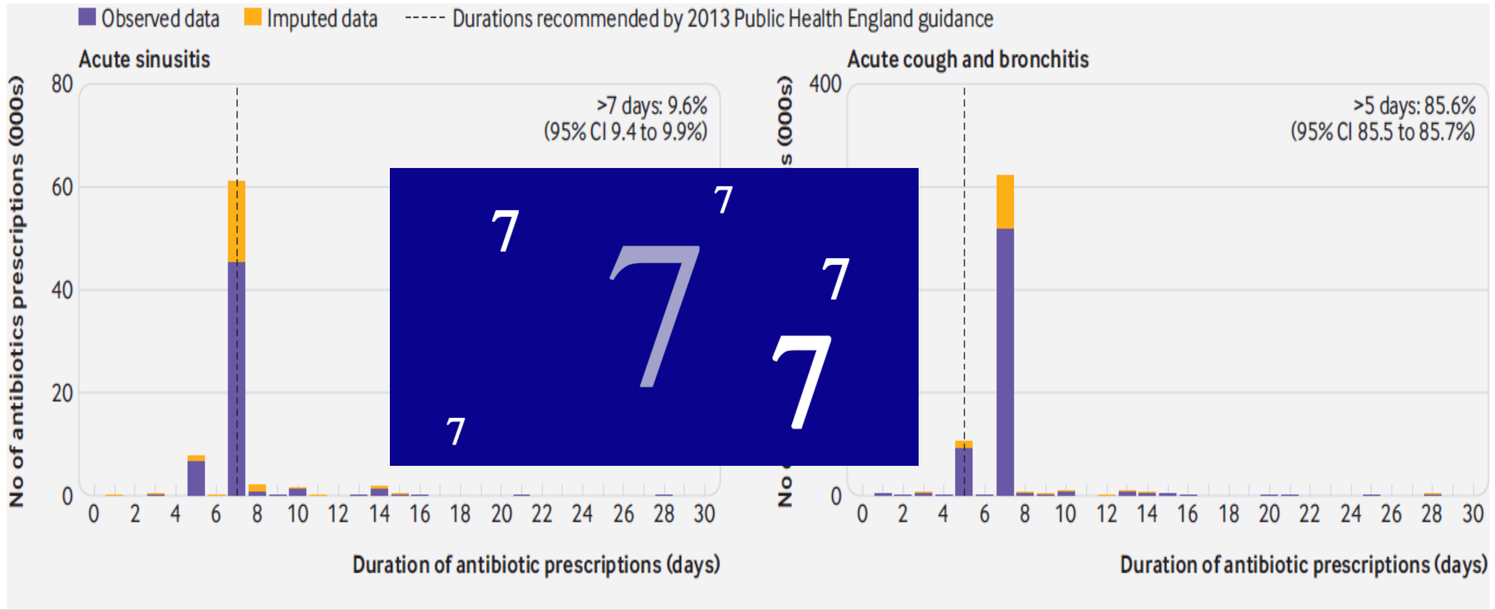


# Antibioticaduur

Duration of antibiotic treatment for common infections in English primary care: cross sectional analysis and comparison with guidelines

Koen B Pouwels,[1,2,3] Susan Hopkins,[4,5,6] Martin J Llewelyn,[7,8] Ann Sarah Walker,[6,9] Cliodna AM McNulty,[10] Julie V Robotham[1,6]

BMJ

# Duration of antibiotic treatment for common infections in English primary care: cross sectional analysis and comparison with guidelines

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BMJ

**Table 2 | Percentage of antibiotics with a duration exceeding guideline recommendations for all patients and antibiotics**

| Recommended treatment duration (days) by condition | No with condition | Antibiotic prescriptions with duration exceeding recommendations | | Excess days (% of total days) |
|---|---|---|---|---|
| | | No | % (95% CI) | |
| Acute sinusitis: | | | | |
| 7 | 76 683 | 7384 | 9.6 (9.4 to 9.9) | 39 422 (7.1) |
| Acute sore throat: | | | | |
| 5* | 239 231 | 200 520 | 83.8 (83.7 to 84.0) | 640 381 (35.0) |
| 10* | 239 231 | 4972 | 2.1 (2.0 to 2.1) | 72 001 (3.9) |
| Acute cough and bronchitis: | | | | |
| 5 | 386 972 | 331 257 | 85.6 (85.5 to 85.7) | 805 051 (29.5) |
| Community acquired pneumonia: | | | | |
| 7† | 952 | 77 | 8.1 (6.4 to 10.1) | 744 (10.3) |
| 10† | 952 | 32 | 3.4 (2.3 to 4.9) | 535 (7.4) |
| Acute COPD exacerbation: | | | | |
| 5 | 12 067 | 10 742 | 89.0 (88.4 to 89.6) | 26 732 (30.8) |
| Acute otitis media: | | | | |
| 5 | 83 054 | 71 750 | 86.4 (86.1 to 86.6) | 193 262 (31.9) |

Eur Respir J 2010; 36: 128–134
DOI: 10.1183/09031936.00130909
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# Duration of antibiotic therapy in hospitalised patients with community-acquired pneumonia

S. Aliberti*, F. Blasi*, A.M. Zanaboni#, P. Peyrani", P. Tarsia*, S. Gaito# and J.A. Ramirez"

EUROPEAN RESPIRATORY journal

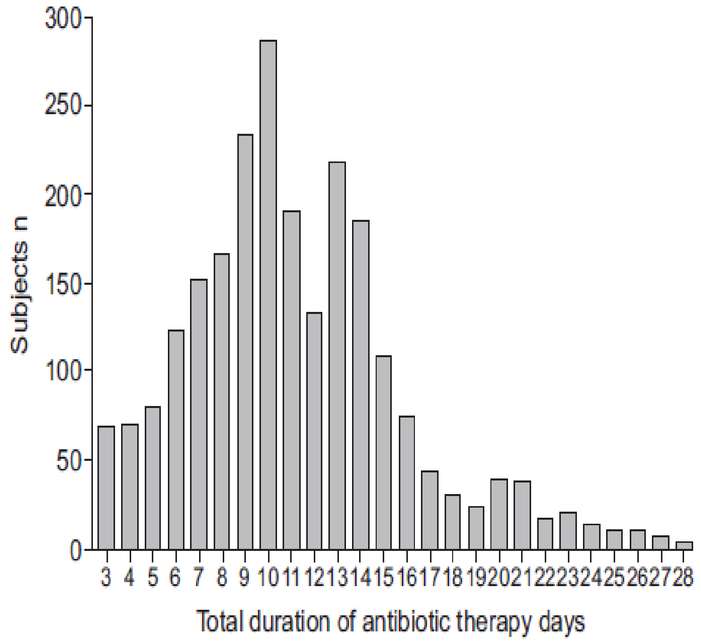


**FIGURE 1.** Total duration of antibiotic therapy among the study population, indicating that the majority of patients are treated for 10–14 days.

**TABLE 2** Total duration of therapy in the study population according to the pathogen isolated

| Pathogen | Total duration of antibiotic therapy days |
|---|---|
| *Streptococcus pneumoniae* | 11.2±4.7 |
| *Staphylococcus aureus* | 12.8±5.2 |
| *Haemophilus influenzae* | 11.5±4.6 |
| *Pseudomonas aeruginosa* | 13.2±5.7 |
| *Moraxella catarrhalis* | 11.4±2.6 |
| *Mycoplasma pneumoniae* | 12.9±6.0 |
| *Klebsiella pneumoniae* | 15.7±5.3 |
| *Legionella* spp. | 17.6±5.4 |

Data are presented as mean±SD.

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EUROPEAN RESPIRATORY journal

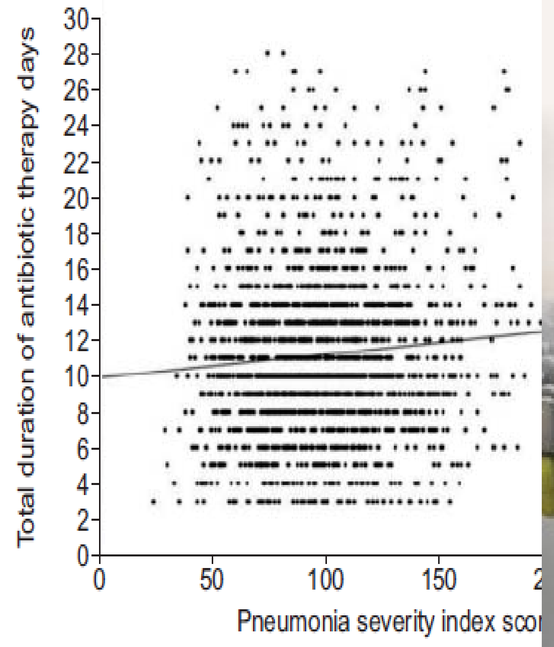


**FIGURE 4.** Lack of relationship between the pneumonia total duration of antibiotic therapy in the study population, countries and quality of care indicators.

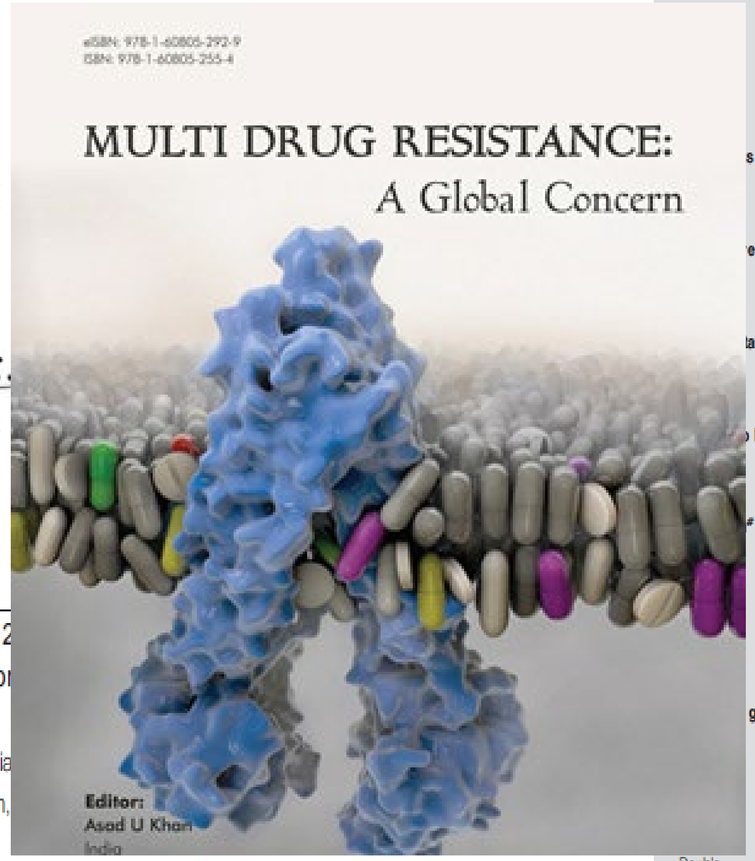


**TABLE 3** Total duration of therapy in the study population according to the severity of the disease on admission, after adjusting for regions and process of care indicators

| Finding | Total duration of antibiotic therapy days | p-value |
|---|---|---|
| **PSI risk class** | | 0.2 |
| | 11.0±4.5 | |
| | 11.1±4.6 | |
| | 10.8±4.6 | |
| | 11.2±4.5 | |
| | 11.8±4.6 | |
| **s** | | 0.1 |
| | 11.1±4.6 | |
| | 11.3±4.6 | |
| **e** | | 0.7 |
| | 11.2±4.5 | |
| | 11.3±4.5 | |
| **al status** | | 0.8 |
| | 11.4±4.5 | |
| | 11.1±4.5 | |
| **ICU** | | <0.001 |
| | 12.3±4.5 | |
| | 11.0±4.6 | |
| **#** | | 0.005 |
| | 12.4±4.5 | |
| | 11.1±4.5 | |
| | | 0.03 |
| | 12.1±4.5 | |
| | 11.1±4.6 | |
| **gas exchange+** | | 0.2 |
| | 11.3±4.6 | |
| | 11.1±4.6 | |
| | | <0.001 |
| | 10.4±4.6 | |
| Double | 11.5±4.6 | |
| **Multilobar infiltrate** | | 0.001 |
| Yes | 11.7±4.7 | |
| No | 10.8±4.6 | |
| **Pleural effusion** | | 0.006 |
| Yes | 11.7±4.6 | |
| No | 11.1±4.6 | |

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# Duration of antibiotic therapy in hospitalised patients with community-acquired pneumonia

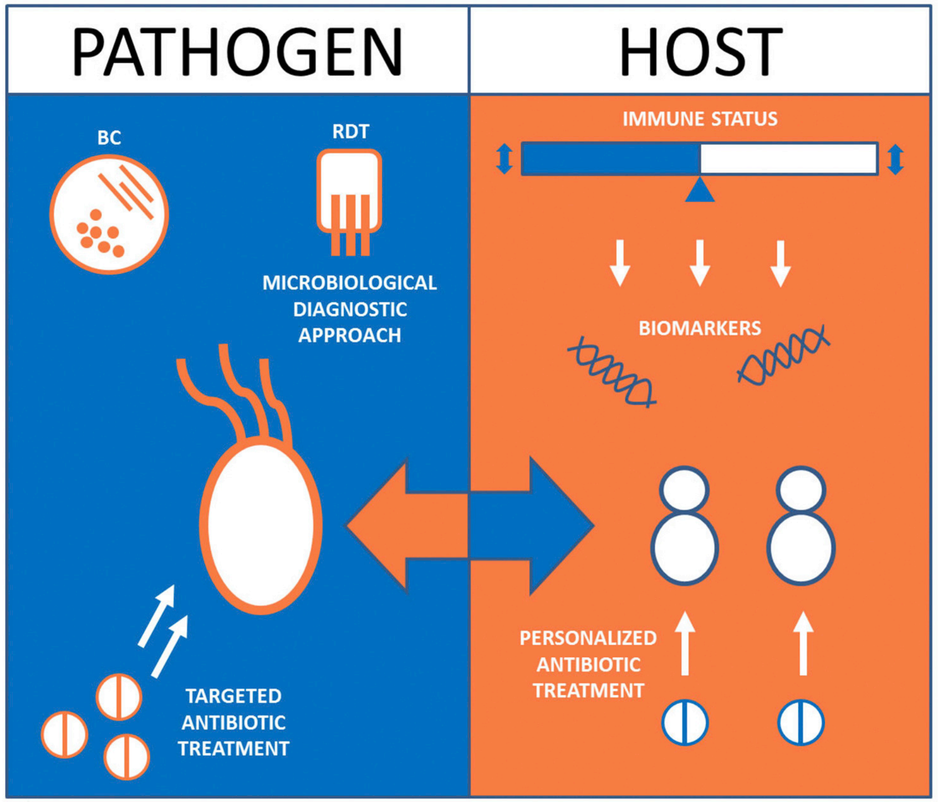
S. Aliberti*, F. Blasi*, A.M. Zanaboni#, P. Peyrani", P. Tarsia*, S. Gaito# and J.A. Ramirez"

EUROPEAN RESPIRATORY journal

## DISCUSSION

Our data indicate that a 10–14 day regimen of antibiotics is the most commonly prescribed duration of therapy in hospitalised patients with CAP. We were unable to find any relationship between total duration of therapy and severity of disease on admission or time to clinical response. Our data suggest that physicians have not embraced the recent recommendations to individualise duration of therapy based on patient characteristics.

Our data suggest that when determining the appropriate duration of therapy, physicians do not consider patient severity on admission. Indeed, we found that duration of therapy was the same regardless of the severity of CAP, as



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# Antibiotic stewardship

**Table 2. Change in Antibiotic Utilization in Patients Pre-EP vs Post-EP**

| Variable | Baseline | Postintervention | Difference, *P* Value |
|---|---|---|---|
| Mean EP antibiotic DOT (IQR), d | | | |
| UTI | 14.3 (13.7 to 15.0) | 12.9 (12.4 to 13.5) | –1.4 (–2.3 to –0.6); *P* = .001 |
| SSTI | 20.0 (19.2 to 20.9) | 17.9 (17.1 to 18.7) | –2.2 (–3.3 to –1.0); *P* < .001 |
| PNA | 18.0 (17.2 to 18.8) | 16.0 (15.3 to 16.7) | –2.0 (–3.2 to –0.9); *P* = .001 |
| VAP | 36.1 (31.5 to 40.8) | 26.5 (23.6 to 29.4) | –9.6 (–16.0 to –3.3); *P* = .003 |
| Mean EP antibiotic exposure (IQR), mg | | | |
| UTI | 22 328 (21 247 to 23 408) | 18 609 (17 693 to 19 526) | –3718 (–5185 to –2252); *P* < .001 |
| SSTI | 41 024 (38 974 to 43 073) | 35 619 (33 778 to 37 460) | –5404 (–8227 to –2582); *P* < .001 |
| PNA | 33 078 (31 108 to 35 048) | 23 647 (22 283 to 25 011) | –9430 (–12 028 to –6833); *P* < .001 |
| VAP | 97 185 (79 041 to 115 329) | 62 938 (53 209 to 72 668) | –34 246 (–57 507 to –10 986); *P* = .004 |

Abbreviations: DOT, days of therapy; DRG, diagnostic-related group; EP, expected practice; IQR, interquartile range; OR, odds ratio; PNA, pneumonia; SSTI, skin and skin structure infection; UTI, urinary tract infection; VAP, ventilator-associated pneumonia.

- Decrease in average antibiotic days of therapy: 27% (VAP), 11% (CAP) 11% (SSTI), 10% (UTI)
- Decrease in antibiotic exposure (mg): 35% (VAP), 29% (CAP), 17% (UTI), 13% (SSTI)
- Mortality pre-intervention = post-intervention

## Expected Practice as a Novel Antibiotic Stewardship Intervention

**Kabir Yadav,[1,2] Eriko Masuda,[3,4] Emi Minejima,[3,5] and Brad Spellberg[3,4]**

[1]Department of Emergency Medicine, Harbor-University of California Los Angeles (UCLA) Medical Center, Los Angeles, CA; [2]Los Angeles Biomedical Research Institute, Los Angeles, CA; [3]Los Angeles County + University of Southern California (USC) Medical Center, Los Angeles, CA; [4]Department of Medicine, Keck School of Medicine at USC, Los Angeles, CA; [5]University of Southern California School of Pharmacy, Los Angeles, CA

*Open Forum Infectious Diseases*

Clinical Infectious Diseases

# Duration of AB treatment

## Short-course Antibiotic Therapy—Replacing Constantine Units With "Shorter Is Better"

Noah Wald-Dickler[1,2] and Brad Spellberg[1,2]
(USA)

*Clin Infect Dis 2019; 69(9):1476-1479*

### Evidence

- Review 26 clinical trials

For every bacterial infection for which trials have compared short-course with longer course antibiotic therapy, short-course therapy has been just as effective

**Table 1. Diseases for Which Short-course Antibiotic Therapy Has Been Found to Be Equally Effective to Longer Traditional Courses of Therapy (With References)**

| Diagnosis | Short (d) | | Long (d) | Result |
|---|---|---|---|---|
| Community-acquired pneumonia [6–14] | 3 or 5 | = | 7, 8, or 10 | Equal |
| Hospital-acquired/ventilator-associated pneumonia [15, 16] | 7–8 | = | 14–15 | Equal |
| Complicated urinary tract infections/pyelonephritis [17–22] | 5 or 7 | = | 10 or 14 | Equal |
| Complicated/postoperative intraabdominal infections [23, 24] | 4 or 8 | = | 10 or 15 | Equal |
| Gram-negative bacteremia [25] | 7 | = | 14 | Equal |
| Acute exacerbation of chronic bronchitis/chronic obstructive pulmonary disease (meta-analysis of 21 trials [26]) | ≤5 | = | ≥7 | Equal |
| Acute bacterial skin and skin structure infections (cellulitis/major abscess) [27–29] | 5–6 | = | 10 | Equal |
| Chronic osteomyelitis [30] | 42 | = | 84 | Equal |

# Infectious Diseases Society of America/American Thoracic Society Consensus Guidelines on the Management of Community-Acquired Pneumonia in Adults

Lionel A. Mandell,[1,a] Richard G. Wunderink,[2,a] Antonio Anzueto,[3,4] John G. Bartlett,[7] G. Douglas Campbell,[8] Nathan C. Dean,[9,10] Scott F. Dowell,[11] Thomas M. File, Jr.[12,13] Daniel M. Musher,[5,6] Michael S. Niederman,[14,15] Antonio Torres,[16] and Cynthia G. Whitney[11]

## Duration of Antibiotic Therapy

32. Patients with CAP should be treated for a minimum of 5 days (level I evidence), should be afebrile for 48–72 h, and should have no more than 1 CAP-associated sign of clinical instability (table 10) before discontinuation of therapy (level II evidence). (Moderate recommendation.)
33. A longer duration of therapy may be needed if initial therapy was not active against the identified pathogen or if it was complicated by extrapulmonary infection, such as meningitis or endocarditis. (Weak recommendation; level III evidence.)

**Table 10. Criteria for clinical stability.**

| |
|---|
| Temperature ≤37.8°C |
| Heart rate ≤100 beats/min |
| Respiratory rate ≤24 breaths/min |
| Systolic blood pressure ≥90 mm Hg |
| Arterial oxygen saturation ≥90% or $pO_2$ ≥60 mm Hg on room air |
| Ability to maintain oral intake[a] |
| Normal mental status[a] |

**NOTE.** Criteria are from [268, 274, 294]. $pO_2$, oxygen partial pressure.

[a] Important for discharge or oral switch decision but not necessarily for determination of nonresponse.

# Community-acquired pneumonia

THE LANCET

*Elena Prina, Otavio T Ranzani, Antoni Torres*

Community-acquired pneumonia causes great mortality and morbidity and high costs worldwide. Empirical selection of antibiotic treatment is the cornerstone of management of patients with pneumonia. To reduce the misuse of antibiotics, antibiotic resistance, and side-effects, an empirical, effective, and individualised antibiotic treatment is needed. Follow-up after the start of antibiotic treatment is also important, and management should include early shifts to oral antibiotics, stewardship according to the microbiological results, and short-duration antibiotic treatment that accounts for the clinical stability criteria. New approaches for fast clinical (lung ultrasound) and microbiological (molecular biology) diagnoses are promising. Community-acquired pneumonia is associated with early and late mortality and increased rates of cardiovascular events. Studies are needed that focus on the long-term management of pneumonia.

*Lancet* 2015; 386: 1097–108

Published Online
August 13, 2015
http://dx.doi.org/10.1016/S0140-6736(15)60733-4

**Department of Pulmonology, Hospital Clinic of Barcelona, University of Barcelona, Institut D´investigacions August Pi I Sunyer (IDIBAPS), Ciber de Enfermedades**

## Duration of therapy

5 days of treatment should be given for low-severity pneumonia with clinical stability after 3 days of treatment, and 7 days should be given for severe pneumonia, which should be adapted depending on the improvements in symptoms and stability.[3,4,6,122,127] Indeed, two meta-analyses

pneumonia.[123] Patients with extrapulmonary complications or empyema and pneumonia due to specific pathogens (eg, *Legionella* spp and MRSA) seem to have benefits from prolonged treatments.

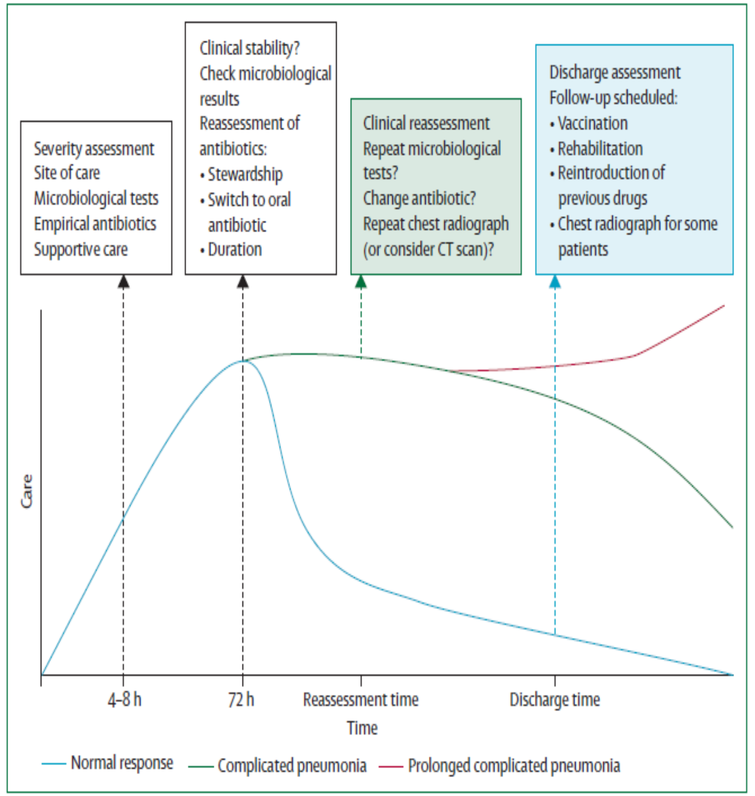


*Figure 3*: Acute and long-term assessment of community-acquired pneumonia

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# Pneumonie

Scoresystemen:
CURB & PSI

## Community Acquired Pneumonia

### Clinical Prediction Rules for Prognostication and Triage

| Criteria for Severe CAP |
|---|
| **Major criteria** |
| • Septic shock<br>• Respiratory failure requiring mechanical ventilation |
| **Minor criteria** |
| • RR ≥ 30 breaths/min<br>• $P_aO_2$ / $F_iO_2$ ratio ≤ 250<br>• Multilobar infiltrates<br>• Confusion<br>• Uremia (BUN ≥ 20 mg/dL)<br>• Leukopenia (WBC < 4000 cells/μL)<br>• Thrombocytopenia (platelet <100k cells/μL)<br>• Hypothermia (temp < 36˚ C)<br>• Hypotension responsive to IV fluids |
| *Severe CAP present in 1 major criterion or 3 minor criteria are met* |

| CURB-65 |
|---|
| Each criteria counts as 1 point |
| C – Confusion<br>U – Uremia (BUN ≥ 20 mg/dL)<br>R – Respiratory rate (RR ≥ 30)<br>B – Blood pressure (SBP < 90 or DBP < 60)<br>65 – Age ≥ 65 |
| *0 -1 points: Outpatient treatment*<br>*2 points: Inpatient vs. observation*<br>*≥ 3 points: Inpatient treatment* |

**Pneumonia Severity Index (PSI)**
(a.k.a. "PORT score" for Patient Outcomes Research Team)

| | | | |
|---|---|---|---|
| Age | 1 points for each yr | SBP < 90 | +20 |
| Sex | -10 points for female<br>0 points for male | T < 35˚ or > 39.9˚ | +15 |
| SNF resident | +10 | Pulse ≥ 125 | +10 |
| Active cancer | +30 | pH < 7.35 | +30 |
| Liver disease | +20 | BUN ≥ 30 mg/dL | +20 |
| Heart failure history | +10 | Sodium < 130 mmol/L | +20 |
| History of stroke | +10 | Glucose ≥ 250 mg/dL | +10 |
| CKD | +10 | Hematocrit < 30% | +10 |
| Confusion | +20 | $P_aO_2$ < 60 mmHg | +10 |
| RR ≥ 30 | +20 | Pleural effusion | +10 |

*≤ 70 points: Outpatient treatment*
*71-90 points: Outpatient vs. observation*
*≥ 91 points: Inpatient treatment*

Metlay JP, et al. Diagnosis and Treatment of Adults with Community-acquired Pneumonia: An Official Clinical Practice Guideline of the American Thoracic Society and Infectious Diseases Society of America. Am J Respir Crit Care Med 2019; 200: e45-e67.

**Despite its added complexity, IDSA/ATS recommend using the PSI over CURB-65 for determining which patients can be safely treated as outpatients.**

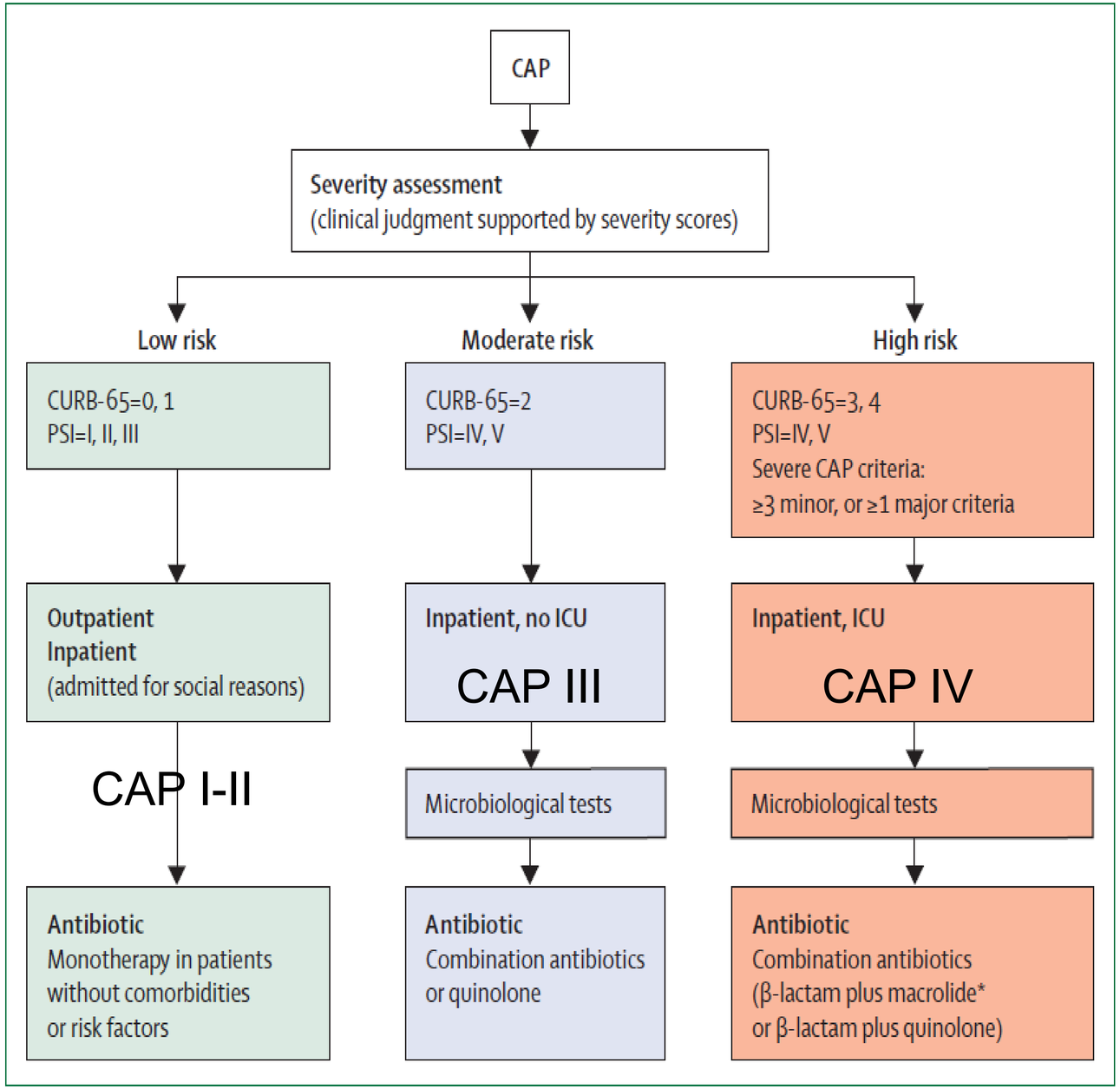
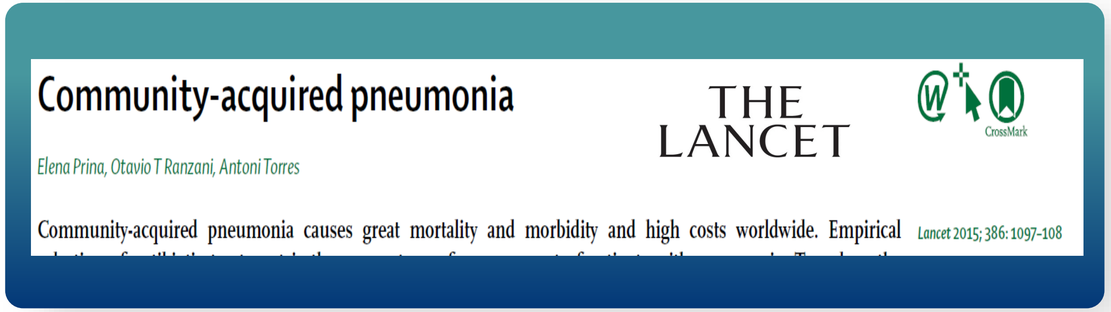



*Figure 2:* Acute management of the community-acquired pneumonia

CAP=community-acquired pneumonia. CURB-65=Confusion Urea Respiratory rate Blood pressure and age ≥65 year old score. PSI=Pneumonia Severity Index. ICU=intensive care unit. *Combination with macrolide is preferred.



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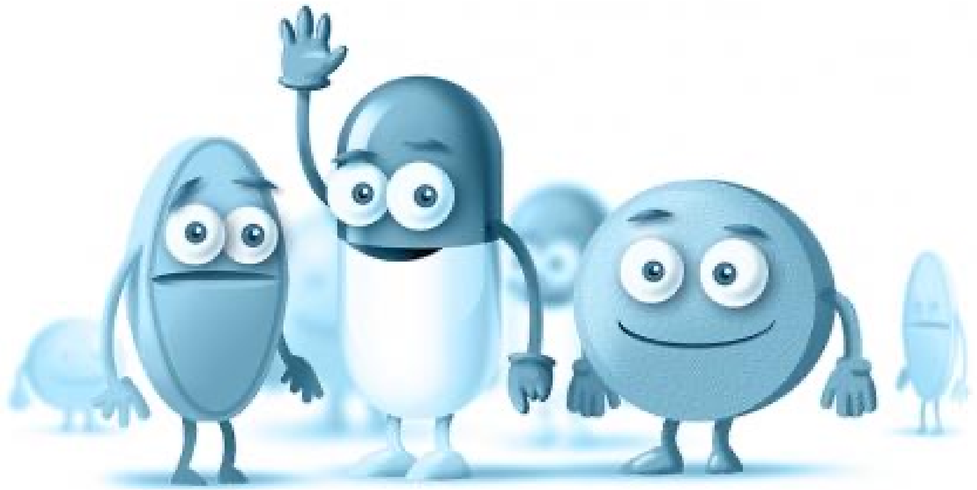
# Antibioticakeuze



# CAP I

Ambulante patiënten

zonder comobordditeiten (CURB 0)

- Betrokken pathogenen:
  - Respiratoire virussen
  - **Streptococcus pneumoniae**

- Indien er geen klinische beterschap optreedt na 72u:
  - andere pathogenen in overweging nemen:
    - Haemophilus influenzae
    - Moraxella catarrhalis
    - Mycoplasma pneumoniae
    - Legionella spp. (vnl. serotype 1)
    - Chlamydia pneumoniae
    - Staphylococcus aureus
  - rekening gehouden worden met lokale suppuratieve complicaties zoals empyeem.

Medical Presentation

# CAP I

Ambulante patiënten

zonder comoborditeiten (CURB 0)

- Patiënten zonder IgE gemedieerde allergie voor penicillines
  - Initiële behandeling: **amoxicilline** (3x1g PO)
  - Onvoldoende respons na 72 uur: amoxicilline-**clavulanaat** ± amoxicilline **+ azithromycine** (1x500mg PO)
- Patiënten met IgE gemedieerde allergie voor penicillines:
  - Initiële behandeling: **moxifloxacine** (1x400mg PO)
  - Onvoldoende respons na 72u: ceftriaxone (1x2g IV) + azithro
- Duur van de (empirische + gerichte) antibiotica:
  - Normaal: 5 dagen, niet langer dan 7 dagen.
  - Azithromycine: 3 dagen

Medical Presentation

# CAP II

Ambulante patiënten

met comorbiditeiten (CURB 1, oa. >65j)

Of hospitalisatie om sociale reden

- Betrokken pathogenen:
  - Respiratoire virussen
  - Streptococcus pneumoniae
  - **Haemophilus influenzae**
  - **Moraxella catarrhalis**

- Indien er geen klinische beterschap optreedt na 72u:
  - andere pathogenen in overweging nemen:
    - Mycoplasma pneumoniae
    - Legionella spp. (hoofdzakelijk serotype 1)
    - Chlamydia pneumoniae
    - Staphylococcus aureus
  - rekening gehouden worden met lokale suppuratieve complicaties zoals empyeem.

Medical Presentation

# CAP II

Ambulante patiënten

met comorbiditeiten (CURB 1, oa. >65j)

Of hospitalisatie om sociale reden

- Patiënten zonder IgE gemedieerde allergie voor penicillines
  - Initiële behandeling: **amoxicilline-clavulanaat** ± amoxicilline
  - Onvoldoende respons na 72 uur: amoxicilline-clavulanaat ± amoxicilline **+ azithromycine**
- Patiënten met IgE gemedieerde allergie voor penicillines:
  - Initiële behandeling: **moxifloxacine**
  - Onvoldoende respons na 72 uur: ceftriaxone + azithromycine
- Duur van de (empirische + gerichte) antibiotica:
  - Normaal: 5 dagen, niet langer dan 7 dagen.
  - Azithromycine : 3 dagen

**Amoxiclav 1000/62.5mg 2dd2 (retard) -> vervangen door:**
**Amoxiclav 875/125mg 3dd**
**OF Amoxiclav 500/125mg 3dd + Amoxicilline 3x1 g**

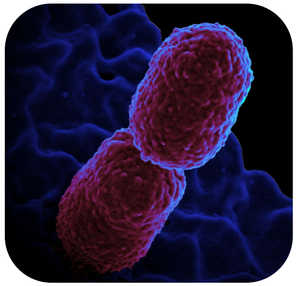
Medical Presentation

# CAP III

Hospitalisatienood

Non-ICU

- Betrokken pathogenen:
  - Respiratoire virussen
  - Streptococcus pneumoniae
  - Haemophilus influenza
  - **Staphylococcus aureus**
  - **Klebsiella pneumoniae**
  - Andere gramnegatieve pathogenen
  - Groep A streptococcen (S. pyogenes)



- Indien er geen klinische beterschap optreedt na 72u:
  - andere pathogenen in overweging nemen:
    - Mycoplasma pneumoniae
    - Legionella spp. (hoofdzakelijk serotype 1)
    - Chlamydia pneumoniae
  - rekening gehouden worden met lokale suppuratieve complicaties zoals empyeem.

Medical Presentation

# CAP III

Hospitalisatienood

Non-ICU

- Patiënten zonder IgE gemedieerde allergie voor penicillines
  - Initiële behandeling:
    - Oraal: **amoxicilline-clavulanaat** ± amoxicilline
    - IV: **amoxicilline-clavulanaat** of ceftriaxone
  - Onvoldoende respons  na 72 uur:
    - Orale behandeling nog steeds mogelijk: amoxicilline-clavulanaat  ± amoxicilline **+ azithromycine**
    - IV behandeling noodzakelijk: amoxicilline-clavulanaat of ceftriaxone **+ clarithromycine** (2x500mg IV)
- Patiënten met IgE gemedieerde allergie voor penicillines:
  - Initiële behandeling: **moxifloxacine**
  - Onvoldoende respons na 72 uur: ceftriaxone + (azithromycine of clarithromycine)

- Duur van de (empirische + gerichte) antibiotica:
  - Normaal: niet langer dan 7d. Steeds herevaluatie na 72u.
  - Azithromycine : 3 dagen
  - Clarithromycine: 5 dagen

Medical Presentation

# CAP IV

Hospitalisatienood

ICU

- Betrokken pathogenen:
  - Respiratoire virussen
  - Streptococcus pneumoniae
  - Haemophilus influenza
  - Staphylococcus aureus
  - Klebsiella pneumoniae
  - Andere gramnegatieve pathogenen
  - Groep A streptococcen (S. pyogenes)
  - Mycoplasma pneumoniae
  - Chlamydia pneumoniae
  - Legionella spp
- De gebruikte antibiotica dienen steeds zowel typische als atypische pathogenen in te dekken.
- Combineren van een bètalactam **met azithromycine of clarithromycine** bij patiënten van deze subgroep leidt tot een verbeterde uitkomst, zelfs wanner de infectie wordt veroorzaakt door een pathogeen die resistent is tegen azithromycine en/of clarithromycine. Dit kan wellicht worden toegeschreven aan het **immunomodulerend effect** van deze 2 antibiotica.

Medical Presentation

# CAP IV

Hospitalisatienood

ICU

- Patiënten zonder IgE gemedieerde allergie voor penicillines
  - **Geen structureel longlijden:**
    - Geen recente blootstelling aan antibiotica of recente hospitalisatie: **amoxicilline-clavulanaat** (**6x1g IV**) + **clarithromycine**
    - Wel recente blootstelling aan antibiotica of recente hospitalisatie: ceftriaxone + clarithromycine
  - **Structureel longlijden (bronchiëctasieën of ernstige COPD: indekken Pseudomonas aeruginosa):** ceftazidime (6g/24u IV) of piperacilline-tazobactam (4x4g IV) + clarithromycine

- Patiënten met IgE gemedieerde allergie voor penicillines:
  - Meropenem + clarithromycine

- Duur van de (empirische + gerichte) antibiotica: bij gunstige klinische evolutie kunnen 7 dagen volstaan. Bij onderliggend structureel longlijden: 10-14 dagen

Medical Presentation

# Noscomiale pneumonie

HAP (>48u opname)

VAP

Aspiratiepneumonie

- Patiënten zonder IgE gemedieerde allergie voor penicillines
  - Geen sepsis , **geen RF voor multiresistente pathogenen: amoxicilline-clavulanaat** (6x1g IV)
  - Geen sepsis, **wel RF** voor multiresistente pathogenen: ceftazidime of meropenem of piperacilline-tazobactam
  - **Sepsis** of septische shock: + **amikacine**
- Patiënten met IgE gemedieerde allergie voor penicillines
  - Geen sepsis, **geen RF voor resistente pathogenen**: **ceftriaxone**
  - Geen sepsis , **wel RF** voor resistente pathogenen: meropenem
  - Sepsis of septische shock: + amikacine
- Duur van de (empirische + gerichte) antibiotica:
  - Geen sepsis, geen RF: 5-7 dagen bij ongecompliceerd verloop.
  - Andere patiënten: 7 dagen bij bewezen gevoeligheid en goede klinische respons.
  - Amikacine: max 3 dagen.

Medical Presentation

# Empyeem

- Betrokken pathogenen:
  - Streptococcus pneumoniae
  - Groep A streptokokken (S. pyogenes).
  - Staphylococcus aureus
  - Andere streptokokken (viridans groep).
  - Anaeroben
  - Enterobacterales
  - Mycobacterium tuberculosis

- Patiënten zonder IgE gemedieerde allergie voor penicillines
  - Milde of matige infecties: **amoxicilline-clavulanaat**
  - Ernstige of overweldigende infectie: behandelen zoals **CAP IV**

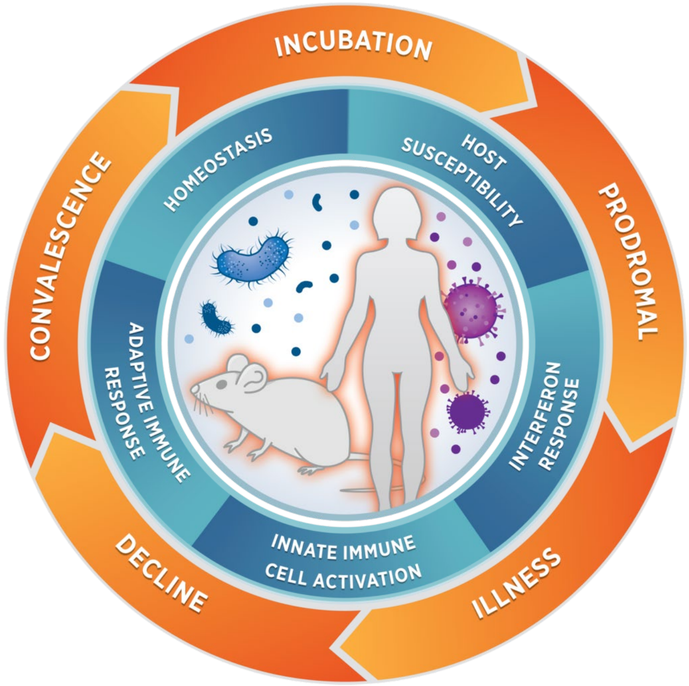
- Patiënten met IgE gemedieerde allergie voor penicillines:
  - Milde of matige infecties: **moxifloxacine**
  - Ernstige of overweldigende infectie en/of risicofactoren: behandelen zoals CAP IV

- Duur van de (empirische + gerichte) antibiotica:
  - Normaal: **14-28 dagen**
  - Optimale duur is afhankelijk van betrokken pathogeen en doeltreffendheid van de drainage.

Medical Presentation

# Conclusie

- Antibiotica limiteren
  - Noodzaak antibiotica?
  - Dagen
- Antibiotica personaliseren
  - Afhankelijk van pathogeen: belang culturen!
  - Afhankelijk van immuunsysteem patiënt
  - Onderliggend structureel longlijden?
- Voorkeurstherapie pneumonie
  - Amoxi of amoxi-clav (moxifloxacine bij penicilline allergie)
  - Zo geen beterschap na 72u: associatie macroliden
  - Zo hoog CRP bij opname (>300mg/L) of CAP IV: associatie macroliden



# Bedankt!

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AZ Sint-Vincentius DEINZE