Management of Community-Acquired Pneumonia *in Adults*

Risk Stratification

Risk stratification can help tailor disease management to patient needs and improve outcomes. Risk stratification for CAP calls for both clinical judgment and complementary use of the Pneumonia Severity Index (PSI/PORT Score).[1, 2] **Scan the QR Code to begin using the PSI/PORT Score.**

SCAN ME

Pneumonia Severity Index (PSI)

What is it?

The PSI/PORT Score is a clinical tool that provides excellent risk stratification for patients with pneumonia.

When can I use it?

It can be used in the clinic or emergency department. when seeing a patient with CAP.

How do I start?

To start calculating the score, scan the QR code above or visit MD+Calc online

What does it mean?

Patients with risk class I or II can be considered for outpatient management, whereas patients with risk class IV or V are at higher risk and hospitalization is recommended.

Patients with risk class III should be considered for either outpatient or inpatient therapy, depending on clinical judgement

Sepsis!

Always evaluate for sepsis, including lactate levels, as the PSI was developed before modern sepsis screeening practices.

Therapeutic Decisions by Risk Assessment[3, 4]

Risk Class I & II

Consider Outpatient
(No Comorbidities)

Amoxicillin 1000 mg PO TID
OR Doxycycline 100 mg PO BID

Outpatient
(With Comorbidities)

Amoxicillin-Clavulanate 875/125 mg PO BID

PLUS

Azithromycin 500 mg PO x1, then 250 mg PO
OR Doxycycline 100 mg PO BID

β-Lactam Allergy
Moxifloxacin 400 mg PO daily
Levofloxacin 750 mg PO daily

Duration: 5 days

Risk Class IV & V

Ward Inpatient

Ceftriaxone 2g IV q24h

PLUS

Azithromycin 500 mg IV q24h x 3 doses
OR Doxycycline 100 mg PO BID

Comorbidities include chronic heart, lung, liver, or renal disease; diabetes mellitus; alcoholism; malignancy; or asplenia.

β-Lactam Allergy
Moxifloxacin 400 mg PO/IV daily
Levofloxacin 750 mg PO/IV daily

Duration: 5-7 days
(except for azithromycin, see above)

Critically Ill ICU Level of Care

E.g. Septic Shock

Ceftriaxone 2g IV q24h

PLUS

Azithromycin 500 mg IV q24h x 3 doses
OR Moxifloxacin IV daily
OR Levofloxacin IV daily
(See dosing below)

See Added Considerations for Critical Illness, below

β-Lactam Allergy
Moxifloxacin 400 mg IV daily
Levofloxacin 750 mg IV daily

Duration: 7 days
(except for azithromycin, see above)

β-Lactam Allergy?

Always consider **PEN-FAST**, the penicillin allergy decision rule, to help assess a patient with any penicillin or β-lactam allergies. **Scan the QR code or visit MD+Calc** online.[5, 6]

SCAN ME

Added Considerations for Critical Illness

1. IV hydrocortisone

If no contraindications, consider adjunctive IV hydrocortisone (200 mg/day)
See CAPE COD study.[7]

2. MRSA

If patient has any risk factors for MRSA, collect nasal swab for MRSA culture and add coverage (e.g. IV vancomycin). Nasal MRSA swab has high negative predictive value in CAP.[8]

Empiric MRSA coverage can be discontinued in 48 hours if nasal swab culture is MRSA negative and no MRSA identified in sputum or blood cultures

MRSA Risk Factors:

- History of MRSA infection/colonization
- Household contact with MRSA colonization
- Persons who inject drugs
- Crowded living conditions (homelessness/shelters, incarcerated persons)
- Residing in MRSA endemic regions (many Northern Manitoba remote communities)

3. Pseudomonas

If patient has any risk factors for Pseudomonas, use pipericillin-tazobactam or meropenem in place of ceftriaxone.

Patients on Anti-Pseudomonal therapy who are clinically improving after 48 hours and whose cultures don't reveal a drug-resistant pathogen should be considered for de-escalation to standard CAP therapy.

Pseudomonas Risk Factors:

- Known colonization or recent infection with *Pseudomonas aeruginosa*,
- Recent ICU exposure (i.e. within past 2 weeks)
- Systemic antibiotic exposure during recent hospitalization (i.e. <90 days)

Transition to Oral Therapy

Considerations for PO:

Amoxicillin 1000 mg PO TID is an appropriate oral stepdown option. For patients who have not yet received a total of 1500 mg azithromycin, PO azithromycin 500 mg daily should also be added.

Alternatively, if levofloxacin or moxifloxacin was provided as initial IV therapy, these agents can be continued orally.

Causative Pathogens for CAP[9, 10, 11]

Non-Resolving Pneumonia?

THINK:
Complications of pneumonia (e.g. empyema or lung abscess), unusual pathogens, or non-infectious mimickers of pneumonia!

Probable Pathogens

Most commonly seen and typical presentation

- *Streptococcus pneumoniae*
- Respiratory viruses

Potential Pathogens

Less common, similar presentation

- Atypical bacteria: *Mycoplasma pneumoniae, Chlamydia pneumoniae, Legionella pneumophila*
- *Haemophilus influenzae*
- *Moraxella catarrhalis*
- *Staphylococcus aureus*
- Mixed anaerobic bacteria (aspiration)

Unusual Pathogens

Less common and atypical presentation or host

- *Mycobacterium tuberculosis*
- *Pneumocystis jirovecii*
- Fungi: Opportunistic (e.g. Aspergillus) or Endemic (e.g. Blastomyces)
- *Streptococcus pyogenes*

References

1. **MDCalc.** PSI/PORT Score: Pneumonia Severity Index for CAP. MDCalc. https://www.mdcalc.com/calc/33/psi-port-score-pneumonia-severity-index-cap. Accessed December 12, 2024.

2. **Anurag A, Preetam M.** Validation of PSI/PORT, CURB-65, and SCAP scoring systems in COVID-19 pneumonia for prediction of disease severity and 14-day mortality. *Clin Respir J.* 2021;15(5):467-471. doi:10.1111/crj.13326.

3. **Uranga A, España PP, Bilbao A, et al.** Duration of antibiotic treatment in community-acquired pneumonia: A multicenter randomized clinical trial. *JAMA Intern Med.* 2016;176(9):1257-1265. doi:10.1001/jamainternmed.2016.3633.

4. **Grant J, Saux NL; members of the Antimicrobial Stewardship and Resistance Committee (ASRC) of the Association of Medical Microbiology and Infectious Disease (AMMI) Canada.** Duration of antibiotic therapy for common infections. *J Assoc Med Microbiol Infect Dis Can.* 2021;6(3):181-197. doi:10.3138/jammi-2021-04-29.

5. **Piotín A, Godet J, Trubiano JA, et al.** Predictive factors of amoxicillin immediate hypersensitivity and validation of PEN-FAST clinical decision rule. *Ann Allergy Asthma Immunol.* 2022;128(1):27-32. doi:10.1016/j.anai.2021.07.005.

6. **MDCalc.** Penicillin Allergy Decision Rule PEN-FAST. MDCalc. https://www.mdcalc.com/calc/10422/penicillin-allergy-decision-rule-pen-fast. Accessed December 12, 2024.

7. **Dequin PF, Meziani F, Quenot JP, et al.** Hydrocortisone in severe community-acquired pneumonia. *N Engl J Med.* 2023;388(21):1931-1941. doi:10.1056/NEJMoa2215145.

8. **Dangerfield B, Chung A, Webb B, Sevill M.** Predictive value of methicillin-resistant Staphylococcus aureus (MRSA) nasal swab PCR assay for MRSA pneumonia. *Antimicrob Agents Chemother.* 2014;58(2):859-864. doi:10.1128/AAC.01805-13.

9. **Evans SE, et al.** Nucleic acid-based testing for noninfluenza viral pathogens in adults with suspected community-acquired pneumonia: An official American Thoracic Society clinical practice guideline. *Am J Respir Crit Care Med.* 2021;203(9):1070-1087.

10. **Metlay JP, Waterer GW, Long AC, 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.* 200(7):2019; e45-67. doi: 10.1164/rccm.201908-1581ST.

11. **Wunderink RG, Waterer GW.** Clinical practice. Community-acquired pneumonia. *N Engl J Med.* 2014;370(6):543-551. doi:10.1056/NEJMcp1214869.

Feel free to get in touch!

Share your feedback on this tool.

Take the Antimicrobial Stewardship Pledge!
With a pledge, receive a Manitoba AMR Alliance lapel pin and e-news updates about new tools and resources.

Contact:

Manitoba AMR Alliance (MAMRA)

Email: twuerz@hsc.mb.ca

Website: ManitobaAMR.ca

Developed by Drs. Himath Jayasinghe and Terence Wuerz, with production assistance from the National Collaborating Centre for Infectious Diseases (NCCID).

Published: January 2025.