Philippine Clinical Practice Guidelines on the Diagnosis, Empiric Management, and Prevention of Community-acquired Pneumonia (CAP) in Immunocompetent Adults

2010 Update

PSMID – PCCP – PAFP – PCR

Part I: CLINICAL DIAGNOSIS

Can CAP be diagnosed accurately by history and physical examination?

- The accuracy of predicting CAP by physicians' clinical judgment is between 60-76%. (Grade B)
- Clinical prediction rules combining history and physical examination findings may be utilized to presumptively identify patients with pneumonia. (Grade B)

Accuracy of Predicting Pneumonia By Physicians' Clinical Judgment

Decision Basis	Physician's Clinical Judgment	Hecklering et al Score (threshold = 2)	Gennis et al Rule (threshold = 1)
Variables	History Clinical findings	Temperature of >37.8 Pulse of >100/min Rales Decreased breath sounds Absence of asthma	Temperature of >37.8 Respiration of >20/min
Accuracy in predicting pneumonia	60%	68%	76%

Is there any clinical feature that can predict CAP caused by an atypical pathogen?

- There is no clinical feature that can reliably distinguish pneumonia due to a typical or an atypical pathogen. (Grade A)

Part II: CHEST RADIOGRAPHY

What is the value of the chest radiograph in the diagnosis of CAP?

- The chest x-ray is essential in the diagnosis of CAP, assessing severity, differentiating pneumonia from other conditions, and in prognostication. (Grade A)

What specific views of chest radiograph should be requested?

- Standing posteroanterior and lateral views of the chest in full inspiration comprise the best radiologic evaluation of a patient suspected of having pneumonia. (Grade A)

Are there characteristic radiographic features that can predict the likely etiologic agent from the chest radiograph?

- There is no characteristic radiographic feature that can predict the likely etiologic agent in CAP.

How should a clinician interpret a radiographic finding of "pneumonitis"?

- A radiographic reading of "pneumonitis" should always be correlated clinically. (Grade C)

What is the significance of an initial "normal" chest radiograph in a patient suspected to have CAP?

- An initial "normal" chest x-ray may connote a radiographic lag phase.

Should a chest radiograph be repeated routinely?

- Routine follow-up chest radiograph is not needed for patients with low-risk CAP who are clinically improving. (Grade B)

What is the role of chest CT scan in CAP?

- The chest CT scan has no routine role in the evaluation of CAP. (Grade B)

Part III: Site-of-Care Decisions

Which patients will need hospital admission?

- A management-oriented risk stratification of CAP based on the patient's clinical condition, status of any co-morbid condition and chest x-ray findings should be utilized in the decision to determine the site of care for patients. (Grade A)

Clinical Features of Patients with CAP According to Risk Categories

Low-risk CAP	Moderate-risk CAP	High-risk CAP
Presence of: Stable vital signs; RR <30 breaths/min; PR <125 beats/min; Temp >36 C or <40 C; SBP >90 mmHg; DBP >60 mmHg No altered mental state of acute onset No suspected aspiration No or stable comorbid conditions Chest X-ray: - Localized infiltrates - No evidence of pleural effusion, abscess	Any of the ff: Unstable vital signs; RR ≥30 breaths/min; PR ≥125 beats/min; Temp ≥40 C or ≤36 C; SBP <90 mmHg; DBP ≤60 mmHg Altered mental state of acute onset Suspected aspiration Decompensated comorbid condition	Any of the criteria under moderate- risk CAP category plus Severe sepsis and Septic shock Need for mechanical ventilation

Which patients will need hospital admission?

- Patients with low-risk CAP are considered suitable for outpatient care in the absence of contraindications. (Grade A)
- These patients with moderate- and high-risk CAP need to be hospitalized for closer monitoring and/or parenteral therapy. (Grade A)

Part IV: Microbiologic Studies

What microbiologic studies are necessary in CAP?

- In low-risk CAP, microbiologic studies are optional. (Grade B)

What microbiologic studies are necessary in CAP?

- In moderate-risk and high-risk CAP, blood cultures and Gram stain and culture with antibiotic sensitivity tests of respiratory specimens should be done in laboratories with quality assurance. (Grade A)
- When possible, tests to document the presence of *Legionella pneumophila* are recommended in hospitalized patients with CAP. (Grade B)

What microbiologic studies are necessary in CAP?

- Invasive procedures to obtain specimens for special microbiologic studies for atypical pathogens are options for non-resolving pneumonia, immunocompromised patients and patients in whom no adequate respiratory specimens can be sent despite sputum induction and routine diagnostic testing. (Grade B)

Part V: Treatment

When should antibiotics be initiated for the empiric treatment of CAP?

- For patients requiring hospitalization, empiric therapy should be initiated as soon as possible after diagnosis of CAP is made. (Grade B)
- For low-risk CAP, treatment may be delayed. (Grade C)

What initial antibiotics are recommended for the empiric treatment of CAP?

- For low-risk CAP without comorbid illness, amoxicillin remains the standard drug of choice (Grade A). Extended macrolides are recommended when atypical pathogens are suspected. (Grade A)

What initial antibiotics are recommended for the empiric treatment of CAP?

- For low-risk CAP with stable comorbid illness, β-lactam with β-lactamase inhibitor combinations (BLIC) (Grade A) or second generation cephalosporins (Grade A) with or without extended macrolides are recommended. For patients who have completed first-line treatment (BLIC or 2nd generation cephalosporin) with no response, an extensive work up should be done to identify the factors for failure of response. Work-up may include doing sputum Gram stain and culture. An alternative treatment is an oral third-generation cephalosporin with or without extended macrolides. (Grade C)

What initial antibiotics are recommended for the empiric treatment of CAP?

- For moderate-risk CAP, a combination of an IV non-antipseudomonal β-lactam (BLIC, cephalosporin or carbapenem) with either an extended macrolide or respiratory fluoroquinolone is recommended as initial antimicrobial treatment. (Grade B)

What initial antibiotics are recommended for the empiric treatment of CAP?

- For high-risk CAP without risk for *Pseudomonas aeruginosa,* a combination of an IV non-antipseudomonal β-lactam (BLIC, cephalosporin or carbapenem) with either an IV extended macrolide or IV respiratory fluoroquinolone is recommended as an initial antimicrobial treatment. (Grade A)

What initial antibiotics are recommended for the empiric treatment of CAP?

- For high-risk CAP with risk for *P. aeruginosa,* a combination of an IV antipneumococcal, antipseudomonal β-lactam (BLIC, cephalosporin or carbapenem) with an extended macrolide and aminoglycoside (Grade A) OR a combination of an IV antipneumococcal, antipseudomonal β-lactam (BLIC, cephalosporin or carbapenem) and IV ciprofloxacin or high dose IV levofloxacin (Grade B).

How can response to initial therapy be assessed?

- Temperature, RR, HR, BP, sensorium, O_2 saturation and inspired O_2 concentration should be monitored to assess response to therapy.
- Response to therapy is expected within 24-72 hours of initiating treatment. Failure to improve afer 72 hours of treatment is an indication to repeat the chest radiograph. (Grade A)
- Follow-up cultures of blood and sputum are not indicated for patients who are responding to treatment. (Grade A)

When should de-escalation of empiric antibiotic therapy be done?

- De-escalation of initial empiric broad-spectrum antibiotic or combination parenteral therapy to a single narrow spectrum parenteral or oral agent based on available laboratory data is recommended once the patient is clinically improving, is hemodynamically stable and has a functioning gastrointestinal tract. (Grade B)

Antibiotic Dosage of Oral Agents for Streamlining or Switch Therapy

Antibiotic	Dosage	Antibiotic	Dosage
Amoxicillin-clavulanic acid	625mg TID or 1 gm BID	Cefaclor	500 mg TID or 750 mg BID
Amoxicillin-sulbactam	1 gm TID	Cefuroxime axetil	500 mg BID
Sultamicillin	750 mg BID	Cefdinir	300 mg BID
Azithromycin dihydrate	500 mg OD	Cefixime	200 mg BID
Clarithromycin	500 mg BID	Cefpodoxime proxetil	200 mg BID
		Levofloxacin	500-750 mg OD
		Moxifloxacin	400 mg OD

Which oral antibiotics are recommended for de-escalation or switch therapy from parenteral antibiotics?

- The choice of oral antibiotics following initial parenteral therapy is based on available culture results, antimicrobial spectrum, efficacy, safety and cost. In general, when switching to oral antibiotics, either the same agent as the parenteral antibiotic or an antibiotic from the same drug class should be used.

How long is the duration of treatment for CAP?

- Duration of treatment is 5 to 7 days for low risk uncomplicated bacterial pneumonia. (Grade B)
- For moderate-risk and high-risk CAP or for those with suspected or confirmed Gram-negative, *S. aureus or P. aeruginosa pneumonia,* treatment should be prolonged to 14 to 21 days. (Grade B)
- A treatment regimen of 10 to 14 days is recommended for *Mycoplasma* and *Chlamydophila pneumonia while Legionella pneumonia is treated* for 14 to 21 days. (Grade B)

How long is the duration of treatment for CAP?

- A 5-day course of oral or IV therapy for low-risk CAP and a 10-day course for *Legionella pneumonia is possible with new agents such as* the azalides, which possess a long half-life and achieve high tissue levels that prolong its duration of effect. (Grade B)
- Patients should be afebrile for 48 to 72 hours with no signs of clinical instability before discontinuation of treatment. (Grade B)

What should be done for patients who are not improving after 72 hours of empiric antibiotic therapy?

- The clinical history, physical examination and the results of all available investigations should be reviewed. The patient should be reassessed for possible resistance to the antibiotics being given or for the presence of other pathogens such as *M. tuberculosis, viruses,* parasites or fungi. Treatment should then be revised accordingly. (Grade B)

Factors to Consider for Non-responding Pneumonia or Failure to Improve

1. Incorrect diagnosis or presence of a complicating noninfectious condition e.g., pulmonary embolism, congestive heart failure, vasculitis, myocardial infarction
2. A resistant microorganism or an unexpected pathogen that is not covered by the antibiotic choice
3. Antibiotic is ineffective or causing an allergic reaction i.e., poor absorption of the oral antibiotic, certain drug interactions, inadequate dose, patient not taking or receiving the prescribed antibiotic
4. Impaired local or systemic host defenses e.g., aspiration, endobronchial obstruction, bronchiectasis, systemic immune deficiency
5. Local or distant complications of pneumonia e.g., parapneumonic effusion, empyema, lung abscess, ARDS, metastatic infection, endocarditis
6. Overwhelming infection
7. Slow response in the elderly patient; *S. pneumoniae and L. pneumophila* may cause slow resolution of pneumonia in the elderly
8. Exacerbation of comorbid illnesses
9. Nosocomial superinfection

What should be done for patients who are not improving after 72 hours of empiric antibiotic therapy?

- Follow-up chest radiograph is recommended to investigate for other conditions such as pneumothorax, cavitation and extension to previously uninvolved lobes, pulmonary edema and ARDS. (Grade B)
- Obtaining additional specimens for microbiologic testing should be considered. (Grade B)

When can a hospitalized patient with CAP be discharged?

- In the absence of any unstable coexisting illness or other life-threatening complication, the patient may be discharged once clinical stability occurs and oral therapy is initiated. (Grade A)

Recommended Hospital Discharge Criteria

During the 24 hours before discharge, the patient should have the following characteristics (unless this represents the baseline status):

1. temperature of 36-37.5 C
2. pulse < 100/min
3. respiratory rate between 16-24/minute
4. systolic BP >90 mmHg
5. blood oxygen saturation >90%
6. functioning gastrointestinal tract

When can a hospitalized patient with CAP be discharged?

- A repeat chest radiograph prior to hospital discharge is not needed in a patient who is clinically improving. (Grade B)
- A repeat chest radiograph is recommended during a follow-up visit, approximately 4 to 6 weeks after hospital discharge to establish a new radiographic baseline and to exclude the possibility of malignancy associated with CAP, particularly in older smokers. (Grade B)

Part VI: Prevention

Part VI: How can CAP be prevented?

- Influenza vaccination is recommended for the prevention of CAP. (Grade A)
- Pneumococcal vaccination is recommended for the prevention of invasive pneumococcal disease (IPD) in adults. (Grade A)
- Smoking cessation is recommended for all persons with CAP who smoke. (Grade A)