Update infectious disease international guidelines

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มหาวิทยาลัยนวมินทราธิราช

Clinical Practice Guidelines: update

- The Diagnosis and Management of Acute Otitis Media (Pediatrics 2013;131:e964–e999)
- Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18 Years (Pediatrics 2013;132:e262–e280)
- IDSA Clinical Practice Guideline for Acute Bacterial Rhinosinusitis in Children and Adults (CID 2012;54:e72-112.)
- The Management of Community-Acquired Pneumonia in Infants and Children Older Than 3 Months of Age: Clinical Practice Guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America (Clin Infect Dis 2011;53:e25–e76.)

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Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

CLINICAL PRACTICE GUIDELINE

The Diagnosis and Management of Acute Otitis Media

Healthy children 6 months-12 years

abstract

FREE

This evidence-based clinical practice guideline is a revision of the 2004 acute otitis media (AOM) guideline from the American Academy of Pediatrics (AAP) and American Academy of Family Physicians. It provides recommendations to primary care clinicians for the management of children from 6 months through 12 years of age with uncomplicated AOM.

In 2009, the AAP convened a committee composed of primary care physicians and experts in the fields of pediatrics, family practice, otolaryngology, epidemiology, infectious disease, emergency medicine, and guideline methodology. The subcommittee partnered with the Agency for Healthcare Research and Quality and the Southern California Evidence-Based Practice Center to develop a comprehensive review of the new literature related to AOM since the initial evidence report of 2000. The resulting evidence report and other sources of data were used to formulate the practice guideline recommendations.

The focus of this practice guideline is the appropriate diagnosis and initial treatment of a child presenting with AOM. The guideline provides a specific, stringent definition of AOM. It addresses pain management, initial observation versus antibiotic treatment, appropriate choices of antibiotic agents, and preventive measures. It also addresses recurrent AOM, which was not included in the 2004 guideline. Decisions were made on the basis of a systematic grading of the quality of evidence and benefit-harm relationships.

The practice guideline underwent comprehensive peer review before formal approval by the AAP.

This clinical practice guideline is not intended as a sole source of guidance in the management of children with AOM. Rather, it is intended to

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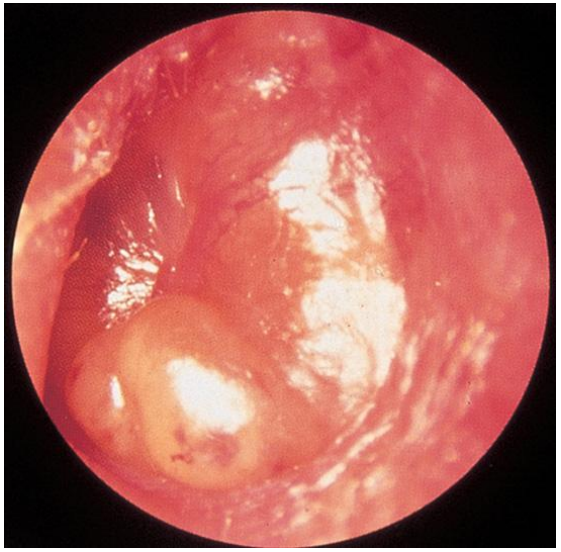
KEY WORDS

acute otitis media, otitis media, otoscopy, otitis media with effusion, watchful waiting, antibiotics, antibiotic prophylaxis, tympanostomy tube insertion, immunization, breastfeeding

ABBREVIATIONS

AAFP—American Academy of Family Physicians
AAP—American Academy of Pediatrics
AHRQ—Agency for Healthcare Research and Quality
AOM—acute otitis media
CI—confidence interval
FDA—US Food and Drug Administration
LAIV—live-attenuated intranasal influenza vaccine
MEE—middle ear effusion
MIC—minimum inhibitory concentration
NNT—number needed to treat
OM—otitis media
OME—otitis media with effusion
OR—odds ratio
PCV7—heptavalent pneumococcal conjugate vaccine
PCV13—13-valent pneumococcal conjugate vaccine
RD—rate difference
SNAP—safety net antibiotic prescription
TIV—trivalent inactivated influenza vaccine
TM—tympanic membrane
WASP—wait-and-see prescription



Pediatrics 2013;131:e964–e999.

Strength of Recommendations and Quality of Evidence

(++, A)

Evidence Quality:

A, B, C, D, X

- **++** = Strong Recommendation
- **+** = Recommendation
- **+/-** = Option

Evidence Quality: A, B, C, D, X

Evidence Quality	Preponderance of Benefit or Harm	Balance of Benefit and Harm
A. Well designed RCTs^ or diagnostic studies on relevant population	Strong Recommendation	Option
B. RCTs or diagnostic studies with minor limitations; overwhelmingly consistent evidence from observational studies	Recommendation	
C. Observational studies (case-control and cohort design)		
D. Expert opinion, case reports, reasoning from first principles	Option	No Rec
X. Exceptional situations in which validating studies cannot be performed and there is a clear preponderance of benefit or harm	Strong Recommendation / Recommendation	

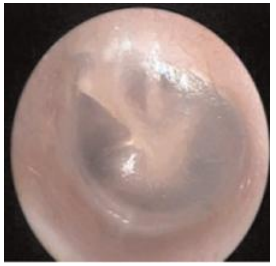
Pediatrics 2013;131:e964–e999; Pediatrics 2013;132:e262–e280

Evidence Quality: A, B, C, D

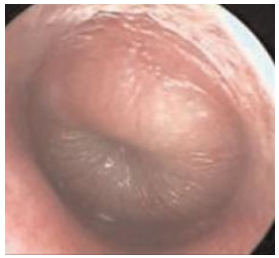
- ระดับ A หมายถึง well performed RCTs, case control study, หรือ cohort study ที่ออกแบบเป็นอย่างดี และการศึกษาวิจัยในอนาคตไม่น่าจะมีผลให้เปลี่ยนแปลงคำแนะนำนี้
- ระดับ B หมายถึง RCTs, case control study, หรือ cohort study ที่มีข้อจำกัดบางประการ การศึกษาวิจัยในอนาคตอาจมีผลให้เปลี่ยนแปลงคำแนะนำนี้ได้
- ระดับ C หมายถึง RCTs, case control study, หรือ cohort study ที่มีข้อบกพร่องอย่างมาก การศึกษาวิจัยในอนาคตน่าจะมีผลสำคัญต่อคำแนะนำนี้
- ระดับ D หมายถึง ข้อสังเกตุทางคลินิกโดยไม่มีหลักฐานยืนยันชัดเจน

Clin Infect Dis 2011;53:e25–e76.

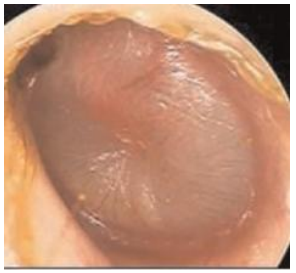
Diagnosis of AOM



- **(+, B)** New onset of otorrhea not due to acute otitis externa



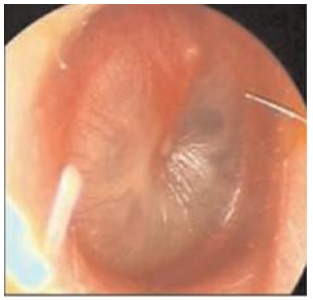
- **(+, B)** Moderate to severe bulging of the tympanic membrane (TM)



- **(+, C)** Mild bulging TM **AND**
  - recent (< 48 hours) onset of ear pain (holding, tugging, rubbing of the ear in a nonverbal child)

  OR

  - intense erythema TM



- Complicated AOM: AOM with otorrhea
- Severe AOM: AOM with one of the followings
  -moderate to severe otalgia
  -otalgia > 48 hours
  -fever ≥ 39°C

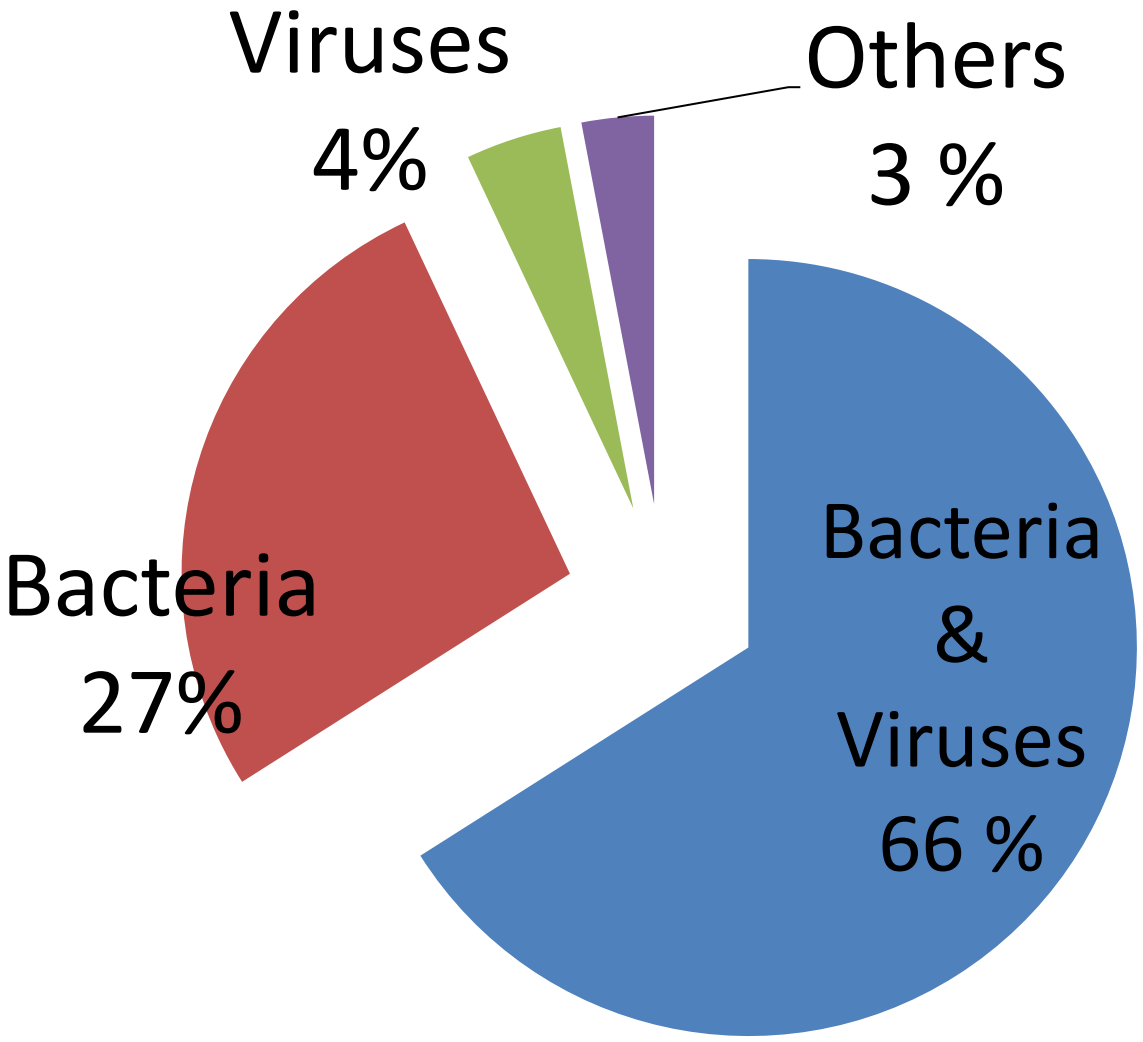
Nonsevere AOM: mild otalgia for < 48 hours and fever < 39°C

Recurrent AOM

- ≥ 3 well documented and separate AOM episodes in the preceding 6 months or

- ≥ 4 episodes in the preceding 12 months with at least 1 episode in the past 6 months

Microbiology & susceptibility



Bacterial pathogens

- *S. pneumoniae* (DRSP40-52%)
- Nontypeable *H. influenzae* (34 % produce β-lactamase)
- *M. catarrhalis* (100% produce β-lactamase)
- *Streptococcus pyogenes* <5%

Treatment: Initial antibiotics or Not

- **(+, B)** **Prescribe ATB** for all diagnostic AOM

- **(+, B)** Either **Prescribe ATB** or **Observe** if
  -nonsevere unilateral AOM in < 2 year-old children
  -nonsevere AOM in ≥ 2 year-old children

Observe: initial symptomatic treatment, start antibiotics only if
-the child's condition worsens at any time or does not show clinical improvement within 48-72 hours.
- the child fails observation

AOM: First line antibiotics (+, B)

Amoxicillin (80-90 mg/kg/day in 2 divided doses)

Amoxicillin-clavulanate (90 mg/kg/day of amoxicillin in 2 divided doses)

[amoxicillin:clavulanate= 14:1] ***if***

- taken amoxicillin in the previous 30 days
- concurrent conjunctivitis
- recurrent AOM not response to amoxicillin

First line antibiotics for penicillin allergy

- Cefdinir (14 mg/kg/day in 1 or 2 doses)
- Cefuroxime (30 mg/kg/day in 2 divided doses)
- Cefpodoxime (10 mg/kg /day in 2 divided doses)
- Ceftriaxone (50 mg/kg/day, IM or IV **for 1-3 d**)

-Clindamycin 30-40 mg/kg/day, divided every 6 hy, for susceptible drug resistant *S. pneumoniae* (DRSP)

-Anaphylaxis to penicillin or cephalosporins allergy:

levofloxacin 10-20 mg/kg/day, OD (max 500 mg/day)

Antibiotics after 48-72 hours of failure of initial antibiotics

(+, B)

Initial antibiotics	New started antibiotics
Amoxicillin 80-90 MKD	Amoxicillin-clavulanate 90MKD
Amox-clavulanate90MKD	Ceftriaxone 50 MKD x3days
Amoxicillin-clavulanate, 2nd, 3rd cephalosporins	Clindamycin 30-40 MKD + oral cephalosporins (cefdinir or cefuroxime or cefpodoxime)
Amoxicillin, Amoxicilli-clavulanate, Clindamycin + oral cephalosporins	Levofloxacin 10-20 MKD, OD
	Or tympanocentesis for pus gram stain&culture

Symptomatic treatment

- Paracetamol 10-15 mg/kg/dose, reduce pain prn every 4-6 hr **(++, B)**
- Topical analgesic agents: limited evidence
- OME: mostly spontaneous cure within 3 months

Prevention

- Exclusive breastfeeding ≥6 months **(+, B)**
- Avoidance of tobacco smoke exposure **(+, C)**
- Recommended pneumococcal conjugate vaccine **(++, B)**
- Recommended annual influenza vaccine **(+, B)**
- May offer tympanostomy tube for recurrent AOM **(+/-, B)**
- Not prescribe prophylactic antibiotics for recurrent AOM **(+, B)**

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Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

CLINICAL PRACTICE GUIDELINE

Clinical Practice Guideline for the Diagnosis and Management of Acute Bacterial Sinusitis in Children Aged 1 to 18 Years

abstract

FREE

OBJECTIVE: To update the American Academy of Pediatrics clinical practice guideline regarding the diagnosis and management of acute bacterial sinusitis in children and adolescents.

METHODS: Analysis of the medical literature published since the last version of the guideline (2001).

RESULTS: The diagnosis of acute bacterial sinusitis is made when a child with an acute upper respiratory tract infection (URI) presents with (1) persistent illness (nasal discharge [of any quality] or daytime cough or both lasting more than 10 days without improvement), (2) a worsening course (worsening or new onset of nasal discharge, daytime cough, or fever after initial improvement), or (3) severe onset (concurrent fever [temperature ≥39°C/102.2°F] and purulent nasal discharge for at least 3 consecutive days). Clinicians should not obtain imaging studies of any kind to distinguish acute bacterial sinusitis from viral URI, because they do not contribute to the diagnosis; however, a contrast-enhanced computed tomography scan of the paranasal sinuses should be obtained whenever a child is suspected of having orbital or central nervous system complications. The clinician should prescribe antibiotic therapy for acute bacterial sinusitis in children with severe onset or worsening course. The clinician should either prescribe antibiotic therapy or offer additional observation for 3 days to children with persistent illness. Amoxicillin with or without clavulanate is the first-line treatment of acute bacterial sinusitis. Clinicians should reassess

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KEY WORDS
acute bacterial sinusitis, sinusitis, antibiotics, imaging, sinus aspiration

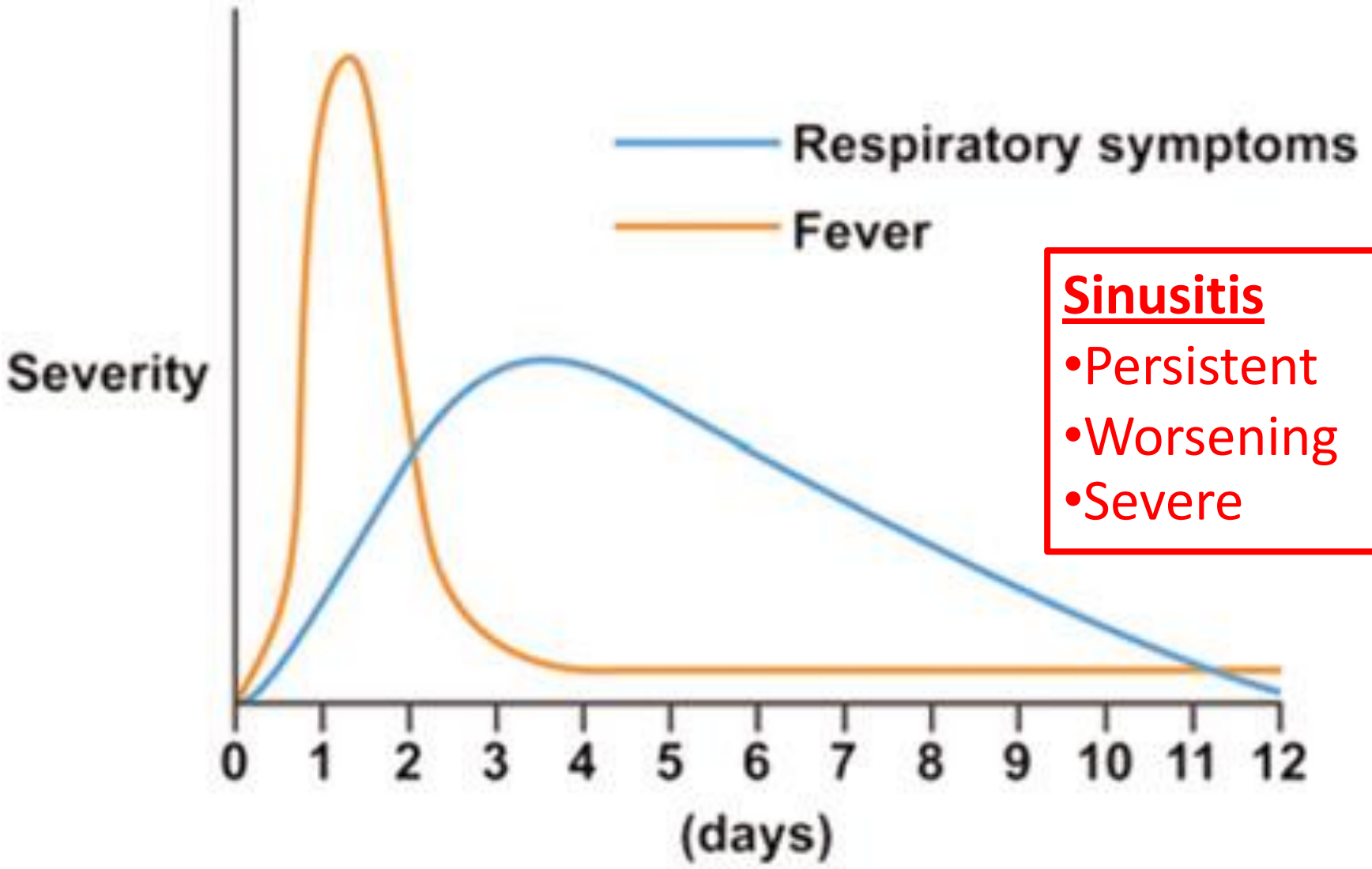
ABBREVIATIONS
AAP—American Academy of Pediatrics
AOM—acute otitis media
CT—computed tomography
PCV-13—13-valent pneumococcal conjugate vaccine
RABS—recurrent acute bacterial sinusitis
RCT—randomized controlled trial
URI—upper respiratory tract infection

Pediatrics 2013;132:e262–e280.
CID 2012;54:e72-112.

Difficult Clinical Diagnosis

SYMPTOM	SINUSITIS	COLD	ALLERGIES
Facial pressure/pain	Yes	Sometimes	Sometimes
Duration of Illness	Over 10-14 days	Under 10 days	Varies
Nasal Discharge	Thick, yellow green	Thick, whitish or thin	Clear, thin, watery
Fever	Sometimes	Sometimes	No
Headache	Sometimes	Sometimes	Sometimes
Pain in upper teeth	Sometimes	No	No
Bad Breath	Sometimes	No	No
Coughing	Sometimes	Yes	Sometimes
Nasal Congestion	Yes	Yes	Sometimes
Sneezing	No	Yes	Sometimes

Uncomplicated viral URI: clinical course



Sinusitis

- Persistent
- Worsening
- Severe

Uncomplicated acute bacterial sinusitis: definition **(+, B)**

- **Persistent illness:** nasal discharge (of any quality) or daytime cough or both lasting > 10 days without improvement;

OR

- **Worsening course:** worsening or new onset of nasal discharge, daytime cough, or fever after initial improvement;

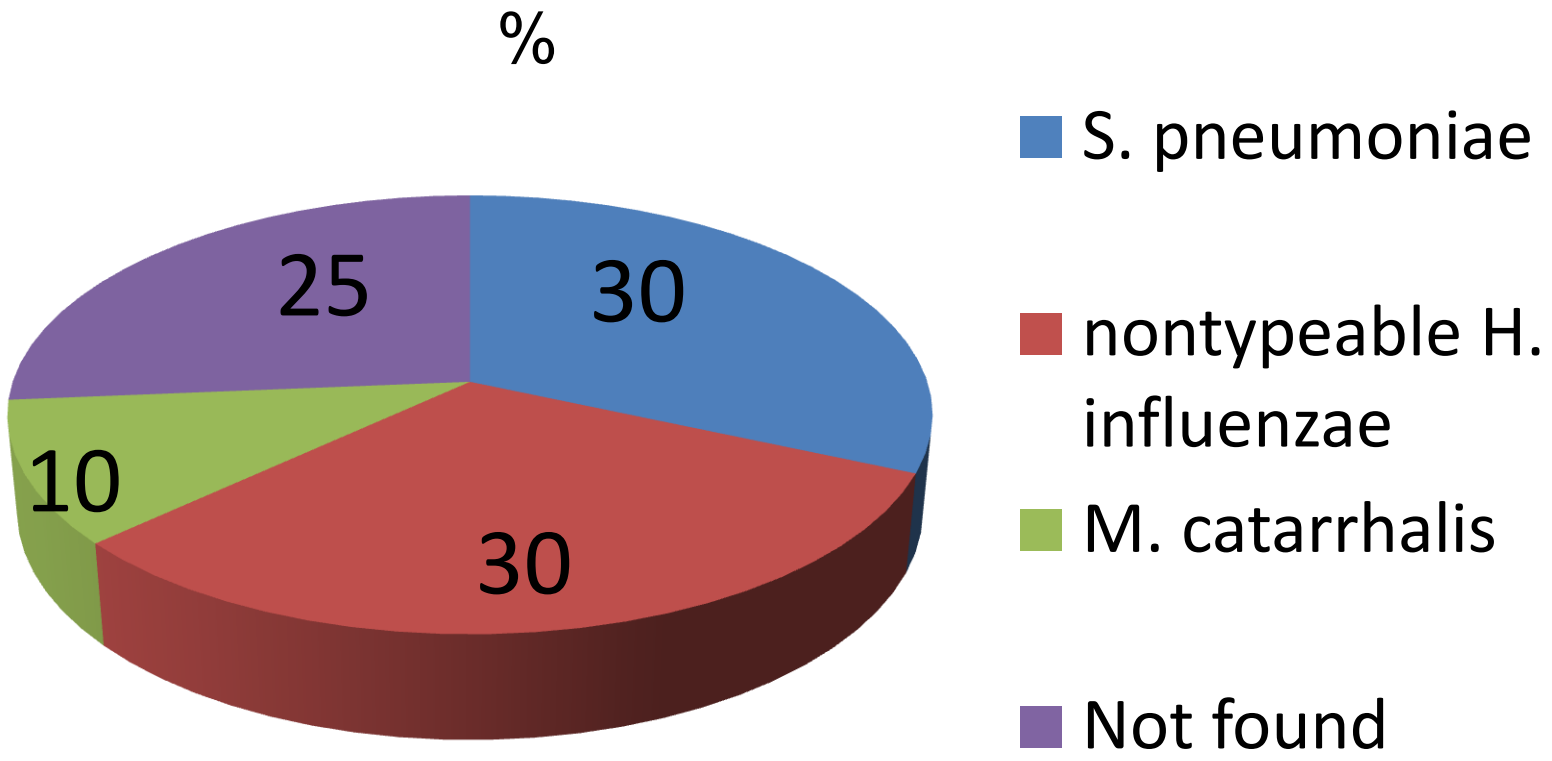
OR

- **Severe onset:** concurrent fever (temperature ≥39°C/102.2°F) and purulent nasal discharge for at least 3 consecutive days

Is imaging studies necessary for diagnosis ?

- Not necessary for uncomplicated bacterial sinusitis **(++, B)**
- Indicated in complicated sinusitis (orbital or central nervous system) **(++, B)**

Microbiology & susceptibility



Anaerobes: rare, *S.aureus*: infrequent, except in complicated cases

Treatment: Initial antibiotics or Not

- **(++, B)** **Prescribe ATB** for **severe onset or worsening course** bacterial sinusitis

- **(+, B)** Either **Prescribe ATB** or **Observe** for **persistent illness** sinusitis

Observe: initial symptomatic treatment, start antibiotics only if

-the child's condition worsens at any time or does not show clinical improvement within 48-72 hours.

- the child fails observation

Sinusitis: First line antibiotics (+,B)

Amoxicillin (80-90 mg/kg/day in 2 divided doses)

Amoxicillin-clavulanate (90 mg/kg/day of amoxicillin in 2 divided doses) [amoxicillin:clavulanate= 14:1] if

- taken amoxicillin within 30 days
- worsening course or severe onset in younger than 2 yr of age
- from day care

First line antibiotics for penicillin allergy

- Cefdinir (14 mg/kg/day in 1 or 2 doses)
- Cefuroxime (30 mg/kg/day in 2 divided doses
- Cefpodoxime (10 mg/kg /day in 2 divided doses)
- Ceftriaxone (50 mg/kg/day, IM or IV, **+ switch ATB**)

Anaphylaxis to penicillin or cephalosporins allergy:

levofloxacin 10-20 mg/kg/day, OD (max 500 mg/day)

Antibiotics after 48-72 hours of failure of initial antibiotics

(+, B)

Initial antibiotics	New started antibiotics
Amoxicillin 80-90 MKD	Amoxicillin-clavulanate 90MKD
Amox-clavulanate90MKD	Ceftriaxone 50MKD**+switch Rx**
Amoxicillin-clavulanate, 2^{nd}, 3^{rd} cephalosporins	Clindamycin 30-40 MKD + oral cephalosporins (cefdinir or cefuroxime or cefpodoxime)
Amoxicillin, Amoxicilli-clavulanate, Clindamycin + oral cephalosporins	Levofloxacin 10-20 MKD, OD

Symptomatic treatment

- Paracetamol 10-15 mg/kg/dose, reduce pain prn every 4-6 hr **(+, B)**
- intranasal steroids as an adjunct to ATBs for sinusitis with underlying allergic rhinitis **(+, B)**
- Not prescribe Saline irrigation, nasal decongestants and antihistamines. **(++, C)**

Prevention

- Recommended pneumococcal conjugate vaccine, annual influenza vaccine
- Not prescribe prophylactic antibiotics for recurrent sinusitis.
- Children with recurrent sinusitis should be evaluated and treated for underlying diseases particularly allergic rhinitis, immunologic defects, anatomic abnormalities, etc.

The Management of Community-Acquired Pneumonia in Infants and Children Older Than 3 Months of Age: Clinical Practice Guidelines by the Pediatric Infectious Diseases Society and the Infectious Diseases Society of America

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Evidenced-based guidelines for management of infants and children with community-acquired pneumonia (CAP) were prepared by an expert panel comprising clinicians and investigators representing community pediatrics, public health, and the pediatric specialties of critical care, emergency medicine, hospital medicine, infectious diseases, pulmonology, and surgery. These guidelines are intended for use by primary care and subspecialty providers responsible for the management of otherwise healthy infants and children with CAP in both outpatient and inpatient settings. Site-of-care management, diagnosis, antimicrobial and adjunctive surgical therapy, and prevention are discussed. Areas that warrant future investigations are also highlighted.

EXECUTIVE SUMMARY

Guidelines for the management of community-acquired pneumonia (CAP) in adults have been demonstrated to decrease morbidity and mortality rates [1, 2]. These guidelines were created to assist the clinician in the care of a child with CAP. They do not represent the only approach to diagnosis and therapy; there is considerable variation among children in the clinical course of pediatric CAP, even with infection caused by the same pathogen. The goal of these guidelines is to decrease morbidity and mortality rates for CAP in children by presenting recommendations for clinical management that can be applied in individual cases if deemed appropriate by the treating clinician.

This document is designed to provide guidance in the care of otherwise healthy infants and children and addresses practical questions of diagnosis and management of CAP evaluated in outpatient (office, urgent care clinic, emergency department) or inpatient settings in

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Clinical Infectious Diseases 2011;53(7):e25–e76

Clin Infect Dis 2011;53:e25–e76.

Definition

- **Pneumonia**: cough or difficult breathing and age-adjusted tachypnea:

Age	Respiratory rate (breaths/min)
<2 months	≥60
2–11 months	≥50
1–5 years	≥40
≥5 years	≥20

WHO . Fact Sheet 331. 2013.

Complicated pneumonia

defined as a pulmonary parenchymal infection complicated by one of the following:

- parapneumonic effusions, empyema,
- multilobar disease,
- abscesses or cavities,
- necrotizing pneumonia,
- pneumothorax or bronchopleural fistula;
- pneumonia that is a complication of bacteremic disease that includes other sites of infection.

Clin Infect Dis 2011;53:e25–e76.

Microbiology & susceptibility

Cause	%
Viruses	30-80
Bacteria	2-50
Atypical bacteria	3-23
Combined	23

Microbiology & susceptibility

Cause: Virus

Virus	%
RSV	40
Others: adeno, boca, metapneumo, influenza, parainfluenza, corona, rhino	60
2 viruses	2-33

Cause: bacteria

- S. pneumoniae 30-44%
- **Others**: H. influenzae type b, M. catarrhalis, S. aureus, group A Streptococcus
- Atypical bacteria:
  Infant: C. trachomatic
  Age >3 year: M. pneumoniae, C. pneumoniae,

Microbiology & susceptibility

Pneumonia

Cause	%
virus	30-80
bacteria	2-50
Atypical bacteria	3-23
combined	23

Parapneumonic effusion

Cause	%
Bacteria (*S. pneu*, Hib)	50
Mycoplasma	20
Virus	10

Investigation

- **CBC**: not necessary in all OPD CAP but should obtain in more serious CAP **(+, C)**
- **Acute-phase reactants** (ESR, CRP, serum procalcitonin): not be routinely measured in fully immunized OPD CAP **(++, C)**, used for management in conjunction with Hx, PE, Ix findings for more serious disease **(++, A)**, used in conjunction with clinical findings to assess response to therapy **(+, C)**

Investigation

- **Hemocultures:**
  OPD case: no clinical improvement or deterioration after 48-72 hr initiation of antibiotic therapy **(++, B)**
  IPD case: presumed moderate to severe bacterial CAP or complicated pneumonia **(++, C)**
- **Pulse oximetry:** CAP with hypoxia, severe dyspnea, alteration of consciousness **(++, B)**

Investigation

- **CXR:**

  -not necessary for the confirmation in well OPD CAP, or patients with wheez without fever or hypoxia **(++, A)** ,

  -indicated in CAP with hypoxemia or significant respiratory distress and in those with failed initial antibiotic therapy (to verify the presence or absence of complications of pneumonia), prolonged fever and cough even without respiratory distress **(++, B)**

Investigation

- **Sputum exam:**
  culture & Gram stain in hospitalized children who can produce sputum. **(+, C)**, or tracheal suction during intubation **(++, C)**, further procedures for severe patients who no clinical improvement within 48-72 hr of initial antibiotics e.g. BAL **(++,B)**, percutaneous lung aspiration **(+, C)**

Investigation

- **Testing for viral pathogens:** A positive influenza test, guiding appropriate antiviral agents , decrease both additional diagnostic studies and antibiotic use**.(++, A)**
- **Testing for atypical bacteria:**

  -rapid enzyme immunoassay for *M. pneumoniae* in suspected case **(+, B)**

  -no reliable available diagnostic tests for *C. pneumoniae* **(++, A)**

Investigation

- **Parapneumonic effusion:**
  -gram stain, culture **(++,A)**
  -PCR: underdeveloped **(++, B)**
  -WBC count, cell differential analysis **(+, B)**
  -pH, LDH, protein, sugar: not necessary **(+, D)**
- **Urine pneumococcal antigen test:**
  not recommendation **(++, A)**

First line antibiotics: OPD case (++,B)

Amoxicillin (90 mg/kg/day , max. 4 g/day)

- mild to moderate CAP, healthy children, complete pneumococcal and Hib vaccination and antibiotic resistance is unlikely

Amoxicillin-clavulanate (90 mg/kg/day of amoxicillin, max. 4 g/day of amoxicillin)

- Penicillin allergy: cefpodoxime, cefuroxime
- Penicillin anaphylaxis or cephalosporins allergy: levofloxacin

First line antibiotics: Atypical bacteria

Azithromycin 10 mg/kg/day (max. 500 mg/day) , ODx1 day, then 5 mg/kg/day (max. 250 mg/day) x 4 days

Alternative :

Clarithromycin 15 mg/kg/day , bid (max. 1 g/day) **or**

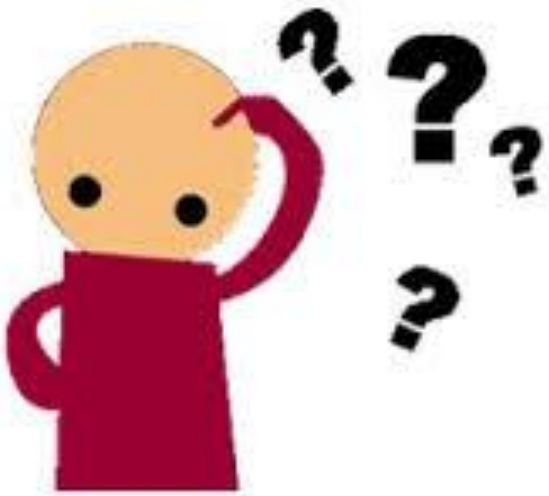
Erythromycin 40 mg/kg/day , qid

For Children >7 years old:

Doxycycline 2-4 mg/kg/day, bid

(++, B)

OPD case



Antibiotics for IPD CAP

Bacterial Pneumonia	Atypical Bacteria
1. ได้รับวัคซีนครบและไม่สงสัยเชื้อดื้อยา 1st : Ampicillin or PGS 2nd : Cefotaxime or Ceftriaxone	1st : Azithromycin 2nd : •Clarithromycin, •Erythromycin lactobionate, •Doxycycline, Levofloxacin (เฉพาะอายุ >7 ปี)
2. ไม่ได้รับวัคซีน หรือสงสัยเชื้อดื้อยา หรืออาการรุนแรง หรือมีหนองในช่องเยื่อหุ้มปอด 1st : Cefotaxime or Ceftriaxone 2nd : Levofloxacin	

การศึกษาวิจัยในเด็กไทย

เชื้อก่อโรคในประเทศไทย

- ข้อมูลเชื้อแบคทีเรียก่อโรคและแบบแผนความไวต่อยาปฏิชีวนะที่เป็นสาเหตุของทั้ง 3 โรคใกล้เคียงกับต่างประเทศ
- เชื้อก่อโรคที่พบมากที่สุด คือ *S. pneumoniae, H. influenzae*
- พบ atypical bacteria ร้อยละ 15-18.8 ไม่แตกต่างจากการศึกษาในต่างประเทศ ที่พบร้อยละ 3-23
- *Mycoplasma pneumoniae* ร้อยละ 14 *Chlamydophila pneumoniae* ร้อยละ 2.8-3.4
- *Burkholderia pseudomallei* ในภาคตะวันออกเฉียงเหนือ
- Scrub typhus ในภาคเหนือ

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แบบแผนความไวต่อยาต้านจุลชีพในประเทศไทย

- ใกล้เคียงกับของต่างประเทศ
- *H. influenzae* และ *S. pneumoniae* ดื้อต่อ macrolides และ trimethoprim-sulfamethoxazole มาก
- *S. pneumoniae* มักดื้อต่อ oral cepharosporin

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สรุป: การใช้ guideline ในประเทศไทย

- สามารถนำ **guideline** นี้มาใช้ในประเทศไทยได้
- ควรให้ยาต้านจุลชีพครอบคลุมเชื้อประจำถิ่น สำหรับผู้ป่วยที่สงสัยติดเชื้อประจำถิ่น
- ถ้ามีการระบาดของไข้หวัดใหญ่ และผู้ป่วยมีอาการปานกลางถึงรุนแรง ควรให้ยา **oseltamivir** หรือ **zanamivir** ทันทีโดยไม่ต้องรอผลยืนยันการติดเชื้อ และให้ยานาน **5** วัน