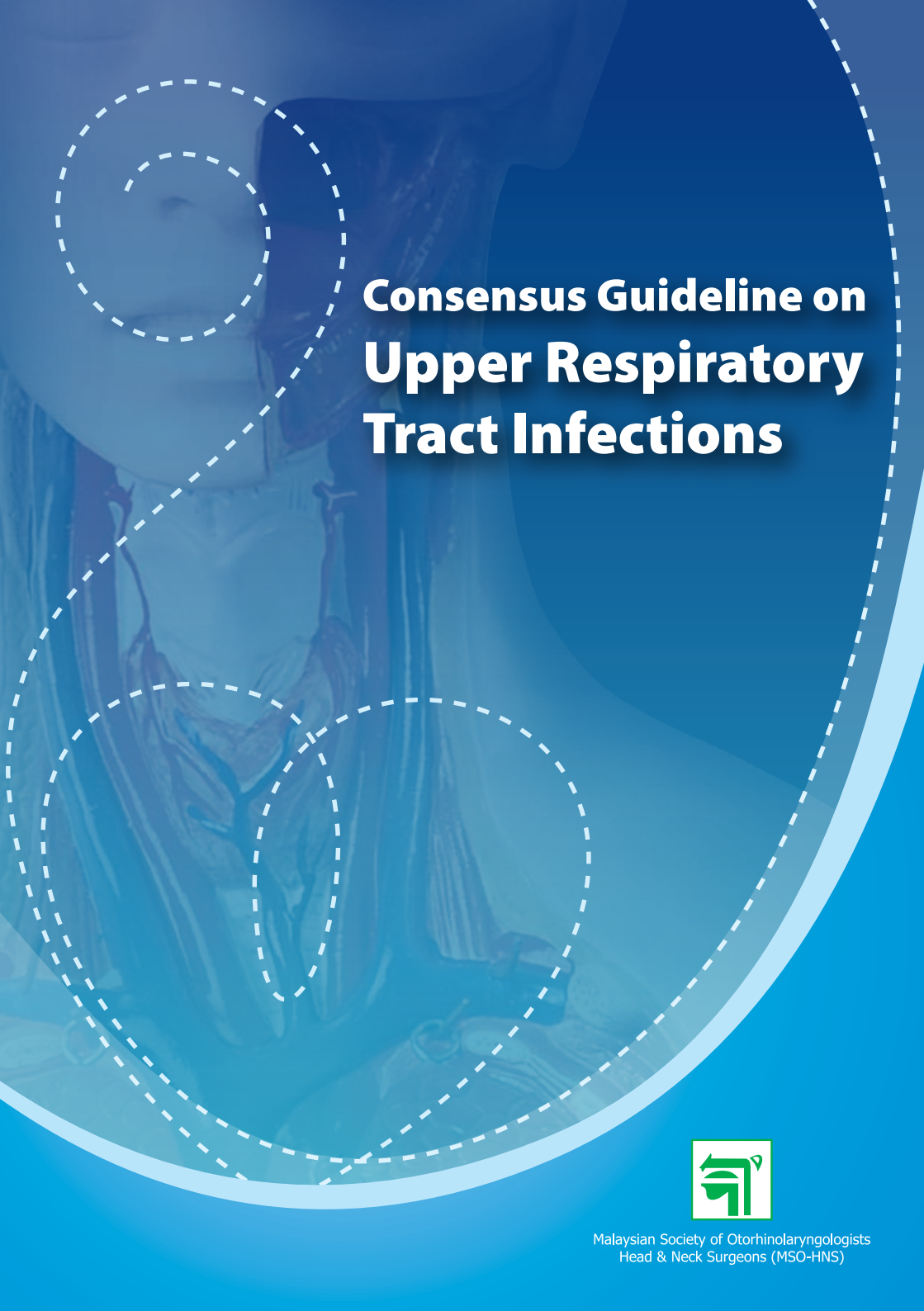

Consensus Guideline on Upper Respiratory Tract Infections

Malaysian Society of Otorhinolaryngologists
Head & Neck Surgeons (MSO-HNS)

This guideline is meant to be a guide for clinical practice, based on the best available evidence at the time of development. Adherence to this guideline may not necessarily guarantee the best outcome in every case. Every health care provider is responsible for the management of his/her unique patient based on the clinical picture presented by the patient and the management options available locally.

This guideline was issued in 2009 and will be reviewed in 2012 or sooner if new evidence becomes available.

Electronic version available on the following websites:
http://www.msohns.com
http://www.kotrapharma.com

GUIDELINE DEVELOPMENT AND OBJECTIVE

GUIDELINE DEVELOPMENT

Upper Respiratory Tract Infection (URTI) is a common condition in most primary care clinics throughout the world. It has an equal distribution among all ages and races. The condition may seem trivial in nature however there are instances where it could possibly lead to serious complications. URTI has many etiologies and causative factors. Medical literature would usually dictate the common cause as viral infection however oral antibiotics are still commonly prescribed for this condition. Despite world wide warning and consensus on the increase of antibiotic resistance, there is still a wide abuse of antibiotics.

There are several available guidelines on URTI worldwide such as Centre of Disease Control and Prevention (CDC) and Infectious Diseases Society of America (IDSA). However, in Malaysia there is no specific clinical practice guideline (CPG) available for URTI which warrants for the need of this guideline.

The development group for this guideline consisted of ear, nose and throat specialists from Ministry of Education and also the private sector phycisians, paediatricians and primary care doctors. During the process of development of this guideline, there was active involvement of a review committee.

Literature search was carried out at the following electronic databases: PUBMED, Journal full text via Ovid search. In addition, the reference lists of all relevant articles retrieved were searched to identify further studies. The following free text terms were used either singly or in combination: *upper respiratory tract infections, pharyngitis, tonsillitis, sinusitis, rhinosinusitis, otitis media, acute otitis media, etiology, diagnosis, antibiotics, strep score and Rhinosinusitis Task Force.*

Reference was also made to other guidelines on the management of pharyngitis, rhinosinusitis and otitis media, which include Infectious Diseases Society of America, Centre of Disease Control and Prevention. This guideline is based largely on the findings of systematic reviews and meta-analyses in the literature, taking into consideration local practices.

The articles were graded using the levels of evidence scale from U.S/Canadian Preventive Services Task Force and the grading of recommendation was modified from the Scottish Intercollegiate Guidelines Network (SIGN).

Assessment of evidence was done independently by individual members and discussed by members of both the development group and review committee before the recommendations were formulated. Where the evidence was insufficient the recommendations were derived by consensus of both the development and review committee.

The draft guideline was posted on the Ministry Health website for comment and feedback. This guideline has also been presented to the Technical Advisory Committee for Clinical Practice Guidelines, and the Health Technology Assessment and Clinical Practice Guidelines Council, Ministry of Health Malaysia for review and approval.

OBJECTIVE

To provide evidence-based guidance in the management of upper respiratory tract infection (URTI) particularly when it manifests as rhinosinusitis, pharyngitis and Acute Otitis Media. The design of this guideline enables the primary care doctors to clearly understand key points of each condition of rhinosinusitis, pharyngitis and Acute Otitis Media and its management. It will incorporate all the best available evidences from the medical literature and also guides the primary healthcare doctors to refer the patients to the specialties accordingly.

CLINICAL QUESTIONS

How can rhinosinusitis, pharyngitis and otitis media be assessed and diagnosed?
How we treat and manage rhinosinusitis, pharyngitis and Acute Otitis Media?

TARGET POPULATION

This guideline is developed for the management of pharyngitis, rhinosinusitis commonly found in adults and Acute Otitis Media in both adults and children.

TARGET GROUP/USER

This guideline is applicable to all primary health care doctors involved in treating patients with upper respiratory tract infection particularly when it manifests as rhinosinusitis, pharyngitis and Acute Otitis Media. This guideline excludes chronic otitis media and otitis externa.

GUIDELINE DEVELOPMENT GROUP

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REVIEW COMMITTEES

The process of development of this guideline was reviewed by a panel of independent expert referees, who were asked to comment primarily on the comprehensiveness and accuracy of interpretation of the evidence supporting the recommendations in the guideline.

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This CPG is endorsed by

Malaysian Society of Otorhinolaryngology Head Neck Surgery (MSO HNS)

CONTENTS

1.0 RHINOSINUSITIS

KEY POINTS

1. Accurate diagnosis of rhinosinusitis
2. Appropriate usage of antibiotics
3. Management algorithm for rhinosinusitis

1.1 INTRODUCTION

Sinusitis is defined as the inflammation of the paranasal sinuses. It has been newly classified as rhinosinusitis as the inflammation always involves the nose first. Acute Bacterial Sinusitis is usually a secondary infection resulting from either sinus ostia obstruction or impaired mucociliary clearance caused by a preceding viral infection in 0.2 – 2% of cases. In some cases, it can be both[2(Level II)].

1.2 CLINICAL FEATURES

1.2.1 Etiologic agents

Streptococcus Pneumoniae, Hemophilus Influenzae and Moraxella Catarrhalis[2(Level III), 7 (Level III)].

1.3 DIAGNOSIS

Rhinosinusitis Task Force guidelines (1997, revised in 2002) recommends the diagnosis as follows[9(Level III)].

Major symptoms	Minor symptoms
1. Nasal Obstruction or congestion 2. Nasal or postnasal discharge/ purulence 3. Diminished or absent of sense of smell 4. Facial pain, pressure or fullness 5. Fever	1. Headache 2. Fever 3. Halitosis 4. Fatigue 5. Maxillary dental pain 6. Cough 7. Ear pain, pressure of fullness

Any patient with one major symptom and two minor symptoms or two major symptoms is diagnosed to have rhinosinusitis.

Depending on the onset of symptoms, Rhinosinusitis can be divided into the following categories[4(Level II-3) ,6(Level III)] :

Categories	Diagnosis
Acute rhinosinusitis	<4 weeks (General practitioners may treat)
Subacute Rhinosinusitis	4 to 12 weeks (to be referred to an ENT Specialist)
Chronic Rhinosinusitis	>12 weeks (to be referred to an ENT Specialist)

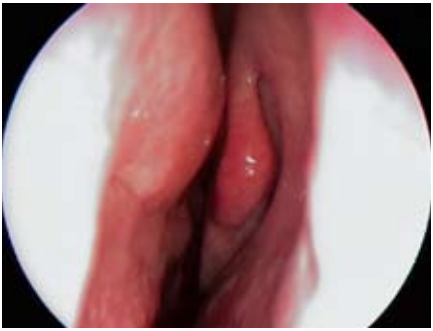


Figure 1 - Normal nasal cavity

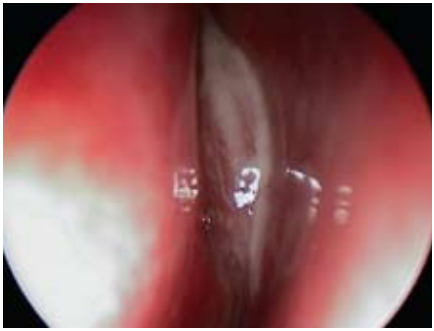


Figure 2 - Acute rhinosinusitis

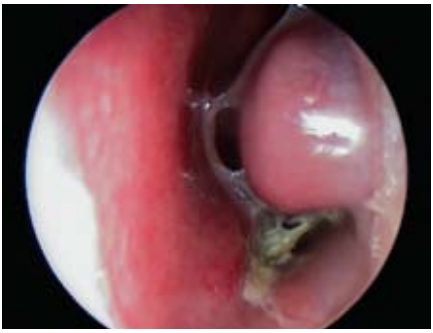


Figure 3 - Chronic sinusitis

Any patient with symptoms and signs of complications merits immediate referral to an ENT specialist.

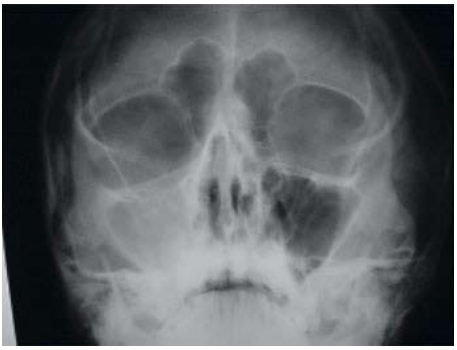
Sign of Orbital complications	Symptoms of Intracranial complications
• Conjunctival chemosis • Periorbital swelling • Blurred vision	• Nausea • Persistent vomiting • Altered sensorium • Seizures • Reduced conscious level

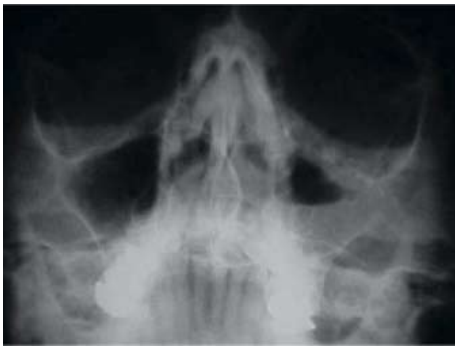
WHEN TO REFER TO ENT SPECIALIST?

1. Any patient with symptoms or signs of complications
2. Any patient who fails to respond after 10 days of second line antibiotics
3. Any patient with Subacute or Chronic Rhinosinusitis

1.4 INVESTIGATIONS

- When the diagnosis is in doubt, a paranasal sinus X-ray (OccipitoMental or Waters view) may help by showing evidence of opacification of the sinus suggestive of an acute infection. It is more readily available than a Computed Tomography (CT) scan of the paranasal sinuses.





- Pus swab culture and sensitivity from the nostrils preferably from the middle meatus to determine the causative organism.

1.5 COMPLICATIONS

Complications from rhinosinusitis can be as follows[8(Level II-3),6(Level II-2)]:

Orbital	Intracranial
• Preseptal cellulitis • Orbital cellulitis • Subperiosteal abscess • Orbital abscess • Cavernous sinus thrombosis	• Meningitis • Intracranial abscess • Cranial osteomyelitis

1.6 MANAGEMENT

a. Pain

Pain relief in the first 24 hours should be achieved with ibuprofen or acetaminophen, because antibiotics typically do not relieve pain in the first 24 hours, and they have only a minimal effect on pain subsequently[13(Level III)].

b. Ancillary treatment[15(Level II-3)]

Oral decongestants	• Pseudoephedrine : 60 mg qid or 120 mg bd
Topical decongestants	• Oxymetazoline : 2 sprays bd • Xylometazoline : 2 sprays tds • Phenylephrine : 2 sprays q4h

c. Treatment with an antibacterial agent [1(Level I), 3(Level II-3), 4(Level III), 5(Level II-3), 10(Level II-2), 11(Level III), 12(Level III)]

Nearly all cases resolve without antibiotics. Antibiotics should be reserved for moderate symptoms that are not improving after 7 days or that worsens after 5 to 7 days and severe symptoms[5(Level II-3), 12(Level III)].

The choice of first-line treatment should be based on the anticipated clinical response as well as the microbiologic flora likely to be present. Antibiotic treatment should be continued for a duration of 10 to 14 days[1(Level I), 5(Level II-3), 10 (Level II-2)].

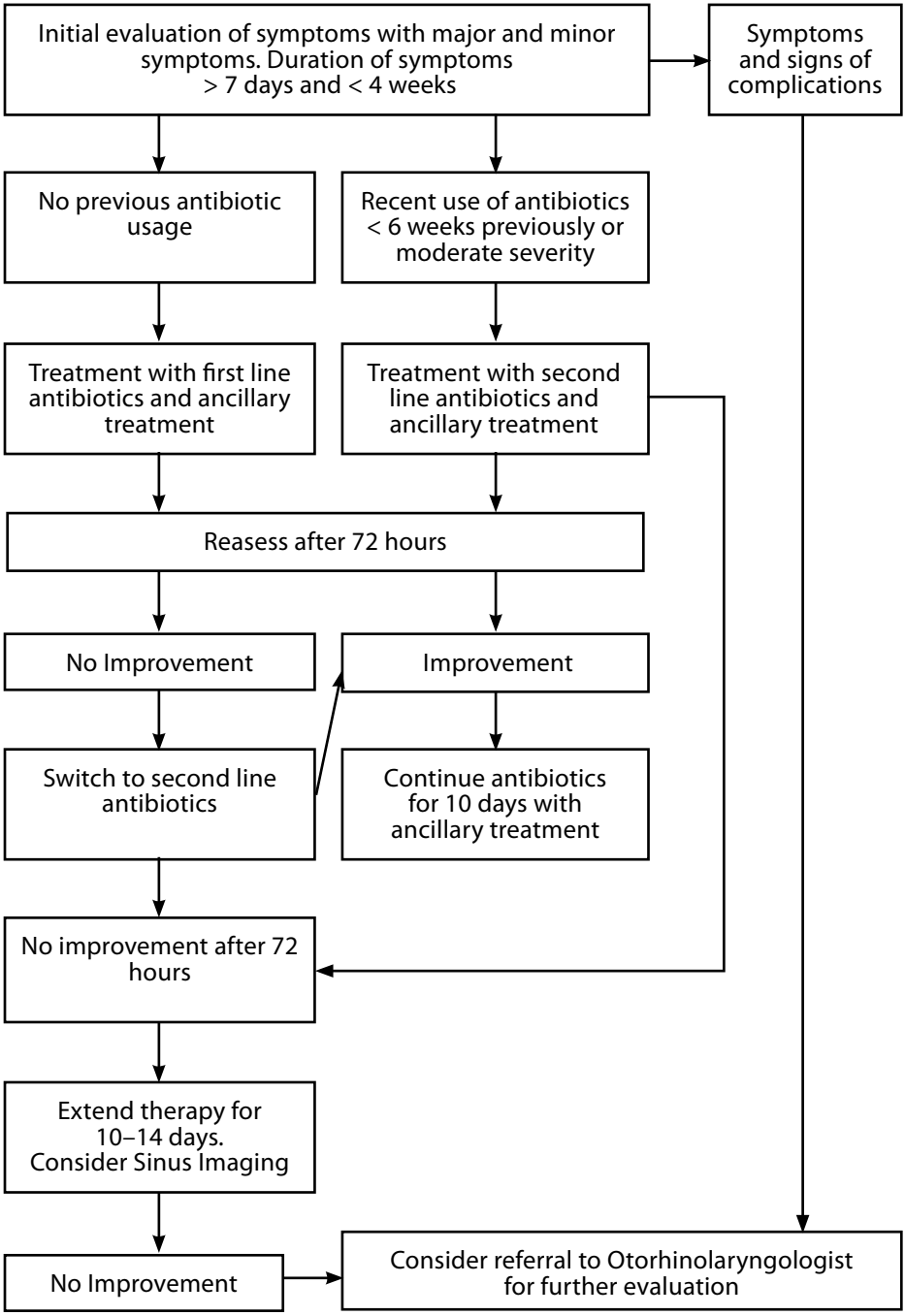
Antibiotic Treatment [14(level 3)]	**Dosage**
Mild disease and no recent antibiotic use	
Amoxicillin-clavulanate potassium	500mg tds, 875mg bd
Amoxicillin	500mg tds, 875mg bd
Cefuroxime	250mg or 500mg bd
If beta-lactam allergic:	
TMP-SMX DS	160 to 800mg bd
Doxycycline	100mg bd
Azithromycin	500mg on day 1, 250mg on days 2 through 5
Clarithromycin	250mg or 500mg bd
Telithromycin	800mg od
Moderate disease or recent antibiotic use	
Levofloxacin	500mg od
Moxifloxacin	400mg od
Amoxicillin-clavulanate (high dose)	2,000mg bd
Ceftriaxone	1g od
If beta-lactam allergic:	
Levofloxacin, Moxifloxacin	As above
Clindamycin plus rifampin **	150 to 450mg qid, 300mg bd

rifampin.
***Provides coverage for Streptococcus pneumoniae but has no activity against Haemophilus influenzae.*

Recommendation

1. Rhinosinusitis can be diagnosed using Rhinosinusitis Task Force Guidelines. **(Grade C)**
2. To use antibiotics only when moderate symptoms do not improve after 7 days or worsen after 5 to 7 days and for severe symptoms **(Grade B)**
3. Antibiotic treatment should be continued for 10 to 14 days. **(Grade B)**

Management Algorithm



2.0 PHARYNGITIS

KEY POINTS

1. Accurate diagnosis of pharyngitis
2. Appropriate usage of antibiotics
3. Management algorithm for pharyngitis

2.1 INTRODUCTION

Acute pharyngitis is the inflammation of the pharynx, occurring within a 2 week period of infective origin. This definition includes acute adenoiditis and tonsillitis, constituting part of the lymphoid aggregations known as the Waldeyer's ring that reside in the pharynx.

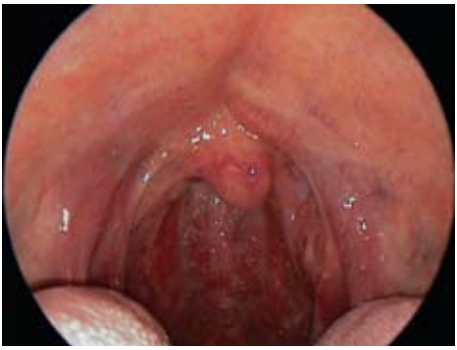


Figure 4 - Diagrammatic representation of acute tonsillitis

Acute pharyngitis accounts for 1-2 percent of all healthcare visits, including outpatient department, emergency room and other physician consultations. Acute pharyngitis is mostly viral in origin and self-limiting. Bacterial pharyngitis accounts for 15-30% of cases in children and 10% of cases in adults[16, Level III; 19, Level III].
Most bacterial pharyngitis are secondary to Group A ß-Haemolitic Streptococcus or Staphylococcus pyogenes and responds to antimicrobial therapy which can prevent its attending immune complications such as rheumatic fever, rheumatic heart disease and post-streptococcal acute glomerulonephritis.

The role of antimicrobials is therefore limited and should be used judiciously. Imprudent usage of antimicrobial use contributes to an emerging trend of antimicrobial resistance. Accurate diagnosis of streptococcal pharyngitis is therefore crucial both to prevent such sequelae and to avoid unnecessary use of antimicrobials.

2.2 CLINICAL FEATURES

2.2.1 The etiologic agents for acute pharyngitis are:

Viral : Adenovirus, Epstein-Barr virus V, Influenza A & B virus

Bacterial : GABHS (Group A ß-Haemolitic Streptococcus or Staphylococcus pyogenes), Moraxella, Hemophilus influenza

Others : Staph, Bacteroides, E.Coli, diphtheria, syphillis

2.2.2 Different types and features of Pharyngitis

Types	Features
Acute catarrhal tonsillitis	1. Inflamed overlying mucous membrane 2. Tonsils not enlarged 3. Part of viral pharyngitis
Acute parenchymatous tonsillitis	1. Substance of the tonsils are infected 2. Tonsils diffusely enlarged
Acute follicular tonsillitis	1. Infection resides in the crypts of the tonsils, filled with pus 2. Yellowish spots with normal intervening mucosa
Acute membranous tonsillitis	1. Late stage of follicular tonsillitis 2. Crypt exudates coalesce on surface of tonsils to form membrane

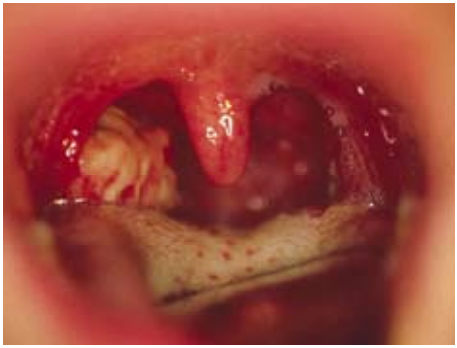


Figure 5 - Acute follicular tonsillitis, evidenced by crypt exudates

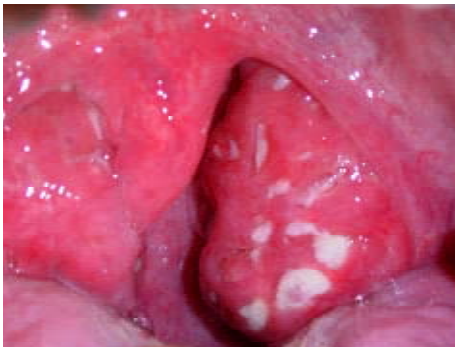


Figure 6 - Acute membranous tonsillitis, evidenced by whitish membrane overlying tonsils

2.3 DIAGNOSIS

Acute pharyngitis can be diagnosed by the following symptoms and signs[24, Level III]:

Signs	Symptoms
• Fetid breath • Coated tongue • Hyperemia of soft palate, uvula, and anterior pillars • Tonsils appearing red and swollen. Presence of crypt exudates indicate follicular tonsillitis, whitish membrane – membranous tonsillitis, and kissing tonsils – parenchymatous tonsillitis • Enlarged or tender upper jugular chain nodes	• Sore throat • Painful swallowing (odynophagia) • High grade fever with chills • Otalgia • Constitutional symptoms with or without mesenteric adenitis • Painful neck swelling

WHEN TO REFER TO ENT SPECIALIST?

1. Recurrent acute tonsillitis
2. Chronic tonsillitis
3. Symptoms of Obstructive Sleep Apnoea (OSA)
4. Unilateral tonsil enlargement
5. Complications of tonsillopharyngitis

The gold standard for streptococcal pharyngitis is throat culture. However, Throat culture is recommended only in an outbreak situation as a method of epidemiologic study and for patients in whom gonococcal disease is possible[25, Level III]. However, there have been significant improvements in sensitivity and specificity of rapid antigen detection testing (RADT). To facilitate management, the modified Centor score can help clinicians determine which patients should need no testing, throat culture/rapid antigen detection testing, or empiric treatment with antibiotics.

**Rapid Antigen Detection Testing (RADT) currently is not widely available in Malaysia. By the consensus of this guideline development committee, in the absence of this test, empirical treatment with antimircobials may be instituted in a score of 3 or above.*

Strep Score for Group a Beta-Hemolytic Streptococcus Pharyngitis

Symptoms	Points
Fever	+1
Absence of cough	+1
Cervical adenopathy	+1
Tonsillar exudates	+1
Patient's age	
<15 years	+1
15 to 45 yeas	0
>45 years	- 1
Total score:	____

Score	Probability of strep (%)	Action
-1 or 0	1	• No further testing or treatment
1, 2, or 3	10 to 35	• Rapid antigen testing; treatment based on result
4 or 5	51	• Consider empiric treatment or rapid antigen testing

Strep Score for diagnosing GABHS Pharyngitis[23, Level III] (taken from Wong DM, Blumberg DA, Lowe LG. Guidelines for the use of antibiotics in acute upper respiratory tract infections. Am Fam Physician. Sep 15 2006;74(6):956-966)

2.4 INVESTIGATIONS

Culture and sensitivity

Throat swab for culture and sensitivity is recommended for severe or persistent disease or in an outbreak situation as a method of epidemiologic study and for patients in whom gonococcal disease is possible[24, Level III].

2.5 COMPLICATIONS

Features of complications of tonsillitis

- Neck abscess
- Dysphagia or deviated uvula [peritonsillar abscess]
- Otalgia or ear discharge [acute otitis media]
- Chest pain, abnormal movements, subcutaneous nodules, erythema marginatum, migrating polyarthritis [rheumatic fever]
- Oliguria and shortness of breath [glomerulonephritis]

2.6 MANAGEMENT

Physicians should limit antimicrobial prescriptions to patients who are most likely to have streptococcal pharyngitis with the intention of preventing rheumatic fever, acute glomerulonephritis and suppurative complications.

Penicillin is the first choice, and erythromycin should be used in patients who are allergic to penicillin. A 10-day course of penicillin V remains the treatment of choice for GABHS pharyngitis. However, amoxicillin is an acceptable alternative because of availability, taste and the increased likelihood of compliance[19, Level III; 25, Level III].

Throat cultures should not be performed for the routine primary evaluation of adults with pharyngitis.

All patients with pharyngitis should be offered appropriate doses of analgesics, antipyretics and other supportive care.

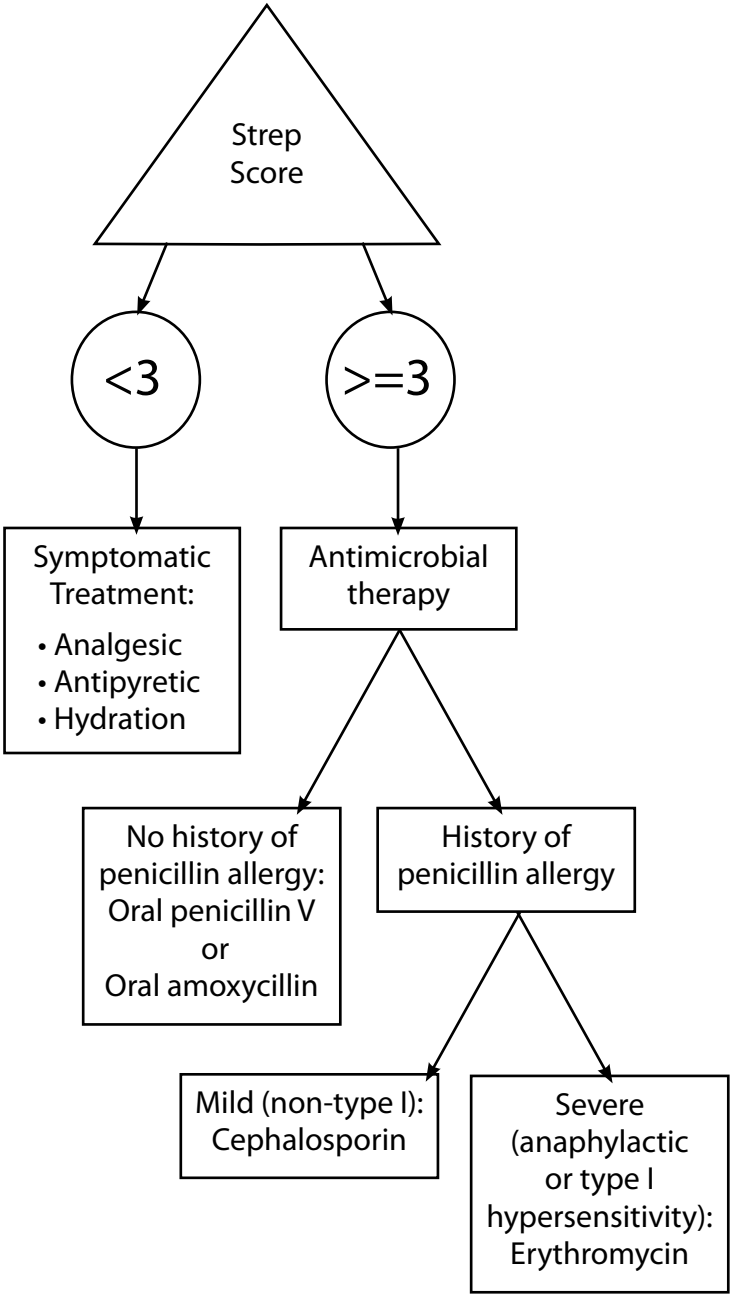
There is no evidence of group A beta-hemolytic streptococcus resistance to or tolerance of penicillin, and erythromycin resistance rates are low[19, Level III; 25, Level III].

Antibiotic Treatment	Dosage	Duration
1st Line Treatment		
Penicillin V	500mg tds	10 days
Penicillin G benzathine	1.2 million units IM	once
2nd Line Treatment		
Amoxicillin	500mg bd or 250mg 3 tds	10 days
Erythromycin ethylsuccinate	400mg qid	10 days
Oral Cephalosporins		
Clindamycin	300mg bd	10 days

Recommendation

1. Use Strep Score to diagnose Group A Beta Haemolytic Streptococcuvs Pharyngitis for the use of antibiotics. **(Grade C)**
2. Oral Penicillin V for 10 days is the treatment of choice for suspected or proven GABHS pharyngitis. Amoxycillin is an acceptable alternative while oral Erythromycin should be used in known penicillin allergy. **(Grade C)**

Management Algorithm



3.0 ACUTE OTITIS MEDIA

KEY POINTS

1. Accurate diagnosis of acute otitis media
2. Appropriate choices of antibiotics
3. Management of algorithm for Acute Otitis Media

3.1 INTRODUCTION

Acute Otitis Media (AOM) is the most frequently occurring bacterial illness in children[33, Level I; 37, Level II-2]. For the clinician, the choice of a specific antibacterial agent has become a key aspect of management due to rising concerns about the increasing rates of antibacterial resistance.

This clinical practice guideline provides recommendations to primary care clinicians for the management of uncomplicated AOM particularly in children from 2 months through 12 years of age. Occasionally, an adult with no previous history of ear disease, but with an acute viral URTI, presents with AOM. The management in older children could be applied to adult[31, Level I; 35, Level III].

3.2 CLINICAL FEATURES

A diagnosis of AOM requires a history and findings as stated below[27, Level I].

Signs and Symptoms of AOM

1. Recent, usually abrupt, onset of signs and symptoms of middle-ear inflammation and middle-ear effusion.
2. The presence of middle-ear effusion that is indicated by any of the following: • Bulging of the tympanic membrane • Limited or absent mobility of the tympanic membrane • Air fluid level behind the tympanic membrane • Otorrhea
3. Signs or symptoms of middle-ear inflammation as indicated by either • Distinct erythema of the tympanic membrane **OR** • Distinct otalgia (discomfort clearly referable to the ear[s] that results in interference with or precludes normal activity or sleep)

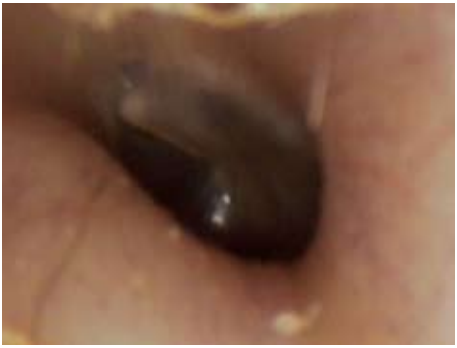


Figure 7 - Normal tympanic membrane

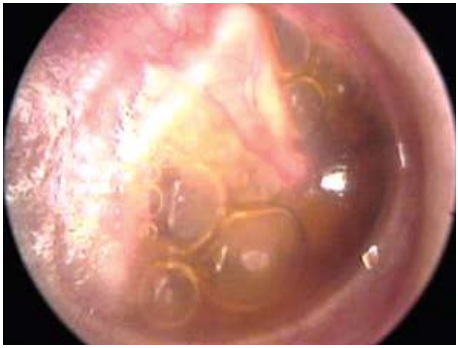


Figure 8 - Otitis media effusion

It is highly important to exclude AOM in a febrile and irritable infant by ear examination.

Clinicians should discriminate between Otitis Media with Effusion (OME) and Acute Otitis Media (AOM)[34, Level II-2]. AOM is considered distinct from otitis media with effusion (OME), which is defined as the presence of fluid in the middle ear without signs or symptoms of acute ear infection[26, Level I]. When OME is mistakenly diagnosed as AOM, antibacterial agents may be prescribed unnecessarily[30, Level I; 38, Level III].

WHEN TO REFER TO ENT SPECIALIST?

1. Recurrent acute otitis media
2. Persistent otorrhea
3. Concerns about mastoiditis or other complications of AOM
4. Perceived need for tympanocyntesis and/or myringotomy
5. Abnormal audiological evaluation

3.3 COMPLICATIONS

AOM may have potentially serious complications including mastoiditis, meningitis, and intracranial abscess formation.

3.4 MANAGEMENT

a. Assessment of pain

If pain is present, the clinician should recommend treatment to reduce pain[27, Level I]. Pain relief in the first 24 hours should be achieved with ibuprofen or acetaminophen, because antibiotics typically do not relieve pain in the first 24 hours, and they have only a minimal effect on pain subsequently. By 24 hours, about 60% of children have pain relief, and this percentage increases to 80% to 90% within a few days[32, Level II-2 ; 28, Level I].

b. Observation without use of antibacterial agents

Observation without use of antibacterial agents (for 48 to 72 hours and limiting management to symptomatic relief) in a child with uncomplicated AOM is an option for selected children based on diagnostic certainty, age, illness severity, and assurance of follow-up[27, Level I].

Criteria for Initial Antibacterial Agent Treatment or Observation in Children With AOM

Age	Diagnosis of AOM is uncertain	Diagnosis of AOM is certain
<6 mo	Antibacterial therapy	Antibacterial therapy
6 mo–2 y	Antibacterial therapy	Antibacterial therapy if severe illness; observation option* if non-severe illness
≥2 y	Antibacterial therapy if severe illness; observation option* if non-severe illness	Observation option*

*Observation is an appropriate option only when follow-up can be ensured and antibacterial agents started if symptoms persist or worsen. Non-severe illness is mild otalgia and fever <39°C in the past 24 hours. Severe illness is moderate to severe otalgia or fever >39°C[27, Level I].

c. Treatment with an antibacterial agent

If a decision is made to treat with an antibacterial agent, the clinician should prescribe amoxicillin (first-line) for most children. Figure 1 summarizes antibacterial options[27, Level I].

The optimal duration of therapy for patients with AOM is uncertain. For younger children, and for children with severe disease, a standard 10-day course is recommended[29, Level III]. For children 6 years of age and older with mild to moderate disease, a 5- to 7-day course is appropriate[27, Level I].

d. Management after failure of the initial management

If the patient fails to respond to the initial management option within 48 to 72 hours, the clinician must reassess the patient to confirm AOM and exclude other causes of illness. If AOM is confirmed in the patient initially managed with observation, the clinician should begin antibacterial therapy. If the patient was initially managed with an antibacterial agent(s), the clinician should change the antibacterial agent(s)[27, Level I].

Once the patient has shown clinical improvement, follow-up is based on the usual clinical course of AOM. Persistent middle-ear effussion after resolution of acute symptoms is common and should not be viewed as a need for active therapy. Two weeks after an episode of AOM, 60% to 70% of children have middle-ear effussion, decreasing to 40% at 1 month and 10% to 25% after 3 months[36, Level I].

Please see Management Algorithm for summary.

e. Management in adult

Current best practice recommends amoxicillin for uncomplicated AOM; continuing or switching to an alternative antibiotic based on clinical response after 48 hours of therapy; and selection of second line antibiotics as first line choices when the patient has already been on an antibiotic within the previous month or is otitis prone. Preferred second-line agents frequently noted in various guidelines include amoxicillin/clavulanate and cefuroxime[35, Level III].

Recommendation

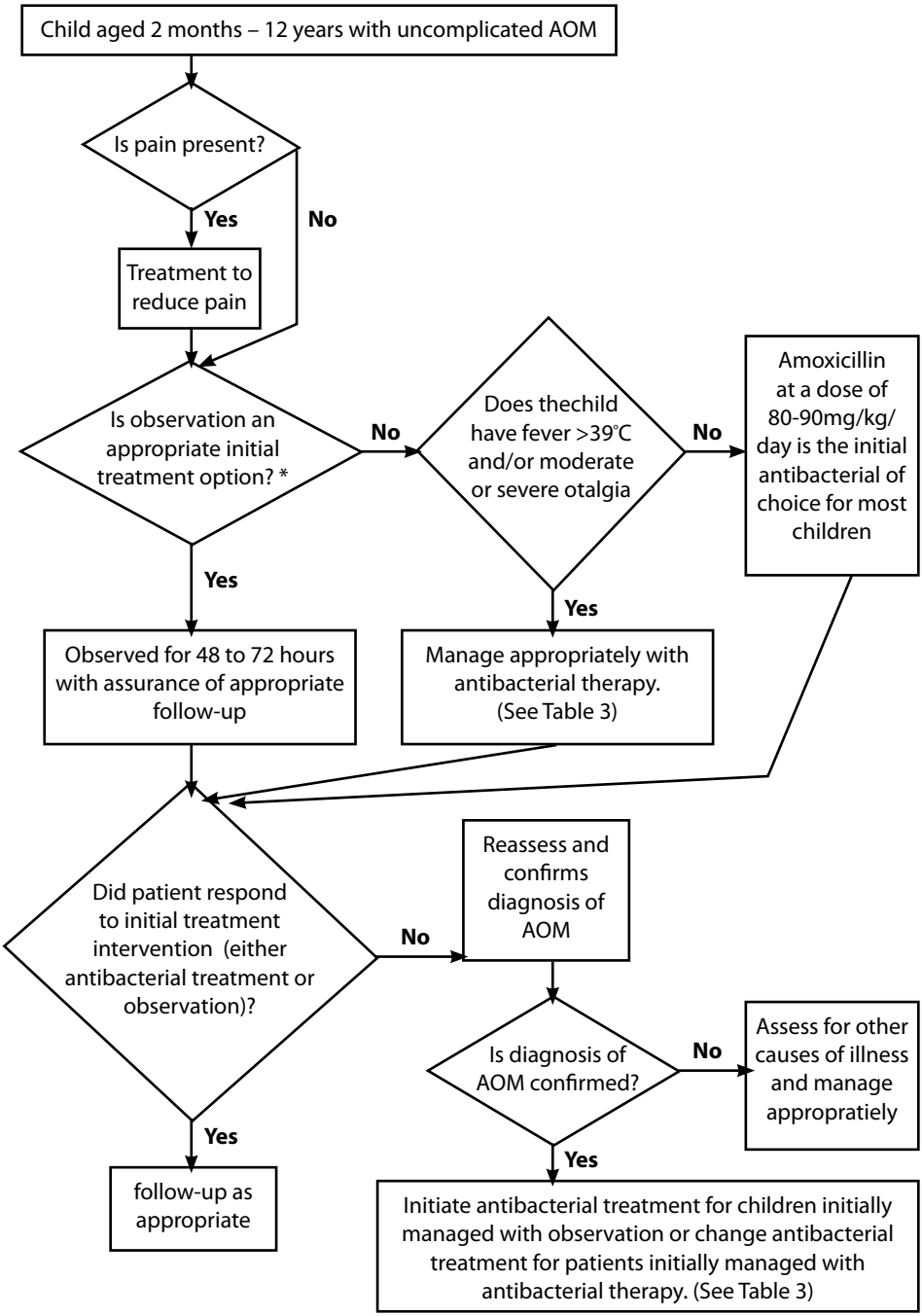
- The diagnosis of AOM requires a history of the acute onset of symptoms and signs of middle-ear inflammation and effusion. **(Grade A)**
- Analgesia is a critical part of the treatment of AOM in children. Acetaminophen and ibuprofen are first-line treatments for mild to moderate pain. **(Grade B)**
- Amoxicillin at a dose of 80 to 90 mg/kg/day should be the first-line antibiotic used for AOM in children. **(Grade A)**
- 10 days of antibiotic treatment should be used for children younger than 6 years. **(Grade C)**
- Antibiotic courses of 5 to 7 days may be chosen for children older than 6 years with mild or moderate AOM. **(Grade A)**
- For management of uncomplicated AOM in adults, amoxicillin is the current best practice and the preferred second-line agents are amoxicillin/clavulanate and cefuroxime. **(Grade C)**

Recommended Antibacterial Agents for Patients Who Are Being Treated Initially With Antibacterial Agents or Who Have Failed 48 to 72 Hours of Observation or Have Failed Initial Management With Antibacterial Agents[28, Level I].

Temperature ≥39°C and/or Severe Otalgia	**At Diagnosis for Patients Being Treated Initially With Antibacterial Agents**		**Clinically Defined Treatment Failure at 48–72 Hours After Initial Management With Observation Option**		**Clinically Defined Treatment Failure at 48–72 Hours After Initial Management With Antibacterial Agents**	
	Recommended	**Alternative for Penicillin Allergy**	**Recommended**	**Alternative for Penicillin Allergy**	**Recommended**	**Alternative for Penicillin Allergy**
No	Amoxicillin (80–90mg/kg per day in 3 divided doses)	* Cefuroxime (30mg/kg per day in 2 divided doses); #Azithromycin (10mg/kg per day on day 1 followed by 5mg/kg per day for 4 days as a single daily dose); #Clarithromycin (15mg/kg per day in 2 divided doses)	Amoxicillin (80–90mg/kg per day in 3 divided doses)	*Cefuroxime (30mg/kg per day in 2 divided doses); #Azithromycin (10mg/kg per day on day 1 followed by 5mg/kg per day for 4 days as a single daily dose); #Clarithromycin (15mg/kg per day in 2 divided doses)	Amoxicillin-clavulanate (90mg/kg per day of amoxicillin with 6.4mg/kg per day of clavulanate in 2 divided doses)	* Ceftriaxone (50mg/kg, 3 days; #Clindamycin
Yes	Amoxicillin-clavulanate (90mg/kg per day of amoxicillin with 6.4mg/kg per day of clavulanate in 2 divided doses)	Ceftriaxone (50mg/kg, 1 or 3 days)	Amoxicillin-clavulanate (90mg/kg per day of amoxicillin with 6.4mg/kg per day of clavulanate)	Ceftriaxone (50mg/kg 1 or 3 days)	Ceftriaxone (50mg/kg 1 or 3 days)	Tympanocentesis, Clindamycin

*Non-anaphylactic reaction #Severe penicillin allergy

Management Algorithm



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NOTES

LEVELS OF EVIDENCE SCALE

I	Evidence obtained from at least one properly randomized controlled trial
II-1	Evidence obtained from well-designed controlled trails without randomization
II-2	Evidence obtained from well-designed cohort or case-control analytic studies preferably from one center or research group
II-3	Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiements (Such as the results of the introduction of penicillin treatment in 140s) could also be regarded as this type of evidence
III	Opinions of respected authorities, based on clinical exeperience;descriptive studies and case reports; or reports of expert committees

SOURCE: U.S/ CANADIAN PREVENTIVE SERVICES TASK FORCE

GRADES OF RECOMMENDATION

A	At least one meta analysis, systematic review, or RCT, or evidence rated as good and directly applicable to the target population
B	Evidence from well conducted clinical trials, directly applicable to the target population, and demonstrating overall consistency of results; or evidence extrapolated from meta analysis, systematic review, or RCT
C	Evidence from expert committee report, or opinions and / or clinical experiences of respected authorities; indicates absence of directly applicable clinical studies of good quality

SOURCE: MODIFIED FROM THE SCOTTISH INTERCOLLEGIATE GUIDELINES NETWORK (SIGN)

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