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Management of Acute Pharyngitis in Pediatrics

25-40% of pharyngitis in this age group is caused by group A strep.

Assess URI symptoms

Serious symptoms?
Consider:
- Admission
- IV antibiotics
- Surgical drainage
- IV fluids if dehydrated

Complicating factors?
Treat as indicated (see text)

Preferred Treatment:
- Penicillin V Potassium (PCN-VK)
- Amoxicillin 45 mg/kg/d bid po x 10d
- Benzathine Pen G IM x 1
- Enthromycin succinate (if pen allergic) 40 mg/kg/d bid po x 10d (max 1gm/d) (see antibiotic table for alternatives)
- *Cephalexin Pediatric: 25-50 mg/kg/d ÷ bid

Consider Rapid Strep Test (low sensitivity)

Education and Symptomatic treatment (see text)

Throat culture Result in 24 hrs

Culture Positive
Throat culture for 'all organisms'

Culture Negative
Mononucleosis or other viruses (check for adenopathy/splenomegaly)
No antibiotics necessary

Routine F/U

Features of Acute Strep Pharyngitis
Suggestive for GABS
- Fever > 39 C (101.5 F)
- Rapid onset sore throat
- Large tonsils with purulent exudate
- Tender anterior cervical adenopathy
- Recent exposure to known case
- Abdominal pain or headache

Suggestive against GABS
- Cough, Postnasal discharge, Laryngitis, Rhinorrhea, Diarrhea, Stomatitis

Serious symptoms:
- Stridor
- Respiratory distress (not sue to congestion)
- Drooling
- Inability to swallow liquids
- Inability to open mouth

Complicating factors:
- Pt or household member with hx of Rheumatic Fever
- HIV positive
- Pt on chemotherapy
- Immunosuppressed
- Diabetes mellitus
- Recurrent strep pharyngitis

Complete 10 days therapy

Improvement in 48 hrs?

R/O peritonsillar or retropharyngeal abcess

Assess compliance

This guideline is designed for general use for most patients but may need to be adapted to meet the special needs of a specific patient as determined by the patient’s provider.
Management of Acute Pharyngitis in Adolescents and Adults

Pharyngitis caused by group A strep
10-20 % in 15-35 yr olds
5-6 % in > 35 yr old

> 15 yrs old
With sore throat

Access URI symptoms

Serious symptoms?

Yes

Consider:
Admission
IV antibiotics
Surgical drainage
IV fluids if dehydrated

No

Complicating factors?

Yes

No

GABS probability?

High (score > 3)

Intermediate (score=0, +1, +2)

Low (score=1, -2)

Throat culture and Empiric Rx
Stop antibiotics if culture neg

Consider Rapid Strep Test
(disourage due to poor performance)

Throat culture (Result in 24 hrs)

Education and Symptomatic treatment (see text)

Sore throat persists > 7 days

Throat culture for all organisms

Throat culture positive

culture negative

No

Pt contagious for 24 hrs after rx started

Mononucleosis or other virus
(check for adenopathy/splenomegaly)
No antibiotics necessary

Pos

Neg

Pos

Neg

Treatment
Penicillin
Erythromycin

Complete 10 days therapy

Improving after 48 hours?

Yes

No

R/O peritonsillar or retropharyngeal abscess;
Assess primary viral cause; adherence

No antibiotics necessary

Pos

Neg

No

Yes

Features of Acute Strep Pharyngitis
Suggestive for GABS (score + 1 each)
Fever > 39 C (101.5 F)
Large tonsils with purulent exudate
Tender anterior cervical adenopathy
Suggestive against GABS (score – 1 each)
Cough
Postnasal discharge

Complicating factors:
Pt no household contact with hx or rheumatic fever
HIV positive
Pt on chemotherapy
Imunosupressed
Diabetes mellitus
Pregnant
Recurrent strep pharyngitis

Preferred Treatment
Penicillin VK 500 mg bid x 10 d
Benicarhine Pen G 1.2 Mu IM x 1
Erythromycin 500 mg bid po x 10 d
(see antibiotic table for alternatives)

Alternative Treatment
Cephalexin: 500mg bid
Amoxicillin/Clavulanate: 500mg bid
Clindamycin: 450 mg tid

This guideline is designed for general use for most patients but may need to be adapted to meet the special needs of a specific patient as determined by the patient’s provider.
**General Information**
- Viral agents cause most cases of pharyngitis: 90% in adults, 60%-75% in children.
- The prime reason to identify and treat Group A Beta-Hemolytic streptococcal (GABHS) pharyngitis is to decrease the risk of acute rheumatic fever. The endemic incidence of ARF is around 0.23-1.88/100,000.
- Early treatment of GABHS can decrease the time a patient is symptomatic by ½ -2 days from a typical 3-7 days and may decrease the period of contagiousness.

**Adolescents and Adults**
- Diagnosis not very accurate based on symptoms and signs alone. (50%-60%)
- A limited set of symptoms and signs can help identify low, intermediate, or high probability.
- Those that are high probability and who are to be treated immediately should get a culture to confirm. Follow-up should be done on those who are culture negative. The rapid strep screen is useful for those that are intermediate probability. A negative result should be followed by a culture. Treatment should be delayed until the culture is back. If a rapid strep is done on a low probability patient, a negative result need not be followed by culture.

**Children**
- Higher prevalence of GABHS in this population, but the diagnosis is more difficult. Symptoms and signs may suggest higher or lower probability.
- Recommend culturing for all cases where GABHS is suspected. Consider rapid strep screen.

**Advantages and Disadvantages of Strep Screens and Strep Cultures**
- **Screen:**
  - Advantages: Rapid positive result. Onsite diagnosis. Prompt treatment
  - Disadvantages: Less sensitive (Poor performance at ANMC may be affected by inadequate sampling). Adds to cost, most will be negative, requiring follow-up culture
- **Culture:**
  - Advantage: Accurate positive and negative result
  - Disadvantage: Delay in result, Logistics of reporting results and subsequent treatment. Delay in treatment. The value of either test is low when the probability is low.

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Differential Diagnosis
Most cases of acute pharyngitis are viral in etiology. Viral pathogens can cause pharyngitis clinically indistinguishable from GABS pharyngitis and can cause distinct clinical syndromes:

- Rhinovirus - coryza
- Herpes simplex type 1 and 2 - gingivitis and stomatitis
- Respiratory Syncitial Virus - hoarseness, wheezing
- Epstein Barr virus - infectious mononucleosis
- Influenza
- Coxsackievirus A - herpangina
- Enteroviruses - diarrhea
- Adenovirus - pharyngoconjunctival fever
- Parainfluenza - hoarseness, croup
- HIV
- Coronavirus - URI symptoms
- Cytomegalovirus

Bacterial pathogens other than GABS can cause pharyngitis:
- Group C and Group G strep
- Mixed anaerobes - Vincent’s angina
- Neisseria gonorrhoea
- Corynebacterium diptheriae - diptheria
- Yersinia pestis - plague
- Treponema pallidum - secondary syphilis
- Francisella tularensis - Tularemia
- Mycoplasma pneumoniae - atypical pneumonia
- Several chlamydial species

Proper swab technique
Throat cultures may be false-negative if specimens are obtained or cultured improperly. Samples should be obtained by vigorous swabbing of both tonsillar surfaces and fossae and the posterior pharynx. Avoid swabbing the soft palate, uvula or tongue as this dilutes the sample. Using two swabs is recommended; one for the Rapid Strep Test (RST) and the other for culture if the RST is negative.

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Complicating Factors

1) Patient or household member with history of Rheumatic Fever
These individuals are at high risk for a recurrent attack of RF with subsequent episodes of GABS pharyngitis, even if optimally treated. The infection does not need to be symptomatic to trigger a recurrence. These patients require immediate antibiotic treatment while awaiting culture results. Discontinue antibiotics if the culture is negative. Prevention of recurrent RF requires continuous antimicrobial prophylaxis and GABS infections in family members should be diagnosed and treated promptly.

2) HIV positive, Patient on Chemotherapy, Immunosuppressed, Diabetes Mellitus, Pregnant
If patients are in good health, treat according to guideline. Consider full differential diagnosis and alternative treatment if necessary.

3) Patient started antibiotics prior to presentation
If patients have started self-treatment (2 or more antibiotic doses) the lab test may be invalidated.

4) Sore throat for > 5 days duration
Patients with pharyngitis persisting over five days are less likely to have GABS pharyngitis. Consider infectious mononucleosis and other infectious possibilities, including viral etiologies, sinusitis and other causes of postnasal drip.

5) Persistent Infection/ Treatment Failure
Patients who have been treated with antibiotics for GABS pharyngitis with in the last month may represent a treatment failure, recurrent disease or carrier state. Treatment failure is defined as recurrence of symptoms within 7 days of completing therapy. Possible reasons: Medication non compliance or Pharyngeal flora producing beta-lactamase.

6) Recurrent GABS pharyngitis
Recurrent strep pharyngitis is defined as recurrence of culture positive GABS pharyngitis greater than 7 days but within 4 weeks of completing antibiotic therapy. The patient is likely to be experiencing recurrent episodes if:
- Clinical findings suggest GABS as the etiology
- There is marked clinical response to antibiotics
- Throat cultures are negative between episodes
- Epidemiologic findings suggest GABS as etiology (age 5-15, winter/spring season)
- Serologic response to GABS extracellular antigens (ASO, anti-DNAase B)
- Refer to ENT if three or more distinct episodes with positive cultures in 12 month period

7) Carrier state
These are patients who are chronically colonized with GABS. The prevalence of the carrier state is between 10-25%. They are at very low risk for developing serious complications (e.g. peritonsillar abscess, ARF), and are unlikely to spread GABS to close contacts. Most require no medical intervention. Patient is likely to be a carrier if:
- Clinical findings suggest a viral etiology
- There is little clinical response to antibiotics
- Throat cultures done between episodes of acute pharyngitis are also positive
- There is no serologic response to GABS antigens
Identification and eradication of strep carrier state (see treatment table) may desirable if:
- There is a family history of RF
- Ping-Pong spread within a family
- Family with significant anxiety about GABS
- Outbreaks of GABS pharyngitis in closed or semi-closed community
- When tonsillectomy is being considered solely because of chronic carrier state

This guideline is designed for general use for most patients but may need to be adapted to meet the special needs of a specific patient as determined by the patient’s provider.
Patient Education

- Most sore throats are not caused by GABS and do not require antibiotic therapy.
- Streptococcal pharyngitis is unlikely with symptoms of congestion, cough, hoarseness, conjunctivitis, laryngitis, or diarrhea.
- If patient is currently on antibiotics (other than sulfa, tetracycline, nitrofurantoin or other non-strep antibiotics) and taking them as prescribed and develops a sore throat, it is probably not strep.
- Instruct patient to call back if symptoms worsen or if they persist beyond 7 days.
- Home remedies:
  - Take acetaminophen or ibuprofen. Do not use aspirin in children and teenagers due to risk of Reyes syndrome.
  - Gargle with warm salt water (1/4 tsp of salt per 8 oz glass of water).
  - Throat lozenges for older children and adults. Gargle with ice can be soothing.
  - Eat soft foods. Drink cool beverages or warm liquids.
- If strep screen or culture is positive and the patient is placed on antibiotics:
  - Make aware that they are "contagious" until they have been on antibiotics for 24 hours.
  - They should see an improvement in their acute symptoms within 48 hours.
  - Emphasize that it is vital for them to complete the 10 days of treatment in order to prevent the occurrence to rheumatic fever.
  - Instruct patient to call back if they are not improving or symptoms are worse after 48 hours, or if other family members show the same symptoms.

This guideline is designed for general use for most patients but may need to be adapted to meet the special needs of a specific patient as determined by the patient’s provider.
Referral Guidelines for Tonsillectomy

1) Recurrent strep pharyngitis: > 3 distinct episodes with positive culture in 12 month period

2) Recurrent exudative tonsillitis (not pharyngitis): > 6 episodes in 12 months, > 5 episodes per year for 2 consecutive years, > 3 episodes per year for 3 consecutive years

3) Obstructive sleep disturbance secondary to tonsillar and/or adenoid hyperplasia. This may be manifested by chronic mouth breathing, nasal obstruction, severe snoring, apnea, daytime fatigue, dysphagia, dental arch maldevelopment, adenoid facies and dysphonia. Failure to thrive, renal and cardiac complications are seen only in the most severe cases and warrant a full medical workup and subsequent evaluation in ENT clinic

4) Recurrent tonsillitis when complicated by peritonsillar abscess, febrile seizure, abscessed lymph nodes or acute airway obstruction. Repeat episodes of severe tonsillitis requiring hospitalization should also be considered for direct surgical referral.

5) Patients being considered for direct surgical referral should also be without preexisting medical problems that might complicate anesthesia delivery and/or the surgical process. A prior ENT evaluation is warranted otherwise. Note: Clearly, decisions for direct referral and, ultimately, surgical intervention must be individualized for each patient. Patients with throat and tonsil problems not meeting these criteria should be referred to ENT Clinic for evaluation.

This guideline is designed for general use for most patients but may need to be adapted to meet the special needs of a specific patient as determined by the patient’s provider.
**Antibiotic Treatment**

- Group A streptococcal pharyngitis is a self-limited disease; fever and constitutional symptoms disappear spontaneously within 3-4 days even without antimicrobial therapy.
- The primary goal of treatment is to prevent the development of Acute Rheumatic Fever (ARF).
- Treatment within 9 days after onset of illness and continued for 10 days is effective in preventing ARF.
- Therapy does not seem to affect risk of poststreptococcal acute glomerulonephritis (AGN).
- Therapy reduces suppurative sequelae of GABS pharyngitis e.g. peritonsillar abscess and cervical adenitis.
- Signs and symptoms resolve somewhat more rapidly in those treated.
- Antibiotic therapy terminates contagiousness within 24 hours.
- Risk of rheumatic fever is about 3% in epidemics and 0.3% in endemic conditions.
- GABS infections are uncommon in children < 3yrs.
- Empiric treatment is discouraged. If scarlet fever or other clinical features are highly suggestive of GABS, and the rapid test is negative, then antibiotics may be started before cultures are available. Patient must be called to discontinue therapy if the culture is negative.

### Preferred Treatment

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Dose: Oral x 10 days unless otherwise indicated</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penicillin V Potassium</td>
<td>If wt &lt; 27kg (60lbs): 250 mg bid</td>
<td>- Inexpensive</td>
<td>- Narrow spectrum</td>
</tr>
<tr>
<td>(PCN-VK)</td>
<td>If wt ≥ 27kg (60lbs): 500 mg bid</td>
<td>- Few side effects</td>
<td>- BID dosing</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td>Adult: 500 mg bid</td>
<td>- Better compliance in peds (tastes better)</td>
<td>- Broader spectrum</td>
</tr>
<tr>
<td>Penicillin G Benzathine</td>
<td>If wt &lt; 27kg (60lbs): 600,000 U IM x 1 dose</td>
<td>- Ensures compliance</td>
<td>- Pain at injection site</td>
</tr>
<tr>
<td></td>
<td>If wt &gt; 27kg (60lbs): 1,200,000 U IM x 1 dose</td>
<td>- Eradicates carrier state</td>
<td>- Cannot discontinue if serious allergy develops</td>
</tr>
<tr>
<td>C-R bicillin (900/300)</td>
<td>If wt = 27kg (60lbs): 1,200,000 U IM x 1 dose</td>
<td>As for Pen G</td>
<td>As for Pen G</td>
</tr>
<tr>
<td>Erythromycin</td>
<td>Ethyl succinate</td>
<td>- Equally effective as PCN in preventing complications of strep</td>
<td>- GI upset</td>
</tr>
<tr>
<td></td>
<td>If wt &lt; 27kg (60lbs): 40 mg/kg/d + bid (max 1 gm/d)</td>
<td>Resistance is uncommon in US (5%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If wt &gt; 27kg (60lbs): 400 mg bid</td>
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<tr>
<td></td>
<td>Erythromycin base 250 qid; 333 mg tid; 500 mg bid</td>
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<tr>
<td>Cephalexin</td>
<td>Pediatric: 25-50 mg/kg/d + bid</td>
<td>- Equal cure rate vs oral PCN</td>
<td>- Broader spectrum</td>
</tr>
<tr>
<td></td>
<td>Adult: 500 mg bid</td>
<td>BID dosing</td>
<td></td>
</tr>
</tbody>
</table>

### Alternative Treatment

**Use for treatment failure of frequent recurrences**

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Dose: Oral x 10 days unless indicated</th>
<th>Advantage</th>
<th>Disadvantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cephalexin</td>
<td>Pediatric: 25-50 mg/kg/d + bid</td>
<td>- Equal cure rate vs oral PCN</td>
<td>- Broader spectrum</td>
</tr>
<tr>
<td></td>
<td>Adult: 500 mg bid</td>
<td>BID dosing</td>
<td></td>
</tr>
<tr>
<td>Amoxicillin/Clavulinate</td>
<td>Pediatric: 45 mg/kg/d + bid</td>
<td>- Eradicates carrier status</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adult: 500 mg bid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clindamycin</td>
<td>Pediatric: 25 mg/kg/d + tid</td>
<td>- Unaffected by beta lactamase</td>
<td>- Expensive</td>
</tr>
<tr>
<td></td>
<td>Adult 450 mg tid</td>
<td>Narrow spectrum</td>
<td>- Pseudomembranous colitis may occur several weeks after treatment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eradicates carrier status</td>
<td>- Stevens Johnson Syndrome</td>
</tr>
</tbody>
</table>

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References
4. University of Michigan Hospitals Clinical Care Guideline: Pharyngitis (in adults and children)
5. ANMC ENT. Direct Referral Guidelines for Tonsillectomy

Meta-analysis of Cephalosporin Versus Penicillin Treatment of Group A Streptococcal Tonsillopharyngitis in Children Janet R. Casey, MD, and Michael E. Pichichero, MD

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