Evidence-Based Information Retrieval:
1. Asking the Clinical Question
2. Using Clinical Queries on PubMed
Evidence-Based Practice (EBM)

- Requires the Practitioner to
  - Formulate a Clear Clinical Question
  - Search the Literature for Relevant Clinical Articles
  - Appraise (Analyse) Articles Retrieved for Validity and Applicability
    - How Will the Result Benefit my Patient/s?
  - Apply the Evidence in Practice
Evidence-Based Medicine (EBM)

- Requires Incorporation of
  - All Previous Searching Skills
  - All Previous Knowledge of Resources

- Synthesized with
  - Clinical Knowledge
  - Clinical Skills
  - Diagnostic Acumen
Problem Statement

- Formulation of the Problem the Most Difficult Aspect
- How to Translate a Clinical Problem into a Search Strategy?
Concept (Facet) Analysis

- Is Jogging Good for Pigs?
- Jogging
- Pigs

Subset of Data on Both Jogging AND Pigs
Concept (Facet) Analysis

OR

Jogging
Running

AND

Pig/s
Hog/s
Clinical Problem Statement

- Can Antibiotics be Used to Treat Adult Pharyngitis?
- Concepts?
- Antibiotics
- Pharyngitis
- Adult?
- Treatment?
PICO Filters for EBM Searching

- **Patient/Problem**
- **Intervention**
- **Comparative Intervention (If Any)**
- **Outcome/s**
- **Patient/Problem**
  - About the Patient/Problem/Population/Condition
- **Intervention**
  - Form of Treatment/Diagnostic Test/Aspect of Healthcare/Exposure
- **Comparative Intervention (If Any)**
  - Eg. Compared with No Intervention/Placebo Study, etc.
- **Outcome/s**
  - Positive
    - Prevention of Illness/Improvement in Health
  - Negative
    - Adverse Effects/Side Effects
Clinical Problem Statement

- Can Antibiotics be Used to Treat Adult Pharyngitis?
- Concepts?
- Antibiotics
- Pharyngitis
- Adult?
- Treatment?
### Concept (Facet) Analysis with PICO Filters

<table>
<thead>
<tr>
<th>Patient/Problem</th>
<th>Intervention</th>
<th>Comparative Intervention (If Any)</th>
<th>Outcome/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharyngitis</td>
<td>Antibiotics</td>
<td>Concepts</td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>Therapy OR Treatment</td>
<td>Focus</td>
<td>Limit</td>
</tr>
</tbody>
</table>

**AND**
Kinds of Questions (1)

• Background (General Reading)
  – About the disorder, test, treatment, etc.

• Asked When Still Inexperienced with Condition
  – 2 Components
    1. W^5H + Verb
       • Who, What, When, Where, Why, How
       • Eg. What causes …..
    2. Condition
       • Eg. Irritable Bowel Syndrome
Kinds of Questions

• Foreground (Specific)
  – About Patient Care Decisions and Actions
  – PICO

• Asked When More Experienced with Condition
Further Reading

• [http://www.jaoa.org/cgi/content/full/107/8/295](http://www.jaoa.org/cgi/content/full/107/8/295)

• JAOA • Vol 107 • No 8 • August 2007 • 295-297 Special Communication

Virgilio, RF, Chiapa, AL, Plamarozzi, EA. Evidence-Based Medicine, Part 1. An Introduction to Creating an Answerable Question and Searching the Evidence
Systematic Reviews

- Used in EBM Searching
- **NOT** the Same as a Review Article
- Includes 6 Steps
  - Precise Formulation of the Problem
  - Efficient Search Strategies
  - Appraisal of Research Designs, Implementations, Analyses
  - Synthesis of Information (Systematic **NOT** Selective)
  - Justified Conclusions
  - Identification of Gaps in Present Knowledge
- Regarded as the **GOLD STANDARD** of EBM Searching
Clinical Queries on PubMed

• Faster searching for clinical material
• Filters (hedges) already applied
• Foreground questions
  – More experience
  – Solving a specific problem
• [http://libguides.wits.ac.za/whsl-pubmedclinquest](http://libguides.wits.ac.za/whsl-pubmedclinquest)
MeSH (Medical Subject Headings) is the NLM controlled vocabulary thesaurus used for indexing articles for PubMed.
MeSH

NLM Controlled Vocabulary

Search: MeSH

|pharyngitis|

Search

MeSH

MeSH (Medical Subject Headings) is the NLM controlled vocabulary thesaurus used for indexing articles for PubMed.

Using MeSH

Help

Tutorials

More Resources

E-Utilities

NLM MeSH Homepage
Type in your first term: Pharyngitis
Pharyngitis

Definition:
Inflammation of the throat (PHARYNX).
Year introduced: SORE THROAT was seen under PHARYNGITIS 1963-1978

Subheadings:
- blood
- cerebrospinal fluid
- chemically induced
- classification
- complications
- diagnosis
- diet therapy
- drug therapy
- economics
- enzymology
- epidemiology
- ethnology
- etiology
- genetics
- history
- immunology
- metabolism
- microbiology
- microsurgery
- mortality
- nursing
- parasitology
- pathophysiology
- physiotherapy
- prevention and control
- psychology
- radiography
- radionuclide imaging
- radiotherapy
- surgery
- therapy
- transmission
- ultrasonography
- urine
- veterinary
- virology
- virology
-....
The MeSH term Pharyngitis includes all these terms as well.

MeSH hierarchy. Remember to choose the most specific term, eg. tonsillitis.
Pharyngitis

Inflammation of the throat (PHARYNX).

Year introduced: SORE THROAT was seen under PHARYNGITIS 1963-1970

Pubmed search builder options

- analysis
- anatomy and histology
- blood
- cerebrospinal fluid
- chemically induced
- chemistry
- classification
- complications
- congenital
- cytology
- diagnosis
- diet therapy
- drug therapy
- economics
- embryology
- enzymology

- epidemiology
- entology
- genetics
- history
- immunology
- metabolism
- microbiology
- mortality
- mortuary
- nursing
- organization and administration
- parasitology
- pathogenicity
- pathology
- physiopathology
- prevention and control
- psychology
- radiography
- radiotherapy
- rehabilitation
- statistics and numerical data
- surgery
- therapy
- transmission
- ultrasonography
- urology
- veterinary
- virology

- Restrict to MeSH Major Topic.
- Do not include MeSH terms found below this term in the MeSH hierarchy.

Tree Number(s): C07 550.781, C08 730.561, C09 775.649
MeSH Unique ID: D010612

Entry Terms:
- Pharyngitis
- Sore Throat
- Sore Throat
- Throat Sore

All MeSH Categories
Diseases Category
Immediate Allergic Diseases
Type in your second term: antibiotics
Results: 1 to 20 of 22

- **Anti-Bacterial Agents**
  1. Substances that reduce the growth or reproduction of BACTERIA.
     Year introduced: 2034 (1963)

- **Anti-Bacterial Agents [Pharmacological Action]**
  2. **Antibiotics, Antitubercular**
  3. Substances obtained from various species of microorganisms that are, alone or in combination with other agents, of use in treating various forms of tuberculosis; most of these agents are merely bacteriostatic, induce resistance in the organisms, and may be toxic. Year introduced: 1975
  4. **Antibiotics, Antineoplastic**
  5. Chemical substances, produced by microorganisms, inhibiting or preventing the proliferation of neoplasms. Year introduced: 1967

- **Rifamycins**
  6. A group of ANTI-BACTERIAL AGENTS characterized by a chromophoric naphthylhydrazino group spanned by an alpha-bridge not previously found in other known ANTI-BACTERIAL AGENTS. They have been isolated from fermentation broths of Streptomyces mediterranea. Year introduced: 1973

- **LL-AM 31 antibiotics [Supplemental Concept]**
  7. from Streptovorbidium; structure
     Date introduced: January 1, 1997

- **Carbapenems**
  8. A group of beta-lactam antibiotics in which the sulfur atom in the thiazolidine ring of the penicillin molecule is replaced by a carbon atom. THIENAMYCINS are a subgroup of carbapenems which have a sulfur atom as the first constituent of the side chain. Year introduced: 1960

- **Thienamycins**
  9. Beta-lactam antibiotics that differ from PENICILLINS in having the thiazolidine sulfur atom replaced by carbon, the sulfur then becoming the first atom in the side chain. They are unstable chemically, but have a very broad antibacterial spectrum. Thiennamycin and its more stable derivatives are proposed for use in combinations with enzyme inhibitors. Year introduced: 1983
MeSH

Display Settings: Summary, 20 per page

Results: 1 to 20 of 22 Selected: 1

- **Anti-Bacterial Agents**
  1. Substances that reduce the growth or reproduction of BACTERIA.
     Year introduced: 20th (1963)

- Anti-Bacterial Agents [Pharmacological Action]
  2.

- **Antibiotics, Antitubercular**
  3. Substances obtained from various species of microorganisms that are, alone or in combination with other agents, of use in treating various forms of tuberculosis; most of these agents are merely bacteriostatic, induce resistance in the organisms, and may be toxic.
     Year introduced: 1975

- **Antibiotics, Antiproliferative**
  4. Chemical substances, produced by microorganisms, inhibiting or preventing the proliferation of neoplasms.
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     Year introduced: 1988

- **Thienamycins**

- Beta-lactam antibiotics that differ from PENICILLINS in having the thiazolidine sulfur atom replaced by carbon, the sulfur then becoming the first atom in the side chain. They are unstable chemically, but have a very broad antibacterial spectrum. Thienamycin and its more stable derivatives are proposed for use in combinations with enzyme inhibitors.
     Year introduced: 1983
Copy the search strategy by highlighting and on the highlight right click on your mouse and select copy.
Pharyngitis

Inflammation of the throat (PHARYNX). Year introduced: Sore THROAT was seen under PHARYNGITIS 1963-1970

PubMed search builder

- "Pharyngitis"[Mesh]
- AND "Anti-Bacterial Agents"[Mesh]

Related information

- PubMed
- PubMed - Map Topic
- Clinical Queries
- NLM MeSH Browser
- MeSHGen

Recent Activity

- antibiotics (22)
- Pharyngitis
- pharyngitis (1)
- "Pharyngitis"[Mesh] AND "Anti-Bacterial Agents"[Mesh] (189)
- advance studies in pharmacy (193)

Search PubMed
Delete search term that appears
Paste search strategy already copied in search bar
Clinical Queries: Scope

• **Broad**
  – May retrieve some material that is irrelevant, but will not miss anything

• **Narrow**
  – More focus, but may miss articles
Clinical Study Categories

Category: Therapy
Scope: Broad

Results: 5 of 1786

1. [Results in the combination therapy of tonsillitis pharyngitis.]

2. Inhaled hyaluronic acid as auxiliary treatment in children with bacterial acute rhinosinusitis.

3. [Familial spina streptococcal-associated myocarditis. Is it a new entity or a coincidence?]


5. Diagnosis of streptococcal pharyngitis.

See all (1786)

This column displays citations linked to a specific clinical study category and scope. These search filters were developed by John Doe, and use filter information.

Systematic Reviews

Results: 5 of 97

1. PRimary care Streptococcal Management (PRISM) study in vitro study, diagnostic cohorts and a pragmatic adaptive randomised controlled trial with nested qualitative study and cost-effectiveness study.

2. Empirical validation of Polish guidelines for the management of acute streptococcal pharyngitis in children.


4. Antibiotics for sore throat.

5. ISDG Updates Guideline for Managing Group A Streptococcal Pharyngitis.

See all (97)

This column displays citations for systematic reviews, meta-analyses, reviews of clinical trials, evidence-based medicine, consensus development conferences, and guidelines. See filter information or additional related sources.

Medical Genetics

Results: 5 of 56


2. Group A streptococcal colonies from a single throat swab can have heterogeneous antimicrobial susceptibility patterns.


4. Antibiotics for sore throat.

5. Management of adults with acute streptococcal pharyngitis: minimal values for backup, drug testing, and use of antibiotics.

6. Differences between macrolide-resistant and susceptible Streptococcus pyogenes: importance of clinical properties in addition to antibiotic consumption.

See all (56)
Apply relevant filters
Results: 5

1. Implementation of an evidence-based acute tonsillitis protocol: our experience in one hundred and twenty-six patients.
   Bird JH, Riggs TC, Schulz C, Lower N, Faris C, Rupancos C.
   PMID: 23910693 [PubMed] - indexed for MEDLINE
   Related citations
   [Different antibiotics for group A streptococcal pharyngitis.]
   van Driel ML, De Sutter AI, Kerber N, Habraken H, Christianss T.
   PMID: 23833338 [PubMed] - indexed for MEDLINE
   Related citations

2. Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis.
   2012 update by the Infectious Diseases Society of America.
   Shulman ST, Bisno AL, Clegg HW, Gerber MA, Kaplan EL, Lee G, Martin JM, Van Beneden C.
   PMID: 23061014 [PubMed] - indexed for MEDLINE
   Free Article
   Related citations

3. Corticosteroids as standalone or add-on treatment for sore throat.
   Hayward G, Thompson MJ, Perera R, Glasziou PP, Dell'aria CB, Heenehan CJ.
   PMID: 23176443 [PubMed] - indexed for MEDLINE
   Related citations

   2012 update by the Infectious Diseases Society of America.
   PMID: 23061014 [PubMed] - indexed for MEDLINE
   Free Article
   Related citations

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   Hayward G, Thompson MJ, Perera R, Glasziou PP, Dell'aria CB, Heenehan CJ.
   PMID: 23176443 [PubMed] - indexed for MEDLINE
   Related citations

Display Settings: Summary, Sorted by Recently Added
Click on Articles to Retrieve Full Text Links as Normal
Different antibiotic treatments for group A streptococcal pharyngitis.

van Deuren M., De Buitleer N., Vekemans J., Hakenrode R., Closset J., Christiani T.

Abstract

BACKGROUND: Antibiotics provide only modest benefit in treating sore throat, although effectiveness increases in participants with positive throat swabs for group A beta-haemolytic streptococci (GABHS). It is unclear which antibiotic is the best choice if antibiotics are indicated.

OBJECTIVES: To assess the evidence on the comparative efficacy of different antibiotics in (a) alleviating symptoms (pain, fever), (b) shortening the duration of the illness, (c) preventing relapse, and (d) modifying complications (suppurative complications, acute rheumatic fever, post-streptococcal glomerulonephritis). To assess the evidence on the comparative incidence of adverse effects and the risk-benefit of antibiotic treatment for streptococcal pharyngitis.


SELECTION CRITERIA: Randomised, double-blind trials comparing different antibiotics and reporting at least one of the following clinical cure, clinical relapse, complications, adverse events.

DATA COLLECTION AND ANALYSIS: Two authors independently screened trials for inclusion and extracted data.

MAIN RESULTS: Seventeen trials (5352 participants) were included, 10 compared with penicillin (six with cephalosporins, six with macrolides, three with carbapenem and one with sulfonamides), one trial compared clindamycin and amoxicillin. Randomisation reporting, allocation concealment and blinding were poor. There was no difference in symptom resolution between cephalosporins and penicillin (intention-to-treat ITT) analysis: N = 9, n = 2010; odds ratio for absence of resolution of symptoms (OR) 0.79, 95% confidence interval (CI) 0.55 to 1.12. Clinical relapse was lower with cephalosporins (N = 4; n = 1385; OR 0.55, 95% CI 0.31 to 0.99); overall number needed to treat to benefit (NNTB) 59, but found only in adults (OR 0.42, 95% CI 0.20 to 0.88; NNTB 33). There were no differences between macrolides and penicillin. Carbapenem showed better symptom resolution post-treatment (N = 3; n = 796; OR 0.70, 95% CI 0.49 to 0.99; NNTB 14), but only in children (N = 2; n = 233; OR 0.57, 95% CI 0.33 to 0.99; NNTB 8.3). Children experienced more adverse events with macrolides (N = 1; n = 499; OR 3.33; 95% CI 1.06 to 10.15).

AUTHORS’ CONCLUSIONS: Evidence is insufficient to show clinically meaningful differences between antibiotics for GABHS tonsillospharyngitis. Limited evidence in adults suggests cephalosporins are more effective than penicillin for relapses, but the NNTB is high. Limited evidence in children suggests carbapenem is more effective for symptom resolution. Data on complications are too scarce to draw conclusions. Based on these results and considering the low cost and absence of resistance, penicillin can still be recommended as first choice.
Different antibiotic treatments for group A streptococcal pharyngitis

Mike L Van Driel¹,²,³, ¹An IM De Sutter²,³, Natallja Kaber⁴, Hilde Habran⁴, Thierry Christiaens⁴

Editorial Group: Cochrane Acute Respiratory Infections Group

Published Online: 30 APR 2013
Assessed as up-to-date: 19 OCT 2012
DOI: 10.1002/14651858.CD004493.pub3

Abstract

Background

Antibiotics provide only modest benefit in treating sore throat, although effectiveness increases in patients with positive throat swabs for group A beta-haemolytic streptococci (GABHS). It is unclear which antibiotic is the best choice if antibiotics are indicated.

Objectives

To assess the evidence on the comparative efficacy of different antibiotics in: (a) alleviating symptoms (pain, fever); (b) shortening the duration of the illness; (c) preventing relapse; and (d) preventing complications (suppurative complications, acute rheumatic fever, post-streptococcal glomerulonephritis). To assess the evidence on the comparative incidence of adverse effects and the risk-benefit of antibiotic treatment for streptococcal pharyngitis.

Search methods

Different antibiotic treatments for group A streptococcal pharyngitis (Review)

van Driel ML, De Sutter AIM, Keber N, Habraken H, Christiaens T
Questions??