

# PHC

432 Handouts

3

## UPPER RESPIRATORY TRACT INFECTIONS



Done by:

Rehab Mosleh, Seham alanazi, Bashayer AlShirah, Areej  
alabdulsalam, Shahad alqreen, Nourah alajmi

جامعة  
الملك سعود  
King Saud University



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## **Objectives**

- 1) How can we differentiate between viral and bacterial infections?
- 2) Sore throat (clinical features, differential diagnosis, complications, management)
- 3) Sinusitis including allergic rhinitis (Clinical features and management)
- 4) Otitis media in children (AOM and Secretory OM, Features, management)
- 5) How can we modify help seeking behavior of patients with flu illness?
- 6) Update in management and role of antibiotics

## **Upper Respiratory Tract Infection**

Upper respiratory tract infection (URI) is a nonspecific term used to describe acute infections involving the nose, paranasal sinuses, pharynx, larynx, trachea, and bronchi.

This commonly includes tonsillitis, pharyngitis, laryngitis, sinusitis, otitis media, and the common cold.

### **Case**

Miss. Haya a 21 year old student came to the clinic complaining of pain in her throat for 4 days which is worse upon swallowing and talking. she also have runny congested nose and cough.

### **What is the most likely diagnosis?**

### **Sore Throat**

**Definition:** A sore throat is pain, scratchiness or irritation of the throat that often worsens with swallowing.

### **Causes:**

**1. Viral (most common >50%)** rhinovirus, coronavirus, parainfluenza virus (causes of common cold), influenza virus, Adenovirus, EBV (causes infectious mononucleosis).

**2. Bacterial:** Group A beta-hemolytic streptococcus (GAS), Haemophilus influenzae, Diphtheria

**3. Other causes:** Allergies, Gastroesophageal reflux disease (GERD), HIV infection, Tumors

### **Clinical features**

#### **Viral infection**

- A runny or congested nose
- Irritation or redness of the eyes
- Cough, hoarseness, or soreness in the roof of the mouth

## **Bacterial infection:**

- Pain in the throat
- Fever (temperature greater than 100.4°F or 38°C)
- Enlarged lymph glands in the neck
- White patches of pus on the side or back of the throat
- No cough, runny nose, or irritation/redness of the eyes

## **How to differentiate between viral and bacterial infection?**

Most of upper respiratory tract infection caused by viral infection.

And it can typically be detected by runny nose, cough, low-grade fever, sore throat, and difficulty sleeping. No antibiotics or anti-viral medications needed for recovery.

Bacterial infections:

Symptoms persist longer than the expected 10-14 days, Fever is higher than one might typically expect from a virus, Fever gets worse a few days into the illness rather than improving, Respond to antibiotic.

## **Differential diagnosis:**

1. Peritonsillar abscess (quinsy).
2. Kawasaki disease (children younger than 5).
3. Epiglottitis (if suspected do not examine throat, examination may lead to airway obstruction).
4. Diphtheria (adherent gray membrane over tonsils and pharynx)
5. Noninfectious causes (GERD, acute thyroiditis, chronic cough, post nasal drip, irritation by tobacco smoke, alcohol or NG tube)
6. Tumor

## **Diagnosis of sore throat**

Precise clinical diagnosis is difficult in practice. Distinguishing between a viral and bacterial etiology is one of the main considerations. The most common bacterial pathogen is GABHS, for which antibiotic treatment may be considered. Several studies have attempted to differentiate between GABHS and viral causes on the basis of symptoms and clinical signs. No single Symptom or sign is useful when used alone, but combinations of factors have been used in

Several clinical prediction rules. A systematic review of these studies has shown that the Centor scoring system may help categorise the individual patient's risk level for GABHS infection.

The Centor score gives one point each for:

- f. Tonsillar exudate
- f. Tender anterior cervical lymph nodes
- f. History of fever
- f. Absence of cough.

The Modified Centor Criteria add the patient's age to the criteria:

- Age <15 add 1 point

-Age >44 subtract 1 point

Interpretations:

-0 or 1 points:

No antibiotic or throat culture necessary.

-2 or 3 points:

Should receive a throat culture and treat with an antibiotic if culture is positive

-4 or 5 points:

Treat empirically with an antibiotic.

## **Investigations:**

### **Throat culture:**

Specimen obtained by throat swab of posterior tonsillopharyngeal area, results in 24 to 48 hours.

Sensitivity: 97 percent; specificity: 99 percent.

Though it's more accurate, yet negative culture does not rule out the diagnosis of streptococcal infection

### **Rapid antigen detection test or rapid streptococcal antigen test:**

Detects presence of group A streptococcal carbohydrate on a throat swab (change in color indicates a positive result); results available within minutes.

Specificity: > 95 percent; sensitivity: 80 to 97 percent.

### **Management:**

1. Reassure the patient that the illness is self-limiting and rarely causes complications; educate patients about viral nature of most infections, and how antibiotics are not indicated.
2. Encourage adequate fluid intake to avoid dehydration.
3. Paracetamol or ibuprofen to relieve symptoms.
4. Majority of sore throats are caused by viruses hence they are self-limiting. Antibiotics do not significantly relieve symptoms or reduce duration of illness in most patients and though complications of streptococcal infection are rare antibiotics are proved to have little benefit in preventing them:
5. Use Centor criteria to assess the need of antibiotics.
6. Antibiotics recommended:

-Penicillin:

- oral penicillin V given 6-hourly for 10 days is widely regarded as the gold standard treatment
- - if allergic use Macrolides
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### **Group A $\beta$ -hemolytic streptococcus (GABHS) infection complications:**

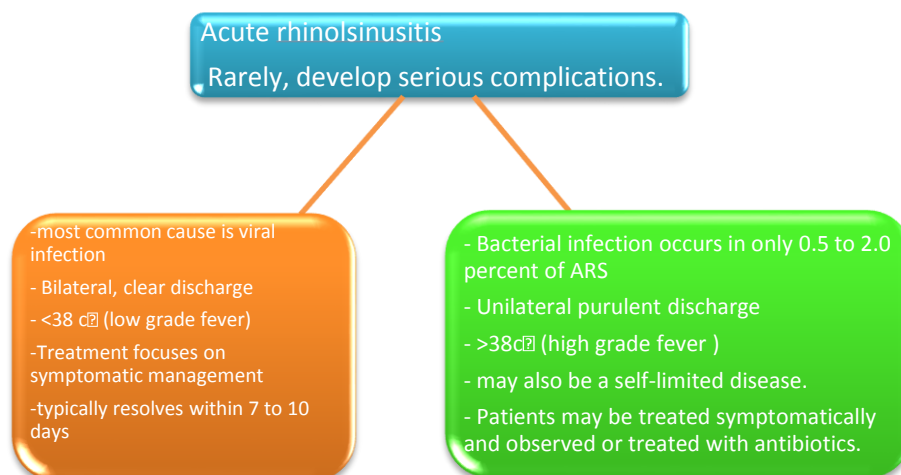
- 1. Suppurative complications: parapharyngeal, retropharyngeal and peritonsillar abscess, sinusitis, cervical lymphadenitis, otitis media, and mastoiditis.
- 2. Non suppurative complications: Acute rheumatic fever and Poststreptococcal glomerulonephritis

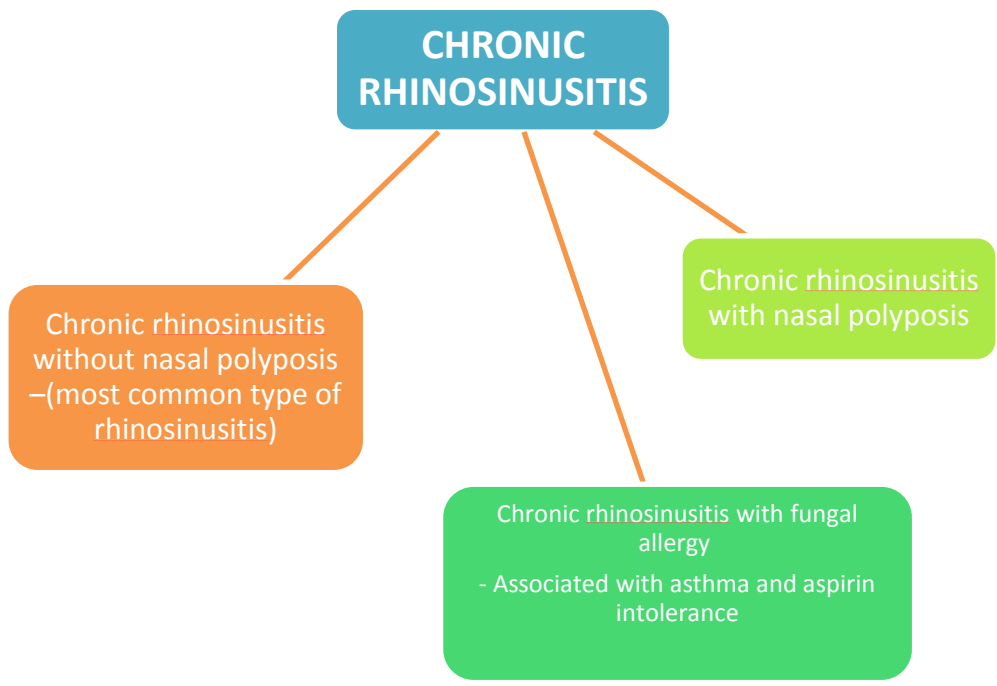
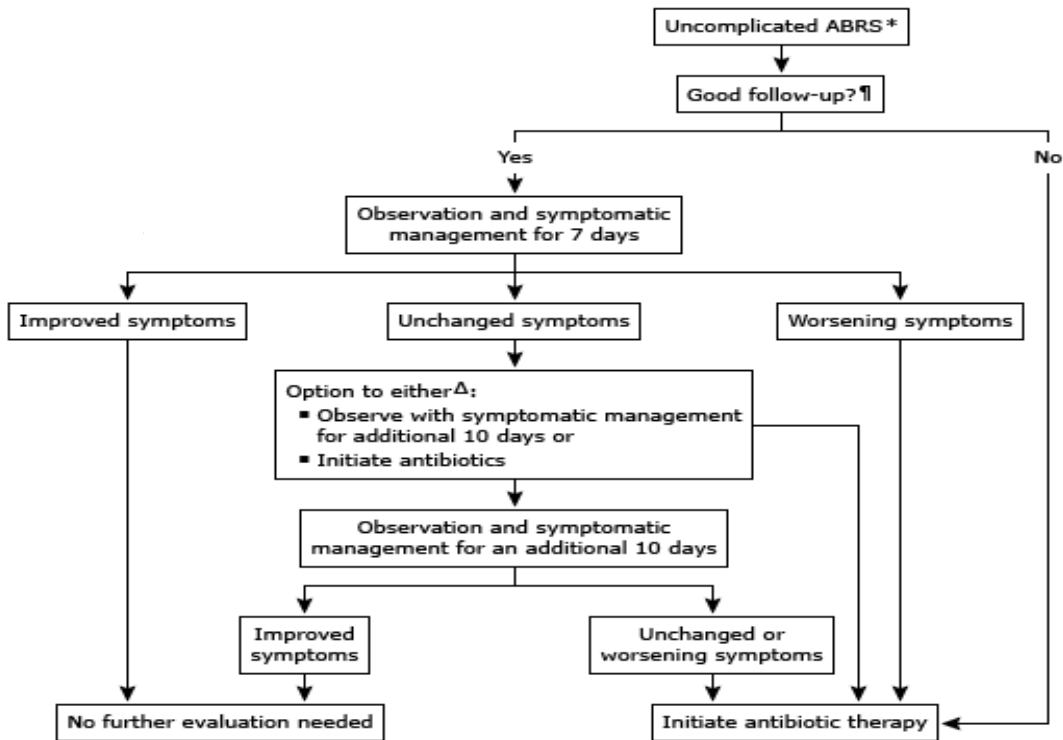
## Sinusitis

### - Sinusitis VS Rhinosinusitis :

- The term "rhinosinusitis" is preferred to "sinusitis" since inflammation of the sinuses rarely occurs without concurrent inflammation of the nasal mucosa
- Rhinosinusitis is defined as symptomatic inflammation of the nasal cavity and paranasal sinuses
- diagnosis of acute rhinosinusitis is based on clinical signs and symptoms

Acute , lasting less than four weeks	Chronic , more than 3 months
nasal congestion and obstruction, nasal discharge, maxillary tooth discomfort, and facial pain or headache, hyposmia or anosmia, and halitosis , fever, cough	There are four cardinal signs/symptoms of CRS: <ul style="list-style-type: none"> <li>●Anterior and/or posterior mucopurulent drainage</li> <li>●Nasal obstruction</li> <li>●Facial pain, pressure, and/or fullness</li> <li>●Decreased sense of smell</li> </ul> At least <b>two</b> of these signs/symptoms must be present to consider the diagnosis
Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis.	<i>Staphylococcus aureus , Pseudomonas aeruginosa , Anearbes S pneumoniae, H influenzae ,M catarrhalis.</i>







## **Complication Of Rhinosinusitis :**

### 1- Orbital complication

**Table 2 – Chandler’s classification of orbital infection deriving from sinusitis**

Group 1	Preseptal cellulitis	Inflammatory edema primarily limited to eyelid due to restricted venous drainage
Group 2	Orbital/postseptal cellulitis	Progressive inflammatory edema involving globe marked by chemosis
Group 3	Subperiosteal abscess	Collection of purulence between bone and periosteum with development of proptosis
Group 4	Orbital abscess	Collection of pus in orbital contents with onset of ophthalmoplegia
Group 5	Cavernous sinus thrombosis	Progression of inflammation intracranially with onset of fever, headache, and cranial nerve palsy

From Chandler JR, et al. *Laryngoscope*. 1970.<sup>13</sup>

2- intracranial ( meningitis , epidural abscess , subdural abscess )

3- bony complication ( potts puffy syndrome )

## **Treatment of Chronic Rhinosinusitis**

### 1- Symptomatic relief

- a. For pain and headache >warm packs and/or (Paracetamol or ibuprofen)
  - b. for nasal congestion : normal saline irrigation or/and intranasal decongestant (on limited usage).
  - c. For prolonged or severe symptoms consider prescribing an intranasal corticosteroid.
  - d. antihistamines only if there is co-existing allergic rhinitis.
- C. Antibiotics

## **Surgical Treatment**

Conservative FESS “Functional endoscopic sinus surgery”.



## **Case**

A 30-year-old teacher presents with a 4-year history of worsening nasal congestion, sneezing, and nasal itching. Symptoms are year-round but worse during the spring season. He has also significant eye itching, redness, and tearing as well as palate and throat itching during the spring season. He remembers that his mother told him at some point that he used to have eczema in infancy.

## **What Is Your Diagnosis?**

### **Allergic Rhinitis**

Allergic rhinitis is caused by a nasal reaction to small airborne particles called allergens. In some people, these particles also cause reactions in the lungs (asthma) and eyes (allergic conjunctivitis)

People with asthma or eczema and have family history of asthma or rhinitis have higher risk to develop allergic rhinitis

### **Clinical feature**

- **Nose** – Watery nasal discharge, blocked nasal passages, sneezing, nasal itching, postnasal drip, loss of taste, facial pressure or pain
- **Eyes** – Itchy, red eyes, feeling of grittiness in the eyes, swelling and blueness of the skin below the eyes (called "allergic shiners"))
- **Throat and ears** – Sore throat, hoarse voice, congestion or popping of the ears, itching of the throat or ears
- **Sleep** – Mouth breathing, frequent awakening, daytime fatigue, difficulty performing work.

## Classification of allergic rhinitis

<p>"Intermittent" means that the symptoms are present:</p> <ul style="list-style-type: none"> <li>• Less than four days a week</li> <li>• Or for less than four weeks</li> </ul>
<p>"Persistent" means that the symptoms are present:</p> <ul style="list-style-type: none"> <li>• More than four days a week</li> <li>• And for more than four weeks</li> </ul>
<p>"Mild" means that none of the following items are present:</p> <ul style="list-style-type: none"> <li>• Sleep disturbance</li> <li>• Impairment of daily activities, leisure and/or sport</li> <li>• Impairment of school or work</li> <li>• Troublesome symptoms</li> </ul>
<p>"Moderate-severe" means that one or more of the following items are present:</p> <ul style="list-style-type: none"> <li>• Sleep disturbance</li> <li>• Impairment of daily activities, leisure and/or sport</li> <li>• Impairment of school or work</li> <li>• Troublesome symptoms</li> </ul>

Reproduced from: Bousquet J, Van Cauwenberge P, Khaltaev N, et al. Allergic rhinitis and its impact on asthma. *J Allergy Clin Immunol* 2001; 108:S147. Table used with the permission of Elsevier Inc. All rights reserved.

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## Type of allergic rhinitis

### Seasonal allergic rhinitis

occurring during specific seasons

- The allergens that most commonly cause **seasonal allergic rhinitis** include pollens from trees, grasses, and weeds, as well as spores from fungi and molds

### Perennial allergic rhinitis

occurring year round

- The allergens that most commonly cause perennial allergic rhinitis are dust mites, cockroaches, animal dander, and fungi or molds. Perennial allergic rhinitis tends to be more difficult to treat.

### Treatment of Allergic Rhinitis

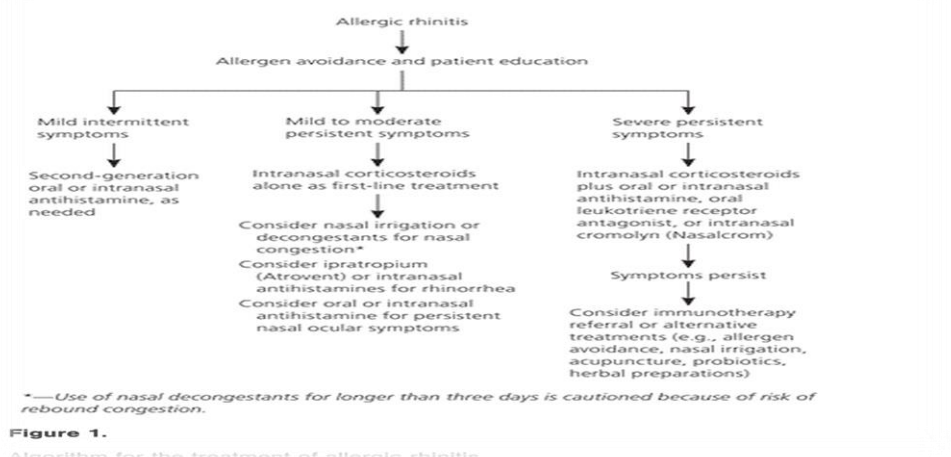


Figure 1.

Algorithm for the treatment of allergic rhinitis.

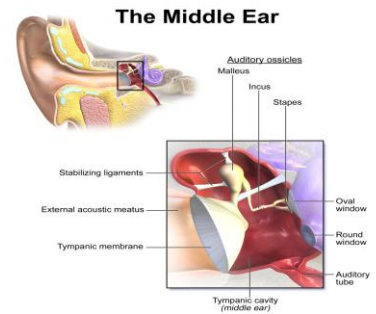
<https://www.youtube.com/watch?v=bMstrmfa4g4>

## **Otitis Media:**

It is an infection of the mucous membrane lining of the middle ear.

## **Types of otitis media:**

1. Acute otitis media (AOM)
2. Otitis media with effusion (OME)
3. Chronic suppurative otitis media
4. Adhesive otitis media.



## **1/ Acute otitis media (AOM):**

- It is a presence of inflammation in the middle ear within the first 3 weeks.
- moderate to severe bulging of the tympanic membrane.
- Acute otitis media is a common problem in children.
- About 50 percent of infants have at least one ear infection by their first birthday
- mostly develop after a viral respiratory tract infection, such as a cold or the flu.
- Viral respiratory tract infections can impair Eustachian tube function, if that happen the pressure in the middle ear will be changes.
- The patient will come complain of:
  - Otagia.
  - Otorrhea.
  - Headache.
  - Fever.
  - Irritability.
  - Loss of appetite.
  - Vomiting.
  - Diarrhea

## 2/Otitis media with effusion:

- It is a nonpurulent effusion of the middle ear.
- Nearly always follows acute otitis media as it resolves.
- The patient will come complain of:
  - Hearing loss
  - Tinnitus
  - Vertigo
  - Otalgia



## 3/Chronic suppurative otitis media (CSOM):

- It is a persistent ear infection that results in perforation of tympanic membrane with persistent drainage from the middle ear.
- CSOM is usually preceded by an episode of acute infection.
- The patient will come complain of:
  - Hearing loss
  - Ear discharge
  - Not complain of Fever or pain

"If he complains of Fever, pain or dizziness, it should alert the clinician to consider complications of CSOM"

- Cholesteatoma

## **INVESTIGATIONS**

- 1) Otoscope
- 2) Tympanometry
- 3) Pure tone audiometry

## **MANAGEMENT**

### **Acute otitis media (AOM):**

- 1) Systemic and topical analgesics
- 2) Antibiotics:

#children <2 years with AOM will be treated immediately with an appropriate antibiotic

#children  $\geq 2$  years :

Who appear toxic; have persistent otalgia, high temperature and otorrhea immediately treated with an appropriate antibiotic.

Who are normal with mild symptoms and signs and no otorrhea, initial observation may be appropriate

### **Recurrent acute otitis media**

Prophylactic antibiotics & tympanostomy tube insertion

### **AOM with perforated tympanic membrane:**

- 1) Oral antibiotics
- 2) Keep ear dry
- 3) Refer to audiologist
- 4) Surgery:myringotomy

### **Otitis media with effusion (OME):**

- 1) It is a self-limiting illness and 90% of children will have complete resolution within 1 year, so reassure the parents.
- 2) If it symptomatic OME or persistent OME>3 months refer the child for a hearing test and to ENT specialist to do insertion of tympanostomy tubes.
- 3) There is no proven benefit from treatment with any medications or any complementary or alternative therapies.

### **Adhesive otitis media:**

- 1) Observation every 6 months if there were any complications
- 2) Ventilation tube insertion
- 3) Hearing aids will help a lot

### **Chronic suppurative otitis media:**

- 1) Admit people with signs of infection

2) Refer to ENT specialist for the treatment and follow up:

Ear toilet

Topical antibiotics

Tympanoplasty

Mastoidectomy with tympanoplasty in case of cholesteatoma

### **Updated in management and role of Antibiotics**

- Microbiologic results indicate that at least one-quarter of children have AOM due to a viral respiratory pathogen, and that some of the episodes of AOM resolve without antibacterial agents.
- Influenza AOM cases resolve and fluid samples from the middle ear become sterile without antibacterial drugs.
- The option of observation of children with AOM, rather than initial antimicrobial therapy, is practiced extensively in Western Europe.
- Antibiotics are the mainstay of treatment of uncomplicated suppurative acute otitis media in adults.
- It is prudent to treat adults with antibiotic therapy for a diagnosis of AOM to prevent the potential for complications of an untreated infection.

### **—How Can We Modify Help Seeking Behavior Of Patient With Flu Illness?**

- 1) Meet, greet & introduce yourself
- 2) Start with open-ended question for chief complaint (eg: what do you have?)
- 3) ask about fever , cough , sore throat and runny nose
- 4) similar symptom in family
- 5) Apply ICE: Idea, Concern & Expectation.
  - Do you know what are these symptoms might be?
  - Do you have any concerns regarding your symptom (eg:corona)?
  - What are your expectations from the treatment I will provide you?
- 6) At the end you should tell the patient the summary and ask him if he has anything to add.

- 7) Safety netting: if patient do not require immediate prescription, advise him/her to visit for antibiotic prescription if symptom persist beyond 3 days, or it get worse.
- 8) Thank the patient and offer a further course of action

### **— When To Seek Medical Care For Upper Respiratory Infection**

- Most patients with acute upper respiratory infections will have a self-limited illness with symptoms resolving in a few days. Depending upon circumstances and symptom progression, some patients should seek medical care.
- Fever, chills, and shortness of breath are not commonly seen with upper respiratory infections and may signal a potentially more significant infection such as influenza, pneumonia, or acute bronchitis.
- Patients who are pregnant, under 2 years of age, or who have underlying illnesses such as asthma or emphysema should seek medical care if they experience shortness of breath.
- Nausea, vomiting, and diarrhea are not usually associated with an acute upper respiratory infection; however, further evaluation by a health care practitioner may be necessary if these symptoms occur.
- Although infants often catch colds, babies less than three months of age who develop fever should be seen immediately by a health care practitioner because their immune system is not yet fully developed and other infections may be present.
- Patients who are immuno-compromised due to medications or illness should contact their health care practitioner if they develop a fever, even if it seems to be due to an upper respiratory infection



## Summary

### Upper Respiratory Tract Infection

- Upper respiratory tract infection (URI) is a nonspecific term used to describe acute infections involving the nose, paranasal sinuses, pharynx, larynx, trachea, and bronchi
  - **Sore Throat** A sore throat is pain, scratchiness or irritation of the throat that often worsens with swallowing.
  - **Causes:** viral (most common >50%), bacterial and other causes
  - **Clinical features:** Viral infection ,Bacterial infection
  - **Differential diagnosis:**
  - **Investigation**
  - **Management**
  - **How to differentiate between viral and bacterial infection?**
- **Sinusitis** Rhinosinusitis is defined as symptomatic inflammation of the nasal cavity and paranasal sinuses. diagnosis of acute rhinosinusitis is based on clinical signs and symptoms
- **Clinical features**
  - **Complication**
  - **management**
  - **allergic rhinitis** Allergic rhinitis is caused by a nasal reaction to small airborne particles called allergens.
  - **Clinical features**
  - **management**
  - **Otitis media** It is an infection of the mucous membrane lining of the middle ear
  - **AOM and Secretory OM**
  - **management**
  - **How can we modify help seeking behavior of patients with flu illness?**

## Questions

1) A 55 year old patient came to the primary complaining of sore throat .The patients reports having a low grade fever, which has resolved. On physical examination there is no swelling on the neck or exudate in the mouth.

From the previous findings, what is your next step in management?

A-Send the patient home with some analgesics.

B-Start the patient on penicillin.

C-Perform RDT for the patient.

D-Throat culture.

2) A patient came in with sore throat, cough and low grade fever and muscle stiffness. After the doctor diagnosed her with her flu and prescribed her the treatment the patient asked the doctor what is the most common cause of sore throat.

The doctor answered:?

A-Fungal

B-Bacterial

C-Viral

D-Allergy

3) Aspirin intolerance has association with?

A- Chronic sinusitis with polyps

B- Allergic rhinitis

C- Rhinitis medicamentosa

D- Fungal allergic sinusitis

**4) The most important step in managing allergic rhinitis is: ?**

- A- Avoidance of allergens
- B- Usage for antibiotic for long time
- C- Drinking fresh orange juice
- D- Topical corticosteroid

**5) All of the following are indications for ventilation tube insertion except:?**

- A-acute otitis media
- B-recurrent otitis media
- C-otitis media with effusion
- D-adhesive otitis media

**Answers:**

- | 1st Question:A
- | 2nd Question:C
- | 3rd Question:A
- | 4th Question:A
- | 5th Question:A

# References

1. <https://www.youtube.com/watch?v=bMstrmfa4g4>
2. <http://www.uptodate.com/contents/allergic-rhinitis-seasonal-allergies-beyond-the-basics>
3. [http://www.uptodate.com/contents/uncomplicated-acute-sinusitis-and-rhinosinusitis-in-adults-treatment?source=search\\_result&search=sinusitis&selectedTitle=1~150](http://www.uptodate.com/contents/uncomplicated-acute-sinusitis-and-rhinosinusitis-in-adults-treatment?source=search_result&search=sinusitis&selectedTitle=1~150)
4. [http://www.uptodate.com/contents/acute-sinusitis-and-rhinosinusitis-in-adults-clinical-manifestations-and-diagnosis?source=search\\_result&search=sinusitis&selectedTitle=2~150](http://www.uptodate.com/contents/acute-sinusitis-and-rhinosinusitis-in-adults-clinical-manifestations-and-diagnosis?source=search_result&search=sinusitis&selectedTitle=2~150)
5. <http://www.uptodate.com/contents/chronic-rhinosinusitis-management>
6. <http://emedicine.medscape.com/article/232791-overview#a6>
7. <http://emedicine.medscape.com/article/232791-overview>
8. [http://www.emedicinehealth.com/upper\\_respiratory\\_infection/page4\\_em.htm](http://www.emedicinehealth.com/upper_respiratory_infection/page4_em.htm)
9. <http://www.mayoclinic.org/diseases-conditions/sore-throat/basics/causes/con-20027360>
10. <http://www.uptodate.com/contents/sore-throat-in-adults-beyond-the-basics>
11. <https://www.dukemedicine.org/blog/it-bacterial-infection-or-virus>
12. <http://www.aafp.org/afp/2004/0315/p1465.html#sec-4>
13. <http://patient.info/doctor/sore-throat-pro>
14. <http://www.uptodate.com/contents/ear-infections-otitis-media-in-children-beyond-the-basics>
15. <http://emedicine.medscape.com/article/994656-overview>
16. <http://www.uptodate.com/contents/ear-infections-otitis-media-in-children-beyond-the-basics>
17. <http://emedicine.medscape.com/article/858990-overview>
18. <http://emedicine.medscape.com/article/859316-overview>
19. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1275975/>
20. <http://emedicine.medscape.com/article/859501-overview>
21. [http://www.uptodate.com/contents/acute-otitis-media-in-children-epidemiology-microbiology-clinical-manifestations-and-complications?source=search\\_result&search=Acute+otitis+media+in+children&selectedTitle=2~150](http://www.uptodate.com/contents/acute-otitis-media-in-children-epidemiology-microbiology-clinical-manifestations-and-complications?source=search_result&search=Acute+otitis+media+in+children&selectedTitle=2~150)
22. [https://en.wikipedia.org/wiki/Upper\\_respiratory\\_tract\\_infection](https://en.wikipedia.org/wiki/Upper_respiratory_tract_infection)
23. American Family Physician
24. PRIMARY HEALTH CARE BOOKLET