

**Treating Respiratory Infections**  
**UAOHN Presentation**  
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# Treating Respiratory Infections

Most respiratory infections are caused by viruses. There are as many as 200 viruses that can combine together in different ways and infect the respiratory tract. Patients often insist on being prescribed an antibiotic for these symptoms. Patients might have a sense of fear and concern if they don't get their antibiotics – they think the antibiotics will cut the severity of their symptoms and the length of time they have to suffer with them, and that taking these drugs will prevent worsening infections.

# Treating Respiratory Infections

“Good” reasons patients want antibiotics: “I’m going on a long-planned vacation and just can’t afford to be sick”, or “I’m getting married this weekend and desperately need to get over an annoying cold”, or “Antibiotics have always worked for me when my throat gets sore”, or “I have small children at home and don’t want to pass this on to them.”

# Treating Respiratory Infections

For the first time, we now have data to back up the assertion that when it comes to treating ambulatory viral infections, antibiotics do more harm than good – and that these infections do get better on their own, without specific prescription therapy.

# Treating Respiratory Infections

One of the most surprising findings shows that while there is a 1-in-4,000 chance that an antibiotic will actually help an acute RTI, there's a 1-in-1,000 chance that the same prescription will send the patient to the ED with a rash, allergic reaction, or diarrhea. In fact, antibiotics cause 1/5 of all ED visits for adverse drug events (142,000 visits a year).

# Treating Respiratory Infections

So, when are antibiotics truly indicated, and when do other treatments suffice? What other treatments provide the most symptom relief for the majority of patients with RTIS? Is it possible to convince sick patients that they usually don't need antibiotics? We'll discuss these issues for the majority of RTI conditions.



# **OTITIS MEDIA (OM)**

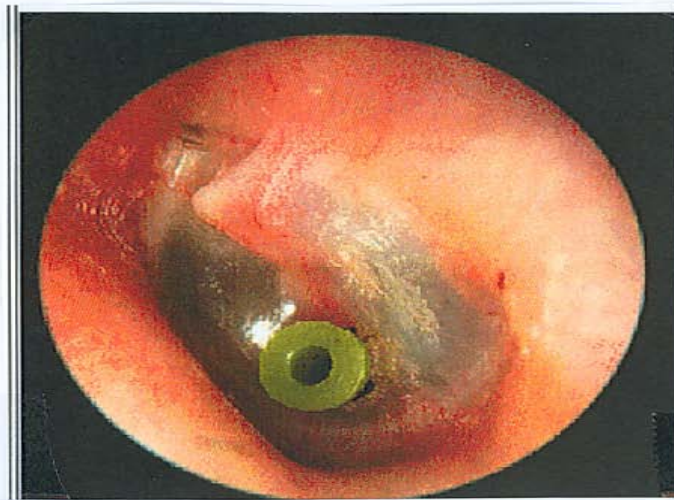
# OTITIS MEDIA (OM)

Though not technically part of the respiratory system, the middle ear is infected by the same spectrum of pathogens seen in the upper respiratory tract. OM is an inflammation of the middle ear space, which can be acute, lasting less than 2-3 weeks, or chronic, with a duration exceeding 3 months. Chronic conditions are seen mostly in children.

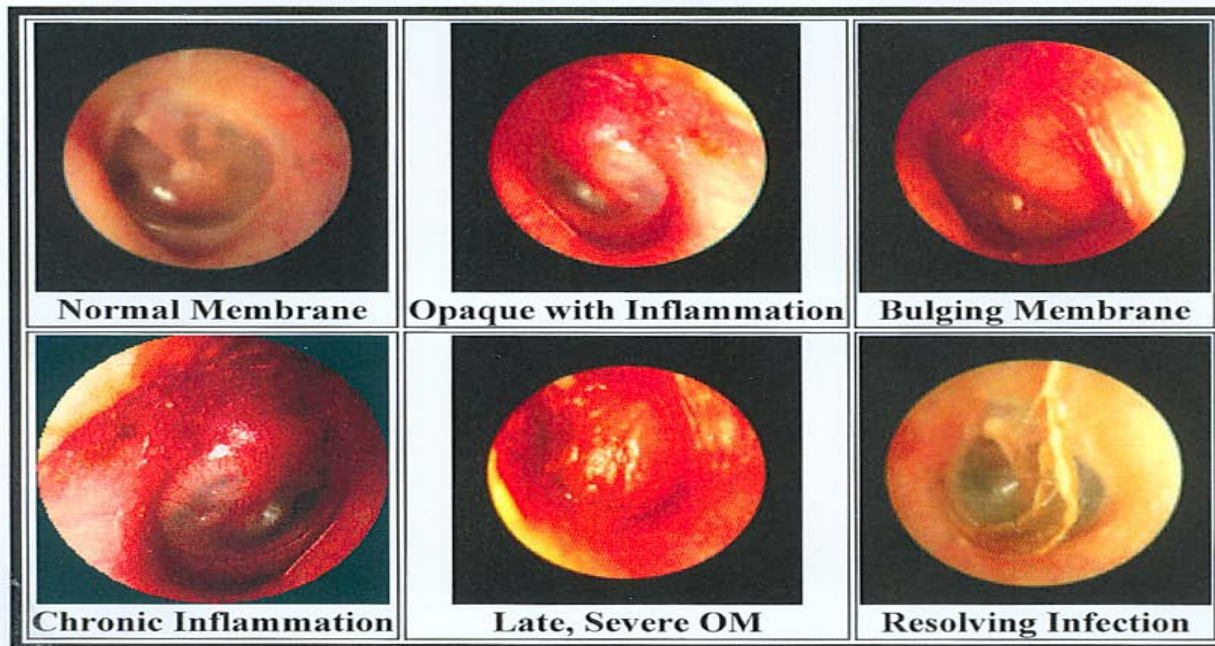
# OTITIS MEDIA (OM)

If the condition recurs despite repeated regimens of oral antibiotics, the patient is often referred for the surgical insertion of tympanostomy tubes to ventilate the ear space. These tubes allow for pus to drain out of the middle ear and promote healing of the membrane. The tubes usually stay intact for a year or two before falling out on their own. Tube insertion is the most common surgical procedure for children in the US, with 2 million performed annually. I do see several adults in my clinical setting with intact tubes.

# OTITIS MEDIA (OM)



**APPEARANCE OF TYMPANIC MEMBRANE  
WITH ACUTE OTITIS MEDIA**



# OTITIS MEDIA (OM)

Topical antibiotic drops are not used as standard treatment in patients with OM, as the presence of an intact tympanic membrane prevents penetration of the topical agent. However, topically applied medications - antibiotics or analgesics – may be used for those who have OM with intact tympanostomy tubes and for those who have otitis externa (swimmer's ear) with intact ear drums. If bacterial infection is suspected, topical antibiotics are a good choice in these situations, because the potential for side effects from systemic administration is decreased. No topical agent should ever be instilled into the ear if there is a hole in the tympanic membrane noted on otoscopic exam. I do use topical agents to relieve pain.

# OTITIS MEDIA (OM)

Some patients get ear pain with every sore throat or allergy attack. These are often accompanied with mildly swollen neck glands. Usually this is caused by a condition called “chronic eustachian tube dysfunction” which is a mechanical problem that needs to be treated by an ENT specialist.

# OTITIS MEDIA (OM)

It's wise to review and update standing orders for using antibiotic or other topical ear drops in the ear. Otitis externa is more often a viral infection and is sometimes called "swimmer's ear." OM can be caused by a combination of bacteria, including staph, strep, hemophilus, and pseudomonas. Fluoroquinolones (the floxacin antibiotics) and neomycin/polymyxin B/hydrocortisone (NPH) are approved for use in the external canal. The only topical antimicrobials approved for middle ear use are ciprofloxacin (Ciprodex) and cipro/dexamethasone otic suspension.

# OTITIS MEDIA (OM)

Remember, never instill a substance or irrigate an ear canal with a non-intact TM, unless functioning tubes are present. I have set a standard of care in my clinic that I only instill irrigation agents or medications into an ear that has an intact eardrum – I'm not comfortable using these items with adults who have tympanostomy tubes inserted.

# OTITIS MEDIA (OM)

Ear infections, both viral and bacterial, are common but rarely serious. The main symptoms are pain, redness around and in the ear, discomfort when pulling on the outside auricle of the ear (and the absence of pain with pressure over the TMJ area), decreased hearing, feeling of congestion and sometimes purulent drainage. Fever can be present with viral and bacterial pathogens.

# OTITIS MEDIA (OM)

Patients might think they have an ear infection, but in reality, have cerumen buildup in the ear canal which can put painful pressure on the tympanic membrane. Or they might have ear pain if they have a hair or other foreign body sitting on the ear drum. Irrigation can relieve these conditions. A red, painful ear canal might be caused by allergies or swimmer's ear. The TM must be completely visible with an otoscope in order to determine what might be causing the ear discomfort.

# OTITIS MEDIA (OM)

Current recommendations for treating acute OM include the option to observe the patient and treat symptoms with warm compresses, analgesics and anti-inflammatory meds. Studies show that while some patients get relief from decongestants, the use of antihistamines is not effective. If purulent drainage develops or symptoms persist for 3 or more days, I usually prescribe topical or oral antibiotics.

# OTITIS MEDIA (OM)

For children under 2, or for those who have frequent recurrence, antibiotics are prescribed sooner. These would include oral Amoxicillin, Azithromycin (Z-pack), Biaxin, etc. The sulfa medication, TMX/SMX is no longer useful in areas with a high percentage of resistant pneumococci, and is not prescribed much along the Wasatch front. I don't culture ear drainage in our clinic, so sometimes it's difficult to assess if a patient needs an antibiotic or an anti-fungal medication for their ear infection.

# OTITIS MEDIA (OM)

**A few other pearls about ear pain: For patients who are susceptible to swimmer's ear, a good preventive treatment is to instill 3-5 drops of a 1:1 alcohol/white vinegar solution into the ear canal before and after swimming. Any person complaining of sharp, sudden pain in the ear, especially accompanied by bloody drainage should be evaluated for a ruptured ear drum. These patients are usually referred out to an ENT specialist. I also refer patients out who complain of chronic tinnitus – The American Tinnitus Foundation has a great website that is helpful, and also acupuncture has shown to be therapeutic.**

**Also, patients who develop painful, swollen nodes behind the ear need to be referred out, if this condition worsens into mastoiditis.**



# PHARYNGITIS

# PHARYNGITIS

When faced with a sore throat, one of the clinician's main tasks is to rule out a case of group A beta-hemolytic streptococcal (GABHS) pharyngitis. All other pathogens can be grouped together because they do not require specific antibiotic treatment. It's important to remember that the only reason we treat strep throat is to prevent acute rheumatic fever and peritonsillar abscess, although these complications are rare in adults who live in developed countries. Oral antibiotics remain the standard of care.

# PHARYNGITIS



# PHARYNGITIS

The classic presentation of strep throat infection includes sore, red and swollen throat, fever, headache, abdominal pain, exudative pharyngitis, and cervical adenopathy (neck discomfort and swollen glands) – without cough, runny nose, or diarrhea (these symptoms point toward viral etiology). However, diagnosis should be based on objective lab data from a rapid antigen test or culture. The “quick strep” tests used in many clinical settings are about 90% accurate, if performed correctly.

# PHARYNGITIS

Whether a negative rapid strep result requires confirmatory culture is controversial. A significant patient history, the clinical exam and/or rapid strep testing are not totally reliable in determining if the pharyngitis is viral or bacterial. Sometimes clinicians will prescribe antibiotics to symptomatic family members who have had direct exposure within 2 weeks to others with confirmed strep throat.

# PHARYNGITIS

Actual strep throat among adults is less common than among children and teens, especially those with a frequency of tonsillitis. Although children with tonsils are 3 times more likely to have GABHS pharyngitis, the effect of tonsillectomy on decreasing the risk for chronic or recurrent tonsillitis is poorly understood.

# PHARYNGITIS

- The Centor Score, recommended by the CDC, uses 4 signs and symptoms and a scale of 0-4 for diagnosis and treatment of pharyngitis.
- 1 point for each of the following: absence of cough, swollen and tender anterior cervical nodes, elevated temp of more than 100.4F or 38C, tonsillar exudates or swelling, and ages 3-14 years. One point is subtracted if the patients is age >45.
- Score 0           No further testing or antibiotics are indicated
- 1-2   Rapid test or culture, antibiotics prescribed if positive
- 3-4 or >        Treat with antibiotics
- Other factors should be considered, such as recent family contact with documented strep infection, which would lower the threshold for testing and/or treatment.

# PHARYNGITIS

If antibiotics are used, the treatment of choice remains penicillin because no resistance has been seen for the past 50 years. However, most experts still favor amoxicillin, because pediatric patients tolerate the taste better, and once-daily dosing may be adequate. Amoxicillin, though, has an unnecessarily broad spectrum. Keflex is also prescribed because it seems to have a high cure rate and lower recurrence rate, but its use has not translated into lower rates of tonsillitis or rheumatic fever. Macrolides such as azithromycin and clarithromycin are often used but should be avoided because of concerns about rising bacterial resistance. For patients with severe symptoms or a history of antibiotic use in the past 3 months, Augmentin, Levaquin or Avelox might be used.

# PHARYNGITIS

Children with GABHS may return to school after 24 hours of antibiotic treatment, and adults, if careful with hand washing, etc, can usually stay at work. Antibiotic therapy reduces symptoms by 16-24 hours. Some people are chronic carriers of GABHS, but the risk for transmission is low.

# PHARYNGITIS

Other supportive treatments for sore throat include Zinc lozenges, like Cold Eeze, which are soothing to the throat. Overuse of zinc can cause digestive upset, so the dosing should be spaced about 4 hours apart. Other anesthetic lozenges, sprays and gargles also help. Tried and true salt water rinses keep the throat moist and reduce pain. OTC analgesics and hydration are also helpful.

# PHARYNGITIS

I also tell my patients to sleep under a cool-mist humidifier to keep the mucus membranes moist. Some red, raw-looking cases of viral or bacterial pharyngitis warrant short-term treatment with narcotic analgesics. Much of the soreness from pharyngitis is due to drainage from the nose or sinuses, from dryness, or from swelling. So treatment must be geared to the suspected cause. Often, an expectorant will decrease drainage into the back of the throat.



# **SINUSITIS**

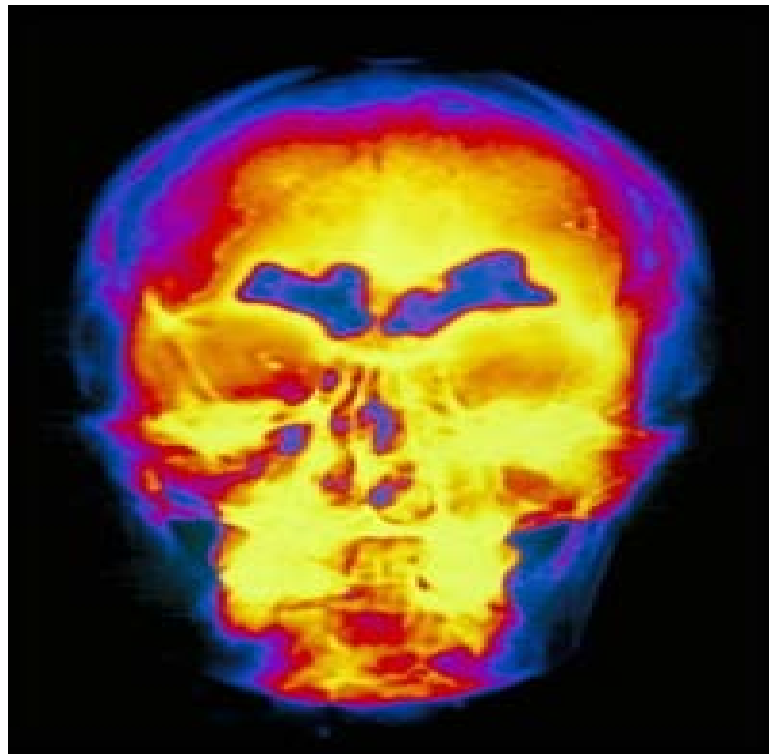
# SINUSITIS

When does a common cold become a sinus infection? The usual course of a viral cold is 1-2 weeks in an adult. These patients may come into the office seeking treatment for a nagging cold that is getting worse or has not gone away for several weeks. Evidence shows that the vast majority of sinus infections resolve spontaneously without antibiotics, but if severe symptoms persist past 7-10 days, antibiotics are often prescribed.

# SINUSITIS

The signs and symptoms of sinusitis are usually more severe than a regular cold and are more inclusive than with allergic rhinitis. They include purulent nasal discharge, facial and dental pain, fever, fatigue, ear pressure, anosmia (loss of sense of smell), and/or severe nasal congestion. Cough and bronchitis symptoms can accompany sinusitis.

# SINUSITIS



# SINUSITIS

Sinusitis responds well to lavage therapy. I often recommend a regimen of irrigation into the nose and sinuses with a neti pot or lavage bottle. (I use Neil-Med Sinus Rinse) Low-dose salt and soda solutions seem to work well, and a few patients add tea-tree oil – but this is irritating for some people. If lavage can be started at the onset of nasal and sinus congestion, sinusitis can often be prevented. I recommend irrigating 2-3 times a day while the sinuses are congested, then decrease to several times a week to keep the sinuses clear of thick mucus.

# SINUSITIS

Other treatment modalities include decongestants, analgesics or anti-inflammatories, expectorants (like guaifenesin) to keep mucus thinned out, and hydrating saline nasal sprays. I inform patients that decongestants might promote more drainage, and they can cause insomnia and a runny nose. Antihistamines, on the other hand, will usually decrease sinus swelling, but dry out mucus membranes and can cause fatigue.

# SINUSITIS

Between the regular lavage treatments, I have patients use their saline nose sprays every 2 hours during the day. Some patients need to be advised about the correct way to administer these sprays. The head needs to be tilted forward so that the patient is looking at the floor when spraying into the nose. Second, insert only the first quarter of the spray tip into each nostril. Using the entire tip bypasses the inferior turbinate and fails to coat the main culprits in the production of nasal congestion. Finally, gently inhale the spray into the nose after each spray. Occasionally, steroid or antihistamine sprays need to be prescribed, and they should be administered in the same manner.



# **ACUTE BRONCHITIS**

# ACUTE BRONCHITIS

When an otherwise healthy adult develops acute bronchitis, the rule is still to withhold antibiotics since more than 90% of cases are viral. It's difficult to convince some patients that with time, their cough and chest congestion will subside. Does treating bronchitis with antibiotics prevent pneumonia? Data now supports the findings that those patients with bronchitis who are treated with antibiotics have the same risk of developing pneumonia as those who are not treated with antibiotics.

# ACUTE BRONCHITIS

When other organisms are suspect (Pertussis, Chlamydia or Mycoplasma), treating with a macrolide antibiotic or doxycycline is appropriate. Of course, common sense and clinical judgment support the early use of antibiotics in patients whose pulmonary function is otherwise limited (severe asthma, COPD, cystic fibrosis, immunocompromised people).

It's prudent to remember that acute bronchitis can be a symptom of Influenza A in patients who have not had their yearly immunization. Influenza symptoms of fever, cough, body aches, sore throat and fatigue hit hard and fast. I don't test for influenza in my clinic, so if I suspect actual flu, I refer these people out ASAP.

# ACUTE BRONCHITIS

Cough must be carefully and systematically evaluated and managed. The acute cough, associated with viral and bacterial infection is treated differently than the chronic cough, which can last longer than 8 weeks. A chronic cough might be due to side effects of ACE inhibitors, allergies, GERD, asthma, COPD, or chronic nonasthma eosinophilic bronchitis, which is diagnosed by sputum culture..

# ACUTE BRONCHITIS

I like to educate my patients about cough. It's important that they know that a moist, productive cough is there for a purpose – to move mucus out of the bronchial tract. Keeping secretions thinned out with sufficient doses of expectorant is vital. I find that most adults can handle 1200 mg. of guaifenesin every 12 hours. An irritating dry cough is more easily suppressed with a cough suppressant accompanied with analgesics to calm the cough reflex. For patients who have persistent mucus, I teach them to practice morning “postural drainage”. Cough rarely requires a narcotic cough medicine, unless it's associated with pneumonia. I tell patients with bronchitis related cough to expect it to last for awhile – although improve - with the use of appropriate medications and the use of a cool-mist humidifier.

# ACUTE BRONCHITIS

I refer patients out to their primary health care providers to get a chest x-ray if I hear moist rales on exam, if breathing becomes labored or painful, if the sputum stays thick and dark despite treatment, or if it becomes bloody. I also prescribe steroid inhalers if significant cough persists longer than 2-3 weeks. Sometimes these patients need to be tested for Pertussis or TB.

# ACUTE BRONCHITIS

Encourage adults to get a Pertussis booster, as the number of cases has increased over the past 3 years. Pertussis, or Whooping Cough, is known as the “100-Day Cough”. Most adults who contract it, but have been immunized as children, don’t get the “bark or whoop” cough that kids get with the disease.

# ACUTE BRONCHITIS

Keep in mind that “reactive airway disease” (RAD) is on the rise in Utah – possibly due to our inversions and poor air quality. They are seen mostly during the winter months. Most patients recover from bronchitis and other respiratory illnesses within several weeks, but a few can have symptoms for months, resulting in an asthma-like condition called RAD. Steroid or bronchodilator inhalers work well for these people, but they need to be advised to avoid lung irritants and allergy triggers. Their airways can become hypersensitive or hyper-reactive.



# **PNEUMONIA**

# PNEUMONIA

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Pneumonia is usually confirmed with positive chest x-ray findings.

# PNEUMONIA



# PNEUMONIA

Several types of oral antibiotics can be used for uncomplicated pneumonia in patients who do not require hospitalization, have no significant comorbidities, or have not used antibiotics within the past three months, and in locations where there isn't a high prevalence of macrolide-resistant bacterial strains. (Our area isn't considered one of these locations.) Azithromycin (Z-pack), clarithromycin or doxycycline are recommended. Erythromycin, though effective and inexpensive, is not well tolerated, requires multiple daily doses, and may cause fatal arrhythmias when used with other specific drugs. I usually don't prescribe the fluoroquinolone (the floxacin antibiotics). Use of Cipro, or ciprofloxacin, has been known to cause ruptured tendons in physically active people.



# **ANTIBIOTIC RESISTANCE**

# ANTIBIOTIC RESISTANCE

The problem of evolving antibiotic resistance can be addressed from three different angles: 1) avoiding antibiotics altogether when they are not clearly indicated; 2) using the right antibiotic; and 3) using the antibiotic for an appropriate length of time. Shorter courses of therapy are popular and are usually OK, except when treating strep throat and sinus infections. These require a full 10-day course of antibiotics.



# **TLC AND ALTERNATIVE THERAPIES**

# TLC AND ALTERNATIVE THERAPIES

I try to remember that for the individual patient, their respiratory infection is often NOT just a cold or viral illness. It interferes with work, sleep, leisure activities and daily responsibilities. Taking the time to write out specific instructions seems to validate many patients' concerns and serves to fulfill the unspoken wish for a prescription. For example, some patients need a detailed "viral prescription" written out for them that includes rest, fluids, specific OTC medicines, the use of a humidifier, etc. I give patients a backup plan informing them that if their condition does not improve by a specific date, they should come back and be evaluated. This practice, especially for the "symptom-prone" or those who frequently use antibiotics, demonstrates that their clinician cares and seems to reassure them – especially if they are anxious about work or travel.

# TLC AND ALTERNATIVE THERAPIES

There are a few alternative supplement therapies that seem to work for some people. Elderberry has been proven to reduce the duration of flulike illnesses by up to 4 days. In comparison, Tamiflu and Relenza reduce the duration of influenza symptoms by only one day. Honey is another supplement that has been tested and has shown to be as effective in treating cough in children as dextromethorphan. Some patients swear by mega-doses of Vitamin C and other therapies. For the most part, as long as the treatment is inexpensive and safe, we should probably be open-minded to patients' ideas.

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# QUESTIONS/COMMENTS

