

## Sinusitis

Health experts estimate that 37 million Americans are affected by sinusitis every year. Americans spend nearly \$6 billion each year on health care costs related to sinusitis. Sinusitis is an inflammation (swelling) of the mucous membranes that line the sinus cavities. This can interfere with normal sinus drainage and cause increased mucus production. Untreated and prolonged sinus inflammation can lead to infection and increased symptoms.

### What are the sinuses?

The sinuses are a part of the upper respiratory system. Adults and older children have four groups of sinus cavities (maxillary, ethmoid, frontal and sphenoid) located within the bones surrounding the nose. Very young children have small sinus passages and cavities rather than fully formed sinuses. Under normal daily conditions, the sinuses produce up to 1.5 liters of mucus per day. Allergy, infection or environmental triggers may increase mucus production or change the characteristics of the mucus in the nose and cause symptoms. Each sinus cavity has an opening into the nose to allow for drainage of this mucus. Therefore, anything that causes swelling in the nose may lead to obstruction or blockage of the sinuses, leading to infection and more sinus problems. To work properly, the sinuses need adequate mucus drainage and a functioning immune system to fight off infections and inflammation.



### Who develops sinusitis?

The common cold (viral respiratory illnesses), allergies and factors in the environment are the most common triggers for the development of sinusitis. Other important factors may include tobacco exposure, nasal septal deviation, nasal polyps, dryness and mold sensitivity (rarely). Diseases such as asthma, cystic fibrosis, bronchiectasis, immune deficiencies and immotile cilia syndrome (though rare) are often associated with sinusitis. In many people with sinus problems, the lining of the nose and sinuses is overly sensitive to a variety of factors. Thus there are multiple possible triggers for the development of sinusitis.

### What are the symptoms?

Sinusitis can either be acute or chronic. Acute sinusitis is often caused by a viral respiratory infection that the body is unable to clear, leading to a subsequent bacterial infection. The point at which the common cold ends and a sinus infection begins is not always easy to determine. Symptoms often include:

- pressure in the area of the affected sinus
- nasal congestion and blockage
- decreased sense of smell
- postnasal drip
- cough
- sore throat and thick nasal drainage
- ear fullness
- worsening symptoms after five to seven days.

Symptoms may vary depending on which sinuses are affected. Some symptoms can cause upper jaw and teeth pain; some can make you lose your sense of smell. Usually, though, you can't tell from the symptoms which sinuses are affected.

If you have chronic sinusitis, which is often not associated with an infection, you may experience recurrent or continuing symptoms that do not respond to treatment. These symptoms are more subtle, and generally do not include fever. The symptoms of chronic sinusitis may vary greatly and last for months or years if untreated. Chronic sinusitis symptoms can include but are not limited to, decreased or absent sense of smell, facial pressure, congestion, postnasal drip, cough and nasal obstruction.

## How is sinusitis diagnosed?

People with allergies, asthma, and nasal polyps are more likely to develop sinusitis. Many people with asthma also have chronic sinusitis. People with deficient immune systems, such as those with HIV, are more likely to have sinus problems. Also, people with cystic fibrosis or other problems with the movement of mucus are likely to have sinusitis. Living in an area with large amounts of pollen or pollution in the air can also increase the risk in sensitive people.

The diagnosis of acute sinus problems can be challenging, as it is not always clear if infection (bacterial) is present or if the common cold (viral) is to blame. A health care provider diagnoses sinusitis after obtaining a complete medical history and performing a physical examination. The proper diagnosis is based on the patient's symptom history and careful inspection of the nasal tissues. Nasal endoscopy, looking into the nose with a special camera and telescope, may be performed to help confirm the diagnosis. A CT scan of the sinuses is typically not required for acute sinusitis, but may be very important in the treatment of patients with chronic sinusitis.

## What is the treatment?

The primary goal when treating sinusitis is to decrease the inflammation in the nose and sinus openings to improve sinus drainage. Colds and allergy attacks can lead to an attack of sinusitis. To keep that from happening, keep your sinuses clear by blowing your nose, using decongestants, and drinking lots of fluids. For people with allergies, avoiding allergens can help prevent not only the allergy symptoms but also sinusitis.

## Nasal Wash

A saltwater or saline nasal wash is an important treatment for sinusitis. It helps remove mucus and bacteria from the nose and sinuses. This can temporarily reduce symptoms of nasal congestion and postnasal drip. It also helps clear environmental triggers from the nasal lining. We often recommend doing a nasal wash before using steroid nasal sprays. The steroid nasal spray helps decrease inflammation so the sinuses can drain. After doing a nasal wash, wait until the draining stops; then use your steroid nasal spray as prescribed by your health care provider.

## Steroid Nasal Spray

A prescription steroid nasal spray can decrease nasal inflammation and mucus production. This will decrease symptoms of nasal congestion and improve sinus drainage. A steroid nasal spray does not provide immediate relief of symptoms and may require several weeks of routine use to be effective. If you have chronic sinusitis, you may benefit from continued daily use of this medication. If you have occasional sinusitis episodes, you may only require periodic use. A combination of a nasal wash followed by a steroid nasal spray is often very helpful. Several steroid nasal sprays are available and include:

- Flonase®, Veramyst® (fluticasone)
- Nasacort AQ®, Nasacort® (triamcinolone)
- Nasarel® (flunisolide)
- Nasonex® (mometasone)
- Rhinocort® (budesonide)
- Zetonna® (ciclesonide)
- Qnasl® (beclomethasone)

When used properly, steroid nasal sprays are safe and effective; however, nasal dryness and bleeding are possible side effects when using these medications.

## Antibiotics

Antibiotics are medicines designed to treat bacterial infections. In some cases of sinusitis, but certainly not all, the underlying cause will be a bacterial infection. Such an infection can be difficult to treat because bacteria thrive in the warm, moist and dark areas of the sinus cavities. These infections usually respond slowly to antibiotic treatment; therefore, you may need to continue treatment for one to three weeks or longer. The choice of antibiotic depends on several factors, such as drug allergies, past use of antibiotics and your symptoms. In some cases, your health care provider can collect mucus from your nose and send it to the laboratory for culture to confirm the presence of bacteria. This test can also help in the selection of the proper antibiotic to fight the infection.

The majority of episodes of sinusitis are successfully treated without the use of antibiotics by treatment directed at the nasal inflammation and specific symptoms. Inappropriate use of antibiotics can lead to bacterial resistance and side effects; thus these medications must be used carefully and thoughtfully.

## Decongestants

These medicines, available as tablet, syrup or nasal spray, may help unblock the openings of the sinuses and temporarily reduce symptoms of nasal congestion. Common over-the-counter decongestants include Sudafed® and Dimetapp® (pseudoephedrine). Combination decongestant/antihistamine medicines are available over the counter. Read the label to see what is in

the over-the-counter medicine you are buying and discuss the medicine with your health care provider. Topical nasal decongestants (sprays) can be highly effective in the immediate shrinking of swollen nasal tissue. However, these sprays should be used only two to three consecutive days, because prolonged use can cause rebound nasal congestion with increased symptoms. Systemic decongestants have the same effect of decreasing the swelling of the lining of the nose and promoting drainage of the sinuses. However, since higher concentrations are present in the bloodstream, systemic decongestants are more likely to cause side effects. These may include high blood pressure, anxiety, sleeplessness, prostate problems in men and the “jitters.” You should always discuss the use of these medications with your health care provider.

## Antihistamines

Antihistamines are medicines designed to counter the actions of histamine. This is the main chemical produced in the body in allergic reactions. Antihistamines in spray, tablet or syrup form help reduce the allergic symptoms of sneezing, itchy eyes and nose, and may reduce nasal stuffiness and mucus production. Your health care provider may elect to add this type of medicine to your treatment, particularly if allergies are present. Common over-the-counter antihistamines include:

- Claritin® (loratadine)
- Chlor-Trimeton® (chlorpheniramine)
- Benadryl® (diphenhydramine)

Claritin and a newer class of prescription antihistamines do not cause drowsiness. They include:

- Clarinex® (desloratadine)
- Allegra® (fexofenadine)
- Zyrtec® (cetirizine)

Topical nasal spray antihistamines include:

- Astepro® (azelastine)
- Patanase® (olopatadine)

## Leukotriene Modifiers

Leukotrienes cause inflammation in the nose, sinuses, lungs, eyes and skin. Leukotriene modifiers are medicines that can help reduce nasal and sinus inflammation. They may be used if you have nasal polyps and aspirin sensitivity. These may be used in addition to nasal sprays and antihistamines. Examples of leukotriene modifiers are:

- Singulair® (montelukast)
- Zflo CR® and Zflo® (zileuton)

Liver enzymes may become elevated with the use of Zflo CR® and Zflo®. Your health care provider will have to monitor your liver with regular bloodwork.

## Pain Relievers

A medication to relieve pain and lessen fever may help in sinusitis, especially for acute episodes. Your health care provider may recommend a medication such as Tylenol® (acetaminophen), aspirin

or ibuprofen, or prescribe a stronger medicine. Because some people with asthma are sensitive to aspirin or ibuprofen, check with your health care provider before taking this medicine.

## Systemic Steroids

Systemic steroids are sometimes required to treat severe nasal and sinus inflammation, such as nasal polyps. These medicines can be in pill or syrup form, as well as injected into a muscle or vein. Systemic steroids are very powerful medicines that can help nasal and sinus conditions. However, many potential side effects are possible and include: cataract formation, high blood pressure, high blood sugar, mood changes, stomach irritation, bone loss (osteoporosis), vision change and menstrual irregularities. These side effects are always possible when using systemic steroids but become more of concern with long-term use.

Most commonly, systemic steroids will be prescribed as a pill in a “tapering” fashion. This means that your dose of steroid will be slowly decreased before completely stopping the medication. This approach also helps avoid some related complications.

## What are the surgical treatments for sinusitis?

Functional endoscopic sinus surgery (FESS) has become the accepted standard approach and technique when surgical treatment of sinusitis is indicated. Surgery, or other invasive treatments, should only be considered when medical therapies have failed to improve the patient’s symptoms and quality of life.

## What is functional endoscopic sinus surgery (FESS)?

FESS is a minimally-invasive approach to the sinus cavities using endoscopes (telescopes) to view the important structures of the nose and sinuses. The view with the endoscope allows for better identification of the underlying disease, which in turn allows the surgeon to be precise, careful and thorough with minimal damage to normal surrounding tissue. All four sets of sinuses can be viewed directly during FESS and obstructing tissue or disease removed as indicated. FESS allows for less tissue removal, more rapid tissue healing, and shorter recovery periods. The surgery is often performed on an outpatient basis.

## When is FESS indicated?

Most commonly FESS is indicated for patients with chronic sinus problems who do not respond to medical treatments. The diagnosis of chronic sinusitis is based on symptoms, nasal examination (i.e., nasal endoscopy), sinus CT findings and response to previous treatments. The majority of patients with sinusitis do not require surgery. However, in some patients symptoms persist despite prolonged medical treatments, and FESS is indicated to help control the problem. With proper patient selection and evaluation, research has proven FESS to be 70-90 percent successful in improving symptoms of sinusitis and related nasal and sinus problems. FESS is not a “cure” for sinusitis, but is helpful in managing symptoms of the chronic nature of the disease. The most common indications for FESS include chronic infection, nasal obstruction or blockage and nasal polyps.

## What are the risks of FESS?

As with any surgical procedure, FESS has associated risks. Although the chance of a complication occurring is small, it is important that you understand the potential complications and ask your surgeon about any concerns you may have.

**Bleeding:** Most sinus surgery involves some degree of blood loss, which is generally well tolerated by the patient. Although most patients do not require nasal packing, a few patients will require a small nasal pack to be removed one to three days after surgery. Blood transfusion is very rarely necessary and is given only if the patient's health would otherwise be compromised.

**Recurrence of disease:** Although FESS provides significant symptomatic benefits for the vast majority of patients, surgery is not a cure for most forms of sinusitis. Therefore, you can expect to continue with your sinus medications even after successful sinus surgery, although, in general, your requirements for such medications should be lessened. In some instances, additional "touch-up" surgery may be necessary to optimize your surgical outcome. This may be necessary in 5-10 percent of cases.

**Spinal fluid leak:** Because the sinuses are located in close proximity to the brain, there is a rare chance of creating a leak of spinal fluid (the fluid surrounding the brain) or injuring the brain. Also called a cerebrospinal fluid (CSF) leak, the reported incidence of this is less than 1 percent of cases. Should the rare complication of a CSF leak occur, it may create a potential pathway for infection, which could result in meningitis. If a CSF leak were to occur, it might require surgical closure and extend your hospitalization.

**Visual problems:** There have been isolated reports of visual loss after sinus surgery. The potential for recovery in such cases is not good. In addition, orbital (eye) injury resulting in double vision, blurring vision, or excessive tearing from the eye are additional potential complications. Fortunately, such a complication is rare. Their reported incidence is also less than 1 percent of cases.

**Other risks:** Other uncommon risks of surgery include alteration of sense of smell or taste; persistence and/or worsening of sinus symptoms and facial pain; and swelling or bruising of the area around the eye.

## Are there any surgical alternatives?

The introduction of balloon sinuplasty provides an alternative minimally-invasive procedure for some sinus patients. In this type of surgery, a catheter is placed into the sinus opening, and a balloon is inflated to enlarge the opening of the sinus cavity. As a new technique, it has shown promise in patients with mild disease of specific sinuses. In patients with more severe disease, it may be used in conjunction with traditional FESS. Further study is needed to really understand the role of this procedure. Feel free to ask your provider if you are a candidate.

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