



SINUSITIS Q&A

WHAT ARE THE SINUSES?

The sinuses are air filled structures, within the bones of the face. There are four types of sinuses on each side of the face, making eight in total. The maxillary sinuses are located in the cheek bones. The ethmoid and sphenoid sinuses are located between the eyes. The frontal sinuses are located in the forehead. The bony walls of the sinuses have a soft tissue lining called mucosa. The mucosa is programmed to move the mucus that it makes out of the sinus through a small hole that connects the sinus to the inside of the nose (also called the nasal cavity). (See Nasal Anatomy, Sinus Anatomy and Nasal Physiology)

WHAT IS THE PURPOSE OF THE SINUSES?

The sinuses are thought to have multiple roles. These roles include acting as a cushion to protect the brain from injury, humidifying and warming the air that you breath, and contributing to the resonance of your voice.

WHAT IS SINUSITIS?

Sinusitis is inflammation of the sinuses that causes symptoms such as stuffy nose (nasal congestion), thickened nasal drainage that is often yellow or green, decreased sense of smell, and pain or pressure in the face (See Adult Sinusitis and Pediatric Sinusitis). Because inflammation of the nasal cavity (rhinitis) is almost always present when there is inflammation of the sinuses, the term "rhinosinusitis" is used by Ear, Nose and Throat physicians (ENTs or otolaryngologists) instead of the term "sinusitis".

Viruses, bacteria, and nasal allergies are common causes of inflammation (See Allergic Rhinitis). The inflamed, swollen lining of the nasal and sinus cavities leads to blockage of the small sinus openings. When a sinus is unable to circulate air and remove the mucus that is normally produced, it becomes vulnerable to infection.

Sinusitis is categorized into types according to how long the symptoms persist:

- Acute - symptoms are present for 4 weeks or less
- Subacute - symptoms are present for more than 4 weeks, but less than 12 weeks
- Chronic - symptoms are present for 12 weeks or greater
- Recurrent acute - 4 or more acute episodes of sinusitis occurring within 1 year, with no symptoms between episodes
- Acute exacerbation of chronic sinusitis - an episode of worsening symptoms in a patient with chronic sinusitis

HOW COMMON IS SINUSITIS?

According to the most recent available data from the Center for Disease Control and Prevention (CDC) nearly 27 million adults were diagnosed with sinusitis in the United States in 2016. Chronic sinusitis affects 11% of the adult U.S. population and is one of the most common chronic illnesses in America.

WHAT CAUSES SINUSITIS?

The most common cause of sinusitis is blockage of the sinus openings, called ostia, due to inflammation. Because the openings are small, blockage can easily occur. Causes of sinonasal inflammation include:

- Viruses
- Bacteria
- Fungus
- Nasal allergy
- Reactive airway disease (such as Asthma and Samter's triad) (See Sinusitis and Asthma)
- Congenital diseases (such as Cystic Fibrosis and Kartagener syndrome) (See Cystic Fibrosis)
- Inflammatory diseases (such as Sarcoidosis and Wegener's Granulomatosis)
- Tooth disease
- Gastroesophageal reflux
- Hormones (when taking birth control pills and during pregnancy)
- Smoking
- Intranasal drug use
- Irritants and pollution in the environment

Blockage of the ostia may also be due to:

- Abnormal development of the nasal structures (such as an enlarged turbinate (or concha bullosa) (see Nasal Anatomy)
- Scar tissue caused by injury or surgery
- A growth or tumor (See Sinus Tumors)
- Nasal packing

Additional risk factors include:

- Immunodeficiencies (such as hypogammaglobulinemia and AIDS) which prevent the body from fighting off infection

When a sinus is unable to circulate air and remove the mucus that is normally produced, it becomes an ideal place for bacteria to grow. Many types of bacteria can infect the sinuses. The bacteria most often found in acute sinusitis are:

- *Streptococcus pneumoniae*
- *Hemophilus pneumoniae*
- *Moraxella catarrhalis*

In chronic sinusitis, multiple bacteria are often present. In addition, these bacteria may be resistant to certain antibiotics. Bacteria commonly found in chronic sinusitis include:

- *Staphylococcus aureus*
- Gram negative bacteria (such as *Pseudomonas aeruginosa*)

HOW IS SINUSITIS DIAGNOSED?

The diagnosis of sinusitis is made based on the symptoms that a patient has, combined with the findings from the examination and/or testing performed by a physician. Your otolaryngologist will ask questions to determine what symptoms you are having and for how long. Symptoms used to make the diagnosis of sinusitis include:

- Nasal drainage that is thick and colored (also called purulent)
- Pain or pressure in the forehead, cheeks or teeth
- Stuffy nose (also called nasal congestion)
- Decreased sense of smell

Additional symptoms that you may experience include:

- Post nasal drip
- Cough
- Bad breath
- Headache
- Ear pain or pressure
- Fever
- Fatigue

During your visit your otolaryngologist will examine your head and neck, and may recommend a procedure called nasal endoscopy (See Nasal Endoscopy). Nasal endoscopy is an examination of the nasal cavity that is performed in the office with a small, lighted telescope. The nose is usually first sprayed with a combination of two medications. A nasal decongestant spray is used to decrease any swelling in the nose. An anesthetic spray is used to decrease any discomfort. Nasal endoscopy provides a more detailed view of the nasal cavity that may identify the inflammatory signs needed to make a diagnosis of sinusitis. If chronic sinusitis is suspected, but the signs are not seen on nasal endoscopy, your otolaryngologist may recommend a CT scan of sinuses to confirm the diagnosis.

HOW IS SINUSITIS TREATED?

Much like the common cold, acute sinusitis caused by a virus will resolve without treatment. Because viruses do not respond to antibiotics, viral sinusitis is managed with supportive care such as nasal saline rinses (See Sinonasal Irrigations), rest and hydration. Medications, such as decongestants, mucolytics and pain relievers, may also help decrease the severity of your symptoms.

The common treatment for acute bacterial sinusitis is an appropriate antibiotic. However, some physicians and patients may prefer watchful waiting (no antibiotic), as most acute bacterial infections will resolve without antibiotics. Your physician will choose an antibiotic based on:

- The most likely type of bacteria causing the infection
- Resistance of the bacteria to certain antibiotics
- Any medication allergies you may have
- Other medications you are taking
- Other medical conditions you are being treated for
- Previous treatments you have had during this infection

Treatment typically lasts 10 - 14 days. Pain relief should also be provided with over the counter or prescription medications. As with acute sinusitis caused by viruses, additional medications,

such as steroids, decongestants and mucolytics may be recommended to decrease the severity and duration of your symptoms. Nasal saline rinses are also often recommended.

Because of the variety of underlying causes, the treatment of chronic sinusitis is more complicated. In general, however, chronic sinusitis requires longer term medical therapy. Antibiotics, when required, are often selected based on the results of sinus cultures and are prescribed for 3-4 weeks. A culture is a test that uses a sample of a patient's nasal mucous to identify which bacteria are present.

WHO TREATS SINUSITIS?

Pediatricians, family practitioners, internists, allergists and pulmonologists are all involved in the treatment of patients with sinusitis. However, patients suffering from symptoms of recurrent acute or chronic sinusitis are often referred to an otolaryngologist. Otolaryngologists, or ENT physicians, are specialists providing both medical and surgical treatment of disorders of the ears, nose and throat. Some otolaryngologists subspecialize in rhinology; the management of diseases of the nose and sinuses. Patients with severe or complicated disease and those who have had prior surgery are often referred to a rhinologist for evaluation and treatment.

WHEN IS SURGERY NEEDED?

Sinus surgery is reserved for patients with chronic sinusitis who still have symptoms despite being treated with appropriate medications. It is important to know that sinusitis should be treated medically before considering surgery. This is because even after successful sinus surgery, most patients with chronic sinusitis will continue to require medication to control the source(s) of inflammation and prevent the return of symptoms.

For patients who do not see improvement with medical treatment, sinus surgery is an excellent option. Today, sinus surgery is typically performed through the nose with a nasal endoscope (See Endoscopic Sinus Surgery). This means that there are no incisions through the skin. The main goal of endoscopic sinus surgery is to restore normal function to the blocked sinuses. During the procedure, the surgeon locates and enlarges the small natural drainage pathways (or ostia) of the sinuses.

Very rarely patients with acute bacterial sinusitis will develop a complication when the infection spreads to nearby structures such as the eye or the brain. Such complications are considered emergencies. Typically, surgery is required in these patients to drain the collection of infection and enlarge the ostia of the involved sinuses.

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