

## Chronic Sinusitis – A Review

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### Abstract

Sinusitis is inflammation that causes pain, pressure, and swelling in the sinuses. Chronic sinusitis is sinusitis that lasts for a long time, usually longer than 12 weeks. Unlike acute sinusitis, which is often due to a sinus infection, chronic sinusitis is not usually caused by bacteria and does not always get better with standard treatment, such as antibiotics. Chronic sinusitis occurs when the spaces inside your nose and head (sinuses) are swollen and inflamed for three months or longer, despite treatment. This common condition interferes with the way mucus normally drains and makes your nose stuffy. Breathing through your nose may be difficult, and the area around your eyes might feel swollen or tender. Chronic sinusitis can be brought on by an infection, by growths in the sinuses (nasal polyps) or swelling of the lining of your sinuses. Also called chronic rhinosinusitis, the condition can affect both adults and children.

**Keywords:** Sinusitis, inflammation, pain, congestion

### Introduction

The sinuses are moist, hollow spaces behind the bones of the face. They usually drain through the nose. When the sinuses are unable to drain, due to issues such as an infection that blocks the nose, swelling, irritation, or an allergic reaction, then mucus and other fluid, including pus, stays trapped in the sinuses. This can cause the sinuses to swell and become irritated or infected. This inflammation is called sinusitis. Acute sinusitis is usually due to the common cold or a mild infection and usually goes away within 10 days. Some people with acute sinusitis develop an infection that requires antibiotics. Chronic sinusitis usually persists longer than 10 days, but the symptoms are the same. Those include pain and pressure above the eyes, along the sides of the nose, and behind the cheeks, green or yellow mucous draining from the nose, feeling congested pain in the nose or throat, fever, difficulty sleeping due to congestion and frequent sneezing<sup>[1]</sup>.

Chronic sinusitis is a long-term inflammation of the sinuses. The sinuses are moist air spaces behind the bones of the upper face — between the eyes and behind the forehead, nose and cheeks. Normally, the sinuses drain through small openings into the inside of the nose. Anything that obstructs that flow can cause a buildup of mucus, and sometimes pus, in the sinuses. Drainage from the sinuses can be obstructed by structural abnormalities of the nose, infection, or tissue swelling

caused by allergies. The buildup of mucus leads to increased sinus pressure and facial pain. In adults, chronic sinusitis most often is linked to nasal swelling caused by allergies, especially allergies to inhaled dust, mold, pollen, or the spores of fungi. These allergies trigger the release of histamine and other chemicals that cause the inner lining of the nose to swell and block sinus drainage<sup>[2]</sup>.

Polyps, nasal tumors and nasal fractures can obstruct the sinus drainage leading to chronic sinusitis. Chronic sinusitis also can be seen in people whose sinuses and nasal passages are structurally abnormally narrow. People with asthma, cystic fibrosis, or immune system problems develop chronic sinusitis more often than others.

### **Etiology**

Viruses and bacteria are the most common etiologies for sinusitis. Streptococcus, pneumococcus, Hemophilus, and Moraxella are the most common bacterial causes. Chronic sinusitis is multifactorial in nature and can include infectious, inflammatory, or structural factors. Thus, other etiologies such as allergic rhinitis (dust mites, molds), exposures (airborne irritants, cigarette smoke or other toxins), structural causes (nasal polyps, deviated nasal septum), ciliary dysfunction, immunodeficiencies, and fungal infections should be considered. Otitis media, asthma, AIDS, and cystic fibrosis are other medical conditions that can be associated with chronic rhinosinusitis.<sup>[3,4]</sup>

Common causes of chronic sinusitis include:

Nasal polyps- These tissue growths can block the nasal passages or sinuses.

Deviated nasal septum - A crooked septum - the wall between the nostrils — may restrict or block sinus passages, making the symptoms of sinusitis worse. Other medical conditions. The complications of conditions such as cystic fibrosis, HIV and other immune system-related diseases can lead to nasal blockage.

Respiratory tract infections - Infections in your respiratory tract — most commonly colds — can inflame and thicken your sinus membranes and block mucus drainage. These infections can be viral, bacterial or fungal.

Allergies such as hay fever - Inflammation that occurs with allergies can block your sinuses.

### **Epidemiology**

When the inflammatory process involves the paranasal sinus, it is sinusitis. It can often involve accompanying nasal airway inflammation, and when it involves both, this is then called rhinosinusitis. Chronic rhinosinusitis is one of the most common chronic conditions. It is prevalent among all age groups and is the fifth most common reason for an antibiotic prescription<sup>[5-7]</sup>.

### **Pathophysiology**

There are four paired sinus cavities: the ethmoid, sphenoid, frontal, and maxillary sinus cavities. These paired cavities allow air to be filtered during inhalation. For the antigens to be filtered and expelled, sinuses need to drain. Chronic inflammation can cause obstruction to the nasal passage, hinder drainage, and lead to lower oxygen tension. This creates foci for bacteria to build up. Ciliary dysfunction or structural abnormalities can further exacerbate this process<sup>[8]</sup>.

### **Histopathology**

Biopsy samples will usually reveal thickened basement membrane, goblet cell hyperplasia, atypical gland architecture and infiltration with monocytes. Sometimes one may also see neutrophils and eosinophils in chronic cases.

### **Risk factors**

Includes a deviated septum, nasal polyps, asthma, aspirin sensitivity a dental infection an immune system disorder such as HIV/AIDS or cystic fibrosis, Hay fever or another allergic condition and regular exposure to pollutants such as cigarette smoke

### **Complications**

Serious complications of chronic sinusitis complications are rare, but may include:

Vision problems - If sinus infection spreads to your eye socket, it can cause reduced vision or possibly blindness that can be permanent.

Infections - Uncommonly, people with chronic sinusitis may develop inflammation of the membranes and fluid surrounding the brain and spinal cord (meningitis), an infection in the bones, or a serious skin infection.

### **Diagnosis**

Methods for diagnosing chronic sinusitis include:

Imaging tests - Images taken using CT or MRI can show details of your sinuses and nasal area. These might pinpoint a deep inflammation or physical obstruction that's difficult to detect using an endoscope<sup>[9]</sup>.

Looking into your sinuses - A thin, flexible tube with a fibre-optic light inserted through your nose allows your doctor to see the inside of your sinuses.

An allergy test - If your doctor suspects that allergies might be triggering your chronic sinusitis, he or she might recommend an allergy skin test. A skin test is safe and quick and can help detect what allergen is responsible for your nasal flare-ups.

Samples from your nasal and sinus discharge (cultures) - Cultures are generally unnecessary for diagnosing chronic sinusitis. However, when the condition fails to respond to treatment or is worsening, your doctor may swab inside your nose to collect samples that might help determine the cause, such as bacteria or fungi.

### **Treatment**

Treatments for chronic sinusitis include:

**Nasal corticosteroids.** These nasal sprays help prevent and treat inflammation. Examples include fluticasone, triamcinolone, budesonide, mometasone and beclomethasone. If the sprays aren't effective enough, your doctor might recommend rinsing with a solution of saline mixed with drops of budesonide or using a nasal mist of the solution.

**Saline nasal irrigation,** with nasal sprays or solutions, reduces drainage and rinses away irritants and allergies.

**Oral or injected corticosteroids.** These medications are used to relieve inflammation from severe sinusitis, especially if you also have nasal polyps. Oral corticosteroids can cause serious side effects when used long term, so they're used only to treat severe symptoms.

**Aspirin desensitization treatment,** if you have reactions to aspirin that cause sinusitis. Under medical supervision, you're gradually given larger doses of aspirin to increase your tolerance.

### **Antibiotics**

Antibiotics are sometimes necessary for sinusitis if you have a bacterial infection. If your doctor can't rule out an underlying infection, he or she might recommend an antibiotic, sometimes with other medications<sup>[10]</sup>.

### **Immunotherapy**

If allergies are contributing to your sinusitis, allergy shots (immunotherapy) that help reduce the body's reaction to specific allergens might improve the condition.

### **Endoscopic sinus surgery**

In cases resistant to treatment or medication, endoscopic sinus surgery might be an option. For this procedure, the doctor uses a thin, flexible tube with an attached light (endoscope) to explore your sinus passages. Depending on the source of obstruction, the doctor might use various instruments to remove tissue or shave away a polyp that's causing nasal blockage. Enlarging a narrow sinus opening also may be an option to promote drainage.

### **Outlook**

Chronic sinusitis can be difficult to treat. Many doctors now treat it as a chronic condition that comes and goes. Identifying and treating the underlying cause of sinusitis can reduce the length of the inflammation and prevent it from coming back. People with chronic sinusitis may need treatment from an allergist or an ear, nose, and throat specialist. Good self-care, including treatment for allergies and asthma and avoiding allergens, may reduce the likelihood of another bout of sinusitis. People who have previously experienced chronic sinusitis should know they are at risk of developing it again, however.

### **Prevention**

Avoid upper respiratory infections - Minimize contact with people who have colds. Wash your hands frequently with soap and water, especially before meals.

Manage your allergies - Work with your doctor to keep symptoms under control. Avoid exposure to things you're allergic to whenever possible.

Avoid cigarette smoke and polluted air - Tobacco smoke and air contaminants can irritate and inflame your lungs and nasal passages.

Use a humidifier - If the air in your home is dry, such as it is if you have forced hot air heat, adding moisture to the air may help prevent sinusitis. Be sure to keep the humidifier clean and free of mold with regular, thorough cleaning.

### **Lifestyle and home remedies**

These self-help steps can help relieve sinusitis symptoms:

Rest. This can help your body fight inflammation and speed recovery.

Moisturize your sinuses. Drape a towel over your head as you breathe in the vapor from a bowl of medium-hot water. Keep the vapor directed toward your face. Or take a hot shower, breathing in the warm, moist air to help ease pain and help mucus drain<sup>[10]</sup>.

Rinse out your nasal passages. Use a specially designed squeeze bottle, saline canister or neti pot to rinse your nasal passages. This home remedy, called nasal lavage, can help clear your sinuses.

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