

Sinusitis

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Bacterial
infections

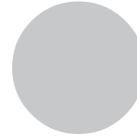
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Sinusitis

Bacterial infections

Bacteria are tiny single-celled micro-organisms which are found everywhere in nature. They can cause infection even when a person's immune system is unaffected by HIV.

In an uninfected person, various parts of the immune system play different roles in protecting against bacteria. People with HIV may have abnormalities in their immune system which make them more vulnerable to bacterial infections: immunoglobulins (antibodies) are not secreted properly; monocytes don't work properly; the bone marrow may be damaged by drugs such as AZT, ganciclovir or anti-cancer chemotherapy; and HIV itself may prevent the release of neutrophils.

Bacteria can cause a range of different problems in different parts of the body; the commonest among people with advanced HIV infection are sinusitis, bacterial pneumonia, bacterial diarrhoea (see Salmonellosis below for further information on the most common one), bronchitis and skin and soft tissue infections. Co-trimoxazole as PCP prophylaxis offers a good level of protection against bacterial infections.



Sinusitis

Infection and/or inflammation of the sinuses is a relatively common problem among people with HIV. The sinuses are hollow cavities in the front of the skull, whose main purpose is to warm the air we breathe. They are lined with membranes that use a constant flow of mucus to capture bacteria and other foreign matter that we breathe in through the passages, and drain out into the nose or lungs.

People with HIV are at increased risk of sinusitis, and its severity increases in people with lower CD4 counts. Sinusitis can be short-lived and time-limited (acute), or an ongoing long-term problem (chronic). Acute sinusitis is caused by infections, while chronic sinusitis is usually caused by a low-level inflammatory process and related to an allergy.

Symptoms of acute sinusitis can be similar to those of the common cold, including nasal congestion, headache, fever, runny nose, facial pressure, tenderness and pain in the cheeks and forehead, and discharges of thick mucus with a strong taste.

The most common bacterial infections which cause HIV-related sinusitis are *Staphylococcus epidermidis*, *Staphylococcus aureus*, *Strepto-*

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coccus pneumoniae, *Haemophilus influenzae* and *Pseudomonas* species. It can also be related to MAI infection. However, in many cases of sinusitis no infection can be identified.

A three pronged attack is necessary in order to treat and prevent further sinus attacks. The first line of attack is to treat with an appropriate antibiotic for the organism. This often has to be guessed as it is difficult to isolate the bacteria. Amoxicillin is often used, sometimes with the addition of clavulanic acid or an antibiotic of the cephalosporin family. Antibiotics of the quinolone group have little effect on staphylococcus bacteria which predominate in sinus infections, but are very useful for treating pseudomonas, which can dominate in HIV infection. Treatment should be continued for several weeks, even if you feel that the sinusitis is better, to reduce the chances of it recurring.

The second prong of attack is to shrink the swollen sinus tissues with the daily application of a nasal spray (e.g. Beconase or Rhinocort—the liquid versions seem to offer an advantage). Pseudoephedrine tablets are useful in an acute

attack to help shrink the tissue. It is important to avoid using topical decongestant sprays as these can cause problems with rebound congestion. It is important to continue to use the steroid spray as the tissue will invariably swell if this is stopped.

The third prong is to remove the pooled secretions by nasal washouts using salt water. This is a rather unsavoury practice whereby warm salt water is sniffed up into the nose from a cup and then sneezed out into a basin. This washes out the accumulated mucous and should be carried out on a regular basis.

In severe cases surgery to clear the sinuses may be offered.

To prevent or minimise the risks of contracting sinusitis, any minor respiratory infection should be treated as potentially significant. Try also to reduce the impact of any allergies you have, by avoiding animals or plants to which you are sensitive and vacuuming often to keep dust down. Smoking and alcohol both exacerbate sinusitis, and consumption should be reduced or avoided during an attack.

a note about this publication

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Sinusitis

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What is sinusitis?

You're coughing and sneezing and tired and achy. You think that you might be getting a cold. Later, when the medicines you've been taking to relieve the symptoms of the common cold are not working and you've now got a terrible headache, you finally drag yourself to the doctor. After listening to your history of symptoms, examining your face and forehead, and perhaps doing a sinus X-ray, the doctor says you have sinusitis.

Sinusitis simply means your sinuses are infected or inflamed, but this gives little indication of the misery and pain this condition can cause. Health care experts usually divide sinusitis cases into

- Acute, which lasts for 3 weeks or less
- Chronic, which usually lasts for 3 to 8 weeks but can continue for months or even years
- Recurrent, which is several acute attacks within a year

Health care experts estimate that 37 million Americans are affected by sinusitis every year. Health care workers report 33 million cases of chronic sinusitis to the U.S. Centers for Disease Control and Prevention annually. Americans spend millions of dollars each year for medications that promise relief from their sinus symptoms.



What are sinuses?

Sinuses are hollow air spaces in the human body. When people say, "I'm having a sinus attack," they usually are referring to symptoms in one or more of four pairs of cavities, or sinuses, known as paranasal sinuses. These cavities, located within the skull or bones of the head surrounding the nose, include the:

- Frontal sinuses over the eyes in the brow area
- Maxillary sinuses inside each cheekbone
- Ethmoid sinuses just behind the bridge of the nose and between the eyes
- Sphenoid sinuses behind the ethmoids in the upper region of the nose and behind the eyes

Each sinus has an opening into the nose for the free exchange of air and mucus, and each is joined with the nasal passages by a continuous mucous membrane lining. Therefore, anything that causes a swelling in the nose—an infection, an allergic reaction, or an immune reaction—also can affect the sinuses. Air trapped within a blocked sinus, along with pus or other secretions, may cause pressure on the sinus wall. The result is the sometimes intense pain of a sinus attack. Similarly, when air is prevented from entering a paranasal sinus by a swollen membrane at the opening, a vacuum can be created that also causes pain.

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What are the symptoms of sinusitis?

The location of your sinus pain depends on which sinus is affected.

- Headache when you wake up in the morning is typical of a sinus problem.
- Pain when your forehead over the frontal sinuses is touched may indicate that your frontal sinuses are inflamed.
- Infection in the maxillary sinuses can cause your upper jaw and teeth to ache and your cheeks to become tender to the touch.
- Since the ethmoid sinuses are near the tear ducts in the corner of the eyes, inflammation of these cavities often causes swelling of the eyelids and tissues around your eyes, and pain between your eyes. Ethmoid inflammation also can cause tenderness when the sides of your nose are touched, a loss of smell, and a stuffy nose.
- Although the sphenoid sinuses are less frequently affected, infection in this area can cause earaches, neck pain, and deep aching at the top of your head.

Most people with sinusitis, however, have pain or tenderness in several locations, and their symptoms usually do not clearly indicate which sinuses are inflamed. Other symptoms of sinusitis can include:

- Fever
- Weakness
- Tiredness
- A cough that may be more severe at night
- Runny nose (rhinitis) or nasal congestion

In addition, the drainage of mucus from the sphenoids or other sinuses down the back of your

throat (postnasal drip) can cause you to have a sore throat. Mucus drainage also can irritate the membranes lining your larynx (upper windpipe). Not everyone with these symptoms, however, has sinusitis.

On rare occasions, acute sinusitis can result in brain infection and other serious complications.



What are some causes of acute sinusitis?

Most cases of acute sinusitis start with a common cold, which is caused by a virus. These viral colds do not cause symptoms of sinusitis, but they do inflame the sinuses. Both the cold and the sinus inflammation usually go away without treatment in 2 weeks. The inflammation, however, might explain why having a cold increases your likelihood of developing acute sinusitis. For example, your nose reacts to an invasion by viruses that cause infections such as the common cold or flu by producing mucus and sending white blood cells to the lining of the nose, which congest and swell the nasal passages.

When this swelling involves the adjacent mucous membranes of your sinuses, air and mucus are trapped behind the narrowed openings of the sinuses. When your sinus openings become too narrow, mucus cannot drain properly. This increase in mucus sets up prime conditions for bacteria to multiply.

Most healthy people harbor bacteria, such as *Streptococcus pneumoniae* and *Haemophilus influenzae*, in their upper respiratory tracts with no problems until the body's defenses are weakened or drainage from the sinuses is blocked by a cold or other viral infection. Thus, bacteria

that may have been living harmlessly in your nose or throat can multiply and invade your sinuses, causing an acute sinus infection.

Sometimes, fungal infections can cause acute sinusitis. Although fungi are abundant in the environment, they usually are harmless to healthy people, indicating that the human body has a natural resistance to them. Fungi, such as *Aspergillus*, can cause serious illness in people whose immune systems are not functioning properly. Some people with fungal sinusitis have an allergic-type reaction to the fungi.

Chronic inflammation of the nasal passages also can lead to sinusitis. If you have allergic rhinitis or hay fever, you can develop episodes of acute sinusitis. Vasomotor rhinitis, caused by humidity, cold air, alcohol, perfumes, and other environmental conditions, also may be complicated by sinus infections.

Acute sinusitis is much more common in some people than in the general population. For example, sinusitis occurs more often in people who have reduced immune function (such as those with immune deficiency diseases or HIV infection) and with abnormality of mucus secretion or mucus movement (such as those with cystic fibrosis).



What causes chronic sinusitis?

If you have asthma, an allergic disease, you may have frequent episodes of chronic sinusitis.

If you are allergic to airborne allergens, such as dust, mold, and pollen, which trigger allergic rhinitis, you may develop chronic sinusitis. In addition, people who are allergic to fungi can develop a condition called “allergic fungal sinusitis.”

If you are subject to getting chronic sinusitis, damp weather, especially in northern temperate climates, or pollutants in the air and in buildings also can affect you.

Like acute sinusitis, you might develop chronic sinusitis if you have an immune deficiency disease or an abnormality in the way mucus moves through and from your respiratory system (e.g., immune deficiency, HIV infection, and cystic fibrosis). In addition, if you have severe asthma, nasal polyps (small growths in the nose), or a severe asthmatic response to aspirin and aspirin-like medicines such as ibuprofen, you might have chronic sinusitis often.



How is sinusitis diagnosed?

Because your nose can get stuffy when you have a condition like the common cold, you may confuse simple nasal congestion with sinusitis. A cold, however, usually lasts about 7 to 14 days and disappears without treatment. Acute sinusitis often lasts longer and typically causes more symptoms than just a cold.

Your doctor can diagnose sinusitis by listening to your symptoms, doing a physical examination, and taking X-rays, and if necessary, an MRI or CT scan (magnetic resonance imaging and computed tomography).



For more treatment information, call Project Inform's toll-free National HIV/AIDS Treatment Information Hotline at 1-800-822-7422.



How is sinusitis treated?

After diagnosing sinusitis and identifying a possible cause, a doctor can suggest treatments that will reduce your inflammation and relieve your symptoms.



Acute sinusitis

If you have acute sinusitis, your doctor may recommend

- Decongestants to reduce congestion
- Antibiotics to control a bacterial infection, if present
- Pain relievers to reduce any pain

You should, however, use over-the-counter or prescription decongestant nose drops and sprays for only few days. If you use these medicines for longer periods, they can lead to even more congestion and swelling of your nasal passages.

If bacteria cause your sinusitis, antibiotics used along with a nasal or oral decongestant will usually help. Your doctor can prescribe an antibiotic that fights the type of bacteria most commonly associated with sinusitis.

Many cases of acute sinusitis will end without antibiotics. If you have allergic disease along with infectious sinusitis, however, you may need medicine to relieve your allergy symptoms. If you already have asthma then get sinusitis, you may experience worsening of your asthma and should be in close touch with your doctor.

In addition, your doctor may prescribe a steroid nasal spray, along with other treatments, to reduce your sinus congestion, swelling, and inflammation.



Chronic sinusitis

Doctors often find it difficult to treat chronic sinusitis successfully, realizing that symptoms persist even after taking antibiotics for a long period. In general, however, treating chronic sinusitis, such as with antibiotics and decongestants, is similar to treating acute sinusitis.

Some people with severe asthma have dramatic improvement of their symptoms when their chronic sinusitis is treated with antibiotics.

Doctors commonly prescribe steroid nasal sprays to reduce inflammation in chronic sinusitis. Although doctors occasionally prescribe them to treat people with chronic sinusitis over a long period, they don't fully understand the long-term safety of these medications, especially in children. Therefore, doctors will consider whether the benefits outweigh any risks of using steroid nasal sprays.

If you have severe chronic sinusitis, your doctor may prescribe oral steroids, such as prednisone. Because oral steroids are powerful medicines and can have significant side effects, you should take them only when other medicines have not worked.

Although home remedies cannot cure sinus infection, they might give you some comfort.

- Inhaling steam from a vaporizer or a hot cup of water can soothe inflamed sinus cavities.
- Saline nasal spray, which you can buy in a drug store, can give relief.
- Gentle heat applied over the inflamed area is comforting.

When medical treatment fails, surgery may be the only alternative for treating chronic sinusitis. Research studies suggest that the vast majority of people who undergo surgery have fewer symptoms and better quality of life.

In children, problems often are eliminated by removal of adenoids obstructing nasal-sinus passages.

Adults who have had allergic and infectious conditions over the years sometimes develop nasal polyps that interfere with proper drainage. Removal of these polyps and/or repair of a deviated septum to ensure an open airway often provides considerable relief from sinus symptoms.

The most common surgery done today is functional endoscopic sinus surgery, in which the natural openings from the sinuses are enlarged to allow drainage. This type of surgery is less invasive than conventional sinus surgery, and serious complications are rare.



How can I prevent sinusitis?

Although you cannot prevent all sinus disorders—any more than you can avoid all colds or bacterial infections—you can do certain things to reduce the number and severity of the attacks and possibly prevent acute sinusitis from becoming chronic.

- You may get some relief from your symptoms with a humidifier, particularly if room air in your home is heated by a dry forced-air system.
- Air conditioners help to provide an even temperature.

- Electrostatic filters attached to heating and air conditioning equipment are helpful in removing allergens from the air.

If you are prone to getting sinus disorders, especially if you have allergies, you should avoid cigarette smoke and other air pollutants. If your allergies inflame your nasal passages, you are more likely to have a strong reaction to all irritants.

If you suspect that your sinus inflammation may be related to dust, mold, pollen, or food—or any of the hundreds of allergens that can trigger an upper respiratory reaction—you should consult your doctor. Your doctor can use various tests to determine whether you have an allergy and its cause. This will help you and your doctor take appropriate steps to reduce or limit your allergy symptoms.

Drinking alcohol also causes nasal and sinus membranes to swell.

If you are prone to sinusitis, it may be uncomfortable for you to swim in pools treated with chlorine, since it irritates the lining of the nose and sinuses.

Divers often get sinus congestion and infection when water is forced into the sinuses from the nasal passages.

You may find that air travel poses a problem if you are suffering from acute or chronic sinusitis. As air pressure in a plane is reduced, pressure can build up in your head blocking your sinuses or eustachian tubes in your ears. Therefore, you might feel discomfort in your sinus or middle ear during the plane's ascent or descent. Some doctors recommend using decongestant nose drops or inhalers before your flight to avoid this problem.



What research is going on?

Scientific studies have shown a close relationship between having allergic rhinitis and chronic sinusitis. In fact, some studies state that up to 80 percent of adults with chronic sinusitis also had allergic rhinitis. There is also an association between asthma and sinusitis. Some researchers think that as many as 75% of people with asthma also get sinusitis. The National Institute of Allergy and Infectious Diseases (NIAID) conducts and supports research on allergic diseases as well as bacteria and

fungus that can cause sinusitis. This research is focused on developing better treatments and ways to prevent these diseases.

Scientists supported by NIAID and other institutions are investigating whether chronic sinusitis has genetic causes. They have found that the alterations in genes which cause cystic fibrosis may also contribute to chronic sinusitis. This research focus will give scientists new insights into the cause of the disease in some people and points to new strategies for diagnosis and treatment.

Another NIAID-supported research study is trying to determine whether fungi may play a role in causing many cases of chronic sinusitis. This research also will help scientists develop better medicines to treat chronic sinusitis.

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