Sinus inflammation

Sinus trouble begins when the small openings that drain into the nose and throat become blocked. The most common way this occurs is due to sinus inflammation. Inflammation causes swelling, which makes it difficult for sinuses to drain.

A draining problem

It starts as a typical cold — a scratchy throat, a stuffed-up nose and a run-down feeling. But instead of tapering off over the course of a week or so, pressure builds up around your forehead and face and the feeling of sickness lingers.

If this sounds familiar, you’ve likely experienced some type of sinus inflammation or infection. Often, acute sinus inflammation (sinusitis) is successfully treated with an antibiotic medication.

But not every sinus problem is that simple. With ongoing sinus problems, careful diagnosis of the underlying problem is crucial to treatment.

Blocked drainage

Your sinuses are a maze of air-filled chambers in the bones around your nose. Your sinuses make mucus, which cleans and moisturizes your nasal passages.

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difficult for sinuses to drain. Once drainage is blocked, mucus builds. This alone can feel uncomfortable, but it also gives bacteria a stagnant, moist environment in which to thrive, which can lead to infection.

The common cold, which is caused by a virus, is the most frequent trigger of sinus trouble. Typically, your body can fight off the virus that’s triggering sinus inflammation and blockage. However, a secondary bacterial infection can take hold.

Sinusitis can also be rooted in one of many additional problems, including:

- **Allergies** — These cause recurrent or constant swelling and irritation of nasal passages (allergic rhinitis), leading to sinus blockage.
- **Fungal infections** — Long-lasting or chronic sinusitis may be triggered by an inflammatory reaction to fungi inhaled from the air.
- **Structural abnormalities** — Small growths of tissue (nasal polyps) or narrow passageways may restrict or block nasal airways or sinuses.
- **Environmental pollution** — Sinusitis can worsen if you smoke or are exposed to air pollution.
- **Other causes** — Nonallergic rhinitis, immune system dysfunction, cystic fibrosis or an abnormality of the tiny hairs that line the sinus (cilia) may cause sinus problems. In addition, other conditions may masquerade as sinusitis. For example, migraines can be mistaken for sinus problems.

**Acute sinusitis**

Most cases of sinusitis are acute, meaning they come and go within less than a month. Symptoms may include:

- Nasal congestion and facial pain and pressure
- Drainage of a thick, yellow or greenish discharge from the nose or down the back of the throat
- Headache, pain in your upper teeth and jaw, or ear pain that comes on abruptly, usually on the heels of a cold
- Fatigue and feeling unwell

Acute sinusitis is often preceded by a cold. When symptoms of acute sinusitis last longer than seven to 10 days — or when symptoms seem to be improving, then suddenly worsen — there’s a good chance of a bacterial infection.

The body usually can fight off a bacterial infection, especially if symptoms are mild. Still, your doctor may appropriately prescribe antibiotics to kill the bacteria. Additional supportive therapies for acute sinusitis can be used in place of or in conjunction with antibiotics.

**Persistent symptoms**

When sinusitis won’t go away or recurs within a week or two of treatment, more extensive testing may be necessary. Testing may include:

- Identifying the microbes causing sinusitis or infection.
- Nasal endoscopy, which involves inserting a thin, flexible scope with an attached light into your nose to visualize the drainage from your sinuses. This can help identify structural abnormalities within your nose.
- Imaging tests using X-rays, computerized tomography (CT) scans or magnetic resonance imaging (MRI) can also be used to visualize the sinuses.
- Allergy skin testing, if allergies are thought to be the cause.

Depending on the diagnosis, your doctor may recommend a number of treatment options. Sometimes, it’s possible to cure the problem. For example, it’s possible that a more appropriate antibiotic taken for a specific duration may clear up a stubborn bacterial infection.

However, the development of chronic sinusitis is also possible. Chronic sinusitis is sinusitis that lasts for 12 weeks without going away, even after treatment. Chronic sinusitis can be related to an overreaction of the immune system to environmental stimulants, such as dust, pollen or fungi. The inflammation of chronic rhinosinusitis doesn’t involve an infection, but acute bacterial infections can periodically develop within diseased sinuses.

Symptoms of chronic rhinosinusitis are generally subtler than those of acute sinusitis. You may still have congestion and drainage down the back of your throat, but there’s generally less facial pain and you generally don’t feel as sick. Chronic sinusitis may also cause headaches or loss of smell.

Usually, there’s no cure for chronic sinusitis, but symptoms can often be effectively managed with treatments such as:

- **Systemic corticosteroids** —
Short-term use of these, often orally, can help calm sinuses.

- **Nasal corticosteroid sprays** — For many with chronic sinusitis, these are used on a daily basis.
- **Nasal irrigation** — This involves gently squirting or pouring a clean, warm saltwater solution into your nose with a squeeze bottle, bulb syringe or a container that’s designed to rinse the nasal cavity (neti pot). Done properly and on a daily basis, this is one of the most effective ways to decrease symptoms of chronic sinusitis. Sometimes, your doctor may recommend adding a medication to your irrigation to help treat inflammation or infection. For example, antifungal irrigation may be prescribed if fungal irritation is suspected as a possible cause of your sinusitis. Results may vary, but some people have an excellent response.
- **Allergy treatments** — If allergic rhinitis is diagnosed, allergy treatments such as prescription antihistamine drugs may be effective.
- **Surgery** — Using an endoscope, various tools can be used to remove tissue, shave away bone or polyps, or enlarge a narrow sinus.

**Don’t tough it out**

Seeking treatment for sinusitis that has lasted 10 days or more is recommended. Seek care immediately if you experience symptoms such as severe pain or a high fever. Complications of sinus infections include worsening of asthma, infection of the lining of the brain (meningitis) and vision problems.

**Free flowin’**

Keeping the passageways of your sinuses open and mucus flowing is key to preventing and treating rhinosinusitis. Help keep your sinus mucus flowing with:

- **Short-term use of decongestants** — Nonprescription nasal sprays or oral decongestants can help shrink tissues, relieving sinus pressure and possibly denying bacteria a stagnant place to thrive. However, when used continuously for more than three days, nasal sprays — due to their rebound effect — can actually make congestion worse. Oral decongestants can cause high blood pressure and elevated pulse rate, and can worsen urinary difficulties from prostate enlargement.
- **Nasal irrigation** — Although more effective at relieving chronic sinusitis, rinsing your nose with a salt solution isn’t harmful and some people feel that it helps relieve acute sinusitis symptoms. Nasal irrigation is less effective with acute sinusitis because the bacteria-filled sinus cavities in need of irrigation are blocked off.
- **Nasal corticosteroid sprays** — Intermittent use of these prescription medications can help reduce inflammation and swelling of sinuses if you have seasonal allergies. It may take two weeks of use before they begin to have an effect.
- **Breathing steam** — Breathing in steam from a bowl of hot water or inhaling moist air from a hot shower can help break up nasal congestion.
- **Taking care of yourself** — Drinking plenty of fluids helps dilute mucus and promotes mucus drainage. Avoid alcohol, smoking and air pollution, as these can contribute to inflammation and swelling of nasal passages.

**Health tips**

**Stretching like the pros**

Here’s how to get the most out of stretching your muscles:

- **Stretch warmed-up muscles** — If you stretch when your muscles are cold, you increase risk of injury, including pulled muscles. Before you stretch, warm up muscles with a low-intensity activity, such as walking for several minutes while gently pumping your arms. Stretching muscles after a more strenuous activity or exercise is also beneficial.
- **Save time by holding your stretches** — It takes time to lengthen tissues safely. Ideally, hold your stretches for at least 30 seconds and up to 60 seconds for a really tight muscle or problem area. If you do so, you’ll need to do each stretch only once or twice for most muscle groups.
- **Ease into each stretch** — Spend the first 15 seconds in an easy stretch, just to the point that you feel a mild tension — never bounce. The tension should be comfortable, not painful. Then stretch just a fraction of an inch farther until you again feel mild tension — not pain — and hold the stretch for 15 seconds. If you feel pain, that’s too far. Back off to the point where the pain is gone, and that’s where you’ll want to hold the stretch.
- **Breathe** — Don’t hold your breath while stretching. Exhale as you go into a stretch and then breathe slowly and evenly as you hold it.
Beyond the human genome

Meet the epigenome

Have you ever known identical twins, especially from early in their lives and into midlife or beyond? Identical twins have exactly the same human genetic code — the human genome, called DNA — in their cells. Yet, over time and with age, two people who began life as indistinguishable from the other can be changed enough to have different appearances, behaviors and even health challenges.

Why the differences? Isn’t your DNA your destiny? Not entirely — other factors are at work in how the human genome is expressed. Of primary interest is epigenetics, which literally translates into “above the genome.” The science of epigenetics focuses on how gene activity is regulated within a cell. If you think of the human genome as being a computer, then epigenetics can be likened to software that tells that computer when to work, how to work and how much to work.

One scientist describes epigenetics as being “all the weird and wonderful things” that can’t be explained by genetics. So, yes, epigenetics is complicated — but it’s worth trying to understand.

Discovering how epigenetics trips and triggers gene expression may hold the key to better treatments for disease, new ways of recognizing disease earlier, and possibly even preventing it altogether.

Getting cellular

Your body is made up of hundreds of different types of cells — liver cells, brain cells (neurons) and skin cells, to name just a few. Although their appearance and func-
tions are different, each of these cells was derived from the same starting point and each contains exactly the same DNA.

What makes skin cells different from liver cells or neurons, even though they all contain essentially the same genes? The answer is the epigenome.

The epigenome governs individual cell development through a selective process of turning genes off or on, which essentially affects gene expression, but doesn’t alter DNA. As a result, skin cells cover your body, liver cells remove toxins from your body, and brain cells help control your bodily functions.

Who you are at birth is determined by nature. But the epigenome’s job doesn’t end once nature is fulfilled and your body is formed. The process of nurture — meaning what happens during your body’s normal cycle of growth and aging — also comes into play.

Factors such as what you eat, how you sleep, what you’re exposed to in the environment, how you react to stress and even physical affection, appear capable of changing or altering epigenetic instructions that overlay your unique DNA and thus can alter gene expression. This is especially so during critical times in life, such as puberty or pregnancy, when it’s thought that cells may be even more susceptible to epigenome changes.

To further complicate things, it appears that aspects of a person’s epigenome may be passed along. Recent studies have shown that what your grandparents ate at puberty might affect your health, possibly making their descendants susceptible to diabetes and heart disease.

**Connecting the dots**

Researchers hope that a full understanding of the human epigenome could eventually change how people age and how diseases are diagnosed, treated and prevented. Many cases of some rare disorders are known to be due to epigenetic changes at certain spots on the genome. Epigenetic changes also may play a role in more-common diseases, such as diabetes, heart disease, neurological disorders, autoimmune diseases and cancer.

In fact, some wonder if epigenetics might be cancer’s Achilles’ heel. Epigenetic missteps that deactivate tumor-suppressing genes are seen in several types of cancer, such as colorectal and brain cancers. Epigenetic-based drug therapies are being used to treat myelodysplastic syndrome (MDS), a blood disease that can progress to leukemia.

**Mechanisms for change**

Researchers worldwide are working to discover the epigenetic mechanisms that influence change in gene expression. Among the many types of epigenetic modifications that occur in cells are those involving tiny chemical tags that attach to genes (A), and chemical tags that grab simple proteins called histones (B).

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**What lies beneath**

Some call cracking the human genome code — which took more than a decade — the tip of the iceberg. Decoding the human epigenome is the much larger, unseen portion of that iceberg. Scientists are joining efforts internationally in decoding the epigenome.

At Mayo Clinic, epigenetics is used in testing for several rare syndromes, such as Prader-Willi syndrome, Angelman syndrome and Beckwith-Wiedemann syndrome. Epigenome-related research at Mayo includes efforts to better predict which individuals with certain brain cancers will have the best response to chemotherapy and radiation.
PSA tests

The latest developments

Prostate-specific antigen (PSA) is a substance produced in the prostate gland. Normally, a small amount of PSA enters the bloodstream. If a higher amount is found, or more importantly, if PSA levels rise abruptly or too quickly over time, it may indicate a prostate problem.

Common diseases of the prostate that could increase PSA include prostate enlargement (benign prostatic hyperplasia, or BPH), prostatitis and prostate cancer. A PSA test can’t diagnose cancer, but it can help indicate the need for further testing, such as a prostate biopsy.

According to a study in the April 2006 issue of the Journal of the National Cancer Institute, the general probability of cancer rises as PSA levels rise. For example, a PSA of 0 to 1 nanograms per milliliter of blood (ng/mL) represents an 11 percent risk of cancer. A PSA level of 1 to 2 ng/mL represents a 20 percent risk, a PSA level of 2 to 4 ng/mL represents a 26 to 30 percent risk and a PSA over 4 ng/mL represents a risk of over 40 percent. Note that there’s no “safe” PSA level, rather a range of risk across all levels.

The problem is the numbers aren’t specific. They don’t differentiate the minority of men who have cancer from the majority who don’t. Nor do they differentiate between cancers that are fast- or slow-growing. Most prostate cancers are considered slow growing.

For older men, a slow-growing cancer may cause few if any symptoms and may not shorten life span, even without treatment. Add to that such factors as age or BPH, which can raise your PSA level independent of cancer, and the equation becomes even more confusing. In addition, different laboratories may use different methods and thus could have varying normal ranges.

Fortunately, refinements in how the PSA test is interpreted allow doctors to better determine those who need further testing from those who probably don’t.

Fine-tuning

In addition to adjustments such as an age-graded scale — that can account for PSA variation in men as they age — refinements of PSA testing include:

- **PSA velocity** — This charts the change of PSA levels over time. PSA levels tend to increase more quickly in men who have prostate cancer than in men who have BPH. For men with PSA levels of 4 ng/mL or below, a rise in PSA of around 0.4 ng/mL or more in a year may indicate the need for further evaluation. For men with PSA levels above 4 ng/mL, a rise of around 0.75 ng/mL may indicate additional follow-up, or even a prostate biopsy.

- **Velocity testing** is a reason why annual or more frequent PSA measurements are important. It allows detection of subtle changes in PSA, which can lead to earlier intervention if cancer is present. Studies suggest that men who have frequently checked PSA have better outcomes if they do develop cancer.

- **PSA doubling time** — Similar to PSA velocity, the test looks at how long it takes for PSA levels to double. The risk of prostate cancer is particularly acute when PSA levels double within less than 18 months.

- **PSA density** — Using ultrasound imaging, your doctor determines the size of your prostate gland. Then, your PSA level is divided by your prostate size. This test helps adjust for the fact that larger prostates produce more PSA and smaller prostates produce less.

- **Free versus total PSA** — This divides PSA in your bloodstream into two types. “Bound” PSA is attached to certain blood proteins and “free” PSA isn’t. Prostate cancer is more likely to produce bound PSA. A lower percentage of free PSA in comparison to bound indicates an increased likelihood of cancer.

**Bottom line?**

Annual PSA testing in conjunction with a digital rectal exam remains your best option for detecting prostate cancer early.
Dry eyes

Grit be gone

Dry eyes can be a source of substantial irritation. In severe cases, the cornea may even be susceptible to damage.

More than water

Healthy eyes are continuously covered by fluid. Tears are a mixture of water, fatty oils, proteins, electrolytes, mucus, bacteria-fighting substances and other agents that help regulate the health of your eye surface (cornea).

Normally, the eyes’ tear film consists of three layers. The outermost layer features fatty oils that smooth the tear surface and slow evaporation of the thicker middle layer, which is mostly water. The innermost layer covering the cornea is mucus, which allows tears to be evenly spread on the eye surface. Dry eyes may result if an imbalance occurs in any of these components. Other causes of dry eyes include:

- **Reduced fluid from the tear glands** — This tends to occur with age in both men and women, but especially in postmenopausal women. It’s also associated with conditions such as diabetes, rheumatoid arthritis and Sjögren’s syndrome.
- **Impaired blinking** — Eyelids that turn out (ectropion) or turn in (entropion) may occur with aging and disrupt normal blinking that distributes tears across the eye surface.
- **Certain drugs** — Among medications that can worsen symptoms are diuretics and angiotensin-converting enzyme (ACE) inhibitors for high blood pressure, antihistamines and decongestants, sleep medications, some antidepressants and opiate-based pain relievers.

Most people with dry eyes don’t have long-term complications, but severe dry eyes that are left untreated are at increased risk of developing infection and even scarring.

Treating the problem

Once the cause of dry eyes is determined, treatment can be directed at the problem. Eyelid conditions that impair normal blinking may require surgical treatment. If the problem is eyelid inflammation due to blepharitis or due to skin conditions such as rosacea, that may be addressed with regular cleaning of the lid and possible use of antibiotic ointment or drops or less commonly, an oral antibiotic.

If the irritant is lack of tears, the mainstay of treatment for mild cases is nonprescription artificial tears. Generally, it’s best to avoid drops such as Clear Eyes and Visine, which remove redness, as these may aggravate dry eye. Some products are thicker in consistency and last longer in the eyes, but they can also blur vision. Others, such as Refresh Dry Eye Therapy, may use an oil-based component or other additives to prevent evaporation. Another product, called Optive, lubricates the eye surface and keeps its cells healthy.

Nonprescription, preservative-free drops can be used as often as needed, but drops that have preservatives should typically be used no more than four times a day. Ask your pharmacist if the product you’re using has a preservative.

If you have moderate to severe dry eyes, see your doctor. Tear conservation methods may be considered. One option is to block the tear drainage ducts with tiny silicone plugs called punctal plugs. A permanent option is to directly heat (cauterize) the tissues of the tear-drainage area so that scarring closes the tear duct.

Sometimes, other treatments are needed to manage severe dry eyes, although none is completely effective. Your doctor may prescribe cyclosporine drops (Restasis). Other options are corticosteroid drops, soft contact lenses and even specialized contact lenses designed to fit over the white of the eye (sclera) in order to help the eye retain moisture.

Goggle-like moisture chamber glasses may be worn to retain moisture. A moisture-retaining eye mask may be worn during sleep. Oral supplements of omega-3 fatty acid may be of help. Another option is an autologous serum eyedrop, which is derived from serum in your own blood and has nutrients along with other components that may improve the health of the eyes’ surface cells.

Among other treatment options under study are the topical use of omega-3 fatty acid on the eyes’ surface and topical hormones that may reduce dryness.

Help yourself

You can take several steps to help reduce dry eye irritation. Start by using eyedrops before your eyes become irritated. Protect your eyes from blowing air, such as wearing wraparound glasses to reduce wind contact. Avoid smoke exposure and rubbing your eyes. If the air in your home is dry, use a humidifier. During intense visual concentration, rest your eyes by closing them for several seconds.
Second opinion

Questions and our answers

Q: How does eating broccoli slaw compare nutritionally with eating broccoli heads?

A: Broccoli slaw, which is mostly the stems of the plant, and broccoli heads are similar nutritionally and are among the most nutritionally dense vegetables. Both have roughly the same amount of protein, calcium, potassium, selenium, folate and several other nutrients.

When it comes to the potent cancer-fighting antioxidant sulforaphane, the heads come out on top. Studies have found that the heads have about twice the sulforaphane of the stems. Still, the stems are a good source of sulforaphane when compared with other vegetables. Broccoli heads are also the clear winners in vitamin A content.

In contrast, broccoli stems have about 2.8 grams of fiber in a half-cup serving compared with about 0.75 grams of fiber in the same amount of heads. In addition, stems are higher in vitamin C than are the heads, and some people find the stems are actually a little “sweeter” than the heads.

But the bottom line is that both the stems and the heads are good for you. So why not get the best of both? For optimal nutrition, consume both the heads and the softer stem portions and eat them raw or minimally cooked, because some nutrient levels drop considerably with cooking time.

Q: My understanding is that calcium absorption relies on vitamin D and that vitamin D needs fat to be used by the body. If I drink low-fat milk with a low-fat meal, is the milk’s supply of calcium wasted?

A: No, the calcium won’t be wasted. The efficiency of calcium absorption from your present meal is based on the vitamin D circulating in your blood from past meals and sun exposure. Vitamin D is added to milk and supplements to enhance your body’s ability to absorb calcium during subsequent meals.

Even a very low-fat diet — where less than 2 percent of calories come from fat — still has enough fat to adequately absorb fat-soluble vitamins, such as A, D, E and K.

In general, those who need to worry about deficiencies of fat-soluble vitamins include some people who have had gastrointestinal problems or some types of gastrointestinal bypass surgery that hinder food absorption (malabsorption) or people on very restricted diets.

Q: I developed urinary stress incontinence after therapy for prostate cancer. I’ve tried regaining bladder control with conservative approaches. I also had a bulking agent injected into my urethra. It’s been a year without much success. Are there any other options?

A: Yes. If you’ve had urinary incontinence for a year without much improvement despite therapy, it may be time to consider implantation of an artificial sphincter device.

An artificial sphincter device is an inflatable silicone cuff that’s placed around the urethra at the base of your bladder. This fluid-filled cuff keeps your urethra closed until you’re ready to urinate. To urinate, you press a valve implanted into your scrotum that causes the ring to deflate, allowing urine to be released. Once your bladder is empty, the device reinflates over the next few minutes.

Surgery to implant the device requires an overnight hospital stay. After surgery, a six-week healing period is needed before the device can be used. Complications requiring a second operation occur at a rate of about 15 to 30 percent. Barring complications — most commonly related to a device malfunction — the device can cure or greatly improve urinary incontinence.