

Nosebleeds

Anatomy and Physiology

The nose is an area of the body that contains many tiny blood vessels or arterioles that can break easily. One of every seven people will develop a nosebleed some time in their lifetime. Nosebleeds can occur at any age but are most common in children aged 2-10 years and adults aged 50-80 years.

Nosebleeds may arise from arteries or from veins. The blood pressure in veins is lower than the blood pressure in arteries. Compressing the nose or packing the nostril with a ribbon of gauze or a balloon in order to exert pressure on the bleeding point is more likely to fail to stop a nosebleed if it comes from an artery. In this situation it is normally possible to stop the bleeding by tying off or blocking the artery which supplies the bleeding point.

The arterial blood supply to the nose comes from two main sources. The top of the nasal cavity and the partition between the nostrils (nasal septum) is supplied by fine branches of the internal carotid artery, one of the main arteries supplying the brain. These reach the nose after they pass through the eye socket, supplying blood to its contents en route. This artery is called the ophthalmic artery and the branches which reach the nose are called the ethmoidal arteries. Most of the lower part of the nasal cavity is supplied by a large branch of the external carotid artery, the artery which supplies blood to most of the face and underlying structures. This artery reaches the nose by passing behind the sinus of the cheek and entering the nose through its sidewall near the back of the nose. Before it reaches the nose it is known as the maxillary artery, but as it enters the nose its name changes to the sphenopalatine artery.

Nosebleeds are divided into two types, depending on whether the bleeding is coming from the front or back of the nose.

What is an anterior nosebleed?

Most nosebleeds or epistaxes begin in the lower part of the septum, the semi-rigid wall that separates the two nostrils of the nose. The septum contains blood vessels that can be broken by a blow to the nose or the edge of a sharp fingernail. Nosebleed coming from the front of the nose or anterior nosebleeds often begin with a flow of blood out one nostril when the patient is sitting or standing.

Anterior nosebleeds are common in dry climates or during the winter months when dry, heated indoor air dehydrates the nasal membranes. Dryness may result in crusting, cracking, and bleeding. This can be prevented by placing a light coating of petroleum jelly or an antibiotic ointment on the end of a fingertip and then rub it inside the nose, especially on the middle portion of the nose (the septum).

How to stop an anterior nosebleed

- Stay calm, or help a young child stay calm. A person who is agitated may bleed more profusely than someone who's been reassured and supported.
- Keep head higher than the level of the heart. Sit up.
- Lean slightly forward so the blood won't drain in the back of the throat.
- Using the thumb and index finger, pinch all the soft parts of the nose. The area where pressure should be applied is located between the end of the nose and the hard, bony ridge that forms the bridge of the nose. Do not pack the inside of the nose with gauze or cotton.
- Apply ice—crushed in a plastic bag or washcloth—to nose and cheeks.
- Hold the position for five minutes. If it's still bleeding, hold it again for an additional 10 minutes.

What is a posterior nosebleed?

More rarely, a nosebleed can begin high and deep within the nose and flow down the back of the mouth and throat even if the patient is sitting or standing.

Obviously, when lying down, even anterior (front of nasal cavity) nosebleeds may seem to flow toward the back of the throat especially if coughing or blowing the nose. It is important to try to make the distinction between the anterior and posterior nosebleed, since posterior nosebleeds are often more severe and almost always require a physician's care. Posterior nosebleeds are more likely to occur in older people, persons with high blood pressure, and in cases of injury to the nose or face.

What are the causes of recurring nosebleeds?

Allergies, infections, or dryness that cause itching and lead to picking of the nose.

Vigorous nose blowing that ruptures superficial blood vessels.

Clotting disorders that run in families or are due to medications.

Drugs (such as anticoagulants or anti-inflammatories).

Fractures of the nose or the base of the skull. Head injuries that cause nosebleeds should be regarded seriously.

Hereditary hemorrhagic telangiectasia, a disorder involving a blood vessel growth similar to a birthmark in the back of the nose.

Tumors, both malignant and nonmalignant, have to be considered, particularly in the older patient or in smokers.

Primary Treatment:

1. Stay calm.
2. Sit down and lean the head slightly forward (so that the blood doesn't drip down the back of the throat and cause an upset stomach).
3. Use your thumb and index finger to firmly squeeze the entire SOFT part of the nose for AT LEAST 5 minutes. Time yourself to make sure that the nose is squeezed constantly for the full 5 minutes. If it is still bleeding, squeeze for another 5 minutes.
4. Optional: Place an ice pack across the nose.

If the nose continues to bleed:

1. Blow the nose to remove the blood clots.
2. Spray each nostril 2 times with an over-the-counter decongestant spray, like Afrin or Neo-Syneprine.
3. Squeeze the nose an additional 5-10 minutes.
4. If you can't get the bleeding to stop, call your doctor or go to the emergency room.

Prevention:

To prevent nosebleeds:

- Gently apply a thin layer of petroleum jelly (Vaseline) to each nostril 1-2 times a day as directed. You can also use saline nasal spray 2-4 times a day.
- Don't pick your nose.
- Don't blow your nose too hard.

Surgical Indications

Most nosebleeds can be controlled by cauterising the bleeding point or by packing the nose. This may be made easier by straightening the nasal septum. Those that cannot be controlled by simpler measures will need surgery to tie off (ligate) the blood supply to the bleeding point or blocking off (embolization) of the blood supply to the affected area.

Anesthetic

Operations to tie off the arteries are usually performed under a general anesthetic, with local anesthetic being applied to the nose to constrict the blood vessels and slow the bleeding. Embolization is usually carried out under heavy sedation or a general anesthetic.

Surgical Technique

Tying off arteries involves an operation to expose the artery and then tying a tight thread around the vessel to stop blood flowing through it. The ethmoidal arteries are exposed by making a small cut in the skin of the side of the nose, adjacent to the inner corner of the eye, and then pulling the contents of the eye socket sideways to expose the arteries as they come out of the contents of the socket, which lie in a fibrous covering. They are then tied or cauterized at the point where they enter holes in the bony side wall of the nose and pass into the nose. The skin incision is then stitched.

The maxillary artery is exposed by making a cut under the upper lip and removing bone from the front wall of the sinus of the cheek (the Maxillary Sinus). Bone is then removed from the back wall of the sinus too to expose the artery which runs in a pad of fat behind the sinus. The artery is blocked off with metal clips and the cut in the gum is closed with dissolving sutures.

Some surgeons will tie off the external carotid artery in the neck after making a cut in the skin over the artery and retracting muscles to reveal the artery. It is tied above the level of the branch to the tongue to avoid depriving it of blood flow. An increasingly popular technique is the tie off the sphenopalatine artery as it enters the mucous membrane of the wall of the nose. A telescope is passed up the nose and used to visualise the outer wall of the nose near the back. Instruments are passed beside the telescope and used to raise a flap of mucous membrane where the artery enters the nose, exposing the artery. The artery can then be cauterised or clipped to stop blood flow.

Embolisation of arteries is usually carried out by the Interventional Radiologist in the X-ray Department. After numbing the skin with local anaesthetic, a thin tube is passed through a needle into the main artery of the leg and up through the arterial system to the nose. Dye, which shows up under an X-ray camera, is squirted through the tube to outline the vessels. This allows the Radiologist to know where he is pushing the tube. The tube is wriggled through the system until it lies in the artery supplying bleeding point. Small particles or blobs of glue are then squirted into the vessel from the tube to block the vessel and stop it bleeding, upstream and downstream of the leaking point. The tube is then removed and pressure is exerted on the artery in the leg to prevent a bruise forming. This technique is not generally available and requires great expertise on the part of the Radiologist.

Length of Operation

Tying off the ethmoidal arteries takes 15 to 30 minutes. Tying off the external carotid artery takes 20 to 40 minutes. Tying off the maxillary artery takes up to an hour. Tying off the sphenopalatine artery takes 10 to 20 minutes. It may take longer if bleeding is profuse and may be impossible if the surgeon is unable to see clearly. It may be necessary to tie off more than one vessel. This may extend the operating time.

Embolisation of an artery may take 30 to 90 minutes. Again multiple embolisations may be necessary which may prolong the procedure.

Time in Hospital

In general most patients are discharged within 48 hours of bleeding stopping unless they have other problems such as anaemia and require a blood transfusion.

Time off Work/Limitations

Any patient who has had a severe nosebleed should be discouraged from forceful nose blowing for 2 to 3 weeks after it has stopped as this may promote further bleeding. They should also be encouraged to sneeze with their mouth open for at least 2 weeks. Nasal obstruction may be reduced by the judicious use of blood vessel constricting nasal sprays, saline nasal douches and gentle sniffing.

Strenuous exercise and heavy lifting are to be discouraged for 4 weeks. Nose picking may also promote further bleeding and is to be discouraged. A dry environment may promote crusting and wasting (atrophy) of the nasal lining, which may in turn promote further bleeding.

Risks and Complications

The operation to tie off the ethmoidal arteries may cause a temporary black eye. Theoretically the eye sight can be affected by retracting the contents of the eye socket but in practise this very rarely happens. Tying off the external carotid rarely causes any complications other than a scar, although there are a variety of delicate nerves which need to be carefully identified and preserved during the procedure if one is to avoid a numb or weak tongue. The cross flow of blood from other arteries to the other structures supplied by the artery tends to prevent a lack of blood flow to the face. Blindness may very

occasionally occur if the artery to the eye aberrantly arises from the external carotid artery rather than the internal carotid artery.

Tying off the maxillary artery may cause problems with numbness to the face and upper teeth, a persistent hole between the mouth and the sinus through the gum incision (oro-antral fistula). It may also fail to stop bleeding as the artery may be tricky to identify in the fat behind the back wall of the sinus. Tying off the sphenopalatine artery is usually effective unless a tortuous nasal passageway or excessive bleeding makes it difficult to see the vessel as it enters the nose. This may result in misplacing the clip or inadvertent division of the artery rather than tying it off. This tends to cause more bleeding.

Embolisation of nasal vessels is not risk free. As with any procedure which involves the passing of a tube into the arteries supplying the brain there is a 1% risk of causing a stroke either by dislodging particles which fly off into the artery and block one or several of the branches. Occasional severe allergic reactions occur to the dyes which are used.

Outcome and Prognosis

In general tying off vessels and embolisation are very successful in controlling nosebleeds. Where there is a disorder of blood clotting this has to be treated as well or surgery/embolisation is not likely to succeed.

Alternative Treatments

Less invasive measures such as compression of the nose, packing, warm water irrigation and blood vessel constricting sprays have usually been tried and failed before ligation or embolisation are required. Once this point has been reached there are no other alternative treatments.

When should an otolaryngologist be consulted?

If frequent nosebleeds are a problem, it is important to consult an otolaryngologist. An ear, nose, and throat specialist will carefully examine the nose using an endoscope, a tube with a light for seeing inside the nose, prior to making a treatment recommendation. Two of the most common treatments are cautery and packing the nose. Cautery is a technique in which the blood vessel is burned with an electric current, silver nitrate, or a laser. Sometimes, a doctor may just pack the nose with a special gauze or an inflatable latex balloon to put pressure on the blood vessel.

Tips to prevent a nosebleed

Keep the lining of the nose moist by gently applying a light coating of petroleum jelly or an antibiotic ointment with a cotton swab three times daily, including at bedtime. Commonly used products include Bacitracin, A and D Ointment, Eucerin, Polysporin, and Vaseline.

Keep children's fingernails short to discourage nose picking.

Counteract the effects of dry air by using a humidifier.

Use a saline nasal spray to moisten dry nasal membranes.

Quit smoking. Smoking dries out the nose and irritates it. Tips to prevent rebleeding after initial bleeding has stopped

Do not pick or blow nose.

Do not strain or bend down to lift anything heavy.

Keep head higher than the heart.

If rebleeding occurs:

Attempt to clear nose of all blood clots.

Spray nose four times in the bleeding nostril(s) with a decongestant spray such as Afrin or Neo-Syneprine.

Repeat the steps to stop an anterior nosebleed.

Call a doctor if bleeding persists after 30 minutes or if nosebleed occurs after an injury to the head.

Nosebleeds: Treatment and Prevention

Treatment:

1. Stay calm.
2. Sit down and lean the head slightly forward (so that the blood doesn't drip down the back of the throat and cause an upset stomach).

3. Use your thumb and index finger to firmly squeeze the entire SOFT part of the nose for AT LEAST 5 minutes. Time yourself to make sure that the nose is squeezed constantly for the full 5 minutes. If it is still bleeding, squeeze for another 5 minutes.
4. Optional: Place an ice pack across the nose.

If the nose continues to bleed:

1. Blow the nose to remove the blood clots.
2. Spray each nostril 2 times with an over-the-counter decongestant spray.
3. Squeeze the nose an additional 5-10 minutes.
4. If you can't get the bleeding to stop, call your doctor or go to the emergency room.

Alternatives:

There is an over the counter product named Nosebleed QR that may be of benefit to patients with frequent nosebleeds who need help stopping an active nosebleed. This should not be considered an endorsement of any particular product, but it may be helpful to you.

Prevention:

To prevent nosebleeds:

1. Gently apply a thin layer of petroleum jelly (Vaseline) to each nostril 1-2 times a day as directed. You can also use saline nasal spray 2-4 times a day.
2. Don't pick your nose.
3. Don't blow your nose too hard.

If you go to your health care provider with a nosebleed, he or she will have you sit up and lean forward to determine the rate and site of the bleeding. Your provider may check your pulse and blood pressure and take a blood sample to check for anemia and your blood type in case you need a transfusion.

How is it treated?

First aid for a nosebleed includes these steps:

- When your nose starts bleeding, sit up and lean forward to prevent blood from passing into your throat, which may cause choking.
- Pinch the nose firmly together between the thumb and index finger, just below the nasal bones,

- and hold it for 10 minutes.
- Moisten a cotton ball or pad with a saline nasal spray and press it against the bleeding part of the nose if possible.
 - Continue to sit quietly and press on your nose.
 - After the bleeding stops, apply zinc oxide to the septum to prevent drying and abrasions. Also, use a saline nasal spray to keep the nose moist.
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- If a nosebleed lasts more than 20 minutes or doesn't respond to first aid, call your health care provider.
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- If you go to your health care provider with a nosebleed, he or she will likely apply a cotton ball soaked in epinephrine, or a nose drop to the site of the bleeding for 5 to 10 minutes.
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- If the bleeding starts again, your provider may apply a cotton ball soaked in stronger medication for 5 minutes in order to numb and temporarily reduce the blood supply to the mucous membrane.

Most anterior nosebleeds respond to direct pressure. If this doesn't work, your health care provider may numb the site of the bleeding again, then pack your nose. Packing for anterior nosebleeds is less complicated and more comfortable than the packing required for posterior nosebleeds.

Your health care provider may use a procedure called cauterization to force the blood to clot (coagulate) at the bleeding site.

Your provider must remove any packing. Severe bleeding and improperly handled packing can be fatal. Treatment, especially for posterior nosebleeds, may sometimes include hospitalization.

How long do the effects last?

Most nosebleeds stop by themselves within 10 minutes.

How can I take care of myself?

Follow the treatment prescribed by your health care provider. In addition you can:

- Use a cool-mist humidifier.
- Keep a nasal spray on hand.
- Put bacitracin ointment, Vaseline, or a saline nasal spray inside your nostrils to control dryness.
- Check with your health care provider about any other medications you may be using. Nosebleeds may be more severe or frequent if you are taking aspirin.
- Don't use cocaine.
- Don't smoke.
- Limit your intake of spicy and hot foods and hot liquids.
- Don't take hot showers.
- Avoid bending over, straining, and lifting heavy objects. Don't exercise vigorously for a few days.
- Use a laxative to avoid straining during bowel movements.
- If you have another posterior nosebleed, contact your health care provider.

How can I help prevent a nosebleed?

Some causes of nosebleeds can be prevented or managed as follows:

- When you have a nasal infection, keep your nasal septum well coated with a petrolatum-based ointment or an antibiotic ointment until your nose heals (usually 3 to 5 days). Then apply the ointment regularly to the nasal septum to prevent drying and breakdown of the membranes.
- Avoid injuring the nasal mucosa with nose-picking, rubbing, or forceful blowing.
- Keep your home humidified.
- Control minor recurrent nosebleeds by applying cotton balls or pads soaked in Xylometazoline nasal drops.

• **Special Instructions:**

1. Apply Saline Nasal Spray into both nostrils 3 to 6 times a day to keep the membranes moist and promote healing. 2. Apply bactroban on a Qtip GENTLY inside each nostril twice a day for at least a month. 3. When bleeding actively, roll a cotton ball into a "cigarette shaped cylinder" and gently put it inside each nostril, and then soak the cotton with AFRIN. 4. Leave the packs in for 10 minutes and then gently pull them out. 5. Avoid blowing your nose until the nasal lining tissue is fully healed.