

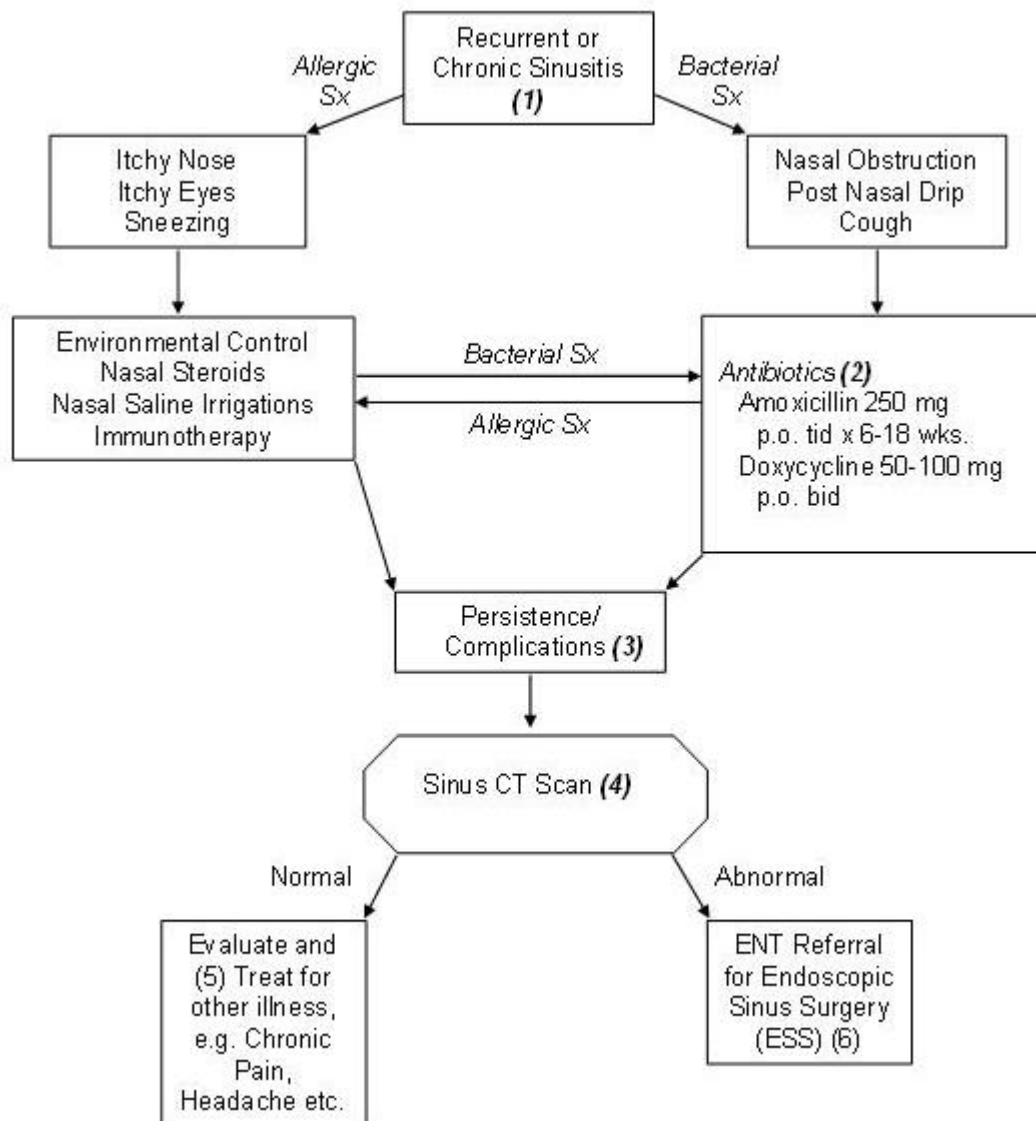


Ambulatory Healthcare Pathways for Ear, Nose, and Throat Disorders

NOSE

- A. [Sinusitis](#)
- B. [Allergic Rhinitis](#)
- C. [Anosmia](#)
- D. [Epistaxis](#)

SINUSITIS



[1] Definition: Chronic sinusitis is a mucociliary transport abnormality in which the paranasal sinuses are neither aerated nor drained. As a consequence low-grade bacterial infection ensues. While pain is common it is difficult to distinguish the pain of chronic sinusitis from that of headache. Hence, the most reliable symptoms are nasal obstruction, nasal congestion, postnasal drip, cough, not feeling well and finally facial pain. Chronic sinusitis is a sinus infection that persists for periods of 6 or more weeks.

Recurrent sinusitis is a similar illness in which the disease responds to antibiotics, but then after normal health, once again recurs. Typically the infections are recalcitrant to treatment and often require 3 or more weeks of antibiotics.

[2] Antibiotics: The key to antibiotic therapy of chronic sinusitis is to provide the antibiotic for an extended period of time to allow the mucociliary transport system time to recover. This is typically 6-12-18 weeks. The antibiotics suppress bacterial infection while the mucociliary transport system recovers. Because there is significant morbidity to potent high dose antibiotics taken over these extended periods, the typical prescriptions are for penicillins, tetracyclines and erythromycins. These are prescribed in low-doses and are taken for a long period of time. Amoxicillin 250mgs 3 x a day is the preferred medication. Doxycycline is an alternate medication. Cephalexin, 250mgs orally 3x days is an alternative for those who claim cutaneous penicillin allergy. The key to the antibiotic therapy is the 6-12 weeks duration.

[3] Complications: These include extension of disease into the orbit or CNS.

[4] Sinus CT Scan: The CT scan is the hallmark of the failure of medical therapy. The CT scan should be taken at a time that the patient is ill. If it is abnormal, then the patient indeed has chronic sinusitis and it is presumed that endoscopic sinus surgery will be indicated and will provide benefit. If the CT scan, taken at a time when the patient is ill, is absolutely normal, then it is presumed that the illness is not a chronic sinusitis. The illness will not respond favorably to surgical intervention. The presumed diagnosis is some other illness, such as, midfacial pain syndrome, which is a chronic pain syndrome -- or one of the trigeminal headaches. Further medical evaluation and therapy is indicated.

[5] Evaluate and Treat: The trigeminal nerve modulates many illnesses of which chronic sinusitis is only one. The differential list of frontal headaches is all modulated by the trigeminal nerve. If the pain is localized over the sinuses, some describe this as a midfacial pain syndrome. Surgical therapy has provided no benefit for these individuals. Further medical evaluation is indicated. If no other specific diagnosis is reached, a midfacial pain syndrome diagnosis is made and the patient is treated with chronic pain medication.

[6] Endoscopic Sinus Surgery (ESS): ESS is an operation which opens the individual sinus

ostia and restores normal mucociliary transportation. For those individuals with chronic or recurrent sinusitis the operation has a 90% success rate with low morbidity in the hands of the experienced, rhinologic surgeon.

- A. Nasal medicaments include decongestants, mucolytic agents, topical decongestants, antihistamines, nasal and systemic steroids and leukotriene inhibitors. The following list these by generic names:
1. Decongestants
 - a. pseudoephedrine
 - b. phenylpropanolamine
 2. Mucolytic agents
 - a. water
 - b. garlic
 - c. guaifenesin
 - d. iodine
 - e. nasal saline drops
 - f. nasal saline irrigation
 3. Topical decongestants
 - a. neosynephrine
 - b. oxymetazoline
 4. Antihistamines
 - a. non specific:
 - diphenhydramine (Benadryl®)
 - others
 - b. H1 specific:
 - oral
 - topical
 5. Steroids
 - a. topical nasal steroids
 - b. oral steroids
 6. Leukotriene inhibitors
 7. Antibiotics
 - a. tobramycin
 - b. gentamycin
 8. Antifungal agents

There is little science and much individual opinion about the treatment of the common cold. We recommend nasal saline, garlic, horseradish, and lots of water. Chicken soup is recommended as a treatment for the common cold. Its efficacy is probably related to the garlic. It is therefore an excellent treatment for it contains fluids, salts, and the garlic

which stimulates rhinorrhea. Antihistamines concentrate and increase the viscosity of nasal mucus and impair mucociliary clearance. They are therefore counterproductive. They may provide benefit for individuals with allergic rhinitis. Topical decongestants are addictive, but many physicians recommend their judicious use. Oral decongestants remain efficacious. Systemic steroids suppress immunity and are not normally prescribed. Topical nasal steroids are indicated for the treatment of allergic rhinitis. Their benefit for infection and anatomic abnormalities has not been investigated. Tylenol and NSAIDS are recommended for malaise and/or pain.

- B. Amoxicillin 250 mg p.o. tid is the drug of choice for acute sinusitis. It is the author's experience that this low dose works. Many experienced physicians use higher doses such as 500 mg tid or 875 mg bid. If the patient fails to respond or relapses the addition (NOT SUBSTITUTION) of Augmentin® 250 mg provides amoxicillin 250 mg + clavulanic acid. The amount of clavulanic acid in Augmentin® 250 and 500 is the same. The Augmentin® supplement is only taken while the patient is ill, usually 3–7 days. The patient completes the antibiotic course with amoxicillin 250 tid. This is cost-effective and minimizes the occurrence of side effects such as intestinal disturbance and yeast or fungal infection.
- C. If the penicillin allergic patient fails a second generation macrolide, a second generation cephalosporin effective against *H. influenzae* and *M. catarrhalis* can be given or a quinolone can be prescribed.
- D. Ciprofloxacin or other quinolone is given when the patient persists or relapses after beta lactam resistant antibiotic treatment. It is effective against *Pseudomonas* and methicillin resistant *Staphylococcus*. While ciprofloxacin was the first available quinolone and is the best for *pseudomonas*, others are available.
- E. These are low dose, low side effect, long-term antibiotic treatments. These prescriptions are continued until the patient is well and then half again as long. They can be administered for 6, 12, 18, or more weeks. The long-term toxicity and risk of low dose antibiotics is less than even the shortest of general anesthetics.
- F. Complications include periorbital infection and brain abscess. Frontal and sphenoid sinusitis also requires prompt aggressive treatment and early referral because of their propensity to cause meningitis and brain abscess.
- G. Diagnosis is a clinical one. Sinus CT without contrast is used to determine operative strategy. Plain film sinus x-rays have limited utility in the diagnosis of acute sinusitis and are of no value in the evaluation of chronic sinusitis.

The diagnosis of sinusitis is made from the clinical history. The most important symptoms are fatigue, nasal obstruction, post nasal drip, cough and nasal congestion. Pain is not a useful symptom as there are many causes of facial pain. The reason the primary care physician (PCP) orders the CT is to save the cost of a specialist visit.

If you believe the patient does not have sinus disease, but rather sinus headaches, order the CT when the patient is at their worst, for when they see that the x-ray is normal they will realize they do not need antibiotics and do require other treatment.

Overview of Sinusitis

Acute sinusitis is extremely common. Most upper respiratory tract viral infections develop a mucopurulent rhinorrhea. Virtually, all of these involve the sinuses. The average American suffers acute viral rhinosinusitis twice annually.

Fortunately, most of these resolve and as the underlying mucosa regains its integrity, the bacterial infection resolves.

Acute bacterial sinusitis is caused by mucociliary transport obstruction at the sinus ostia. This may be inflammation in the anterior ethmoids with secondary obstruction of the maxillary and/or frontal sinus drainage systems or it can be swelling and obstruction of the ostia directly, all of the above are compounded by anatomic narrowing and by previous inflammation with resultant cicatricial scarring.

The two most common causes of acute ostial obstruction are the common cold and allergic rhinitis. In these situations the ostia are narrowed and the mucociliary transport systems of the sinuses are impaired. Secretions stagnate and are infected by the ever present upper respiratory tract bacteria including: *Streptococcus*, *H. influenza*, *M. catarrhalis* and occasionally *Staphylococcus* and *Pseudomonas*. Bacteriology according to Dr. Fairbanks is listed in Table I.

Table 1.

	Children	Adults
<i>S. pneumoniae</i>	35-42%	20-43%
<i>H. influenzae</i>	21-28%	22-35%
<i>M. catarrhalis</i>	21-28%	2-10%
<i>Strep. Species</i>	3-7%	3-9%
<i>Anaerobes</i>	3-7%	0-9%
<i>Staph. aureus</i>	-	0-8

The treatment for acute bacterial sinusitis is antibiotics. The ancillary nasal medicaments are the art of medicine, and while they may improve patient comfort, have no proven benefit for outcome. Antibiotic therapy is driven by susceptibilities. Those relative to sinusitis are listed in Table 2. according to Dr. Fairbanks.

Most patients respond to antibiotics within 36– 48 hours. If within this period they fail to respond or continue to worsen, one assumes the bacteria are resistant to the antibiotic and second line antibiotic therapy is recommended.

Table 2. Susceptibility of Isolates of PK/PD Breakpoints
Percentage of Strains Susceptible

Agents	<i>S. pneumoniae</i>	<i>H. influenzae</i>	<i>M. catarralis</i>
Amoxicillin/clavulanate	92	98	100
Amoxicillin	92	70	7
Cefixime	66	100	100
Cefpodoxime	75	100	85
Cefdinir	76	100	85
Ceftriaxone	96	100	94
Cefuroxime	73	83	50
Erythro-clarithromycin	72	0	100
Telithromycin	84	?	100
Azithromycin	71	2	100
Clindamycin	90	0	0
Doxycycline	80	25	96
Resp. quinolones	99	100	100
TMP/SMX	64	78	19

Acute isolated frontal and sphenoid sinusitis is uncommon, but when it occurs, is concerning because of its immediate proximity to the brain and potential to cause meningitis and brain abscess. If frontal or sphenoid sinusitis fails to respond within 24 hours, it requires aggressive treatment, including IV antibiotics. If it does not respond to intravenous antibiotics, surgical drainage is indicated. Emergent frontal sinusitis presents with isolated frontal sinus pain of acute onset. The patient is sick and has fever. The white count is elevated with a left shift. The sinus is tender to percussion. Emergent sinus CT scan is indicated. If abnormal, the patient is admitted for IV antibiotic therapy. Failure to improve within 24 hours is an indication for emergency surgery.

The same paradigm is true for sphenoid sinusitis and ethmoid sinusitis with periorbital

cellulitis or abscess.

Recurrent sinusitis is the diagnosis for those who clear the sinus infection, but very shortly after discontinuing antibiotic therapy, develop a new infection. This can be from a narrowed, scarred, or otherwise damaged sinus drainage, or it can result from ongoing allergic or other inflammatory rhinitis. Low dose prophylactic antibiotics are indicated, but if, after 6–12 weeks of antibiotics the sinusitis again recurs, the prognosis without surgical drainage is poor.

Chronic sinusitis is an entirely different illness. To understand chronic sinusitis one must understand the mucociliary transport system.

The nose and paranasal sinuses are lined with upper respiratory tract epithelium. This is an epithelium with cilia covered by a mucus blanket floating on a layer of saline. Bacteria, irritants and other particulate matter are trapped in the mucus layer and then carried along by the ciliary motion out of the sinuses, to the back of the nose, and into the pharynx. If the mucociliary transport system is impaired, the sinuses will be chronically infected. Aerobes and anaerobes are easily grown. Culture and sensitivity and stronger and stronger antibiotics provide little benefit. Attention must be directed towards the cause of the mucociliary transport system impairment. This may be anatomic or it may be scarring from repeated infections. Very often it is caused by or worsened by allergy and very often it is worsened by the irritants present in today's polluted air. If the cause cannot be identified and corrected, the patient is chronically infected, congested, obstructed, and ill with sinus symptoms such as pain, postnasal drip and cough.

If a patient with sinusitis continues to have symptoms after 6-12 weeks of appropriate antibiotic and nasal steroid therapy, ENT referral is indicated.

With the advent of nasal endoscopy and sinus CT, we have come to learn that plain sinus radiographs are misleading so much of the time, that they are of no benefit. Even the presence or absence of maxillary and frontal sinusitis is often misinterpreted on plain radiographs. Plain sinus radiographs are virtually never requested.

The diagnosis of sinusitis is made on the basis of history and physical examination. Sinus CT is ordered primarily as a "road map" for the operating surgeon. It can be ordered, however, to document presence and extent of disease.

If a patient is being referred for an ENT consultation, one should request a sinus CT prior to the visit.

MRI is a poor imaging examination for sinus disease and would never be ordered in lieu of sinus CT. If diffuse sinusitis is present on MR, a sinus CT will be indicated.

Lastly, sinus CT is not the end all for evaluating sinus disease. Some individuals with sinus symptoms and normal sinus CT will be found to have chronically inflamed sinus mucosa at surgery. This group does benefit from sinus surgery despite negative imaging studies. Endoscopic sinus surgery has become the surgery of choice for sinus disease. Conversely, the old surgical procedures including Caldwell-Luc, nasal antral windows, external ethmoidectomy, etc. are rarely recommended.

Endoscopic sinus surgery evolved from the understanding of the mucociliary transport system and a realization that the best way to obtain normal healthy sinuses is to enlarge the natural sinus ostia.

Once an improved drainage system is established, the diseased sinus mucosa reverts to normal.

The surgery is relatively safe and is performed as an outpatient. Discomfort is minimal, convalescence is short, and complications are few. Overall success rates are around 90%.

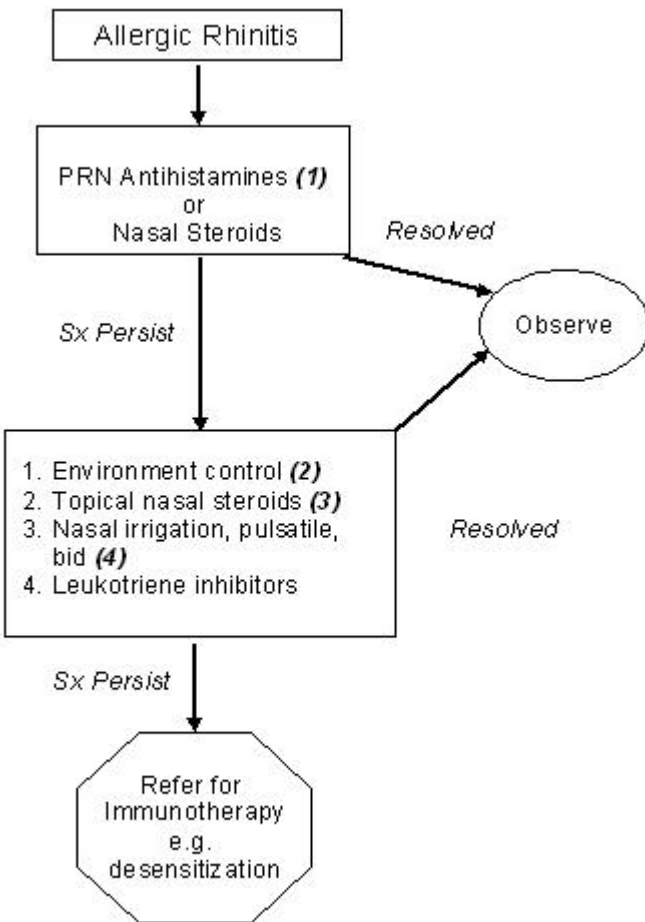
There are certain conditions in which the prognosis is less than 90%. Individuals with the ASA sensitivity or sampters triad (asthma, aspirin sensitivity, and nasal polyps) do poorly with all treatments. They can be improved with sinus surgery. We do not speak of cure, we speak of control, and for many, surgery has improved control significantly.

Nasal polyps are felt to be a result of inflammation, present in those with infection, allergy, and other sources of irritation. Patients with nasal polyps do benefit from endoscopic sinus surgery, but the cure is only as good as the subsequent control of the underlying inflammatory rhinitis. Post polypectomy treatment is twice daily pulsatile nasal irrigation and topical nasal steroids. This treatment continues for life.

Many patients with asthma have allergic rhinitis and chronic sinusitis. Endoscopic sinus surgery will improve the sinus disease. Those individuals, whose asthma worsens during flare ups of their nasal and sinus illness, will have marked benefit in their nose and their lungs following sinus surgery. Carefully selected groups will have very high cure rates; poorly selected groups will have limited benefit.

Many HIV infected patients will develop sinonasal disease as their HIV illness progresses. These patients will benefit greatly from endoscopic sinus surgery followed by twice daily nasal irrigations. Many children and young adults with cystic fibrosis will have sinonasal disease; many will have nasal polyps. These people also benefit from early endoscopic sinus surgery followed by aggressive nasal irrigations.

ALLERGIC RHINITIS



- A. Simple allergic rhinitis is traditionally managed with antihistamines. Non specific antihistamines are available over the counter and are most often combined with a nasal decongestant such as pseudoephedrine, in part to enhance their efficacy and in part to counteract the side effect of drowsiness. H1 specific antihistamines are less likely to cause drowsiness. Different individuals respond differently to the different antihistamines. There does not seem to be a single “best” antihistamine for all.
- B. Environmental control is complex. There are excellent free patient handouts provided by companies that benefit from the sale of the equipment. The following are our general recommendations.

House Dust:

House dust is partially composed of the breakdown products of natural plant and animal fibers. If the fibers or materials that makeup a large part of the home furnishings (rugs, curtains, stuffed furniture, bedding, etc.) are replaced with synthetic materials (nylon, acetate, polyester, etc.), which are nonbiodegradable, many of the sources of house dust will be eliminated.

Bedroom:

Since a large part of each 24-hour day is spent in the bedroom, dust control in this area should be more vigorous.

1. Remove stuffed or upholstered furniture.
2. Furniture should have smooth plastic, metal, or wood finishes.
3. Remove from the room and the adjoining closet all stored books, toys, clothing, bedding, etc. which collect and produce dust. Such articles that must be stored in the bedroom should be placed in plastic bags and sealed.
4. Bare wood or tile floors are best; if a rug seems necessary, washable throw rugs are best. Any rug should be 100 percent synthetic and the pad should be foam or rubber.
5. Curtains or drapes should be easily washable and made of synthetic material, although cotton is permissible.
6. Forced-air heater ducts leading to the bedroom should be closed off or a polyester filter should be replaced often during the winter months.
7. Bedding must be of synthetic material and laundered frequently. Avoid feather or kapok filled pillows. Mattresses and box springs should be covered by zippered, vinyl mattress covers. These may be purchased at most large department stores.
8. Windows and doors leading to the bedroom should remain closed as much as possible.
9. Walls, ceilings, and floors should be washed. Daily cleaning with a damp mop and a damp cloth is important.
10. Vacuums disperse large amounts of dust particles into the air; therefore, it's best to have the allergic person outside the home during and for at least two hours after running the vacuum. If the allergic individual does the vacuuming, a mask should be worn.

Special Items:

1. Pets, furry or feathered, should not be allowed in the home at any time.
2. House plants should not be placed in the bedroom; the soil contains mold and biodegradable material which can be extremely allergenic.
3. Mold (mildew, fungi) are associated with damp places and can be eliminated or retarded by lowering the humidity via vents, fans, heaters, etc. and by using mold retardants such as Captan® (Orthofungicide), (can be purchased at a local nursery). Zephiran® (benzalkonium chloride) 1:750, found in pharmacies. Other commercially available mold retardants such as Lysol® can also be used. Captan®, is nonpoisonous to humans, and may be sprayed through a garden spray; use eight tablespoons of 25% solution or four tablespoons of 50% powder per gallon of water. Zephiran® (full strength) may be sprayed on walls, etc.

4. Air cleaners or air purifiers are very helpful. Portable units should be placed in the bedroom at a location where the clean airflow is across the head of the bed. Larger units are also available which are incorporated with your existing forced air heating system. There are two basic types of air cleaners in the market, a HEPA filter or an electronic air cleaner (electronic precipitator). Both appear to work well, but the HEPA filter is thought to be the most efficient. Air cleaners may be rented to assess usefulness. Rental fees are usually applicable to sale price.
5. Tobacco smoke is an irritant to the respiratory system and smoking should not be allowed in the home.

Environmental Control Products:

1. Allergy Control Products: <http://www.allergycontrol.com/>
2. National Allergy Supply Incorporated: <http://www.natlallergy.com/>

- C. Nasal steroids provide impressive treatment for allergic rhinitis. They should be used daily, as their benefit derives from suppressing both the short and the long-term inflammatory allergic response. All the nasal steroids have similar efficacy. The newer nasal steroids have seemingly fewer side effects, i.e. nasal irritation and bleeding and require only once a day administration.
- D. Nasal irrigation. There are three commercially available nasal irrigation systems. The first is produced by [Hydro Med](#) and is called the Grossan Hydro Pulse Nasal/Sinus Irrigation System. Ethicare also makes a nasal irrigation system. [Ethicare](#) makes a nasal irrigator that attach to a Teledyne Water Pik. All three irrigation systems are equally effective. As the Grossan and the Ethicare systems are designed exclusively for nasal irrigation, it may be easier to obtain medical insurance reimbursement. Which system you use is a matter of personal preference. Grossan and Kenwood both provide premade additives. I have found that commercially available table salt is effective and inexpensive. Some patients, however, have preferred the pre-mixed solutions.

The following instructions are the same for any of the nasal irrigation systems.

Assemble the nasal irrigator as instructed in the materials. Turn the water control to the lowest setting. Select and attach the nasal irrigator. The nose is best washed with diluted salt water. No salt or too much salt will cause irritation or a burning sensation. Most people use 1 level teaspoon of common table salt in 500 milliliters (1 pint) of water. Tap water is generally sterile and is excellent for nasal irrigation. The water temperature is controversial. Some like cold water and some like it hot. 98.6° Fahrenheit, (37° centigrade) is the body temperature ideal for nasal irrigation. The coolest water that should be irrigated through the nose is 72o Fahrenheit and the

warmest 102° Fahrenheit.

If you select the Grossan or the Ethicare Nasal Irrigation systems, they come with a nasal adaptor. If you select the Teledyne irrigation system, these are sold in drug stores. You will require an adjustable model. You will need to obtain a special nasal adaptor. These are available from Ethicare.

1. The first is Hydro Med [<http://www.hydromedonline.com/>] which provides the Grossan Nasal Irrigator, telephone number (800) 560-9007.
2. The second is the Ethicare [<http://www.ethicare.com>] nasal irrigator, telephone number 800) 253-3599.

Some of these companies produce their own water delivery system. The pulsatile irrigation is the key to success. Non-pulsatile systems are considered less effective, but better than no irrigation.

Fill your nasal irrigator with the chosen water temperature and salt concentration. Turn the unit on and lean over the sink. Place the irrigator up to your nose. Let the water run into your nose. It will run out the opposite side or out your mouth. Tilt and twist the irrigator side to side and up and down directing the water flow into all portions of the nasal cavity. When the first nostril feels clean, switch to the opposite side. You can irrigate with one quarter of the bowl, one half of the bowl or the entire bowl. You irrigate until your nose feels clean. This can be repeated once twice or even 3 times during the day. As you get accustomed to the water cleaning your nose, you can increase the water pressure.

Tobramycin

In some cases, patients will be advised to irrigate with an antibiotic called Tobramycin. The Tobramycin bottles will require prescriptions, typically as Tobramycin 80 mg./2cc., dispense 10 vials. Appropriate syringes will be provided by the pharmacy or physician's office. Using a syringe, draw up to 1/2 cc. (20 mg.) of Tobramycin. This is added to the last 30-50 cc (2 oz.) of fluid in the irrigation bowl. Irrigate the first half of this through your right nostril, and the second half through your left nostril. Stronger concentrations may cause nasal irritation. Weaker concentrations may not deliver as much antibiotic as would be ideal.

Tap water is generally sterile, and so infection has not been a problem. By the same token, the Tobramycin in the syringes will keep the syringes sterile, so they can be reused for up to ten treatments.

If Tobramycin is not covered by your insurance company or is not available to you, Gentamicin can be used. The same final concentration, namely 20 mg in 30-50 cc of nasal irrigant is recommended.

Overview of Allergic Rhinitis

Allergic rhinitis affects 30–40 percent of Americans. It is a very common illness. Inhalant allergens typically include dust mites, molds, animal dander, (cats more than dogs), and botanical pollens, typically trees and grasses.

The symptoms of allergic rhinitis are itchy nose, itchy eyes, and sneezing. Symptoms of obstruction and rhinorrhea are caused by allergic rhinitis, but are also caused by bacterial sinusitis and are not normally helpful in the differential. The occasional “attack” of allergy is well treated with an antihistamine. H1 specific antihistamines are less sedating and for those who take them on a regular basis, seem superior to the over-the-counter antihistamines or antihistamine/decongestant combinations.

For the patient with allergic rhinitis who does not obtain adequate relief with antihistamines, treatment with nasal steroids is recommended. Leukotriene inhibitors may provide additional benefit.

The key to the treatment of allergic rhinitis is environmental control.

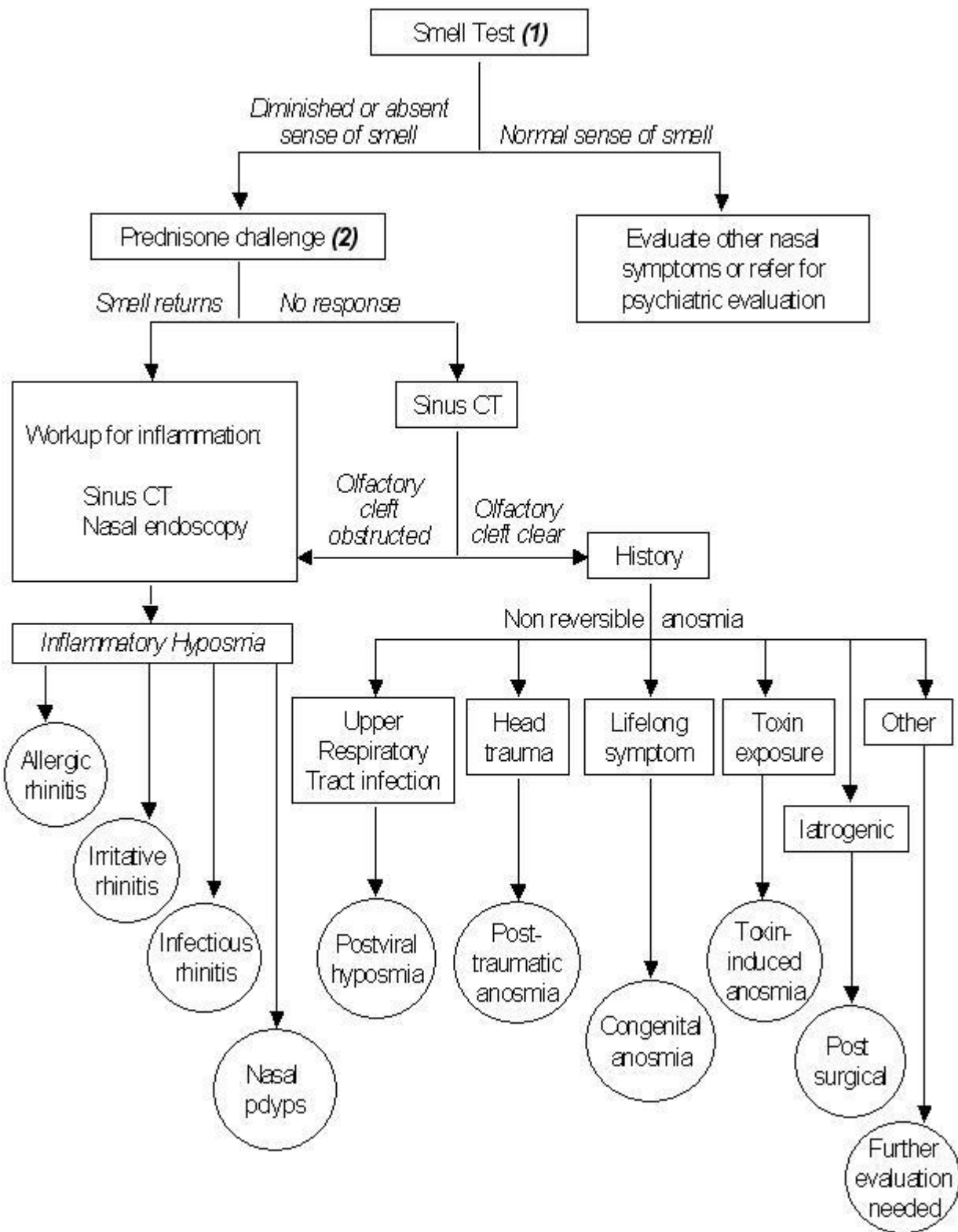
Most allergy product companies have educational materials with appropriate product information. These can be obtained easily by the primary care physician. In fact, many of the companies who provide the products for environmental control have very nice brochures with excellent information available at no charge. They are more than willing to send 50 or 100 at a time.

Environmental control combined with nasal steroids will successfully manage a large percentage of individuals with allergic rhinitis. Those with other underlying illness such as anatomic nasal obstruction or chronic sinusitis may benefit from ENT consultation and surgery. The individual with unrelenting allergic rhinitis may benefit from desensitization.

While I am a proponent of desensitization, it is a tremendous undertaking. The underlying allergies are identified and then a special desensitization serum is custom made and administered to the patient 3 times a week for the first six to twelve months and once a week for a long time thereafter. This is expensive and a major time commitment.

Nasal irrigation is an ancillary procedure, which we at the [UCSD Nasal Dysfunction Clinic](#) have found to provide substantial benefit to those with allergic rhinitis. Irrigating the nasal cavity once or twice a day either washes away enough of the allergen laden mucus or by some other mechanism provides sufficient benefit that many patients report tremendous relief.

ANOSMIA



A. The best smell test is an olfactory threshold with an odor identification test. The second best test is the University of Pennsylvania Scratch and Sniff Test (UPSIT). The third

best and easiest to use, is the AST (Alcohol Sniff Test). Unwrap an isopropyl alcohol wipe. Ask the patient to sniff and determine that they can identify the isopropyl alcohol odor. With the patient's eyes closed and with normal respiration (i.e., no sniffing and no deep inhalation) place the alcohol pad 20cm under the nose (essentially mid sternum). Slowly move the pad closer and closer to the nose.

Normosmics detect the alcohol at a distance greater than 10 cm. Hyposmics detect the alcohol between 5 and 10 cm and anosmics cannot smell the alcohol. They may feel it (trigeminal), but they cannot smell the isopropyl alcohol. One, 2, 3, or even 4 cm is severe hyposmia.

B. Prednisone course: 60 mg p.o. q am x 5 days.

Overview of Smell Loss

Smell impairment affects 1–2% of Americans and while it is true that some do not complain, for many it is a significant sensory loss. The majority of food appreciation comes from olfaction. Those who are smell impaired have lost their ability to taste and appreciate the flavors of food. In addition, it represents a health hazard, for they cannot smell smoke, the early warning sign of fire. They cannot smell the odorants placed in propane and natural gas to warn of gas leaks. They cannot detect the odors of spoiled and rotten foods and are therefore at risk for recurrent food poisoning.

Smell testing is not generally available. The alcohol sniff test described above is a very good screening test. The average ENT physician and neurologist is neither skilled nor interested in smell impairment; therefore, individuals often need to be treated by their primary care physician or referred to a center with interest and expertise in olfaction.

In non-demented individuals, one third of smell impairments are caused by inflammatory nasal disease. Other common causes are upper respiratory tract infection and head trauma. Olfactory loss is common in many dementias, most notably in Alzheimer's and in Parkinson's disease. Olfactory loss is also seen with aging.

The differential diagnosis for smell impairment is lengthy, but for most diseases it is only one of a myriad of signs and symptoms. For the interested physician, there are numerous articles and even textbooks on the subject.

The suggested ambulatory pathway is reasonable. The prednisone challenge, combined with a history looking for viral, traumatic and inflammatory nasal causes, will lead to a correct diagnosis or reason for referral in the majority of cases. For those who are smell impaired, the following are the standard recommendations we offer at the [UCSD Nasal Dysfunction Clinic](#).

Special Instructions to Anosmics

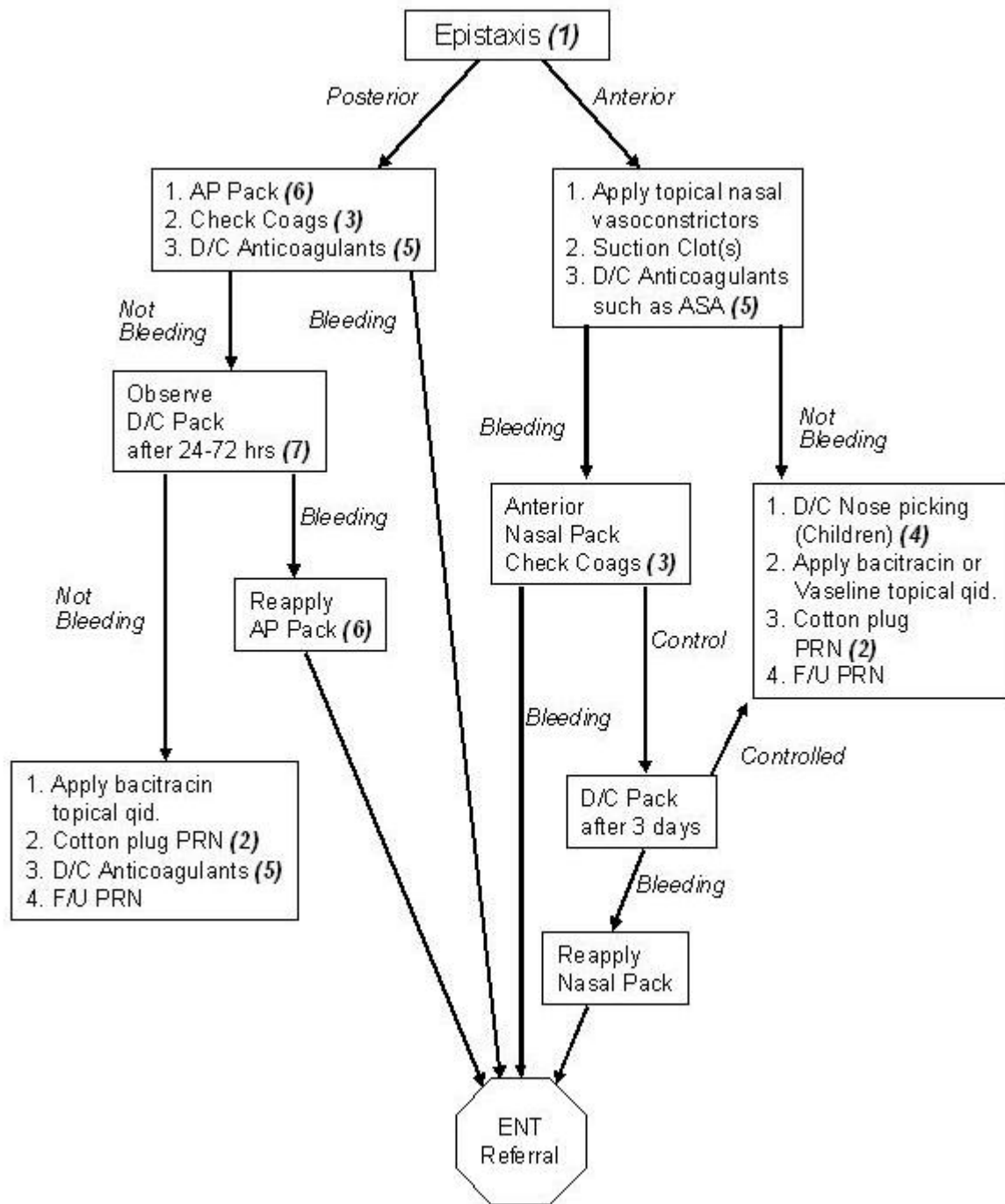
Persons who are anosmic should observe some simple precautions.

A smoke detector in the home is important. At a minimum there should be a smoke detector in the kitchen, in every room that might have a fire, such as a room with a fireplace, and in every room in which the patient might sleep, i.e. bedroom, den, etc. Smoke detectors can be battery operated or connected directly into a 110 volt AC current system. They can be obtained at most hardware, lighting or other building stores.

An electric stove is preferable to a gas stove, but a gas stove equipped with an automatic pilot improves the safety. Commercial gas detectors are available. If the house uses propane or natural gas, there should be an appropriate gas detector at each location where a gas leak might occur. Propane gas and regular gasoline are heavier than air, and so detectors for these substances should be placed near the floor. Natural gas is lighter than air and rises as does smoke. Detectors for these substances should be placed at high points such as the ceiling, top of the stairwell, etc. Propane detectors are available through propane dealers, recreational vehicle dealers, and marine stores. Natural gas detectors, propane detectors, and gasoline detectors are all available through marine facilities.

Care should be taken in preparing food, particularly leftovers, since undetected, spoiled food can be hazardous. When in doubt, discard leftovers or have a family member with a normal sense of smell confirm that the food is not spoiled.

EPITAXIS



A. Coagulation work up

1. Hemoglobin/hematocrit
2. Partial thromboplastin time
3. INR
4. Platelet Count
5. IVY Bleeding Time

B. Topical Vaseline

Vaseline applied to the anterior nose qid keeps the mucosa moist and dramatically reduces recurrent nose bleeds. For the elderly and for others with recurrent epistaxis, topical Vaseline bid is excellent prophylaxis.

C. Cotton Plug

The nose is a vascular organ and responds actively to airflow. A cotton ball saturated in bacitracin ointment positioned in the anterior nasal chamber obstructs the airflow, moistens the mucosa, and impairs bacterial growth. This places the nasal mucosa at rest and promotes healing of the damaged, dilated blood vessels.

D. Epistaxis Tray

1. Instruments:

- a. Head light
- b. Nasal speculum
- c. Frazier (neurosurgical) sucker
- d. Bayonet forceps
- e. Bandage scissors
- f. Medicine cup 2 oz.
- g. 10 cc syringes (3)
- h. Needles: 25 gauge spinal, and 27 and 30 gauge hypodermic

2. Medications:

- a. 1% lidocaine with 1:100,000 epinephrine
- b. Cocaine 160 mg (4 cc of 4% solution)
- c. AgNO₃ cautery sticks
- d. Surgicel®
- e. Bacitracin ointment

3. Anterior Packs

4. Vaseline gauze 1/2 x 36 inches (2)

5. Merocel Fast-pak Nasal Tampon® (Xomed)*

6. Rhinorocket® (Shippert Medical Tech)**

7. Posterior packs:

- a. Epistat® (Xomed)*
- b. Rapid Rhino (Allied Therapeutics) ***
- c. Epistaxis Catheter T-3100® (Bausch Lomb Surgical)****
- d. Foley catheter, #16 with 30 cc balloon
- e. 0 Silk Sutures
- f. 4 x 4 gauze sponge
- g. Umbilical clamp

E. Nose bleeds in children are either early manifestation of coagulopathy or most commonly the result of nose picking. Nocturnal nose picking is cured by placing

baseball batting or gardening gloves on the hands of the sleeping child.

- F. Many adults take one aspirin daily. Most use 325 mg p.o. daily. 80 mg will protect the heart and leave the nose alone.
- G. There are many anterior posterior (AP) nose packs. The one we use is the Epistat® by Xomed and the Rapid Rhino® by Applied Therapeutics, Inc. Other commercial AP balloons are available. You can fashion your own with a Foley balloon for the posterior choana and layered gauze for anterior packing. The AP pack is the only quick means to control posterior or difficult, diffuse epistaxis.
- H. How long to leave a posterior pack is controversial. Convention is 5 days. Three days seems to work well. Whether this can be further shortened requires case by case clinical judgment. It is difficult to find consensus on anterior-posterior packs. Having spoken with numerous ER physicians, primary care providers and practicing otolaryngologists, it is the author's opinion that a number of nose bleeds not easily controlled with simple anterior packs are controllable with balloon anterior posterior packs. More difficult posterior bleeds require ENT referral. Those requiring a posterior pack are uncomfortable and will require narcotics for the pain. There is a frequently observed phenomenon in which individuals with posterior packs have a diminished pulmonary drive and will often have decreased oxygenation. This combined with sedating analgesia mandates hospital admission and monitoring.
- I. The difficult nose bleed easily controlled with a balloon anterior posterior pack, who does not require anything more than Tylenol® for pain, whose oxygenation remains normal for an hour or two of observation in the office or emergency department, and who has strong family support to observe them, may be sent home. The decision to deflate the balloon at 24, 48, or 72 hours is made on a case by case basis.

Overview of Epistaxis

Nose bleeds are very common. The majority are controlled by time and direct pressure. Anterior rhinoscopy will often show a dilated septal mucosal vessel with an overlying sore or scab.

Treatment consists of placing the mucosa at rest with a small cotton plug and vasolinated ointment for 3–5 days. Thereafter, the individual can apply the vasolinated ointment to their nose 2, 3, or 4 times daily. For those on anticoagulants coagulation labs should be carefully checked and monitored. For patients taking aspirin for arteriosclerosis prophylaxis, 80 mg of aspirin is sufficient. Most use 325 mg daily, as the adult aspirin tablets are easier to find

and cheaper.

Most people over clean their nose most commonly with Kleenex nasal tissues. The septum is not to be rubbed. Teach patients to blow their nose without rubbing or touching the nasal septum.

If the vessel continues to bleed, it may benefit from cautery. Silver nitrate cautery will stop some. Others will require electric cautery. Never cauterize both sides of the septum at the same time for this puts the patient at risk for septal perforation. A few patients develop profuse epistaxis and these invariably come from medium sized arteries in the superior and posterior nasal cavities. These are only controlled via tamponade of the bleeding vessel, accomplished by occluding the posterior choana and the anterior naris—commonly called an anterior-posterior pack.

Assuming ENT referral is available, this is recommended. The otolaryngologist will typically vasoconstrict and anesthetize the nose and then endoscopically examine the nasal cavity. If the bleeding artery can be identified, it can be cauterized. If the bleeding is profuse and endoscopy is impossible, if the septum is tortuous, or the anatomy is such that the bleeding site cannot be seen, the otolaryngologist can place a more secure anterior-posterior pack. Treatment alternatives are then threefold. The most conservative conventional approach is to hospitalize the patient and leave the packing in place for 3–5 days. The packing is then removed and most patients are successfully discharged.

Three to five days of hospitalization is expensive. The anterior-posterior pack is uncomfortable. A surgical alternative is to anesthetize the patient, examine the nose endoscopically, and cauterize the bleeding vessel. If the septum prevents this, a septoplasty is performed. If this is not successful then the internal maxillary artery and its contributing branches can be ligated in the sphenopalatine fossa behind the maxillary sinus. These are accessed through a standard Caldwell-Luc procedure.

Fifteen percent of nose bleeds arise from the ethmoid vessels, and in these cases an additional incision will be made between the nose and the eye and the anterior and posterior ethmoid arteries clipped.

The third alternative is to perform an arteriogram. Bleeding coming from the internal maxillary artery can be embolized. The anterior ethmoid arteries arise from the ophthalmic artery which in turn arises from the internal carotid. These are not amenable to embolization.

The disadvantages of arteriography and embolization are the expense and the small risk of a stroke. The skilled interventional radiologist experienced in embolization can do this reasonably well with reasonable safety. For the most part, angiography and embolization

are ideal very sick individuals who are significantly anticoagulated and for whom surgery is not a safe option.

Nose picking is a contributing factor in epistaxis. Adults can usually be instructed to be more careful. Children pick their nose at night and this is best controlled by placing a glove or sock over their hand so that their fingers no longer fit inside their nose. Dry climates predispose to recurrent nose bleeds. Daily or twice daily application of Vaseline® provides substantial benefit. The petroleum based antibiotics are not recommended as these predispose to topical sensitivity. Bacitracin® ointment contains the necessary petroleum properties and is bacteriostatic. Other petroleum products work equally well.

There is a caveat for nose bleeds. While most are simple, straight forward problems, they are often the heralding sign of underlying coagulopathy. Hemophilia, von Willibrand's disease, thrombocytopenia, all may have epistaxis as their initial symptom.