CHAPTER 1
HEENT Pitfalls

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Introduction

Emergencies affecting the ear, nose, and throat (ENT) constitute a large component of chief complaints seen in urgent care centers. The majority of these patients have benign conditions that can be managed on an outpatient basis. Some seemingly innocuous complaints can be reflective of diseases that pose significant risk of morbidity and possibly mortality. As with most diseases, the key to differentiating between minor and dangerous conditions is the history and physical examination. A huge spectrum of pathology can manifest in the head and neck, and the management of this patient group can be overwhelming for an individual practitioner. In this chapter, we present key facts, highlight the pitfalls inherent in diagnosing these conditions, and offer pearls intended to facilitate their management.

Eye

Pitfall | **Failure to ensure that patients with epithelial defects are treated with appropriate antibiotics and seen by an ophthalmologist within 24 hours**

A wide variety of eye complaints are encountered by acute care providers. Differentiation between corneal abrasions, corneal ulcers, and corneal foreign bodies can be difficult. The majority of patients with any of these conditions present with eye pain and a gritty or foreign body sensation. Visual acuity may be affected, depending on the location of the defect, so testing and documenting visual acuity are essential, as they are in all patients with eye complaints. Acute monocular visual loss may signify a more dangerous condition, such as central retinal artery occlusion, central retinal vein occlusion, acute angle closure glaucoma, or retinal detachment or a central nervous process (stroke, transient ischemic attack (TIA), or multiple sclerosis (MS)). Patients with any of these signs should be referred to an emergency department.

Patients with suspected corneal epithelial defects should have a full eye examination. A slit lamp is preferred to Wood's lamp. The instillation of analgesic and/or cycloplegic drops will significantly relieve the patient's symptoms and increased his/her ability to tolerate the examination, but these drops should not be used if globe rupture is suspected. Fluorescein staining is mandatory for the evaluation of a corneal defect and to rule out herpes keratitis. Defects in the epithelial surface appear as a stain that does not clear with blinking. The size and position of any defect(s) should be documented. Punctate defects, which appear in a circular pattern, are sometimes seen in contact lens wearers, particularly after prolonged wear. Larger defects with a crater formation are ulcers.

Parallel vertical abrasions should raise suspicion for a foreign body under the lid. When this type of injury is detected, the patient's eyelid should be

Table 1.1 Treatment of corneal abrasions, ulcers, and foreign bodies

	Antibiotic	Ointment dose	Drops dose	Duration
No contacts	Trimethoprim/ polymyxin B	0.5″ four times a day	1–2 drops q 2 h	Continue until symptom free for >24 h
No contacts	Erythromycin	0.5″ q 3–4 h	None	Continue until symptom free for >24 h
No contacts	Sulfacetamide	0.5″ four times a day	1–3 drops q 2–3 h	Continue until symptom free for >24
Contacts	Tobramycin	0.5″ three times a day (severe infection, q 3–4 h)	1–2 drops q 4 h Severe infection: 2 drops q 30–60 min	Until evaluation by ophthalmology
Contacts	Ciprofloxacin	None	1–2 drops four times a day	Until evaluation by ophthalmology
Ulcer	Tobramycin	0.5″ q 3–4 h	2 drops q 30–60 min	Until evaluation by ophthalmology
Ulcer	Ciprofloxacin	None	1–2 drops q 1 h	Until evaluation by ophthalmology

Data from Silverman MA, Bessman E. Conjunctivitis: treatment and medication. Medscape. http://emedicine.medscape.com/article/797874-overview. April 27, 2010.

everted to allow further assessment. Without treatment, and over time, the vertical abrasions will coalesce and form an ulcer. Foreign bodies may also be lodged directly on the corneal surface. In many cases, they can be removed with a cotton swab or irrigation, but if that procedure is unsuccessful, removal with a needle or burr may be necessary and should be done only by someone with specific training. Metal foreign bodies may lead to the development of a rust ring, which should only be removed by an ophthalmologist [1].

> KEY FACT | **Foreign bodies or rust rings can wait up to 24 hours for removal by an ophthalmologist.**

The immediate treatment of corneal abrasions, ulcers, and foreign bodies is similar (Table 1.1). Simple abrasions that are smaller than 3 mm do not require follow-up as long as no foreign body is present, the patient's visual acuity is normal, and symptoms resolve within 24 hours [2]. However, if there is any doubt, referral to an ophthalmologist is reasonable. All other defects should be seen by a specialist within 24 hours. Antibiotics, which may be prescribed as either ointment or drops, should be administered to all patients with epithelial defects. Ointment is generally preferred (particularly for children) because it is easier to apply, stays in place longer, and lubricates the eye. However, ointments are not well tolerated by most adults because they obscure vision and interfere with activities such as driving and reading. Drops are dispersed by the natural lubrication mechanisms of the eye. Firmly squeezing the eye shut for 5 minutes after administration will close the drainage ducts and increase penetration. Contact lens wearers with corneal abrasions require antipseudomonal antibiotic coverage and should be advised to refrain from wearing their contacts until they are cleared to do so by an ophthalmologist. All patients with corneal ulcers also require antipseudomonal antibiotic coverage.

Patients with painful corneal abrasion may require systemic narcotics. Ophthalmic nonsteroidal anti-inflammatory drugs (NSAIDs) may be prescribed, but are expensive. Topical anesthetics such as tetracaine should never be prescribed or given to patients for use at home, as repeated use may be associated with the development of ulcers. Tetanus status should be updated as needed. Eye patching has not been shown to be effective in accelerating healing. In fact, because it might worsen the infection and thus lengthen the time to recovery, it is not recommended [3].

> KEY FACT | **All patients with corneal ulcers require antipseudomonal antibiotic coverage.**
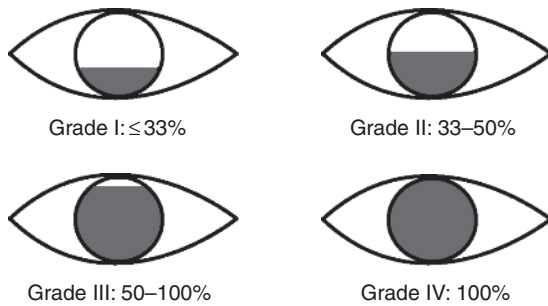
Figure 1.1 Grades of hyphema.

Pitfall | **Failure to identify high-risk patients with hyphema who require inpatient admission**

A hyphema is a collection of blood in the anterior chamber. Patients typically present with eye pain and pupillary constriction. Visual acuity is variably affected, based on the amount of blood present. The condition most commonly results from trauma, but it can appear spontaneously in patients with sickle cell anemia or bleeding dyscrasias. Hyphemas are graded on a scale of I to IV, based on the amount of blood present (Figure 1.1). The hyphema grade is important to the clinical management and disposition of the patient. Visual acuity should be documented and globe rupture ruled out before a complete eye examination – including measurement of intraocular pressure – is performed. Concomitant ocular and bony injuries are common in patients with hyphema. Computed tomography (CT) may be indicated for patients with facial trauma. Laboratory studies to identify coagulopathy (complete blood count (CBC), prothrombin time (PT), partial thromboplastin time (PTT)) should be done in patients with known or suspected bleeding disorders. After globe rupture is excluded, ultrasound, if available, can be used to evaluate the eye for retinal detachment, lens damage, an intraocular foreign body, and choroidal hemorrhage [4].

All patients with hyphema are at risk of long-term complications such as synechiae and angle recession, cataracts, and delayed bleeding, and therefore must be followed up daily by an ophthalmologist. Certain patients have risk factors that necessitate emergent consultation and might warrant admission: these include sickle cell disease, bleeding dyscrasias (such as anticoagulation or hemophilia), potentially open globes, young age, and grade III or IV hyphemas [5–7]. Healthy compliant patients with none of the above risk factors who have hyphemas that fill less than 50% of the anterior chamber can be discharged home with ophthalmologic follow-up within 12 to 24 hours. Interventions are focused on an avoidance of re-bleeding and prevention of intraocular hypertension. Patients should be placed with the head of the bed elevated 30 degrees, in a dim quiet room. An eyeshield should be placed, and removed only for examination. The patient should be placed on bed rest with bathroom privileges and should not read or watch television as those activities may cause pupillary constriction and obstruct outflow. Analgesia with topical cycloplegics may be used, and systemic narcotics are frequently also required. NSAIDs should be avoided because of their associated bleeding risk. Nausea and vomiting should be treated aggressively since they can raise intraocular pressure. These instructions should be clearly communicated to any patient being discharged.

Throat

Sore throat is an extremely common complaint. It has a broad differential, ranging from viral illness to life-threatening conditions such as epiglottis and retropharyngeal abscess. In the majority of cases, these conditions can be differentiated by the history and physical examination. The fear of "strep throat" brings many people to acute care centers. Most people do not realize, however, that infection with Group A Streptococcus (GAS) is responsible for fewer than 10% of cases [8]. Other bacterial causes of acute pharyngitis include gonorrhea, diphtheria, and *Fusobacterium*. Viruses account for the majority of cases of pharyngitis. Typical viral pathogens include adenovirus, Epstein–Barr virus (EBV), cytomegalorvirus (CMV), the human immunodeficiency virus (HIV), and influenza.

Pitfall | **Indiscriminate use of antibiotics for acute pharyngitis**

Treatment of GAS pharyngitis with antibiotics can reduce the duration of illness by 1 or 2 days, decrease the risk of transmission, and prevent nonsuppurative complications (rheumatic fever and post-streptococcal glomerulonephritis, which are both rare among adults in the United States) and suppurative complications (peritonsillar abscess, sinusitis, retropharyngeal abscess). Those treatment goals, although well intentioned, lead to a great deal of prescriptions for unwarranted antibiotics. Overuse of antibiotics is typically thought of as hazardous to the population at large in terms of increasing resistance patterns, but it can also be dangerous for the individual. Disruption of the normal flora puts the patient at risk of superinfections by organisms such as *Candida* and *Clostridium difficile* and makes the antibiotic less effective for that patient for a full year [9]. The decision to prescribe antibiotics can be based on the individual patient's condition or by a combination of culture, the rapid streptococcal antigen test (RSAT), and the Centor criteria (see below). The use of culture is often impractical in an acute care practice, given that it can take 2 or 3 days to get results. The RSAT is 70–90% sensitive and 90–100% specific [10–12]. To perform this test, vigorously swab both tonsils and the posterior pharynx. Obtaining an adequate sample is crucial, as sensitivities correlate directly to inoculum size [13]. A positive test result is helpful, but a negative result does not rule out the disease. Many facilities do not have RSAT capabilities, so the diagnosis of GAS pharyngitis is frequently based on clinical criteria.

The Centor criteria constitute a clinical decision rule designed to assist with the diagnosis of streptococcal pharyngitis. The four criteria are tonsillar exudates, swollen, tender anterior cervical nodes, the absence of a cough, and a history of (or current) fever. If none of these criteria is present, the likelihood of a culture being positive for the presence of GAS is 2.5%. The likelihood of a positive test result increases with the number of criteria present: one criterion, 6.5%; two criteria, 15%; three criteria, 32%; and all four criteria, 56% [11]. The Centor criteria have a better negative than positive predictive value. Treatment based on the presence of three or four criteria alone will lead to overtreatment of 50%. The absence of three or four criteria leads to a negative predictive value of 80%, making this information more clinically useful.

Several studies have evaluated treatment strategies based on a combination of clinical criteria, RSAT, and culture, yielding variable results [14, 15]. The general recommendation is as follows: adults with fewer than two Centor criteria should not receive further testing or treatment. Adults with two or more criteria should be tested with RSAT, without reflex culture for negative results. Antibiotic treatment based on a positive RSAT is reasonable, but treatment based on clinical symptoms alone is not recommended [14, 16, 17]. Treatment recommendations for children differ, and a more generous treatment strategy can be adopted for adults in close contact with children. The traditional antibiotic regimen is penicillin, in either an intramuscular preparation (benzathine penicillin G, 1.2 million units given once) or an oral form (PenVK, 500 mg PO, BID for 10 days). Macrolides can be used for penicillin-allergic patients (azithromycin, 500 mg PO, daily for day 1, then 250 mg PO daily for days 2–5). Recent studies have shown improved bacterial eradication with cephalosporins, although this has not yet been proven to be clinically significant [18, 19].

Adjunctive treatment for GAS pharyngitis includes hydration, fever control, and in some cases corticosteroids. Several studies have shown that corticosteroids improve severe throat pain and shorten the clinical course [20–22]. Dexamethasone, 10 mg IV or IM, can be given as a one-time dose, making it convenient. Alternatively, prednisone

can be prescribed as a 5-day, 40-mg burst. Analgesia with acetaminophen, NSAIDs, or topical numbing medications may be used. Patients with a strep throat can generally be discharged, providing they can tolerate fluid.

> KEY FACT | **Corticosteroids improve severe throat pain and shorten the clinical course of GAS pharyngitis**

Mononucleosis deserves special consideration for any patient with pharyngitis, particularly if antibiotics may be prescribed. Treatment with the "cillin" family of antibiotics has been linked with the development of a macular erythematous generalized rash. Mononucleosis is a viral illness that can be caused by CMV, EBV, or adenovirus. The symptoms are generally malaise, fatigue, severe pharyngitis with lymphadonopathy, and fever.

Testing for mononucleosis can be complicated, because the monospot test catches only EBV-related mononucleosis with good sensitivity after 2 weeks of infection. However, the test may not be positive in early infection and is not positive for non-EBV cases. The test stays positive for approximately one year. Alternatively, a blood smear for atypical lymphocytes and evaluation of the differential may hold clues for diagnosis. Treatment of mononucleosis relies mainly on supportive care, fluids, and analgesia. Steroids may be administered if the airway is obstructed; otherwise, no significant benefit is conveyed by their use [23]. Patients in whom mononucleosis is diagnosed can usually be discharged from the ED. They should be instructed to avoid contact sports for 4 to 6 weeks or until they are cleared to resume those activities by their primary care provider because of the risk of splenic rupture.

Peritonsillar abscesses (PTAs) are the most common cause of deep neck infection [24, 25]. PTAs form next to the palatine tonsils and are generally preceded by pharyngitis. The cause is usually polymicrobal, the predominant organisms being GAS, *Staphylococcus aureus* (including methicillin-resistant *Staphylococcus aureus* (MRSA)), and respiratory anaerobes. Patients typically present with a unilateral sore throat, a "hot potato" voice, and trismus, and they may drool. These patients can have quite an ill appearance and may develop a life-threatening airway obstruction. If trismus is so severe that visualization of the tonsils is limited, CT imaging or examination in an operating room may be required. The typical appearance of a PTA is an extremely swollen, erythematous, fluctuant tonsil. The uvula is deviated to the opposite side. While PTAs are almost always unilateral, bilateral cases may rarely occur and pose a diagnostic challenge.

Imaging is not required to diagnose a PTA, although it may be necessary to differentiate these abscesses from peritonsillar cellulitis and other deep-neck infections. A CT scan with IV contrast is the traditional approach. However, ultrasound imaging is gaining popularity as it offers the advantages of no radiation, immediate results, and real-time guidance for drainage. If the patient has only cellulitis – without abscess formation – antibiotics and supportive care are adequate. If an abscess is present, incision and drainage, either by needle aspiration or with a scalpel, is required. This should be done only by a clinician trained in the procedure. Clindamycin is the preferred antibiotic. For patients with severe infections, vancomycin should be added, particularly if MRSA in the area has a high resistance to clindamycin. Supportive care includes hydration, fever control, analgesia (both systemic and topical), and possibly corticosteroids, with dosing as listed for GAS pharyngitis.

PTA is a potentially life-threatening disease, and it is important to err on the side of transfer to an emergency department. Many patients need to be admitted and need to receive parenteral antibiotics until they are afebrile, tolerate fluids, and show clinical improvement. Reliable patients who have no signs of airway compromise, appear to be otherwise well and have dependable plans for follow-up within 24 hours, may be discharged with a 14-day course of antibiotics.

Retropharyngeal abscess and epiglottitis are two deadly deep-neck infections that must be considered in patients with severe throat pain. Retropharyngeal abscess is much more common in children, but it can occur in adults. Patients are likely to complain of neck stiffness and, typically, appear quite ill. Consider this diagnosis when the

severity of the throat pain does not correlate with the physical examination. This condition requires a CT scan for diagnosis, parenteral antibiotics, surgical consultation, and admission. Patients should be transported to the hospital by ambulance.

In the past, epiglottitis was seen more frequently in the very young, but because children are now routinely immunized against *Haemophilus influenza*, older adults have become the primary group with this disease. It is more common among immunocompromised patients, particularly those with HIV infection. Patients with epiglottitis appear fairly sick. They usually sit in a tripod position, have inspiratory stridor, and appear anxious or uncomfortable. Do *not* attempt to manipulate the airway or use invasive measures (including tongue blades) to evaluate the posterior oropharynx. The diagnosis can be made with a lateral neck radiograph, which should be obtained as a portable film because the patient requires constant monitoring for airway obstruction. If this condition is suspected, place the patient in a position of comfort, minimize stimulation, and transport by ambulance to the nearest emergency department as quickly as possible for parenteral antibiotics, ENT consultation, and admission. These patients often need intubation or creation of a surgical airway.

> KEY FACT | **In the past, epiglottitis was seen more frequently in the very young, but older adults have become the primary group with this disease.**

Ear

Ear lacerations have the potential to be extremely disfiguring, especially if they are not repaired correctly. The two most important factors for a successful cosmetic outcome are careful management and coverage of the cartilage and prevention of hematoma formation. The cartilage is avascular and depends on the overlying skin for nutrients and metabolic support. If it is deprived of that support, infection, erosive chondritis, and necrosis can result. This is the process that leads to "cauliflower ear,"
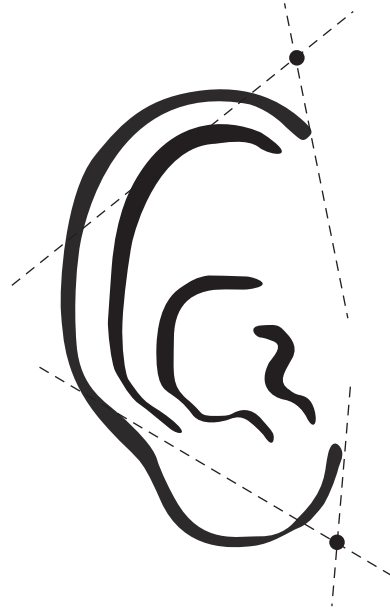
Figure 1.2 Ring block. For the first set of injections, insert the needle superior to the attachment of the ear to the scalp. Direct the needle toward the tragus, aspirate, and inject approximately 2 mL as you pull back. Do *not* remove the needle completely. Redirect posteriorly, along the direction of the helix. Aspirate and inject approximately 2 mL as you pull back. For the second set of injections, insert the needle inferior to the attachment of the earlobe to the scalp. Direct the needle toward the tragus, aspirate, and inject approximately 2 mL as you pull back. Do *not* remove the needle completely. Redirect it posteriorly, along the direction of the helix. Aspirate and inject approximately 2 mL as you pull back.

which may also be caused by blunt trauma. As such a deformity is rarely amenable to reconstruction, prevention is important [27].

> KEY FACT | **The cartilage of the ear is avascular and depends on the overlying skin for nutritional and metabolic support.**

Pitfall | **Failure to cover exposed cartilage and to prevent hematoma formation after acute trauma**

Anesthesia is best provided with either a ring block (Figure 1.2) or a field block. The ring block

Figure 1.3 Application of a compression dressing will prevent the development of an auricular hematoma.

anesthetizes the entire ear, except for the concha and external auditory canal. The field block, which targets the greater auricular and lesser occipital nerves, anesthetizes the earlobe and lateral helix.

Once the area is numb, appropriate wound repair starts with copious irrigation, just as with any other laceration. Be careful to avoid high pressure, which could dissect the skin away from the cartilage even further. Trim away devitalized cartilage and skin. The cartilage should also be trimmed back if there is insufficient skin to cover it. Up to 5 mm of cartilage can be removed without cosmetic concerns. The next step is approximation of the cartilage. If bringing together the overlying skin accomplishes this goal, this is sufficient. If not, the cartilage should be sutured with 4–0 to 5–0 absorbable sutures. Include the perichondrium in the stitch to prevent tearing the cartilage. Repair the skin with 5–0 to 6–0 non-absorbable sutures, using an interrupted technique [28, 29].

Covering the ear with a bolster or compression dressing is mandatory to prevent development of an auricular hematoma (Figure 1.3).

Follow-up for these patients is critical. The ear must be re-evaluated within 24 hours by an acute care physician or ENT specialist. The dressing must be removed to assess for hematoma and follow-up with ENT should occur within a week.

Lips

Pitfall | **Failure to appropriately repair oral lacerations.**

Lip lacerations are common. When the laceration crosses the vermilion border, proper approximating of the border is critical for producing a satisfactory cosmetic and functional repair. Misalignment of the vermilion border as little as 1 millimeter will result in a cosmetically noticeable scar [28]. The vermilion border should be marked with a pen prior to infiltration of local anesthetic (which can distort local anatomy). An alternative to this approach is the use of a maxillary or mental nerve block instead of local infiltration. Place the first suture through each side of the vermilion, bringing them together. The remainder of the wound can then be closed. If the skin of the face is involved, 5–0 prolene or nylon should be used and can be used for the vermilion border as well; 4–0 chromic gut should be used on the lip. Intraoral lacerations may not always require closure because the mucosa heals very quickly and very well on its own. Large lacerations (greater than 2 cm) and those that interfere with mastication should be closed. An appropriate suture choice is 3–0 chromic gut.

The use of antibiotics in patients with lip lacerations is controversial. Through-and-through lacerations, wounds caused by animal bites, and grossly contaminated wounds are at higher risk for infection, so prophylactic antibiotics are commonly recommended [30]. Both amoxicillin and clindamycin cover oral flora. For all other oral wounds, antibiotics are not necessary. A simple oral antibiotic rinse (e.g. Peridex) is beneficial and can be prescribed if desired [30]. Upon discharge, patients should be instructed to use salt water rinses several times per day, especially after eating, to keep the laceration clean. They can brush their teeth normally. They will need to return for a wound check within 48 hours. The nonabsorbable sutures on the lip should be removed in 5 to 7 days, and the absorbable suture may also be removed at this time if it is still present.

Nose

Pitfall | **Failure to appropriately control epistaxis**

Epistaxis is a common patient presentation in the acute care setting. It occurs more frequently in the winter months because of low humidity levels. Digital trauma, chemical irritants, and infections are common causes. Most cases of epistaxis are self-limited but can be life-threatening with severe bleeds. Bleeds emanate from two primary locations. Anterior bleeds, which are much more common, occur in Kiesselbach's plexus and are often amenable to pressure. Posterior bleeds are most frequently from the sphenopalatine artery and are potentially more serious. The overwhelming majority of patients with epistaxis can be managed by pressure alone and patients should be taught the appropriate location to hold pressure. Pinch the nose with thumb and index finger immediately below the nasal bones. The pressure must be held for a full 5 minutes without interruption. Tilting the head forward is a more effective position, as it maintains patency of the airway and prevents blood from running down the back of the oropharynx.

Pressure works most of the time, but when this technique fails, the key to effective and efficient management is having the proper equipment and setup. Adequate visualization into the nares is mandatory and can be achieved by using good lighting, a nasal speculum, and suction. A topical medication such as oxymetazoline or lidocaine (applied as jelly, nebulized or atomized), should be used for comfort and hemostasis. The application of ice has been taught as a means of inducing hemostasis; it is actually ineffective and uncomfortable [31]. The source of anterior bleeds is typically visible along the nasal septum. Silver nitrate cautery may be used to stop this type of bleeding, but because silver nitrate will not work in a wet field the target area needs to be dried prior to its application. Circumferential cautery around the bleeding site prior to cauterizing the vessel itself is often effective [32]. Never cauterize both sides of the nasal septum, and keep contact to less than 15 seconds to prevent necrosis [33]. Packing may be required if the aforementioned methods fail. If the bleeding source can be visualized, then anterior packing may be sufficient. Numerous commercial devices are available for this purpose. Lubrication, often with lidocaine jelly and oxymetazoline, will make the procedure more comfortable. If hemostasis is achieved with unilateral anterior packing, the patient can be discharged, with ENT follow-up within 24 to 48 hours. Systemic prophylactic antibiotics may not be necessary [34], but most clinicians prescribe anti-staphylococcal antibiotics to prevent toxic shock [35]. All discharged patients should be told to avoid blowing their nose. If posterior or bilateral anterior packing is required, admission to the hospital, typically to an intermediate level of care for airway monitoring, is recommended. Routine laboratory testing is not required for epistaxis. Exceptions, however, include patients with severe bleeding or known bleeding dyscrasias and those who are taking anticoagulation medications. In those cases, a CBC and PT/PTT may be indicated. Patients with renal failure may require a basic metabolic panel (BMP), as uremia compromises platelet function. Hypertension is often thought of as a cause of epistaxis, but in reality arterial hypertension does not cause epistaxis. Hypertension is more likely a result of the stress

caused by the bleeding [36]. A blood pressure measurement, taken after the bleeding has been controlled and the patient is calm, will usually be closer to normal.

> KEY FACT | **Arterial hypertension does not cause epistaxis.**

Pearls to improve patient outcomes

• Patients with corneal abrasions, ulcers, and corneal foreign bodies are all treated with antibiotics and should see an ophthalmologist within 24 hours.
• Contact lens wearers with corneal abrasions or patients with corneal ulcers (regardless of contact lens use) require antipseudomonal antibiotic coverage and should be advised to refrain from wearing their contacts until they are cleared to do so by an ophthalmologist.
• Provide systemic corticosteroids to patients with severe throat pain due to GAS pharyngitis in order to hasten symptomatic improvement.
• Consider peritonsillar abscess in patients with a sore throat affecting only one side.
• When patients have throat pain that is out of proportion to the physical findings, consider retropharyngeal abscess and epiglottitis.
• Admit patients with posterior and bilateral anterior packing for control of nosebleeds.

Acknowledgment

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