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When using any protocol, always follow the Guidelines of Proper Use.
SORE THROAT PROTOCOL
When using any protocol, always follow the Guidelines of Proper Use.

Inclusion Criteria
- Nontoxic patient with sore throat complaint
- No signs of airway compromise

Definition
- Pain located or perceived in the throat or anterior neck region

Differential Diagnosis
- GABHS (Group A beta-hemolytic streptococcus)
- Mononucleosis
- Gonococcal pharyngitis
- Peritonsillar abscess
- Epiglottis
- Retropharyngeal abscess
- Diphtheria (rare)
- Cervical lymphadenitis
- Thyrotoxicosis
- Gastroesophageal reflux

Considerations
- Viral 40%
- Bacterial 30%
- Strep throat – Group A Beta Hemolytic Strep (GABHS)
  - 15–30% childhood pharyngitis
  - 5–10% of adult pharyngitis
  - Peak ages 4–11 years
  - Peak months January – May
  - Associated symptoms and findings
    - Sudden onset
    - Odynophagia
    - Fever
    - Headache
    - Abdominal pain
    - Nausea and vomiting;
Viral pharyngitis
- Cough
- Rhinorrhea
- Lack of cervical adenopathy

**Viral Pharyngitis**

**URI**
- Treat symptomatically

**Mononucleosis**

**Findings**
- Exudative tonsillitis
- Fever
- Posterior cervical chain lymphadenopathy considered diagnostic
- Monospot
  - 90% sensitive age > 5 years
  - 75% sensitive age 2–4 years
  - Less than 30% sensitive age < 2 years
- CBC: 50% lymphocytes, 10% atypical lymphocytes
- Liver function tests elevated in 80–85% of patients up to 3 times normal
- Splenomegaly
- Hepatomegaly
- Encephalitis
- Meningitis

**Treatment options**
- Treat symptomatically
- No contact sports or gym for 4 weeks after onset of illness
  - Follow up with primary care provider before resuming sports or gym
- Ampicillin or amoxicillin rash can occur if prescribed
- Steroids may decrease symptoms and swelling but may also delay recovery and there is a concern for association with development chronic EBV syndrome
- Steroid dosing if used:
  - Adult or patients heavier than 40 kg: prednisone 40 mg PO daily for 4 days
• Pediatrics: prednisone 1 mg/kg PO daily for 4 days (NMT 40 mg)

**Strep throat — GABHS**

- Rheumatic fever can be prevented if antibiotic treatment started within 9 days of onset
- Glomerulonephritis cannot be prevented with antibiotic treatment

**Evaluation**

**Centor criteria**
- Tonsillar exudates
- Tender anterior cervical lymphadenopathy
- Fever by history
- Absence of cough
  - If 3 present: 40–60% have GABHS
  - If 3 or 4 absent: 80% negative predictive value
  - None or one criterion present: No testing or treatment needed for GABHS

**Consider Rapid Strep Tests**
- Sensitivity 85–95%
- Specificity 96–99%
- May be positive with carriage state and another cause of acute pharyngitis besides GABHS may exist

**Treatment options**

- Per Sanford Guide
- Pen VK
- Cephalexin
- Erythromycin or Zithromax if penicillin allergic (increasing resistance has occurred)
- Steroids one dose
  - Prednisone 40–60 mg PO > 40 kg
  - Prednisone or prednisolone 1 mg/kg PO (NMT 60 mg)
  - Decadron 10 mg IM if unable to take PO
  - Decadron 0.06 mg/kg IM (NMT 10 mg) if unable to take PO
**Epiglottis or suspected epiglottitis**
- Now more common in adults than children
- Constitutes an airway emergency — consult anesthesia
- Do not agitate or aggressively exam
  - If patient is in distress
  - Drooling present
  - Tripod position or sniff position present
- Pain on moving thyroid cartilage
- Lateral neck films findings — only obtain in stable patient
  - Thumb sign
  - Vallecule sign — loss of vallecula
  - Review or listen to radiology report
- Notify physician promptly before x-ray if epiglottis suspected or patient in distress

**Peritonsillar abscess**
- Sore throat 100%
- Fever 26–97%
- Voice change
- Dysphagia
- Drooling
- Headache
- Trismus
- Uvular deviation and peritonsillar bulge
- Neck CT scan may be required to delineate abscess from necrotic lymph node
- Notify physician if diagnosed or suspected

**Retropharyngeal abscess**
- Usually age 3–5 years

**Complications**
- Airway compromise
- Aspiration pneumonia
- Internal jugular vein thrombosis
- Carotid artery erosion
- Cranial nerve palsies

**History and findings**
- Fever
- Dysphagia
• Decreased oral intake
• Stridor or dyspnea
• Neck swelling
• Neck motion pain
• Ill appearing
• Duck-like voice

X-ray findings
• Neck CT scan much more sensitive than lateral neck plain films
• Lateral soft-tissue neck films (neck flexion may cause false positive reading)
• Retropharyngeal space anterior to C2 > 7 mm or > half the width of vertebral body
• Space anterior to C6 > 14 mm in preschool children or > 22 mm in adults

Treatment
• Supplemental oxygen (avoid patient agitation)
• Keep child calm
• Notify physician promptly

Discharge Criteria for Sorethroat
• Nontoxic
• No airway obstruction concerns
• Can tolerate oral intake
• Benign diagnosis

Discharge instructions
• Sorethroat or pharyngitis aftercare instructions
• Follow up with primary care provider or ENT surgeon within 5 days as needed

Consult Criteria for Sorethroat
• Airway compromise
• Toxic
• Dehydration > 5%
• Suspected epiglottitis
• Peritonsillar or retropharyngeal abscess
• Unable to tolerate oral intake
• Immunosuppression
**Vital signs consult criteria**
- Adult heart rate ≥ 110
- Pediatric heart rate
  - 0–4 months ≥ 180
  - 5–7 months ≥ 175
  - 6–12 months ≥ 170
  - 1–3 years ≥ 160
  - 4–5 years ≥ 145
  - 6–8 years ≥ 130
  - 7–12 years ≥ 125
  - 12–15 years ≥ 120
  - 16 years or older ≥ 115
- Hypotension
- O2 saturation < 95% on room air

**Lab consult criteria**
- WBC ≥ 18,000 or < 3,000
- Bandemia ≥ 15%
- Acute thrombocytopenia
- Metabolic acidosis

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**Otitis Externa Protocol**

When using any protocol, always follow the Guidelines of Proper Use.

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**Inclusion Criteria**

- Nontoxic patient

**Definition**

- Inflammation of the external auditory canal

**Differential Diagnosis**

- Auditory canal foreign body
- Otitis media
- Chondroma
- Herpes zoster

**Considerations**

- Caused by breakdown in protective barrier of ear canal
  - Pseudomonas; staph; strep species; fungi
- Pain increased with movement of external ear or touching external ear canal
- Discharge common
- Fever uncommon

**Malignant Otitis Externa**

- Elderly
- Diabetes
- Immunocompromise (pseudomonas frequent concern)
- Marked swelling
- Headache
- Possible cranial nerve deficit

**Evaluation**

- Usually none except otoscope and external ear exam
- Serum glucose if diabetic
- Suspected malignant otitis externa
  - CBC
  - C-reactive protein
CT scan indications (discuss with supervising physician)

- Neurologic abnormalities
- Toxic appearing patient
- Malignant otitis externa
- Fever

Treatment Options

- Clean ear canal (most important aspect of treatment)
- Irrigate or ear loop curettage (may be difficult due to pain)
  - Use ½ peroxide and ½ water (or water only) — if TM visible and intact (keep liquid near body temperature)
- Can use ear wick if canal markedly swollen — remove in 3 days; replace if canal still very swollen
- NSAID’s or narcotics prn

Antibiotic choices

- Acetic acid 2% (Domeboro otic) 4–6 drops q4–6h for 7–10 days or until ear canal normal for 2 days
- Cortisporin otic suspension or solution (has neomycin which can cause allergy) 4 drops qid for 7–10 days or until ear canal normal for 2 days (use suspension if TM perforated)
- Ofloxin 5 drops bid for 7–10 days or until ear canal normal for 2 days (drug of choice for TM perforation)
- Oral antibiotics for facial or neck cellulitis, significant edema of ear canal, or when TM cannot be visualized
- Diabetics may be treated also with ciprofloxacin PO for 10–14 days
- May use Sanford Guide

Discharge Criteria

- Benign otitis externa

Discharge instructions

- Otitis externa aftercare instructions
- Keep ear dry for 3 weeks (no swimming)
• Prophylaxis for future OE after swimming with rubbing alcohol or acetic acid 2% if no TM perforation
• Follow up with primary care provider or ENT surgeon within 7–10 days if needed

Consult Criteria
• Malignant external otitis (needs ENT consultation and IV antibiotics only — no topical antibiotics)
• Fever
• Return visit for same episode
• Glucose > 400 mg/dL in diabetic

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**Eye Protocols**
When using any protocol, always follow the Guidelines of Proper Use.

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**Inclusion Criteria**
- Common eye complaints

**Considerations**
- Most conjunctival infections are viral
- Allergic manifestations common
- Contact lens keratitis can be bacterial or from oxygen deficit of cornea

**Evaluation**
- Visual acuity if complaints of decreased vision
- Examination of
  - Conjunctiva
  - Cornea
  - Pupils
  - Extraocular motion
  - Any discharge
  - For consensual photophobia (light shined in unaffected eye causes pain in affected eye — have affected eye closed during exam)
  - Periorbital tissues
  - Anterior and posterior chambers
  - Visual fields examination as indicated
- See specific conditions below

**Conjunctivitis**

**Allergic**
- Itching and redness; watery
- Papillary hypertrophy

**Treatment options**
- Systemic antihistamine
- Remove offending agent if known
- Choices:
  - Naphcon-A ophthalmic 1–2 drops qid prn
  - Ketorolac ophthalmic 1 drop qid prn
Low dose steroid eye drops prn — short course
  - Dexamethasone ophthalmic 1–2 drops tid-qid prn or similar ophthalmic steroid
  - Contraindications:
    - Herpes simplex infection (corneal dendrite)
    - Glaucoma
    - Fungal infection

**Discharge criteria**
- Benign presentation and findings

**Consult criteria**
- Photophobia
- Visual changes

**Viral**
- Adenovirus most common
- Watery mucus discharge
- Gritty or foreign body sensation
- HSV: vesicles eyelid margins or periorbital skin; corneal dendrites

**Treatment options**
- Usually no specific therapy
- Artificial tears prn
- HSV
  - Viroptic ophthalmic drops 1 gtt q2h not to exceed 9 gtts Qday
  - Consult physician for herpes infection
  - Ophthalmology referral within 1 day for HSV infection

**Bacterial**
- Purulent discharge
- Staph most common
- Gonorrhea: profuse purulent discharge
- Chlamydial: mucopurulent discharge; photophobia occasionally
- Contact lens: pseudomonas possible
Treatment options

Common drugs
- Erythromycin eye ointment
- Sulfa eye drops
- Gentamicin eye drops
- All medications given for 7 days

Contact lens complications
- Remove lens until eye normal for 2 days
- Ciloxan 1–2 drops QID × 7 days
- Consult physician

Chlamydia
- Doxycycline 100 BID × 3 weeks
  OR
- Erythromycin 500 mg QID PO × 3 weeks (erythromycin pediatric dose 50 mg/kg PO divided into 4 doses × 14 days (NMT 500 mg per dose)
- Mother of children and other close contacts at risk — treat with doxycycline 100 mg BID × 7 days in age > 8 years, otherwise erythromycin treatment

Gonococcal
- Doxycycline 100 BID × 3 weeks or erythromycin 500 mg QID PO × 3 weeks
- Rocephin 1000 mg IM (can be given daily for 3 days)
- Neonates: rocephin 50 mg/kg IV daily for 7 days; erythromycin eye ointment QID × 14 days
- May use Sanford Guide

Discharge criteria
- Benign, non-herpetic conjunctivitis

Discharge instructions
- Conjunctivitis aftercare instructions
- Follow up with primary care provider or ophthalmology within 1 day for contact lens complications, gonococcal or chlamydial infections
- Consult criteria
• Visual change
• Photophobia
• Suspected gonococcal or chlamydial infection
• Significant pain
• Contact lens complications

Infectious Keratitis

Causes
• HSV
• Staph
• Herpes zoster

Evaluation
• Direct visualization
• Fluorescein staining and wood’s lamp
• Look for dendritic lesions

Treatment options
HSV
• Viroptic 1 drop q2hr while awake (NMT 9 drops qday)
• Follow up with ophthalmologist within 24 hours

Bacterial (all treatments for 7 days)
• Erythromycin eye ointment
• Sulfa eye drops
• Gentamicin eye drops

Discharge instructions
• Appropriate keratitis aftercare instructions if discharged

Consult criteria
• All infectious keratitis

Blepharitis, Hordeolum (Stye) and Chalazion

Stye
• Painful, swollen, tender and red on eyelid
• Staph 90–95% of the time
• Usually will drain spontaneously

**Treatment options**
- Warm soaks 3–4 days a day until resolved
- Erythromycin eye ointment or sulfa eye drops or gentamicin eye drops (all for 7–10 days)
- Clean eyelid margins with baby shampoo
- Refer to ophthalmologist in 10–14 days if not resolved

**Chalazion**
- Treatment similar to Stye

**Blepharitis**
- Treatment similar to Stye

**Discharge instructions**
- Appropriate aftercare instructions

**Periorbital (Preseptal) Cellulitis**
- Usually from S. Aureus
- More common in children
- Age < 3 years can progress to bacteremia
- Is anterior to orbital septum

**Signs**
- Red swollen eyelid
- No vision changes
- Ocular mobility normal
- Conjunctival discharge may be present
- May have minimal pain
  - More severe with orbital cellulitis and helps to differentiate between the two
- Chemosis (conjunctival swelling)
- Fever

**Evaluation**
- Detailed ocular exam
  - Anterior and posterior chambers
  - Extraocular motion
  - Pupillary examination
  - CT scan may be needed if unable to differentiate from orbital cellulitis
• CBC and blood culture if age < 5 years
• Culture of eye discharge if present

**Treatment options**
• Augmentin 45 mg/kg/day divided bid PO for 10-14 days
• Vancomycin
• Rocephin
• May use Sanford Guide

**Discharge instructions**
• Periorbital or Preseptal cellulitis aftercare instructions
• Follow up in 24 hours with PCP or ophthalmologist

**Orbital Cellulitis**
• Most commonly from ethmoid sinusitis spread

**Findings and symptoms**
• May have toxic appearance
• Proptosis
• Limited extraocular motion
• Diplopia
• Significant pain
• Dark red eyelids
• Decreased vision
• Increased intraocular pressure

**Complications**
• Meningitis
• Cavernous sinus thrombosis
• Vision loss

**Evaluation**
• Detailed ocular exam
  • Anterior and posterior chambers
  • Extraocular motion
  • Pupillary examination
  • CT scan may be needed if unable to differentiate from orbital cellulitis
• CBC and blood culture if age < 5 years
• Culture of eye discharge if present
Treatment
- Ceftin IV and/or per Sanford Guide
- Admission to hospital

Consult criteria
- All suspected or diagnosed orbital cellulitis patients

Corneal Ulcer or Lesions
- Consult physician

Discharge instructions
- Corneal ulcer aftercare instructions

Iritis
- Photophobia — is consensual (light shined into opened normal eye causes pain in closed affected eye due to pupillary reflex)
- Ciliary flush (red injection at edge of cornea circumferentially)
- Cells and flare in anterior chamber; hypopyon more rare
- Miosis
- 50% associated with systemic disease
- Slit lamp exam

Treatment
- Homatropine eye drops 2–5% 1 drop TID
- Steroid eye drops per ophthalmologist
- Consult physician

Discharge instructions
- Iritis aftercare instructions
- Close ophthalmology follow-up

Corneal Abrasion
- Can detect with direct ophthalmoscopy or fluorescein staining
- No consensual photophobia unless iritis present
- Heals in 24–48 hours
- If corneal pain recurs in 2-3 days, it may indicate sloughing of corneal epithelium
Treatment

- No patching
- Can use local anesthetic eye drops at time of exam only (do not prescribe for home pain control since it is mildly cytotoxic and will prevent healing)
- Narcotics PO prn × 2–3 days

Extensive corneal abrasion

- Homatropine 2% sol 1–2 gtt to achieve cycloplegia (pupil dilation) — may repeat q15 min. × 2 prn
- Can prescribe 1–2 gtt QID up to 3 days

Discharge instructions

- Corneal abrasion aftercare instructions
- Follow up in 2–3 days for recheck with primary care provider or ophthalmologist

Ultraviolet Keratitis (Band Keratitis)

- Usually from welding or tanning beds
- Acular or Voltaren eye drops 1 gtt QID for several days until eye corneal pain resolved (not longer than 2 weeks)
- Similar evaluation and treatment as corneal abrasion

Discharge instructions

- Ultraviolet (flash burn) keratitis aftercare instructions

Eye Foreign Body

- Usually a foreign body sensation is the chief complaint
- Anesthetic eye drops with proparacaine or tetracaine immediately relieves symptoms for 15 minutes or so
- Patient may or may not be able to localize the foreign body

Examination

- Evert eyelids as needed to locate the foreign body
- If foreign body is not identified, flush under eyelids with eye irrigation fluids to see if symptoms can be resolved
- If foreign body persists after eye flush, use moistened sterile cotton swab to gently swab
under eyelids to see if any foreign bodies are found or the patient’s symptoms of foreign body sensation resolve
● Check lacrimal duct opening for retained eyelash

**Discharge criteria**
- Foreign body removed
- No visual changes or significant residual discomfort

**Discharge instructions**
- Eye foreign body aftercare instructions

**Consult criteria**
- Retained intraocular foreign body, discuss with supervising physician
- Significant residual pain post foreign body removal
- Acute visual changes or complaints

**Corneal Foreign Bodies**
- If an iron containing metallic foreign body is present, a rust ring may develop in a few hours
- Examine anterior and posterior ocular chambers — if abnormal discuss with supervising physician or ophthalmologist
- Fluorescein staining can be used as needed to locate foreign bodies and abrasions
- The Provider may opt to not remove small residual rust rings outside of visual axis, and refer to an ophthalmologist for further treatment in 1–3 days

**Removal instructions**
- After 3–4 drops of eye anesthetic over 1 minute are instilled into the affected eye and the patient has no further complaints of a foreign body sensation or pain, a sterile moistened cotton swab is used to swab across the foreign body to effect removal
- If the cotton swab does not remove the corneal foreign body, an experienced Provider may use a blunt eye spud or eye burr to remove the foreign body
- Consult a physician if not experienced with using a blunt eye spud or eye burr
• If a metallic foreign body has rusted, a residual rust ring will be left after the majority of the central rust area has been removed with the cotton swab
  • A blunt eye spud or eye burr can be used to remove some of the residual rust left, although it is not unusual to not be able to remove it all
• Fresh rust rings are more difficult to remove and after sterile cotton swabbing the residual rust ring can be left to mature in 1–3 days and the patient can then be referred to an ophthalmologist for follow-up

**Discharge instructions**
• Corneal foreign body aftercare instructions
• Refer to ophthalmology within 3 days
• Return if pain worsens, or photophobia or visual changes develops

**Consult criteria**
• Discuss with the supervising physician if the residual rust is in the visual axis

**Corneal Laceration**
• Protective rigid eye shield
• Consult physician and ophthalmologist immediately
• Analgesia and vomiting control IM or IV prn to decrease valsalva

**Eyelid Lacerations**

*Findings to discuss with physician (usually needs referral treatment)*
• Tarsal plate involvement
• Eyelid margin
• Tear duct injury
• Orbital septum injury
  • Fat can protrude
• Tissue loss

**Globe Injury**
• History is important of what patient was doing at time of injury
Globe injury can be obvious with uveal tissue prolapsing from a wound or pupil, or the eye or papillary shape can be grossly abnormal, or the injury may be subtle

Small eyelid lacerations can cover or mask perforations of globe
- Do not close laceration until globe injury is ruled out

Assess eye motion and visual acuity
- Visual acuity can be counting fingers at 18 inches or light perception if necessary
- Critical to avoid pressure on the eye
- Palpate orbital rims for deformity and crepitus
- Do not remove any foreign bodies that have penetrated the globe
- Conjunctival hemorrhage covering 360 degrees of the bulbar conjunctiva can indicate globe rupture
- Assess pupils for size, shape, afferent defect, direct and indirect pupillary light reflex and the red reflex
- Examine anterior chamber
- CT orbital scans are the preferred imaging to evaluate for occult globe injury

**Treatment**
- Place protective rigid eye shield immediately after assessment

**Disposition**
- Consult physician and ophthalmologist immediately
- Analgesia and vomiting control IM or IV prn to decrease valsalva and minimize intraocular pressure increases

**Chemical Eye Injuries**

*Alkali burns most serious*
- Causes immediate liquefaction necrosis if the pH is very high
- Penetrates the tissue deeply
- Immediate eye lavage with NS for one hour (Morgan lens)
- Exam after lavage
- Notify physician promptly
**Acid burns**
- Cause coagulation of proteins which can limit depth of injury
- Can use fluorescein to evaluate cornea (exam after lavage if needed)
- Weak acids burns usually managed as outpatient

**Evaluation**
- Inspection
- After lavage if strong alkali: fluorescein or slit lamp
- Check visual acuity

**Treatment**
- Significant burns flush with NS using Morgan lens for 30–60 minutes
- Check pH at 5 and 30 minutes of eye lavage to achieve ph 7.3–7.5
- Mild burns with weak acids can be lavaged less (with or without Morgan lens) depending on symptoms
- Use topical eye anesthetic for pain of examination and treatment as needed
- Gentamicin plus erythromycin or bacitracin ophthalmic ointment tid × 5–10 days or until healed for significant chemical burns
- Mild burns without significant damage can be managed with one topical eye antibiotic ointment
- Narcotics or NSAID’s PO prn pain

**Discharge criteria**
- Mild conjunctivitis and keratitis from weak acid chemical burns
- Discuss with supervising physician all chemical eye injuries

**Discharge instructions**
- Chemical eye injury aftercare instructions
- Refer to ophthalmologist within 1 day if indicated

**Consult criteria**
- Alkali burns
- Acid burns of moderate or worse severity
• Visual acuity changes

Glaucoma
• Severe pain, ipsilateral visual defects and may see halos around objects
• Nausea and vomiting common with acute closed angle glaucoma
• Steamy and cloudy cornea
• Increase IOP (normal IOP 10–22 mm Hg)
• Mid-dilated pupil and firm globe
• Consult physician promptly

Orbital Blowout Isolated Fracture
• Orbital wall composed of 7 bones
• Occurs usually with larger object than the orbit (baseball; fist)
• Can result in diplopia

Evaluation
• Neurologic exam
• Extraocular motor exam
• Evaluate for associated ocular injuries (present 20–40% of the time)
• Plain facial (water’s view best) or CT orbital films
• CT brain scan as per head injury protocols
• Ocular anterior and posterior chamber exam
• TM’s exam for hemotympanum
• Grasp upper teeth and palate and pull to assess for Lefort fractures (movement noted)
• Dental exam
• C-spine films prn (see Neck Pain Protocol)

Treatment
• Most patients can be followed as outpatient with plastic surgeon or ophthalmologist in a timeframe determined by the surgeon
• Discuss with supervising physician
• No nose blowing
• Augmentin 500 mg TID PO × 10 days or Levaquin 750 mg Qday PO × 10 days
• Pediatric Augmentin dose — 12.5 mg/kg PO bid × 10 days
• Analgesics PO prn
• Ice prn for swelling
• Tetanus if not up to date (see Tetanus Protocol, page 558)

**Discharge criteria**

• Uncomplicated inferior blowout fracture without extraocular muscle entrapment or other facial fractures or associated conditions

**Discharge instructions**

• Head injury aftercare instructions
• Orbital blowout fracture aftercare instructions
• Referral to Ophthalmology or plastic surgeon within 7 days

**Consult criteria**

• Discuss all facial fractures except nasal with supervising physician

**Subconjunctival Hemorrhage**

• No treatment
• Check PT/INR if on coumadin
• CBC if constitutional symptoms present

**Retinal Detachment**

**Causes**

• Tear in retina

**Risk factors**

• Near sighted
• Advanced age
• Diabetes
• Sickle cell anemia
• Prior retinal detachment history

**Findings and symptoms**

• Painless
• Light flashes
• Decreased peripheral vision
• Floaters
• Lowering of curtain over vision in affected eye
**Examination includes**
- Direct ophthalmoscopy (may need pupils dilated)
- Bedside ultrasound with vascular probe can detect retinal detachment

**Treatment**
- Elevate head of bed for inferior detachment
- Lay flat for superior detachment

**Consult criteria**
- Consult physician and ophthalmologist promptly

**Central Retinal Artery Occlusion**
- True emergency
- Usually from emboli
- 90 minutes to restore vision before irreversible damage
- Evaluate for sickle cell anemia and temporal arteritis

**Findings**
- Sudden loss of vision in one eye
- Pupil reacts consensually
- Afferent defect to light in affected eye (pupil does not constrict)
- Increased intraocular pressure
- Pale fundus
- Dilated pupil
- Retinal artery may have “box cars” appearance
- Macula has enhanced cherry red appearance (different blood supply)

**Treatment**
- Gentle massage on globe to attempt dislodging emboli
- Rebreathing bag or mask to increase CO2

**IOP treatment**
- Timoptic
- Diamox
- Ophthalmology paracentesis of anterior chamber
Consult criteria
- Notify supervising physician immediately
- Ophthalmologist consult immediately

Central Retinal Vein Occlusion
- Rapid and painless vision loss of one eye
- Slower onset than retinal artery occlusion
- From thrombosis of central retinal vein

Findings
- Retinal hemorrhages
- Impressive appearance of fundus bloody engorgement
  - Optic disc edema

Treatment
- Aspirin

Consult criteria
- All central retinal vein occlusion patients
- All patients with acute vision loss

Hyphema and Hypopyon (Blood or Pus in Anterior Chamber)
- Consult physician

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Nosebleed Protocol

When using any protocol, always follow the Guidelines of Proper Use.

Inclusion Criteria

- Nosebleeds without shock or respiratory distress

Definition

- Bleeding from nostril, nasal cavity or nasopharynx

Differential Diagnosis

- Nasal foreign body
- Sinusitis
- Barotrauma
- Thrombocytopenia
- Leukemia
- Anticoagulation therapy
- Cocaine abuse
- NSAID use
- ASA use
- Hemophilia
- Von Willebrand’s disease
- Trauma

Considerations

- 90% of nosebleeds are anterior
- Most common cause is nose picking
- Hypertension common
- Look for foreign body in young children (suspect if foul smell or discharge present)
- Posterior Epistaxis
  - Less common than anterior Epistaxis
  - Associated with
    - Elderly
    - Hypertension
    - Atherosclerosis

Evaluation

- Attempt visualization of bleeding
• Use nosebleed tray equipment or otoscope
• Have patient clear blood by forcefully blowing nose
• Use suction prn
• Cocaine intranasally can be used for hemostasis and pain control
• If bleeding has stopped and site unknown, take moistened cotton swab and gently stroke suspected area to elicit bleeding
• CBC if suspected significant blood loss or patient is tachycardic or orthostatic
• PT/INR if on coumadin. PTT if on heparin or has Von Willebrand’s disease

Treatment Options
• Control anterior nosebleed by pinching all of nose below nasal bone up to 2–4 minutes
• May treat hypertension if > SBP 180 or DBP > 110
  • Repeat BP 10–15 minutes initially, before treatment, to see if BP decreases sufficiently without medication
  • Treat initial SBP > 210 or DBP > 120 if actively bleeding
• IV NS if vital signs or CBC reflect significant bleeding (notify physician promptly)

Silver nitrate
• Silver nitrate stick cautery directly on bleeding site for 5–7 seconds, and then in a circle around bleeding site, holding 5–7 seconds each spot, to form a solid eschar
  • Then hold 2 dry cotton swabs side by side for 60 seconds over cauterized area with enough pressure to stop any bleeding (usually mild pressure is all that is needed)
  • May repeat in places that continue bleeding with more cautery and cotton swabs pressure until bleeding stops

Additional treatments
• Use Rapid Rhino anterior or posterior balloons (or similar intranasal balloons) if silver nitrate cautery not used or ineffective
• Can also use Merocel packing
• Afrin type nasal spray can be used for hemostasis
Septra DS or sinusitis medication Rx per Sanford Guide for 5–7 days if packing or balloon used

Discharge Criteria
- Successful treatment of bleeding
- Anterior nosebleed
- Hemodynamically stable
- No respiratory distress

Discharge instructions
- Nosebleed or epistaxis aftercare instructions
- Packing removal in 2–3 days
- Refer to ENT or primary care provider in 2–3 days
- Antibiotic ointment twice a day for 7–10 days for cautery or after packing removed — gently applied

Consult Criteria
- Unable to stop bleeding
- Posterior nasal bleeding or packing
- Significant blood loss per CBC or vital signs abnormalities
- Tachycardia or orthostatic vital signs
- Coagulopathy secondary to coumadin or other causes
- Bleeding site not identified or not known whether anterior or posterior

Vital signs and age consult criteria
- Adult HR > 105
- SBP < 90 or relative hypotension (SBP < 105 with history of hypertension)
- Pediatric heart rate
  - 0–4 months ≥ 180
  - 5–7 months ≥ 175
  - 6–12 months ≥ 170
  - 1–3 years ≥ 160
  - 4–5 years ≥ 145
  - 6–8 years ≥ 130
  - 7–12 years ≥ 125
  - 12–15 years ≥ 115
  - 16 years or older ≥ 110
**Lab consult criteria**

- Acute hemoglobin decrease of > 1 gm
- Hemoglobin < 10 gm
- Thrombocytopenia
- INR > 1.2
- PTT > 1.2 times normal

Notes

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ENT EMERGENCY PROTOCOL
When using any protocol, always follow the Guidelines of Proper Use.

Inclusion Criteria
- No imminent airway obstruction

Ludwig’s Angina

Definition
- Cellulitis (occasionally abscess) involving submandibular and sublingual spaces

Considerations
- Mortality has declined to < 10% since penicillin was introduced
- Can result in elevation of tongue to obstruct airway
- Increased association with diabetes; SLE; neutropenia; alcoholism
- Polymicrobial infection is usual
- Infection of 2nd and 3rd molars most common cause — 80% of cases
- Is a clinical diagnosis
- Assess airway status — may need anesthesia or ENT if difficult intubation likely
- Ability of tongue to be protruded beyond vermilion border excludes sublingual space infection

Signs
- Bilateral submandibular swelling — All
- Elevated or protruding tongue — 19/20
- Fever — 9/10
- Increased WBC — 17/20
- Recent dental extraction or toothache — 8/10
- Neck swelling — 7/10
- Dysphagia — 5/10
- Trismus — 5/10
- Neck pain — 1/3
- Respiratory (stridor; dyspnea; tachypnea) — 7/20
- Dysphonia and dysarthria — 1/5
**Evaluation**
- Is a clinical diagnosis
- Airway management takes precedence over testing
- CT scanning best modality if needed
- Soft tissue neck and panorex useful when CT not available
- CBC
- BMP

**Treatment options**
- Antibiotics effective
  - Penicillin + Flagyl
  - Unasyn
  - Clindamycin
- Surgery
  - Needed 20–65% of time
  - If abscess identified
- Airway management if needed
  - Endotracheal intubation
  - Cricothyroidotomy by physician
  - Notify supervising physician immediately if suspected airway compromise

**Complications**
- Aspiration
- Mediastinitis
- Pneumonia
- Empyema
- Bacteremia
- Septic emboli
- Pericarditis
- Cavernous sinus thrombosis
- Cerebral abscess

**Consult criteria**
- All Ludwig’s angina cases
- If imminent airway concern, notify physician immediately
Angioedema of Oropharyngeal Area

**Considerations**
- Affects deeper tissues
- Localized non-pitting edema
- 25% of population experiences urticaria or angioedema during lifetime
- Localized swelling resolves in several days
- Typically involves face and upper lip
- GI tract involvement causes
  - Nausea
  - Vomiting
  - Diarrhea
  - Abdominal pain
  - Esophageal involvement can cause chest pain
- Neurologic involvement rare
- Upper respiratory involvement responsible for mortality

**Predictors of need for airway intervention**
- Increased age
- Tongue swelling
- Oropharynx swelling
- Odynophagia

**Signs**
- Respiratory distress
- Stridor
- Voice changes
- Dysphagia

**Causes**
- Hereditary angioedema (HAE)
- Angiotension converting enzyme inhibitors (ACE) around 70% of patients
  - Increased incidence in African-Americans and women
  - Most occur in first week of therapy
  - But can occur anytime

**Treatment options**
- Medical management usually suffices
- Stop offending agent if known
Less responsive to treatment than urticaria

- Most can be treated with
  - Benadryl 50 mg PO or IM adult; continue for 5–7 days PO
  - Benadryl 1–2 mg/kg PO or IM pediatrics; continue for 5–7 days PO

- Additional treatment if needed
  - Pepcid 20–40 mg IV/PO for adult
  - Pepcid 0.25 mg/kg IV/PO for pediatric (NMT 40 mg)

- Consider steroids
  - Prednisone 40–60 mg PO qday for 5–7 days (> 40 kg)
  - Prednisone/prednisolone 1 mg/kg PO qday (children < 40 kg) for 5–7 days

Airway compromise or significant oropharyngeal swelling (notify physician immediately)

- Epinephrine
  - Caution if coronary artery disease history present
  - Adult: 0.3 mg SQ; (notify physician promptly)
  - Pediatrics: 0.01 mg/kg SQ – do not exceed adult dose (notify physician promptly)
  - Oxygen prn

- Consult physician promptly for posterior oropharyngeal angioedema
- Stop ACE inhibitors if currently taking

**Discharge criteria**

- Observation for 4–6 hours
- Discharge mild lip or non-oropharyngeal angioedema with normal vital signs and no distress

**Discharge instructions**

- Angioedema aftercare instructions
- Refer to primary care provider within 1 day if not improving, otherwise 3–4 days if improving

**Consult criteria**

- Discuss all patients with supervising physician
Barotitis Media and Barosinusitis

- Caused by relative negative pressures from descent during flying usually with a coexistent URI or positive pressures from ascent during diving
- Findings that may be seen
  - Loss of TM landmarks, congestion around umbo, hemorrhage into middle ear

**Valsalva maneuver**
- On airplane descent can be used to prevent occurrence (nostrils pinched and patient blows against a closed mouth forcing air into Eustachian tubes with tympanic membranes feeling the pressure and moving – do not perform if vertigo present

**Treatment options**
- For tympanic membrane congestion only
  - Nasal and oral decongestants
- For hemorrhage into middle ear
  - Adult: prednisone 60 mg PO qday for 6 days then taper over 7–10 days
  - Children: prednisone 1 mg/kg PO for 6 days then taper over 7–10 days (do not exceed adult dose)
- Otitis media antibiotics are prescribed if tympanic membrane perforation or discharge noted
  - Keep ear dry
- Narcotics and/or NSAID’s prn for pain

**Discharge instructions**
- Barotitis or barosinusitis aftercare instructions
- Refer to ENT surgeon if perforation or vertigo present – refer to PCP otherwise
- No altitude traveling till symptoms and findings resolve

**Consult criteria**
- Discuss with supervising physician immediately any patient with joint pain or swelling, chest pain or dyspnea (order chest x-ray), dizziness, headache, altered mental status or hypotension after diving
Nosebleeds

Considerations
- 90% of nosebleeds are anterior
- Most common cause is nose picking
- Hypertension common
- Look for foreign body in young children (suspect if foul smell or discharge)

Evaluation
- Attempt visualization of bleeding
- Use nosebleed tray equipment or otoscope
- Have patient clear blood by forcefully blowing nose
- Use suction prn to clear blood clots or active bleeding as needed
- If bleeding has stopped and site unknown, take moistened cotton swab and gently stroke suspected area to elicit bleeding
- CBC if suspected significant blood loss or tachycardic or orthostatic
- PT/INR if on coumadin. PTT if on heparin or has Von Willebrand’s disease

Treatment options
- Control anterior nosebleed by pinching all of nose below nasal bone up to 2–4 minutes
- May treat hypertension if > SBP 170 or DBP > 110
  - Repeat BP 10–15 minutes initially, before treatment, to see if BP decreases sufficiently without medication
- Treat initial SBP > 210 or DBP > 120 if actively bleeding
- IV NS if vital signs or CBC reflect significant bleeding (notify physician promptly)

Silver nitrate
- Silver nitrate stick cauterity directly on bleeding site for 5–7 seconds, and then in a circle around bleeding site, holding 5–7 seconds each spot, to form a solid eschar
  - Then hold 2 dry cotton swabs side by side for 60 seconds over cauterized area with enough
pressure to stop any bleeding (usually mild pressure is all that is needed)

- May repeat in places that continue bleeding with more cautery and cotton swabs pressure until bleeding stops

**Additional treatments**

- Use Rapid Rhino anterior or posterior balloons (or similar balloons) if silver nitrate cautery not used or ineffective
- Can also use Merocel packing
- Afrin type nasal spray can be used for hemostasis
- Septra DS or sinusitis medication Rx per Sanford Guide for 5–7 days if packing or balloon used

**Discharge Criteria**

- Successful treatment of bleeding
- Anterior nosebleed
- Hemodynamically stable
- No respiratory distress

**Discharge instructions**

- Nosebleed or epistaxis aftercare instructions
- Packing removal in 2–3 days
- Refer to ENT or primary care provider in 2–3 days
- Antibiotic ointment twice a day for 7–10 days for cautery or after packing removed — gently applied

**Consult Criteria**

- Unable to stop bleeding
- Posterior nasal bleeding or packing
- Significant blood loss per CBC or vital signs abnormalities
- Tachycardia or orthostatic vital signs
- Coagulopathy secondary to coumadin or other causes
- Bleeding site not identified or not known whether anterior or posterior

**Vital signs and age consult criteria**

- Adult HR > 105
• SBP < 90 or relative hypotension (SBP < 105 with history of hypertension)
• Pediatric heart rate
  • 0–4 months ≥ 180
  • 5–7 months ≥ 175
  • 6–12 months ≥ 170
  • 1–3 years ≥ 160
  • 4–5 years ≥ 145
  • 6–8 years ≥ 130
  • 7–12 years ≥ 125
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  • 16 years or older ≥ 110

Lab consult criteria
• Acute hemoglobin decrease of > 1 gm
• Hemoglobin < 10 gm
• Thrombocytopenia
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NASAL AND FACIAL FRACTURES PROTOCOL

When using any protocol, always follow the Guidelines of Proper Use.

Inclusion Criteria
- Stable patients without multiple trauma
  (See Motor Vehicle Accident Protocol as needed)

Nasal Fractures
- Most common fracture
- X-rays may miss around 50%

Complications
- Septal hematoma
- Associated orbital wall blowout fractures
- Facial fractures with CSF (cerebrospinal fluid) leak — cribiform plate fracture
- Hyphema
- Retinal detachment
- Subconjunctival hemorrhage

CSF rhinorrhea
- Cribiform plate fracture
- Increased by leaning forward
- Increased with jugular compression
- Ring sign (2 rings formed when CSF placed on filter paper)
- Dipstick findings — CSF glucose > 30mg%

Evaluation options
- Physical examination
- Clear nares of blood
- Evaluate for septal hematoma
- CT facial bones if suspected facial fractures
- CT head injury protocols
- C-spine films prn (see Neck Pain Protocol)
- Plain nasal films not usually needed but can be ordered
• CBC if significant blood loss suspected or tachycardia/hypotension
• Tympanic membranes for hemotympanum
• Eye exam of anterior and posterior chambers if suspected eye injury or complaints
• Excessive tearing may indicate nasolacrimal duct injury — if suspected instill fluorescein in eye and exam posterior pharynx (with Wood’s light if needed) to see if dye flows into pharynx through intact duct

Treatment options
• Epistaxis controlled with pinching nares together for 2–5 minutes
• Septal hematoma needs immediate drainage — consult supervising physician
  • Can be drained with 18 gauge needle after cocaine topical anesthesia
  • Rolled cotton swab can help decompress hematoma
  • Packing after drainage for 3–5 days
  • Antibiotics to prevent sinusitis (same as otitis media antibiotics)
• Analgesics prn
• Tetanus if not up to date (see Tetanus Protocol, page 558)

Discharge criteria
• Simple nasal fractures

Discharge instructions
• Nasal fracture aftercare instructions
• Refer to ENT within 7–10 days
• Head injury instructions

Consult criteria
• Septal hematoma
• Associated facial fractures
• Other associated injuries
• Significant blood loss

Orbital Blowout Fractures
• Orbital wall composed of 7 bones
Occurrences usually with larger object than the orbit (baseball; fist)
Can result in diplopia

**Evaluation**
- Neurologic exam
- Extraocular motor exam
- Plain facial (water’s view best) or CT orbital films
- CT head injury protocols
- Ocular anterior and posterior chamber exam
- TM’s for hemotympanum
- Grasp upper teeth and palate and pull to assess for Lefort fractures (movement noted)
- Dental exam
- C-spine films prn (see Neck Pain Protocol)

**Treatment**
- Antibiotics (same as sinusitis treatment)
- Analgesics prn
- Tetanus if not up to date (see Tetanus Protocol, page 558)

**Discharge criteria**
- Uncomplicated inferior blowout fracture without extraocular muscle entrapment or other facial fractures or associated conditions
- Head injury instructions should be given to competent alert patient or family member or similar person

**Discharge instructions**
- Head injury aftercare instructions
- Orbital blowout fracture aftercare instructions
- Referral to Ophthalmology or plastic surgeon within 7 days

**Consult criteria**
- Discuss all facial fractures with supervising physician
- Referral to Ophthalmology within 7 days

**Mandible Fracture**
- Third most common facial fracture
● 20–40% of mandibular fracture patients have associated injuries
● Children age 4–11 years at risk for facial growth disturbance if fracture missed

Findings
● Facial asymmetry
● Malocclusion of teeth
● Paresthesia to lower lip or gums indicate inferior alveolar nerve damage
● Blood in mouth suggests open fracture
● Jaw may deviate to side of fracture

Evaluation
● Airway exam — notify physician immediately if any airway concerns
● Dental exam
● Neurologic exam
● Plain mandible films or panorex
● CT mandible if the plain films not helpful in suspected fracture
● CT head if per head injury protocols or abnormal neurologic exam
● Chest x-ray if missing teeth cannot be located
● C-spine films prn (see Neck Pain Protocol)

Treatment
● Dental antibiotics choices
  • Pen VK 500 mg PO qid × 7–10 days
  • Cleocin 300 mg PO qid × 7–10 days
  • Erythromycin 250 mg PO qid × 7–10 days
● Tetanus if not up to date (see Tetanus Protocol, page 558)
● See Dental Injury Protocol

Discharge criteria
● Simple nondisplaced mandible fractures
● Soft diet
● Analgesics prn

Discharge instructions
● Mandible fracture aftercare instructions
● Referral to oral surgeon within 1–4 days
• Head injury instructions

**Consult criteria**
• Discuss all mandible fractures with supervising physician

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**Dental Injury Protocols**

When using any protocol, always follow the Guidelines of Proper Use.

**Inclusion Criteria**
- Stable patients

**Considerations**
- Injury to primary teeth common in toddlers
- Older children dental injuries commonly from sports
- Assess for other injuries
- Primary tooth eruption from 7 months to 2–3 years of age
- Malocclusion of teeth is a mandible or maxilla fracture until proven otherwise

**Tooth Fractures**
- Ellis class 1: enamel injured only
- Ellis class 2: dentin involved
- Ellis class 3: pulp involved (bloody dental tissue seen)
Dental Avulsions of Permanent Teeth

- 1% loss of successive reimplantation of avulsed per minute that tooth is not replaced in socket
- More than 15 minutes out of socket has poor salvage rate
- After 60 minutes of being out of socket there usually is no salvage rate
- Avulsed teeth should be handled by crown only
- Put in Hank’s solution; milk; normal saline as a temporizing measure
- Put tooth back immediately after aspirating any clot and irrigating the socket
- Apply a mouth guard (sports mouth guard acceptable)
- Antibiotics: Pen VK 500 mg PO qid for 10 days and see dentist or oral surgeon within one day for further treatment
- It is preferable to discuss with dentist at time of injury

Dental Avulsions of Primary Teeth

- Leave out of mouth

Gingival Lacerations

- Heal well
- Reapproximate with chromic or Vicryl sutures
- Antibiotics of penicillin or erythromycin for 7–10 days or Clindamycin weight or age adjusted tid × 10 days

Lip and Intraoral Lacerations

- Repair from inside out then close skin
- Use absorbable sutures intraorally
- Line up vermillion border if involved
- Antibiotics
  - Pen VK 500 mg PO qid for 7–10 days (weight adjusted for pediatrics)
  - Erythromycin PO tid for 7–10 days if penicillin allergic
  - Clindamycin 300 mg PO tid × 10 days (weight adjusted for pediatrics)
- Refer to Laceration Protocol
Evaluation

- Dental history important to know to determine if teeth worth saving
- Time of injury important
- Palpate and lightly percuss teeth (should be a ping sound normally)
- Remove blood clots
- Check for intraoral lacerations and any through and through involvement
- Check facial bones for looseness (Lefort fractures) but pulling forward on palate or upper maxillary rim
- Plain x-rays for
  - Bony abnormalities
  - Aspirated teeth
  - Foreign bodies (tooth fragments) in lacerations
- Panorex films if available
- Refer to Head Injury Protocols

Treatment

- Enamel fractures do not require immediate treatment
- Class 2 fractures
  - Cover with Dycal (calcium hydroxide paste)
- Class 3 fractures
  - Anesthetize tooth
  - Immediate covering with Dycal
  - Antibiotics
    - Adult
      - Pen VK 500 mg PO qid × 10 days
      - Clindamycin 300 mg PO tid × 10 days
      - Amoxicillin 500 mg PO tid × 10 days
    - Weight adjustment of above antibiotics for pediatrics
- Analgesics prn
- Loose teeth referred to dentist and prescribe a soft diet
- Can use mouth guard to splint very loose teeth
- Move displaced teeth into position post local anesthesia
- Tetanus prophylaxis: (High risk = every 5 years; Low risk = every 10 years)
  - Tetanus IG 250–500 units if high risk and less than 3 tetanus or unknown history of
immunizations previously in life — usually with the elderly

- Refer to health department or primary care provider to complete tetanus primary vaccination series if < 2 vaccines given in past
  - See Tetanus Protocol

**Discharge Criteria**

- Ellis class 1 and 2 fractures
- Primary tooth avulsions
- Mildly loose teeth
- Refer to dentist or oral surgeon
  - Ellis class 2 fractures within 24 hours for primary dental avulsions and loose teeth
  - Ellis class 3 fractures dental referral ASAP, no more than next day if possible
- Give avulsed teeth that are not reimplanted to patient to take to dentist

**Consult Criteria**

- Displaced teeth
- Avulsed permanent teeth
- It is preferable to discuss with dentist at time of injury
- Discuss with supervising physician Ellis class 2 and 3 fractures

**Notes**

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