

“...Eyes, Ears, Mouth, & Nose” Common Facial Injury in Sport

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Faculty Disclosure

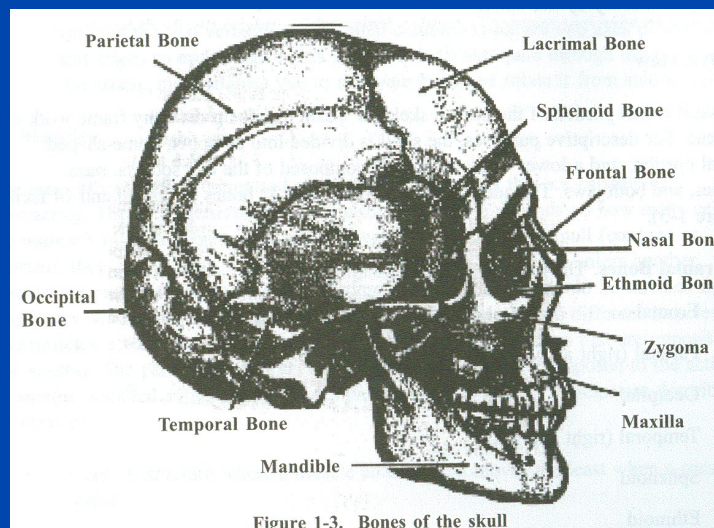
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I do not have financial or other relationships with the manufacturer(s) of any commercial services(s) discussed in this educational activity.

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Objectives

- Understand functional facial anatomy
- Identify common facial injuries in sport
- Understand sideline management of facial injuries
- Discuss return to play after facial injury



Epidemiology

- 6% to 33% of all facial injuries occur while playing sports
- 60%-90% occur in boys and men (ages 10 - 29)
- Protective equipment has helped
 - In 1979, 37% of all maxillofacial trauma was sports related; 13% in study from 2009-2010



Romeo SJ, Hawley CJ, Romeo MW, Romeo JP, Honsik KA. Sideline management of facial injuries. Curr Sports Med Rep Current Sports Medicine Reports 2007;6(3):155–161
Murphy C, O'Connell JE, Kearns G, Stassen L. Sports-Related

Eye Injuries in Sports

- Epidemiology
 - 1/3 of eye injuries in the United States that lead to blindness are sports-related
 - 100,000 physician visits per year
 - 85% of injuries did not wear protection



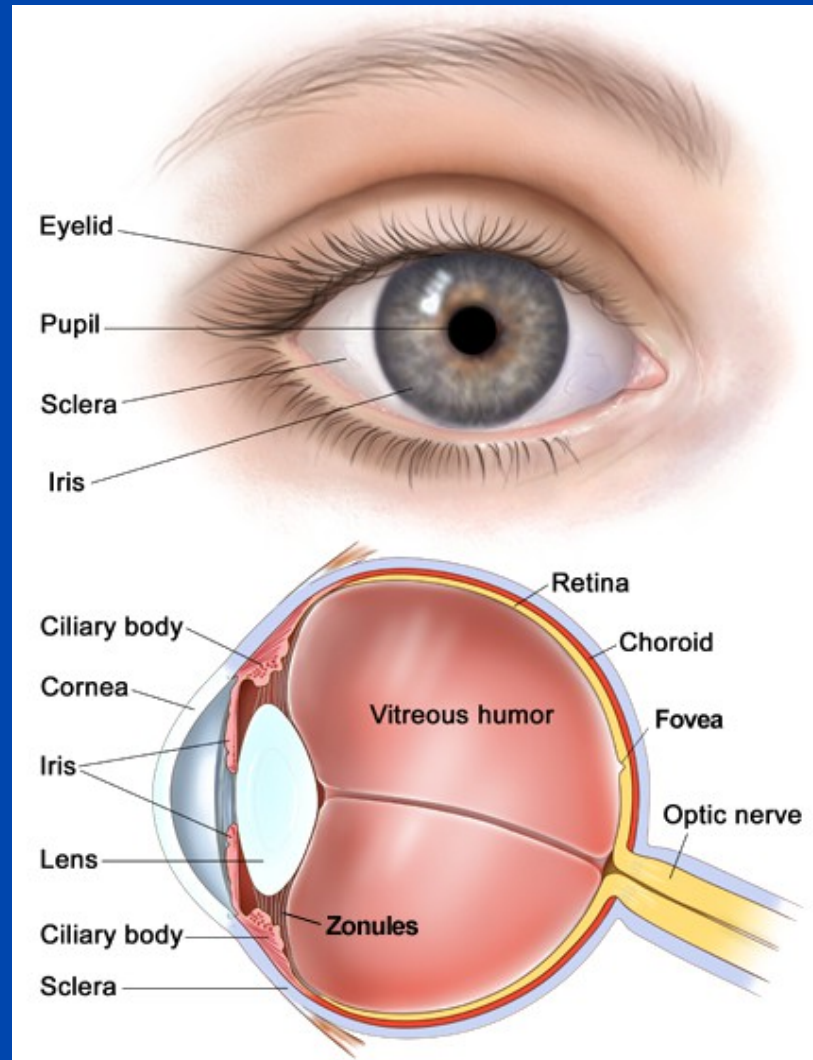
U.S. Consumer Product Safety Commission. (2000) Sports and Recreational Eye Injuries. Washington (DC): U.S.

Eye Injuries in Sports

Risk	Sport
High	BB and paintball
	Basketball
	Baseball
	Softball
	Ice hockey
Moderate	Tennis
	Soccer
	Volleyball
	Football
	Fishing
	Golf
Low	Swimming
	Snow skiing
	Water skiing
	Bicycle
	Snowboarding
Eye-safe	Exercise (jogging, running, walking, aerobics)

Cass SP. Ocular Injuries in Sports. Current Sports Medicine Reports 2012;11(1):11–15.

Functional Anatomy



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Eyelid laceration

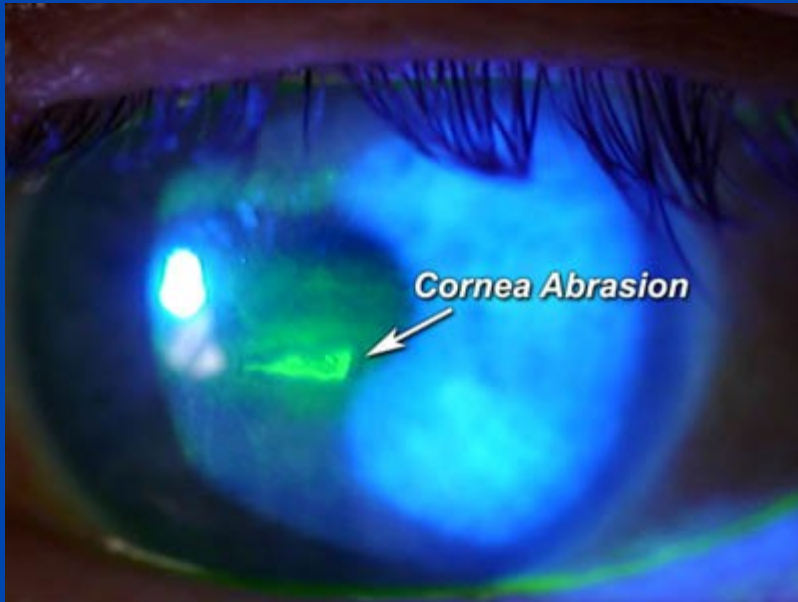


- Definition
 - Blunt trauma, sharp object, protective gear
- Signs/Symptoms
 - Swelling
 - Hemorrhage
 - anatomic disruption of lids
- PE
 - Depth (orbital fat?)
 - Lacrimal duct
 - Eyelid margin
 - Full-thickness tear
- Field of Play

Eyelid Laceration

- Clinical evaluation
 - Irrigate
 - Suture with 5.0 nylon
 - Antibiotic ointment
- RTP
 - Eye protection until sutures are removed (5-7 days)

Corneal Abrasion

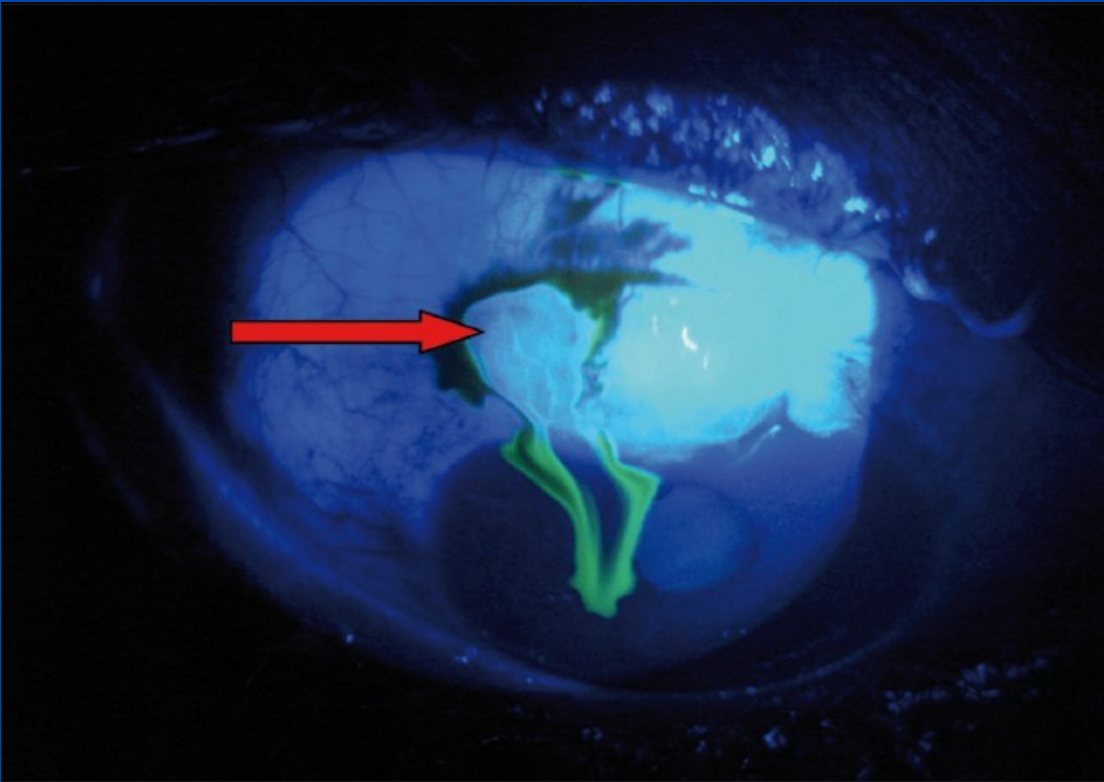


- Definition
 - Cutting, scratching, or abrading the thin, protective surface of the anterior portion of the ocular epithelium
- Signs/Symptoms
 - Redness
 - Pain
 - FB sensation
 - Tearing
- Field of Play
 - R/O open globe

Corneal Abrasion

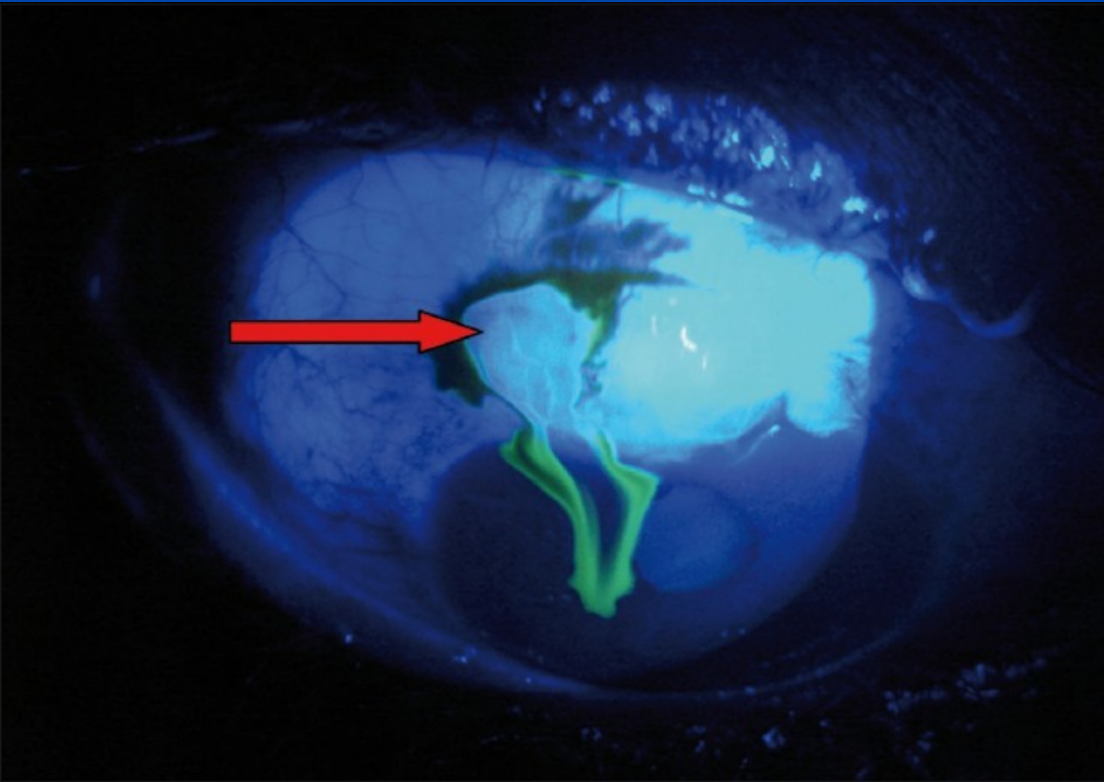
- Clinical evaluation
 - Fluorescein dye with blue/black light
 - Tetanus
 - Antibiotic ointment
 - Re-evaluation within 24-48 hours
 - NEVER give patient topical anesthetic drops
 - Consider topical NSAIDs
 - Contact wearers need antibiotic drops that cover gram negative; refer to Ophthalmology

Corneal Perforation



- Definition
 - Disruption of protective surface of the anterior portion of the ocular epithelium
- Signs/Symptoms
 - Vision loss
 - Pain
 - Positive Seidel Sign
 - Tearing
- Field of Play
 - Hold from play
 - NPO

Corneal Perforation



- Treatment
 - Topical broad-spectrum antibiotic
 - Rigid eye shield
 - Refer to Ophthalmology
- RTP
 - Per Ophthalmology

Retinal detachment



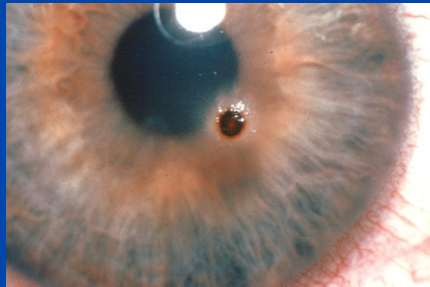
- Definition
 - Separation of the retina from the choroid
- Signs/Symptoms
 - Flashes of light
 - Visual field defect
 - Floaters
- Field of Play
 - Visual acuity
 - Hold from play
 - Refer to Ophthalmology within 24-48 hours

Retinal detachment

- RTP
 - Per ophthalmology

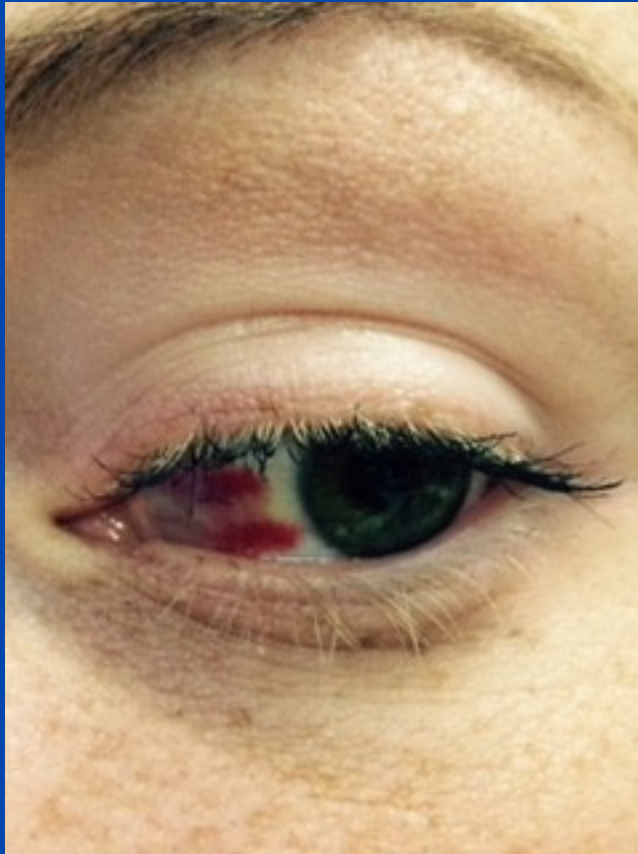


Foreign Body



- Definition
 - Superficial versus deep
- Signs/Symptoms
 - Same as abrasions
- Field of Play
 - Proparacaine
 - Sterile fluid and swab
 - Evert the lid
- Treatment
 - Rule out corneal abrasion
- RTP
 - Normal visual acuity

Subconjunctival Hemorrhage



- Definition
 - Bleeding under the conjunctiva
 - Trauma, vomiting, sneezing, rubbing
- Signs/Symptoms
 - Focal erythema
 - Consider open globe
 - FB?
- Field of Play
 - Continue play
- Treatment
 - None
- RTP
 - Immediately

Preseptal Cellulitis



- Definition
 - Infection of the eyelid
- Signs/Symptoms
 - Periorbital erythema
 - Conjunctivitis
 - Blurred vision
- Field of Play
 - Continue play
- Treatment
 - Clindamycin or
 - TMP-SMX + penicillin or cephalosporin

Orbital Cellulitis



- Definition
 - Infection of the soft tissue of the orbit
- Signs/Symptoms
 - Conjunctiva chemosis
 - IOP increased
 - Pain with EOM
- Field of Play
 - Hold from play
- Treatment
 - Admit to hospital
 - IV antibiotics
- RTP

Burns



- Definition
 - Sunburn
 - Chemical
- Signs/Symptoms
 - FB sensation
 - Lacrimation
 - Pain
 - Vision loss
- PE
 - Conjunctival redness
 - IOP
 - Corneal defect
 - Stromal haze
- Field of Play

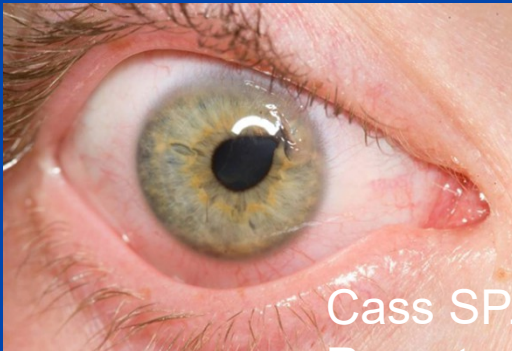
Burns

- Clinical management
 - Oral analgesics
 - Atropine
 - Artificial tears
 - Rest
 - Refer to ophthalmology for chemical burns
- RTP
 - When asymptomatic



Globe Rupture

- Definition
 - rupture or laceration of cornea or sclera
 - High velocity or blunt trauma
- PE
 - Visual loss
 - Pain
 - Eccentric or “teardrop” pupil
 - Hyphema
 - 360° subconjunctival hemorrhage
- Field of Play
 - Don't touch
 - Rigid shield



Cass SP. Ocular Injuries in Sports. Current Sports Medicine Reports 2012;11(1):11-15.

Globe Rupture

- Clinical evaluation
 - Tetanus
 - Scheduled IV pain medications and antiemetics
 - Avoid increasing intraocular pressure (IOP)
 - Refer to Ophthalmology
 - RTP (return to play):
 - Per Ophthalmology



es recover

Madden CC, Netter FH. Netter's Sports Medicine.
Philadelphia, PA: Saunders/Elsevier; 2010

Bisplinghoff JA. High-Rate Internal Pressurization of Human
Eyes to Predict Globe Rupture. *Archives of Ophthalmology*.
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Hyphema



- Definition
 - result of blunt trauma to the eye causing bleeding into AC
 - shearing forces on the blood vessels of the iris
- Signs/Symptoms
 - Discomfort
 - Photosensitivity
 - Anterior chamber shows layering of blood or clot
- Field of Play
 - Assess visual acuity
 - Rigid eye shield
 - Avoid increasing IOP

Cass SP. Ocular Injuries in Sports. *Current Sports Medicine Reports* 2012;11(1):11–15.

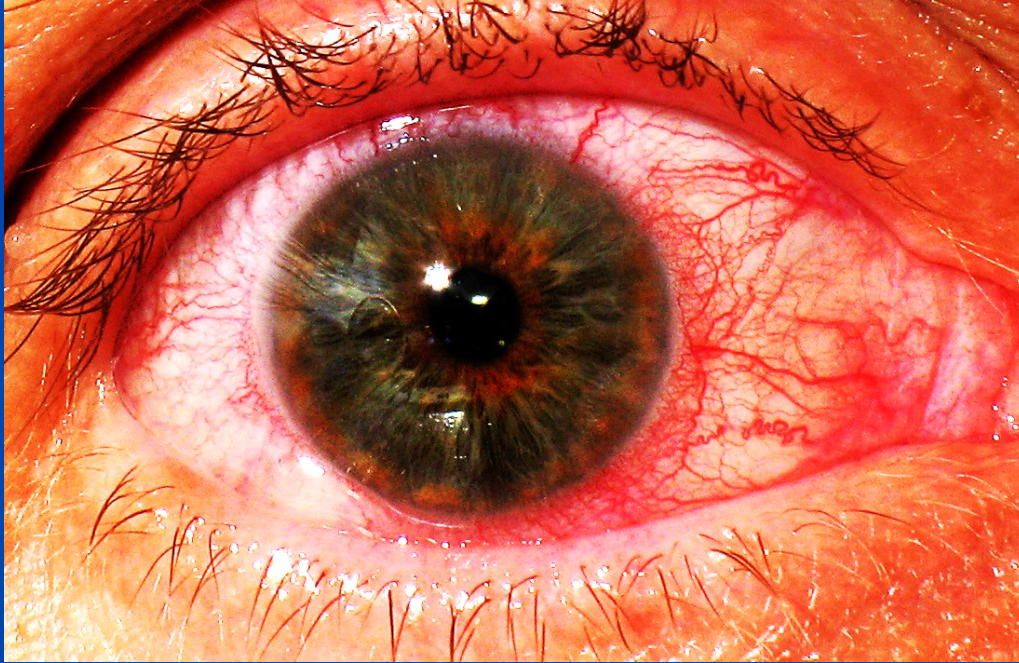
Hyphema

- Clinical evaluation
 - Elevate head of bed to 45°
 - Refer to Ophthalmology
 - Atropine
 - Daily IOP (tonopen) for at least 3 days
- RTP
 - Cleared by Ophthalmology
 - Recurrent bleeding—most at risk within 5 days after injury (4% to 6% of cases)
 - Eye shield for 2 weeks followed by slow progression back to activity



Miller G, Netter FH. Netter's Sports Medicine.
Philadelphia, PA: Saunders/Elsevier; 2010.

Traumatic Iritis



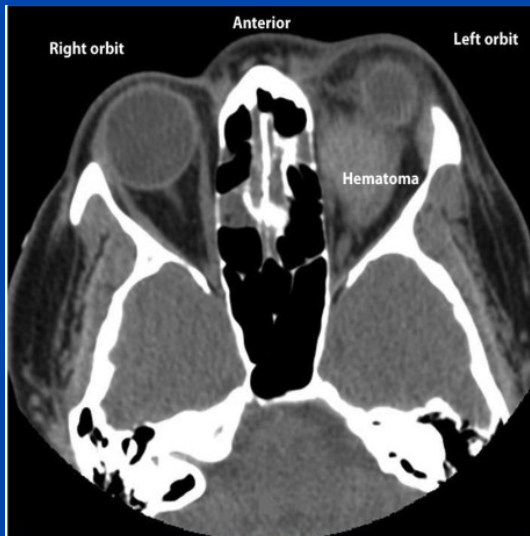
- Definition
 - Trauma increases permeability of capillaries and stimulates inflammation to AC
- PE
 - Limbic injection
 - Decreased visual acuity
 - Miotic pupil
 - Tearing
 - Similar to hyphema presentation but no blood
- Field of Play

Traumatic iritis

- Clinical evaluation
 - Topical cycloplegics
 - Topical steroids
 - Taper steroid after 5-7 days
- RT
 - When asymptomatic

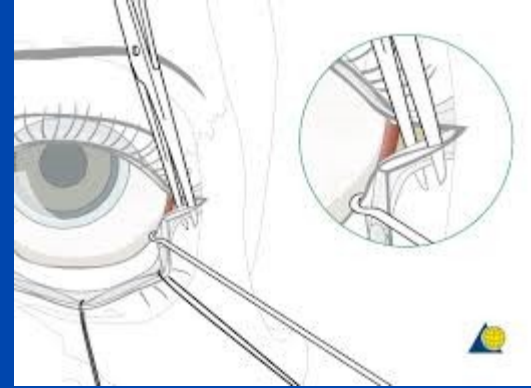


Retrobulbar Hemorrhage/Orbital Compartment Syndrome



- Definition
 - Blunt force trauma resulting in bleeding posteriorly
- PE
 - painful proptosis
 - decreased visual acuity
 - lid ecchymosis
 - chemosis
 - bradycardia
 - Impaired EOM
- Field of Play
 - Transfer

Retrobulbar Hemorrhage/Orbital Compartment Syndrome



- Clinical evaluation
 - Increased IOP > 60 minutes can result in permanent vision loss
 - Ice packs, pain control, bed rest
 - Lateral canthotomy and cantholysis
- RTP
 - Per Ophthalmology

Monocular athlete

- Functionally one-eyed athletes are those who have a best-corrected visual acuity of worse than 20/40 in the poorer-seeing eye
- Eye protection at all times



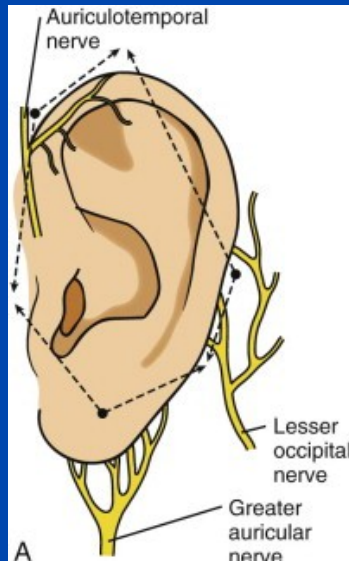
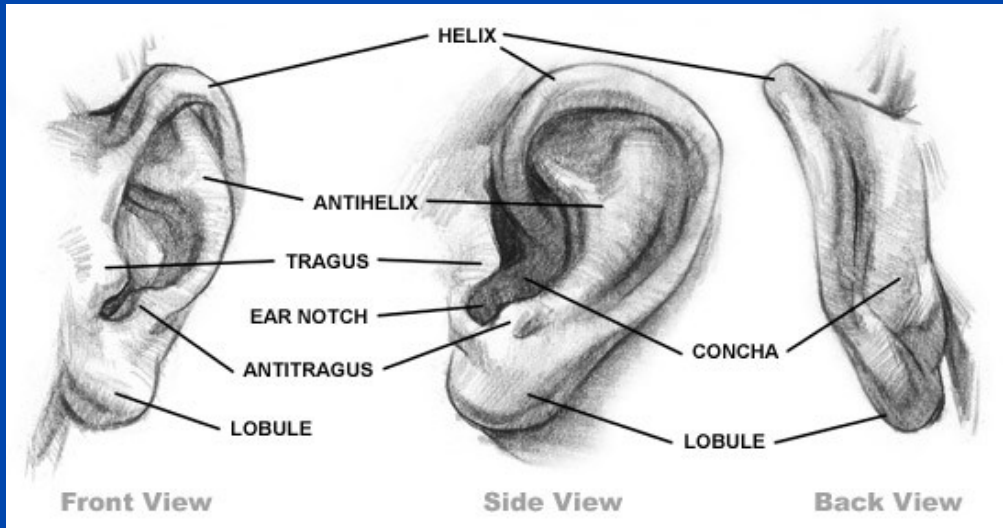
Sport	Minimal Eye Protector	Comment
Baseball/softball (youth batter and base runner)	ASTM F910*	Face guard attached to helmet
Baseball/softball (fielder)	ASTM F803 for baseball*	ASTM specifies age ranges
Basketball	ASTM F803 for basketball*	ASTM specifies age ranges
Bicycling	Helmet plus streetwear/fashion eyewear	
Boxing	None available; not permitted in sport	Contraindicated for functionally one-eyed athletes
Fencing	Protector with neck bib	
Field hockey (men's and women's)	ASTM F803 for women's lacrosse	Protectors that pass for women's lacrosse also pass for field hockey
Football	Polycarbonate eye shield attached to helmet-mounted wire face mask	
Full-contact martial arts	None available; not permitted in sport	Contraindicated for functionally one-eyed athletes
Ice hockey	ASTM F513 face mask on helmet;* goaltenders, ASTM F1587*	HECC or CSA certified; full-face shield
Lacrosse (men's)	Face mask attached to lacrosse helmet	
Lacrosse (women's)	ASTM F803 for women's lacrosse*	Should have option to wear helmet
Paintball	ASTM F1776 for paintball*	
Racquet sports	ASTM F803 for selected sport*	
Soccer	ASTM F803 for selected sport*	
Street hockey	ASTM F513 face mask on helmet*	Must be HECC or CSA certified
Track and field	Streetwear with polycarbonate lenses/fashion eyewear†	
Water polo/swimming	Swim goggles with polycarbonate lenses	
Wrestling	No standard available	Custom protective eyewear can be made

Eye Injury—Return to Play Summary

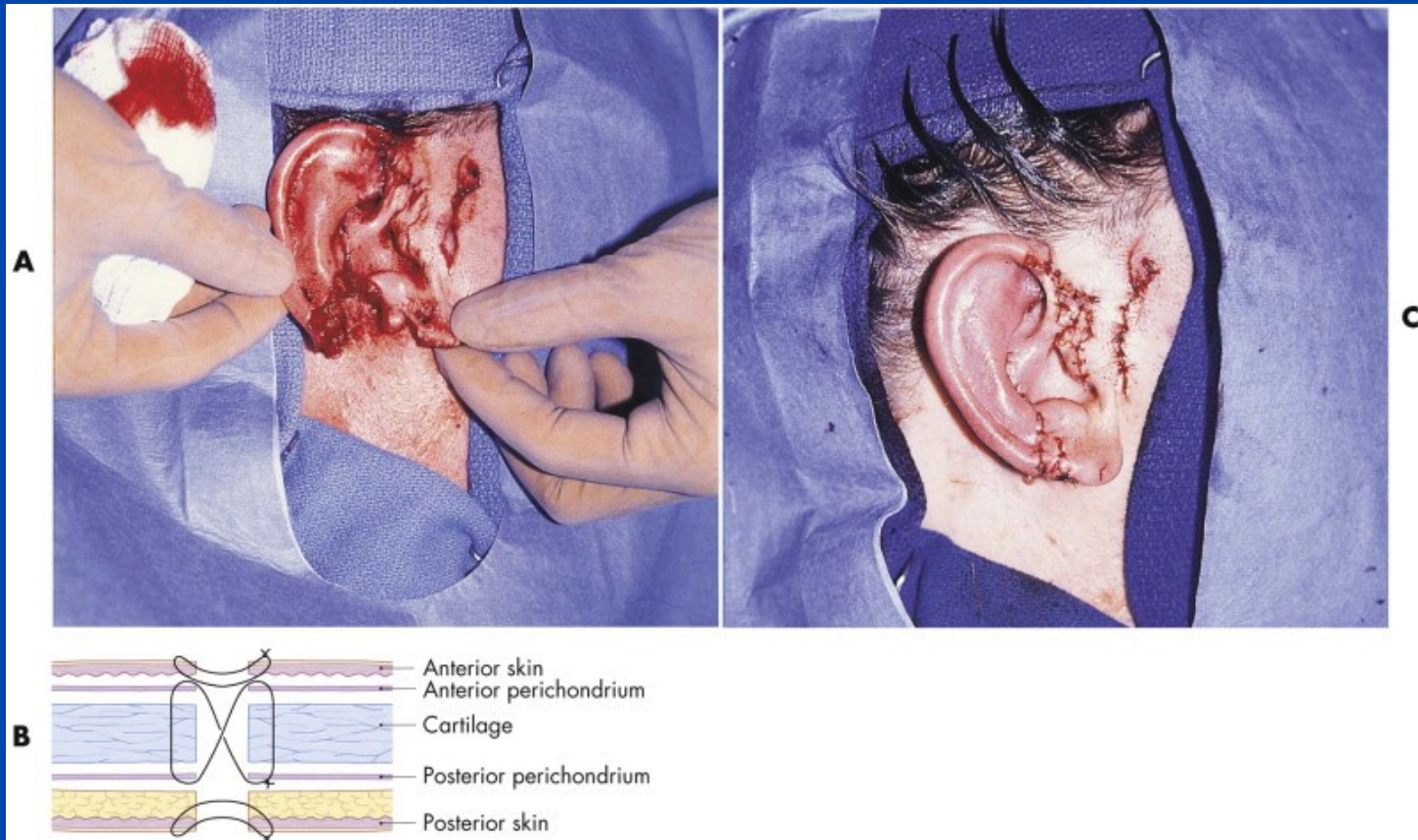
Eye Injury	Return to Play
Corneal abrasion	May return to play if no functional or binocular loss of vision.
Corneal foreign body	Same guidelines as for corneal abrasion
Blow-out fracture	Should not return to competition. Should be cleared by an ophthalmologist and ENT prior to return.
Globe rupture	Should not return to competition. Should be cleared by an ophthalmologist prior to return.
HypHEMA	Should not return to competition. Should be cleared by an ophthalmologist prior to return.
Retrobulbar hemorrhage	Should not return to competition. Should be cleared by an ophthalmologist prior to return.
Retinal tear or detachment	Should not return to competition. Should be cleared by an ophthalmologist prior to return.
Eyelid laceration	May return to play if bleeding controlled and no functional or binocular loss of vision.
Penetrating eye trauma	Should not return to competition. Should be cleared by an ophthalmologist prior to return.
Burns and radiation exposure	May return to play if no functional or binocular loss of vision.

Cass SP. Ocular Injuries in Sports. *Current Sports Medicine Reports* 2012;11(1):11–15.

Ear laceration



- PE
 - Cartilage
 - Split earlobe?
- Field of Play
 - If no cartilage, irrigate, suture or cover and immediate RTP
- Treatment
 - Earlobe: 5.0 – 6.0 non absorbable suture
 - Split earlobe: ER
 - Cartilage exposed: ER
 - Prophylactic antibiotics to



Pfenninger JL, Fowler GC. Pfenninger And Fowler's
Procedures for Primary Care. St. Louis, MO: Mosby; 2003.

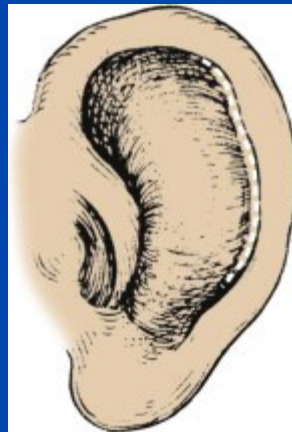
Auricular hematoma

“Cauliflower ear”



- Definition
 - Shearing of the perichondrium from the cartilage
- PE
 - Tenderness and fluctuance
- Field of Play
 - Continue play

Auricular hematoma

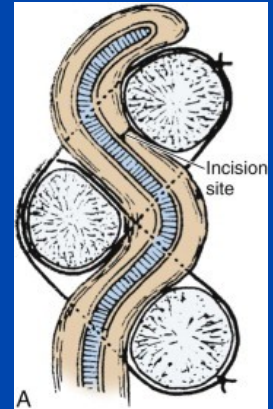
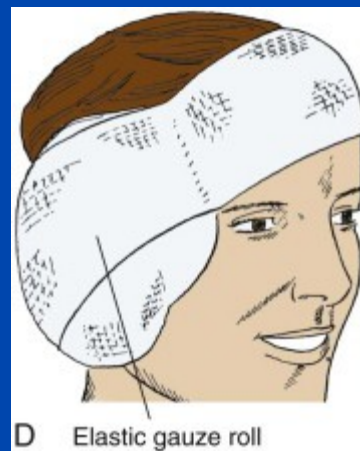
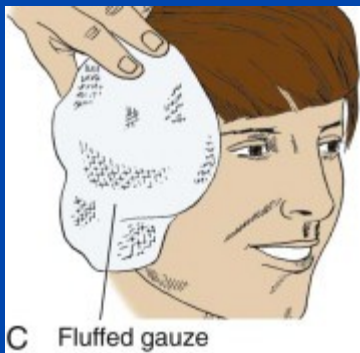
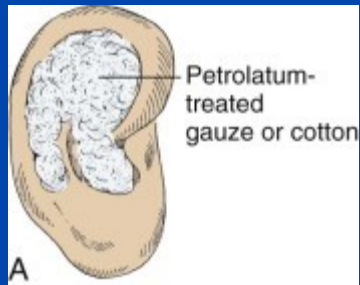


- Treatment
 - Acute and < 2 cm
 - Aspiration 16 or gauge
 - Acute > 2 cm
 - Incision and drainage
 - > 7 days refer to ENT
 - Antibiotics

• Augmentin

Pfenninger JL, Fowler GC. Pfenninger And Fowler's Procedures for Primary Care. St. Louis, MO: Mosby; 2003.

Auricular hematoma



- Splint
 - Thermoplastic
 - Dental Silicone
 - Cotton bolster
 - Compressive dressing
- RTP
 - Non-contact
 - Immediate
 - Contact
 - Removal of the dressing/sutures
 - Protective gear



Pfenninger JL, Fowler GC. Pfenninger And Fowler's Procedures for Primary Care. St. Louis, MO: Mosby; 2003.

Head guard
Headgear

Ruptured tympanic membrane



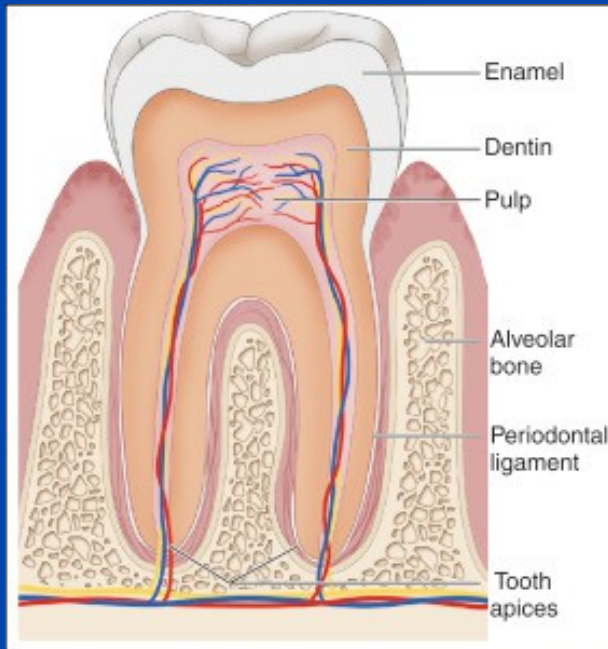
- Definition
 - Trauma (barotrauma or direct blow) or infection
- PE
 - Sudden pain
 - Hearing loss
 - Vertigo
 - Nausea
- Field of Play

Ruptured tympanic membrane



- Treatment
 - Antibiotics only if infection—avoid topical unless water exposure
- RTP
 - When asymptomatic from vertigo
 - Audiometry if >25% TM involved
 - No Swimming until healed
 - < 2 mm usually heal spontaneously within days to weeks
 - If not healed within

Dental trauma

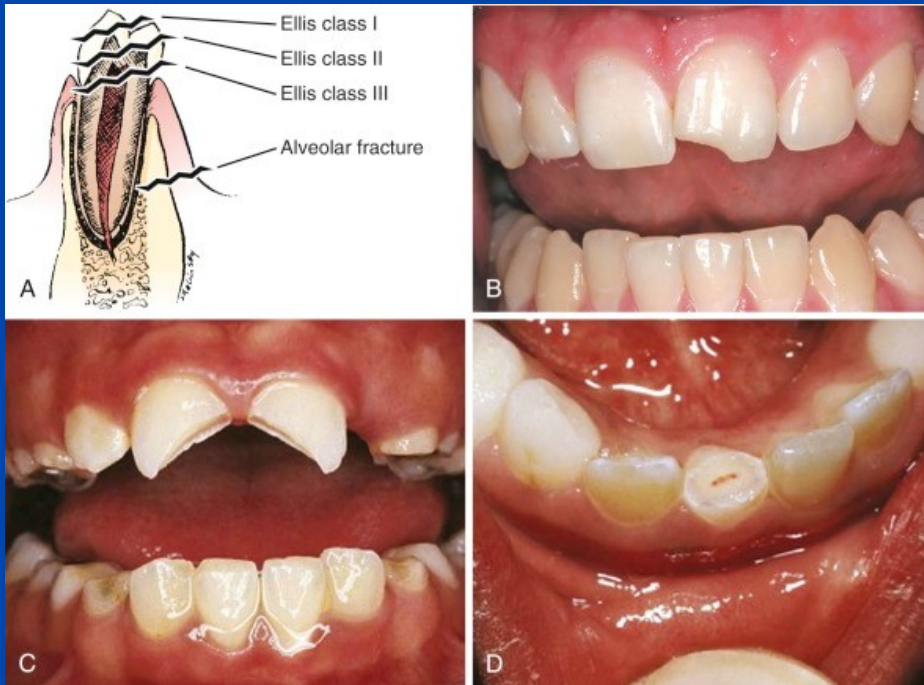


- Definition
 - Broken or loose tooth due to direct blow
- Ellis classification
 - Ellis class I
 - Only enamel
 - Ellis class II
 - Exposes yellow dentin
 - Ellis class III
 - Exposes pulp that is pink, may bleed and is painful

Benko K. Emergency Dental Procedures, Clinical Procedures in Emergency Medicine 2010:1217–1234.

Dental trauma

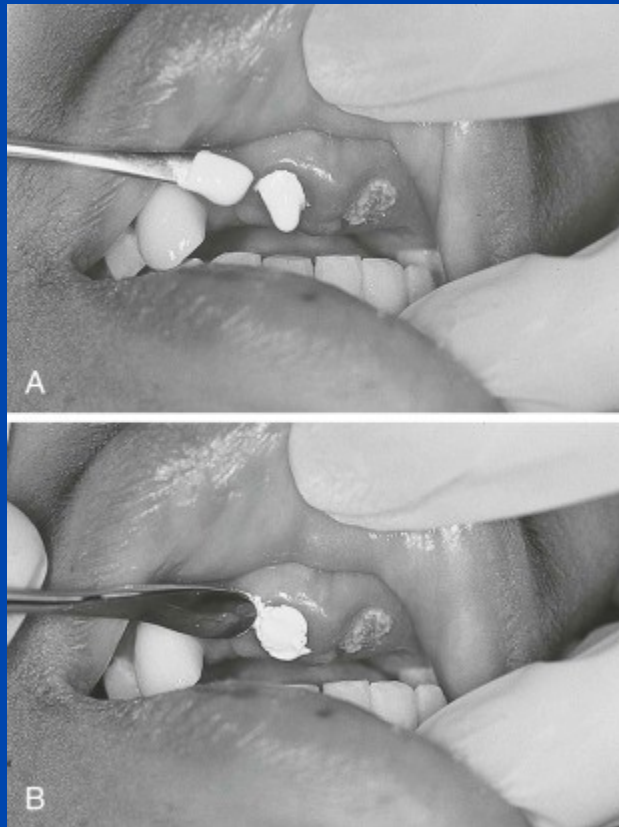
- Field of play
 - Ellis class I
 - RTP immediately
 - Smooth sharp edge with emery board
 - Save dental fragments
 - Ellis class II
 - Risk of pulp necrosis
 - Sensitive to tongue blade percussion
 - Calcium hydroxide paste and mouth guard



Benko K. Emergency Dental Procedures. Clinical Procedures in Emergency Medicine 2010:1217–1234.

Athlete < 12 should be seen within 24

Dental trauma

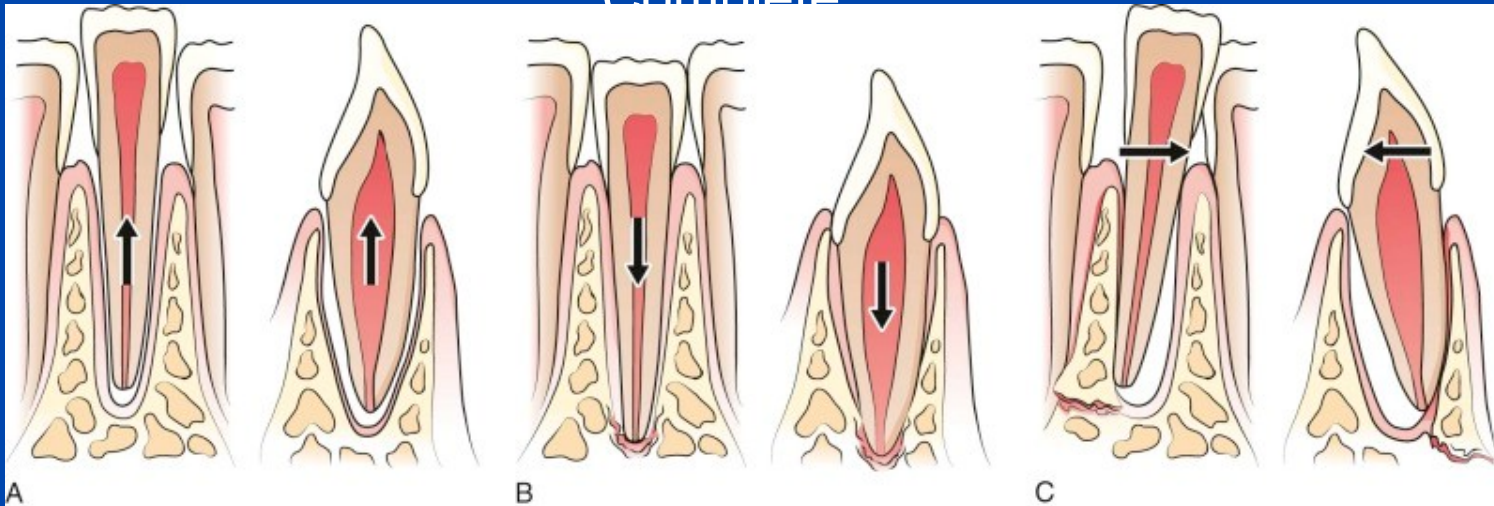


- Field of play
 - Ellis class III
 - Control bleeding
 - Cover with dental paste and foil
 - Consider antibiotics (i.e. penicillin or clindamycin)
 - Immediate referral to a dentist
- RTP
 - Immediate

Benko K. Emergency Dental Procedures. Clinical Procedures in Emergency Medicine 2010:1217–1234.

Dental trauma

- Luxation
 - Extrusive
 - Intrusive
 - Lateral
 - Complete



Benko K. Emergency Dental Procedures. Clinical Procedures in Emergency Medicine 2010:1217–1234.

Dental trauma

- Complete luxation
 - Field of play
 - Avoid touching root (periodontal ligament)
 - Gently rinse with NS if dirty
 - Re-implant (except primary teeth)
 - Or transport in saliva, milk, Hanks solution, Save-A-Tooth
 - NO TAP WATER
 - Treatment
 - Emergent dental referral



Benko K. Emergency Dental Procedures. Clinical Procedures in Emergency Medicine 2010:1217-1234.

Dental trauma



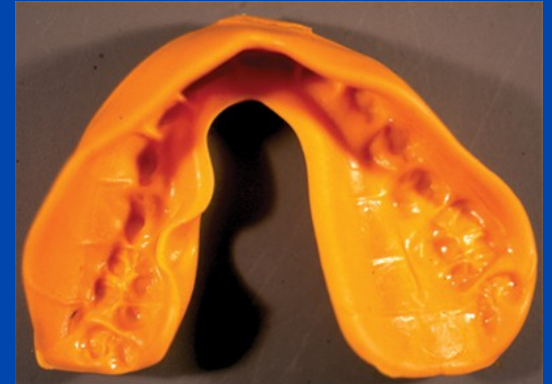
- Subluxation
 - PE
 - r/o intrusion
 - (-) displacement, (+) mobility
 - Bleeding
 - Field of play
 - Stable: mouth guard and continue
 - Unstable: Hold from play
 - Treatment
 - Dental f/u within 24 hours for splinting

Benko K. Emergency Dental Procedures. Clinical Procedures in Emergency Medicine 2010:1217-1234.

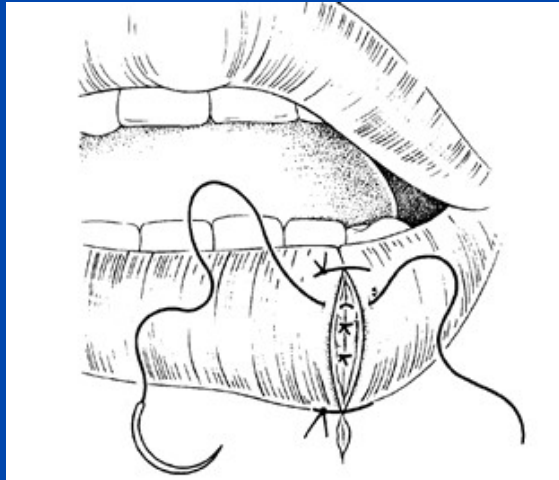
Dental Trauma

Prevention

- Mouth guard
 - Resilient
 - Tasteless
 - Minimal interference with speech
 - Retention/fit
 - Thickness
- Mouthguards in football: 50% down to 0.07% dental and mouth injuries
- No mouthguards basketball: 34%
- Stock, boil and bite, vacuum custom, pressure laminated custom



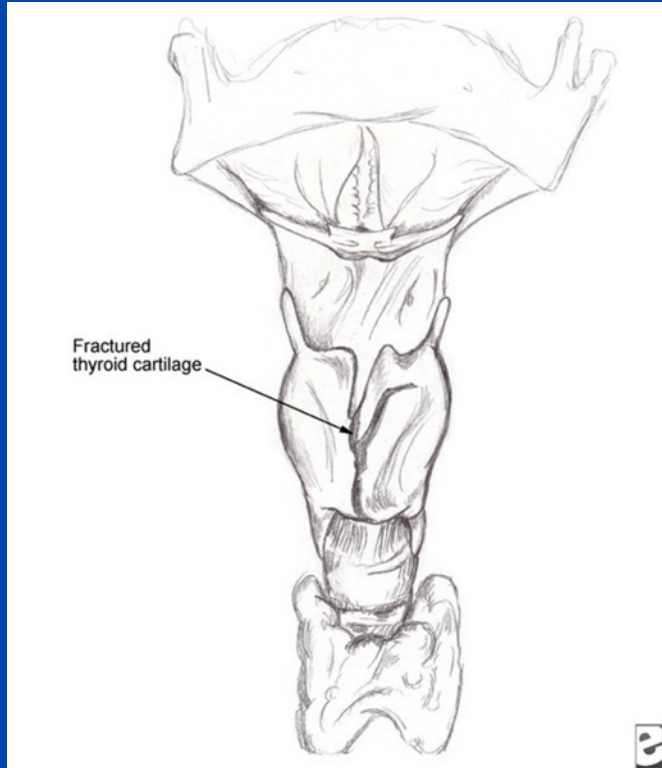
Lip laceration



- PE
 - Through-and-through
 - Vermillion border
- Treatment
 - Suture
 - Vermillion border
 - Inner mucosal layer
 - Muscular layer
- RTP
 - Immediate

Auerbach PS. Wilderness Medicine. Philadelphia: Mosby Elsevier; 2007.

Laryngeal Fracture (rare)



- Definition
 - Blunt anterior neck trauma
- PE
 - Bruising
 - Hoarseness (85%)
 - Tenderness
 - Dysphagia
- Treatment
 - AIRWAY
 - Tracheotomy as soon as possible (avoid intubation)
 - TRANSPORT

Cummings CW, Flint PW, Haughey BH, et al. Cummings
Otolaryngology: Head and Neck Surgery Philadelphia:
Elsevier; 2015.

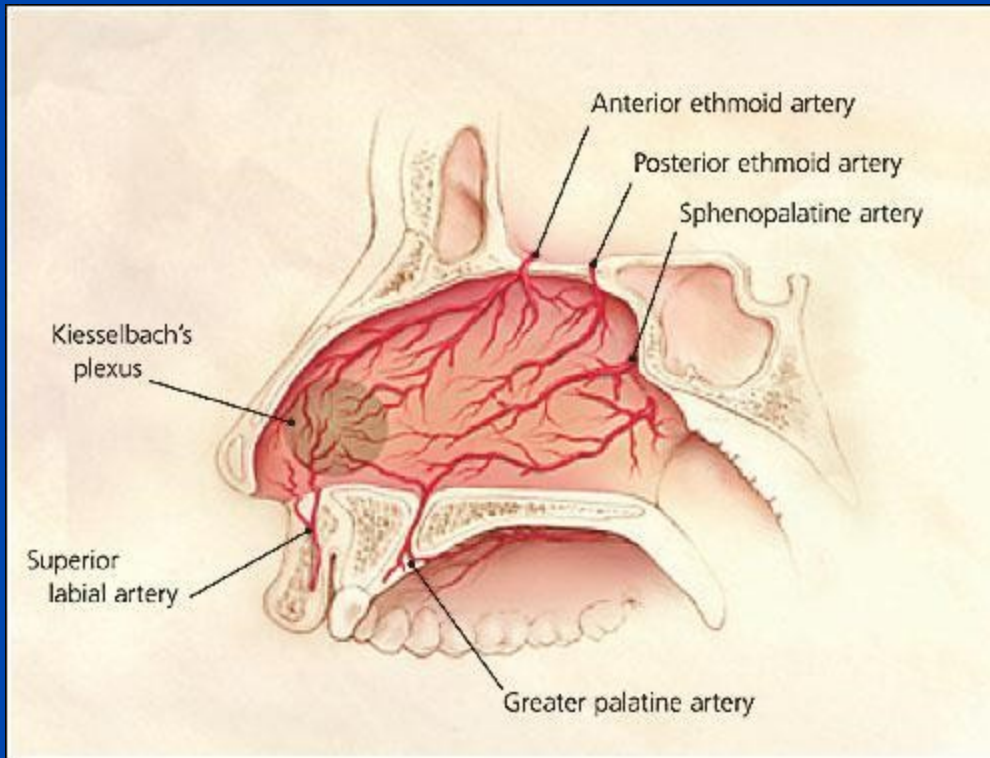
Nose

Epistaxis



- Definition
 - Nose bleed typically from Little (Kiesselbach) area (90-95% anterior)
- PE
 - Locate source of bleed
 - R/O facial fracture
- Field of Play
 - Control bleeding
- RTP
 - When asymptomatic

Epistaxis



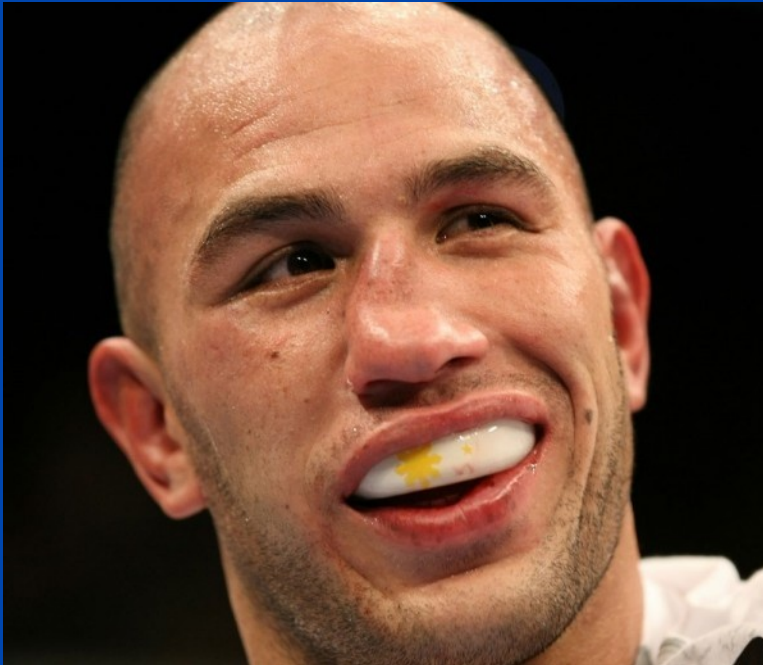
- Treatment

- Pinch nostrils and apply pressure to upper lip
- Cold compresses over nose
- Alpha adrenergic nasal spray
- Silver nitrate applicators
- Epinephrine
- Use dental roll to finish contest
- Discourage packing

Madden CC, Netter FH. *Netter's Sports Medicine*. Philadelphia, PA: Saunders/Elsevier; 2010.

Nose

Nasal Fractures



- Definition
 - Fracture of nasal septum
 - Most common facial fracture
- PE
 - Pain
 - Epistaxis
 - Bruising
 - Crepitus
 - Deformity
 - Nasal septal hematoma
 - CSF leak
 - r/o orbital fracture

Nose

Nasal Fractures



- Field of Play
 - Alpha adrenergic nasal spray
 - Compression
 - Reduce immediately
- Treatment
 - Polycarbonate face shield
 - Antibiotics +/-
- RTP
 - No return same day
 - 1 week post-reduction
 - Protective facial shield 4 weeks post-injury

Nose

Septal Hematoma



- Definition
 - Blood accumulation between septal cartilage and mucoperichondrium
- PE
 - Bluish bulge
 - Pain
 - Nasal obstruction
 - Swelling
- Treatment
 - Aspiration with 18-gauge needle
 - I/D also an option
 - Prophylactic antibiotics

Cases in Which Time is a Critical Factor

- Eye laceration involving lacrimal drainage system
- Corneal or large conjunctival lacerations
- Ruptured eye globe or penetrating injuries of the eye
- Hyphema
- Traumatic iritis
- Retinal detachment
- Orbital wall fractures
- Facial fracture with evidence of CSF leak, airway obstruction, LOC, or visual changes
- Nasal fracture not readily reducible



Cases in Which Time is a Critical Factor

- Septal hematoma (prompt aspiration and prophylactic antibiotics)
- Continuous posterior epistaxis
- Anterior neck trauma with airway compromise
- Laryngeal fractures
- Tooth injuries
 - With pulp involvement
 - Avulsion
 - Intrusion/extrusion injuries



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Questions & Discussion
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