

Ophthalmology in Primary Care

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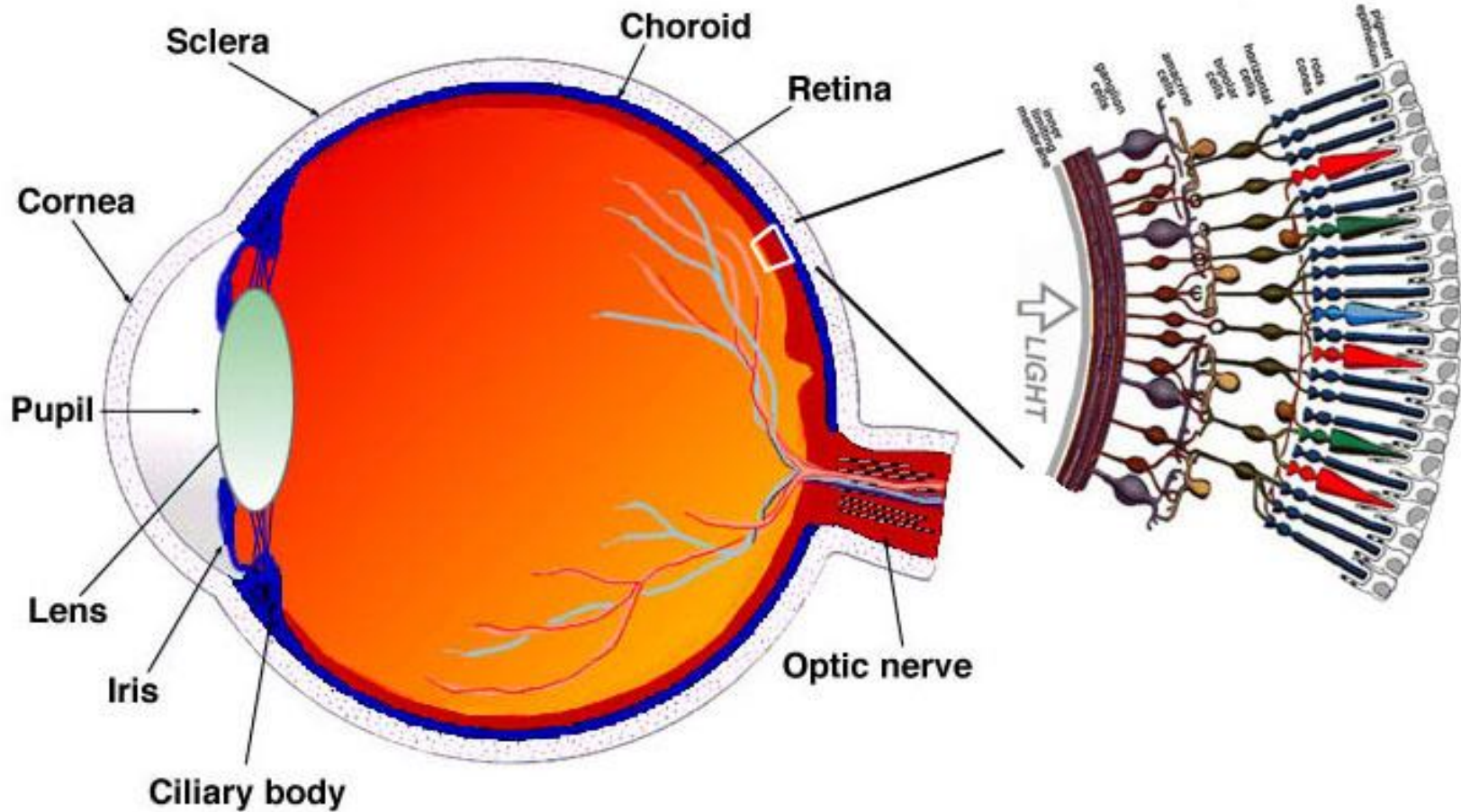
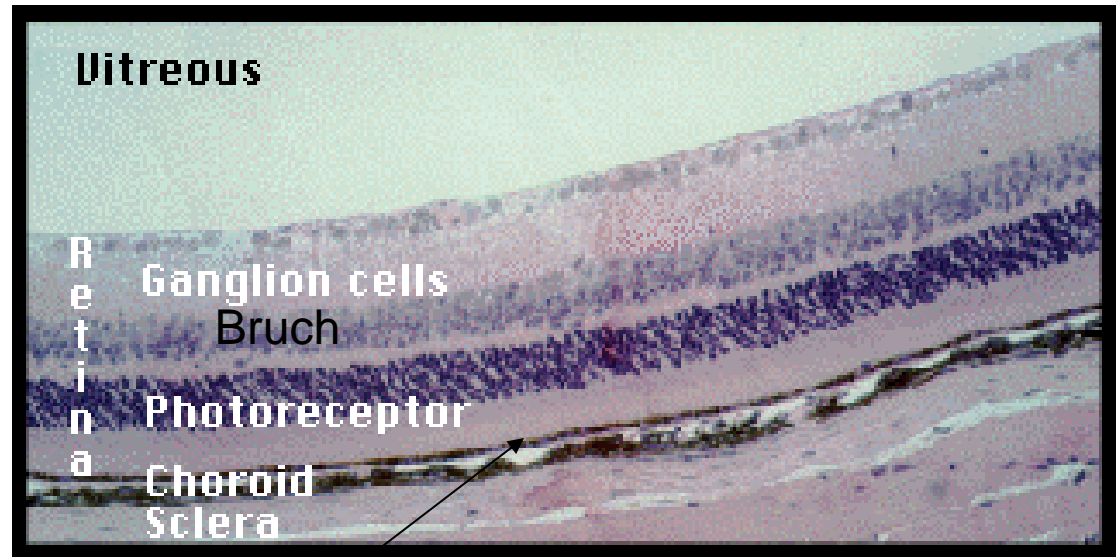
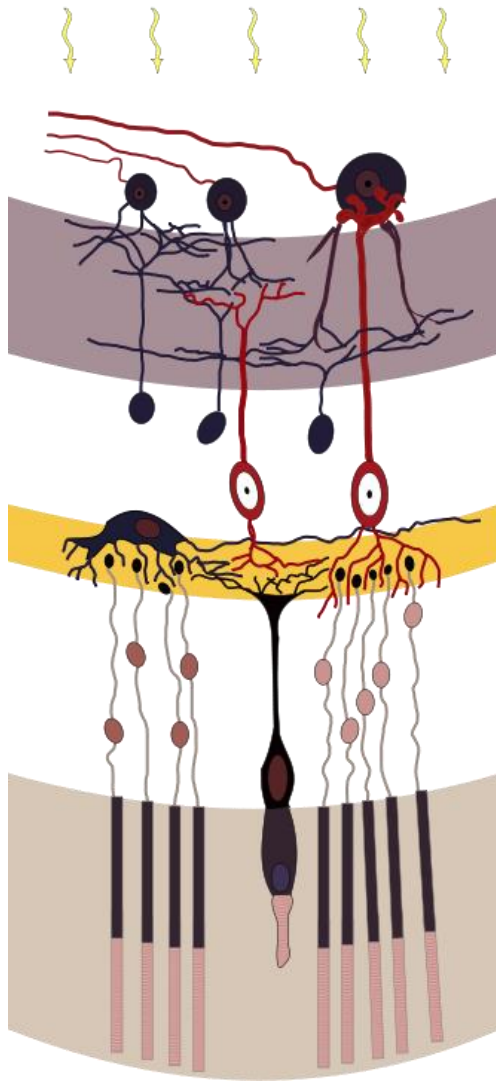


Fig. 1.1. A drawing of a section through the human eye with a schematic enlargement of the retina.

<http://webvision.med.utah.edu/sretina.html>

The Retina



Bruch's membrane: innermost layer of choroid; abuts pigmented epithelial cells which are responsible for transport between retina and choroid

<http://commons.wikimedia.org/wiki/File:Retina-diagram.svg>

Acute Visual Loss

Retinal Detachment

Retinal Vascular Occlusion

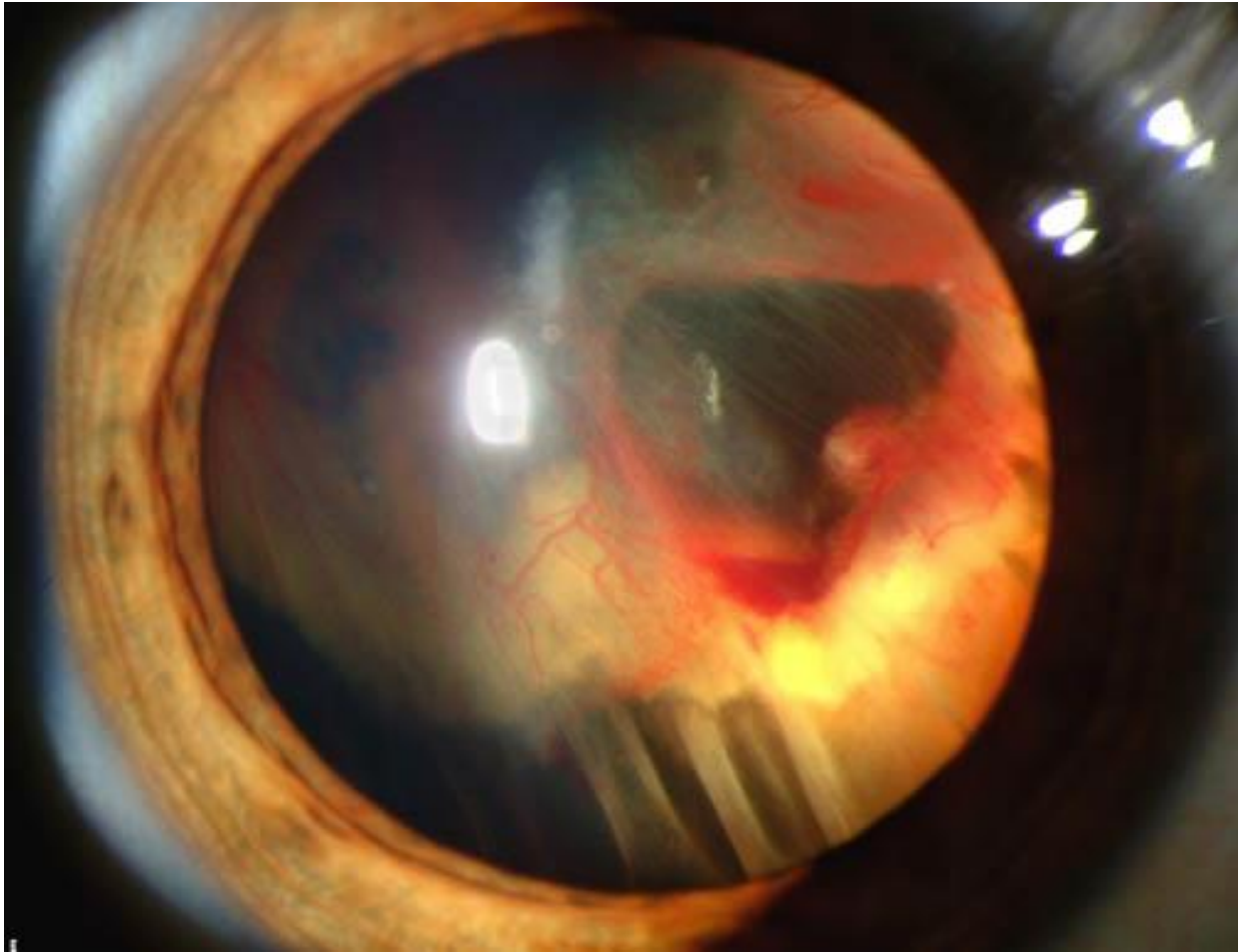
amaurosis fugax, arterial occlusion,
venous occlusion

Other: optic neuritis, papillitis, ischemic
neuropathy, giant cell arteritis



Retinal Detachment

features	<ul style="list-style-type: none">❖spontaneous or traumatic separation from epithelial layer❖high risk: post-cataract surgery, myopia, inflammatory disorders❖most common site: superior temporal
signs and symptoms	<ul style="list-style-type: none">❖flashers, floaters, “curtain” closing, shadows, bubbles, wavy distortions❖progressive, central vision spared till macula detaches❖relative afferent pupillary response defect❖asymmetric red reflex: detached area appears lighter❖retinal hydration lines (rugae)
treatment	<ul style="list-style-type: none">❖<i>refer all detachments</i>❖position head, allow gravity to slow the progression❖cryotherapy, laser photocoagulation, pneumatic retinopathy, surgery
prognosis	<ul style="list-style-type: none">❖80% single occurrence; 15% require repeat treatment;❖5% never re-attach❖worse prognosis: macula detachment



http://commons.wikimedia.org/wiki/File:Retinal_detachment_in_Von_Hippel-Lindau_disease.jpg



Amaurosis fugax

- ✓ ***transient*** acute loss of vision
 - ✓ “curtain” descends, then returns to normal
 - ✓ unilateral visual loss, lasts several minutes
 - ✓ meets criteria for a TIA
-
- ✓ usually patients >50 yo, hx or risk of atherosclerosis
 - ✓ cause: ipsilateral carotid circulation atheroma
 - ✓ emboli interrupts retinal blood flow, then passes
 - ✓ check for carotid plaques; endarterectomy

Retinal Artery Occlusion

[embolic, thrombotic]

carotid atherosclerotic disease

cardiac valvular disease

giant cell arteritis

thrombosis

hypercoagulative states

cardiac myxoma

IDU, talc emboli

trauma

lipid emboli (cholesterol emboli)

DIC

sickle cell anemia

polyarteritis nodosa

corticosteroid injections

retinal migraine

syphilis

cat-scratch disease

Central Retinal Artery Occlusion

symptoms	<ul style="list-style-type: none">▪ sudden, painless, often complete unilateral visual loss
signs	<ul style="list-style-type: none">▪ early: narrowing of arterioles, “boxcarring”▪ hours later: opalescent retina (edema); cherry red spot (perifoveal pallor)▪ later: ganglion cell death, optic atrophy, pale disc, blind eye
treatment	<ul style="list-style-type: none">▪ true ophthalmic emergency▪ intermittent firm pressure/release massage (contraindicated if recent surgery or trauma)▪ immediate referral, vessel dilation, paracentesis

Central Retinal Vein Occlusion

risk factors	<ul style="list-style-type: none">▪elderly, hypertension, glaucoma, diabetes▪increased blood viscosity: polycythemia vera, sickle cell anemia, lymphoma, leukemia
symptoms	<ul style="list-style-type: none">▪<i>subacute unilateral blurriness</i> to loss of vision
signs	<ul style="list-style-type: none">▪relative afferent pupillary defect▪<i>“blood and thunder” fundus</i>▪dilated veins, flame-shaped hemorrhages, edema, exudates, optic disk swelling▪later: neovascularization
treatment	<ul style="list-style-type: none">▪typically resolves somewhat with time (20/200)▪laser treatments, prevent neo-vascular glaucoma▪work up for underlying cause



optic neuritis

sudden inflammation of nerve; destruction of myelin at risk

causes	symptoms/signs	treatment
<ul style="list-style-type: none">▪ <u>autoimmune dz</u> <i>SLE, sarcoid</i>▪ <u>infection</u> <i>tb, syphilis, lyme, meningitis, encephalitis, others</i>▪ <u>multiple sclerosis</u> ▪ toxicity <i>methanol, ethambutol</i>▪ vitamin B₁₂ def	<ul style="list-style-type: none">➤ loss of vision, <i>unilateral</i>➤ loss of pupillary reaction to light➤ loss of color vision➤ pain with EOMs	<ul style="list-style-type: none">➤ may resolve spontaneously, 2-3 weeks➤ corticosteroids, IV ➤ <u>prognosis</u> good unless MS or SLE

Chronic Visual Loss

Glaucoma

Cataract

Macular Degeneration

Retinopathy



Glaucoma

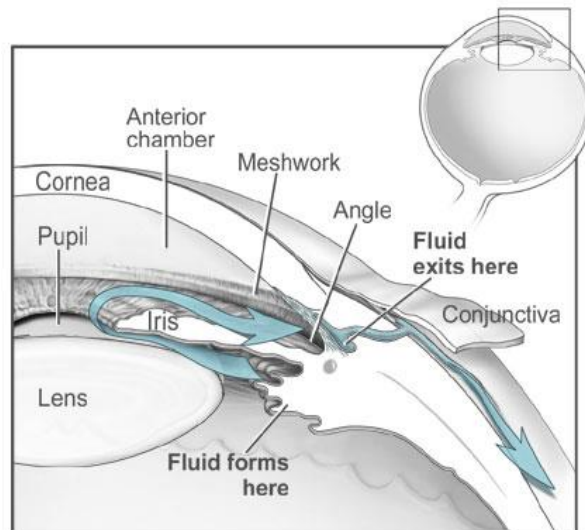
Increased intraocular pressure (IOP)

AND optic nerve damage

- visual field loss → blindness
- **PREVENTABLE!**
- prevalence 0.5%; 3-4 female:1 male
- ocular htn (IOP without optic nerve damage) **1.5%**
- highest risk
 - African Americans
 - diabetes mellitus
 - family history

Glaucoma, pathophysiology

- aqueous humor—produced by epithelium of ciliary body
- flows past lens, around iris, through pupil
- anterior chamber drains through trabecular meshwork to canal of Schlemm
- any resistance to drainage leads to increased pressure



National Eye Institute, National
Institutes of Health
Ref#: NEA11

Glaucoma

(normal intraocular pressure: 8 - 21 mmHg)

Open Angle	Angle-Closure Ocular Emergency!
<ul style="list-style-type: none">▪ insidious, asymptomatic rise in IOP▪ chamber remains open▪ bowing of iris on exam▪ arcuate scotomata▪ contraction of peripheral field▪ central vision spared	<ul style="list-style-type: none">▪ sudden complete occlusion▪ typically IOP >60 mmHg▪ pain, blurred vision, photophobia▪ colored halos or rainbows▪ vasovagal: nausea, vomiting, diaphoresis▪ red, teary; hazy cornea; fixed mid-dilated pupil▪ conjunctival injection, lid and corneal edema, firm globe

Glaucoma, screening → all 3 steps!

- Check anterior chamber angle
risk of closure, avoid anticholinergics
- Optic Nerve Exam
temporal pallor
cup:disc ratio ≥ 0.5
angulated narrow arterioles
edema
- IOP: >21 mmHG



<http://www.icoph.org/med/glaucoma/glaucoma55.html>

normal pressure glaucoma: highest in Japanese ancestry;
look for changes in optic disc, risk loss of vision

Glaucoma, treatment

Angle Closure

- **True Ocular Emergency**
- lower IOP: multiple medications
 - beta blocker: timolol topical
 - carbonic anhydrase inhibitor: intravenous acetazolamide
 - osmotic agent: mannitol
- Laser iridectomy

Glaucoma, medical treatment

promote drainage	prostaglandin-like	latanoprost (Xalatan) bimatoprost (Lumigan)	redness, stinging, change in eyelid pigment, retinal edema
	cholinergic agents	pilocarpine carbachol	pain, blurred vision, stuffy nose, diaphoresis, salivation, GI upset
	epinephrine components	dipivefrin (Propine)	redness, allergy, palpitations, elevated BP, h/a, anxiety
decrease production	beta blockers	timolol (Timoptic) betaxolol (Betoptic)	dyspnea, bradycardia, hypotension, impotence, fatigue, depression
	carbonic anhydrase inhibitors	dorzolamide (Trusopt) brinzolamide (Azopt) acetazolamide (Diamox) po methazolamide (Neptazane) po	frequent urination, paresthesias, rash, depression, fatigue, impotence, metallic taste
both	alpha agonists	brimonidine (Alphagan)	fatigue, dizziness, red/itchy eyes, dry mouth

Glaucoma, surgical treatment

laser trabeculoplasty	open clogged canals
filtering trabeculopathy	remove small piece of trabecular meshwork
electrocautery	remove strip of trabecular meshwork
drainage implants	silicone tube placement

iridectomy
(Univ of Iowa, EyeRounds.org)



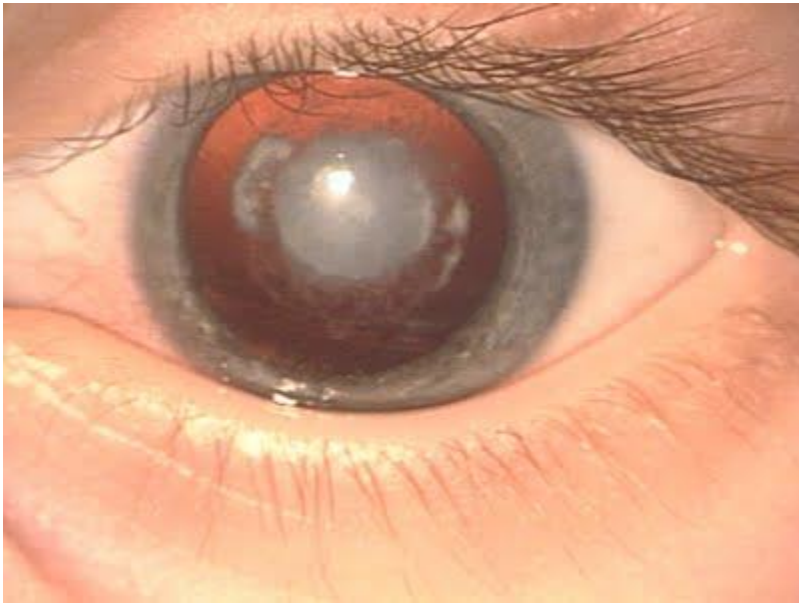


Cataract

epidemiology	<ul style="list-style-type: none">▪50% of 65-74 yo▪70% of > 75 yo▪1.4 million extractions/year in US
causes	<ul style="list-style-type: none">▪congenital/genetic (0.4% of births)▪acquired: trauma, inflammation, radiation/UV light, metabolic/nutritional defects (diabetes)
patho-physiology	<ul style="list-style-type: none">▪normal lens is 35% protein▪lens continues to grow in size, weight, density▪increased proportion of insoluble protein▪brown to yellow discoloration

Cataract, cont'd

symptoms	<ul style="list-style-type: none">▪ slowly progressive loss of vision; blurriness, glare, fixed spots, reduced color perception▪ “second sight” less reliance on reading glasses
signs	<ul style="list-style-type: none">▪ cataract appears dark against red reflex▪ use +5 diopters to view▪ prohibits exam of fundus
treatment	<ul style="list-style-type: none">▪ early: magnifying glasses, dilation▪ later: surgical removal (improve ADLS, permit fundus exam, prevent secondary glaucoma or uveitis)▪ surgical risk: bleed (<0.1%), retinal detachment, secondary glaucoma, after-cataract



EyeRounds.org



Univ of Iowa
EyeRounds.org



Age-related Macular Degeneration

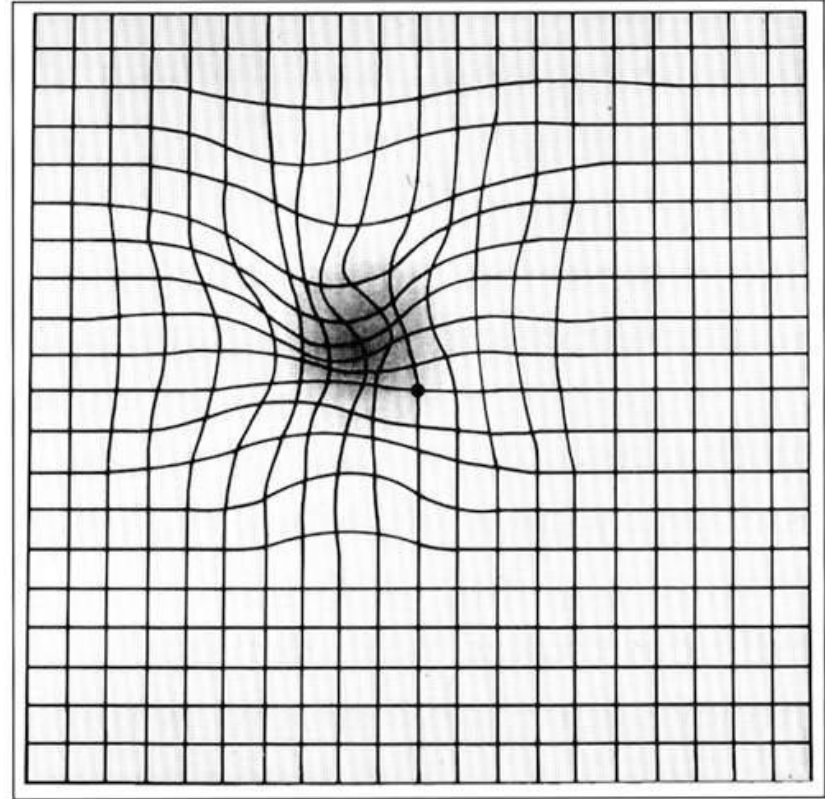
drusen	<ul style="list-style-type: none">▪ yellowish hyaline nodules (colloid bodies)▪ deposit in Bruch's membrane▪ small, discrete bumps OR large, irregular indistinct deposits▪ limit the nutritional and metabolic support
degenerative changes “dry AMD” <i>(most common)</i>	<ul style="list-style-type: none">▪ can occur without drusen▪ clumps of hyperpigmented or depigmented atrophic areas▪ degeneration of supporting structures
subretinal neovascularization “wet AMD” <i>(most advanced)</i>	<ul style="list-style-type: none">▪ subretinal hemorrhagic fibrosis▪ pigment epithelium degeneration▪ photoreceptor atrophy▪ further breakdown of Bruch's membrane▪ hemorrhage—acute visual loss

ARMD, cont'd

symptoms	<ul style="list-style-type: none">▪blurry vision, gradual▪wavy or distorted vision (metamorphopsia)▪central blind spot (scotoma)
signs	<ul style="list-style-type: none">▪decreased acuity▪Amsler grid distortion▪drusen mottling▪atrophy, loss of pigment, macular scarring▪subretinal or intra-retinal bleed or serous leak
treatment	<ul style="list-style-type: none">▪laser photocoagulation, subretinal surgery▪intravitreal injections (wet AMD):<ul style="list-style-type: none"><i>Lucentis</i> (recombinant antibody fragment)<i>Macugen</i> (selective vascular endothelial growth factor antagonist)▪antioxidants, caretinoids, omega 3 fatty acids, zinc



intermediate ARMD



http://commons.wikimedia.org/wiki/File:Intermediate_age_related_macular_degeneration.jpg

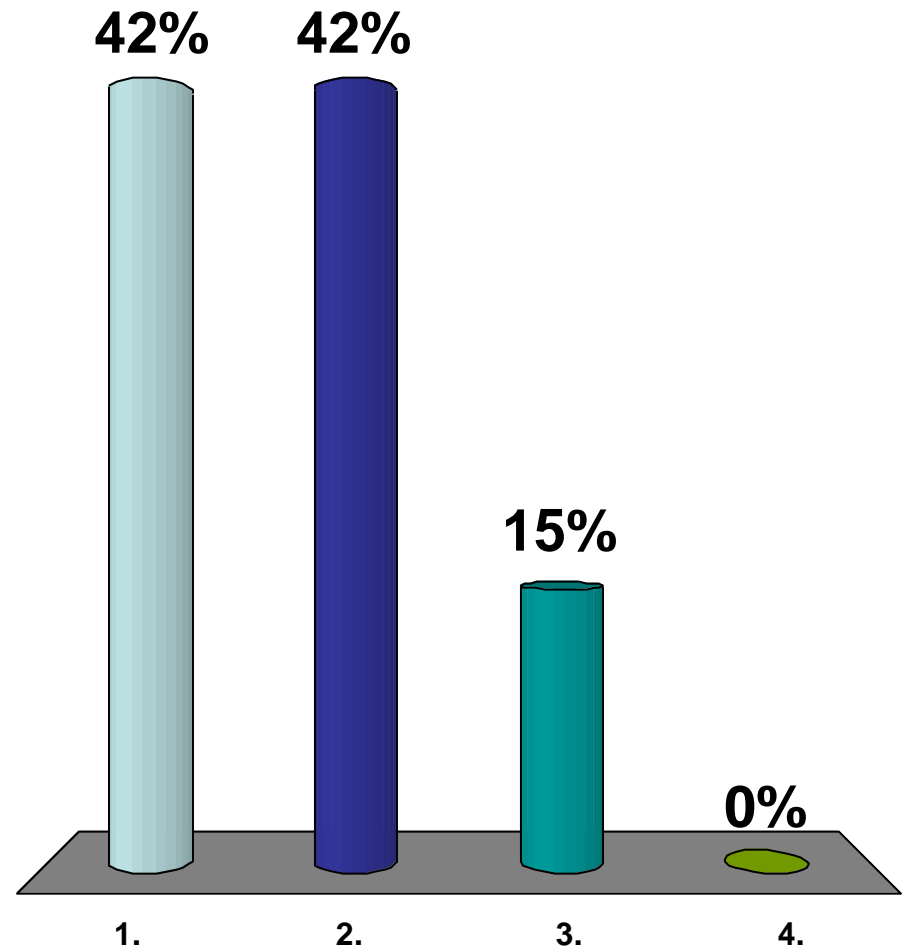


Retinopathy

<p>diabetic</p> <p><i>type 1</i>: screen 3-5 yrs after diagnosis, annually</p> <p><i>type 2</i>: screen at diagnosis, annually</p> <p>ischemic injury to retinal vasculature</p>	<ul style="list-style-type: none">▪background “simple” (microaneurysms, hemorrhages, exudates)▪preproliferative (arteriolar ischemia, cotton wool spots)▪proliferative “malignant” (neovascularization, macular edema)
<p>hypertensive</p> <p>acute or accelerated hypertension more likely</p>	<ul style="list-style-type: none">▪diffuse arteriolar narrowing▪“copper wire” narrowing▪“silver wire” sclerosis
<p>treatment</p>	<ul style="list-style-type: none">▪refer all!▪laser photocoagulation▪treat underlying disease

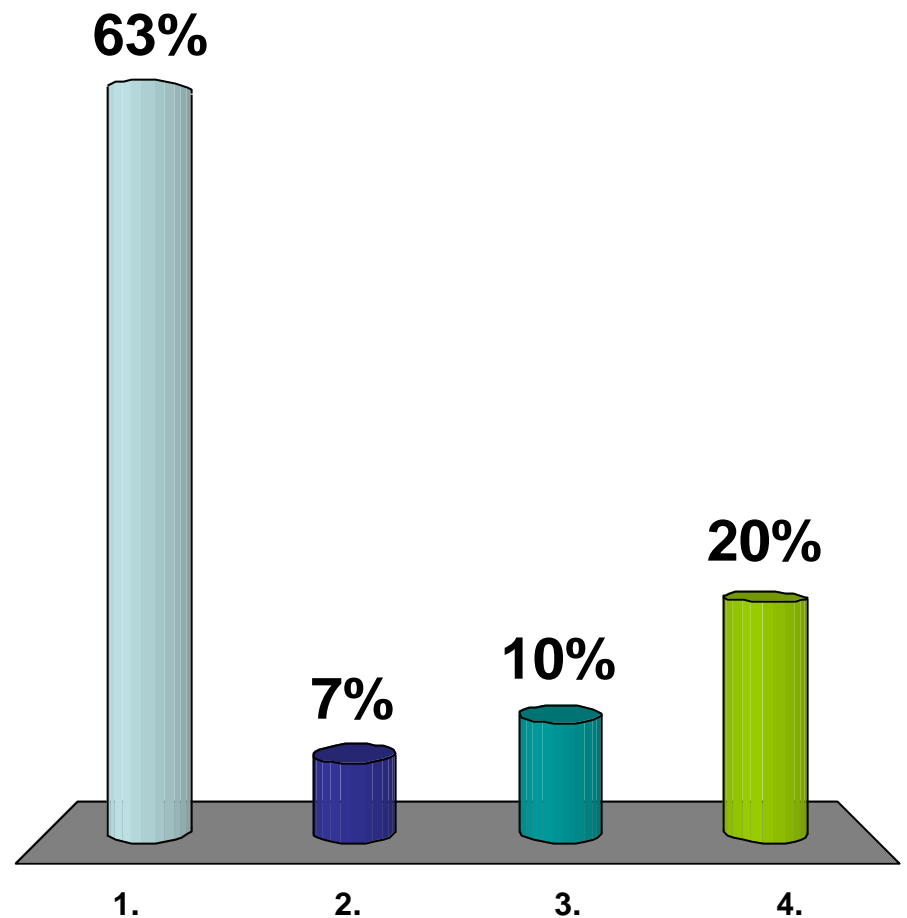
What structure is responsible for the greatest proportion of refraction?

- ✓ 1. cornea
- 2. lens
- 3. retina
- 4. sclera



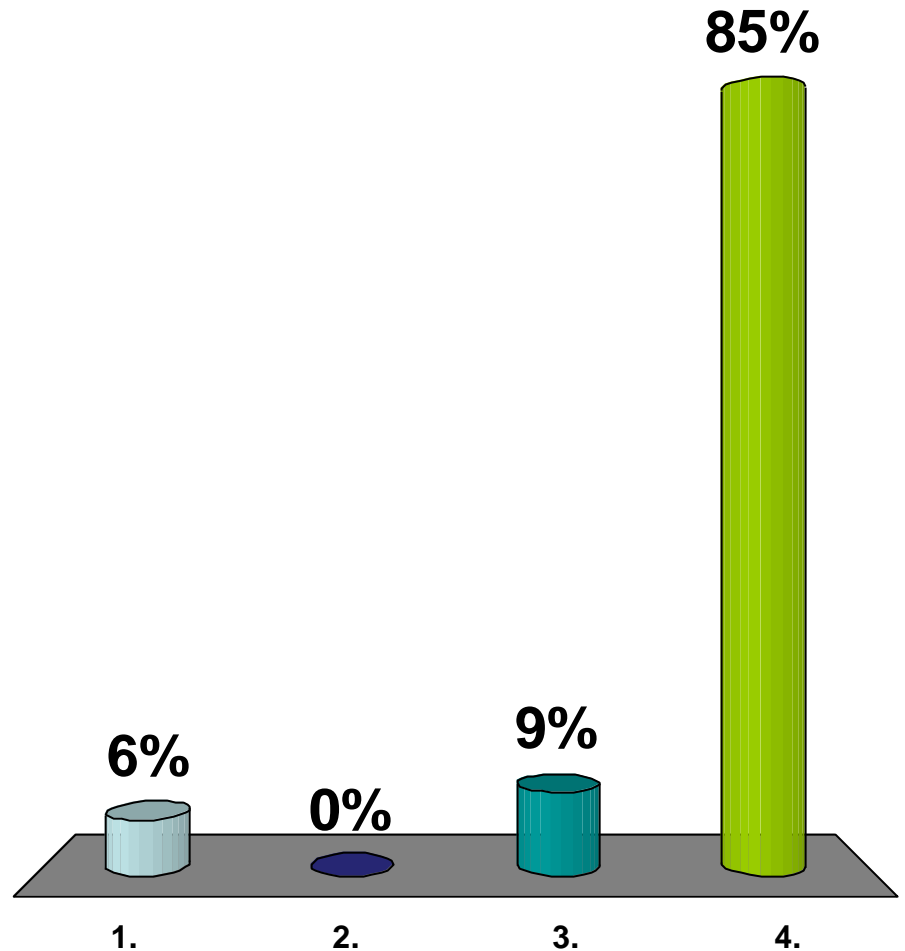
The innermost layer of the choroid is:

- ✓ 1. Bruch's membrane
- 2. optic disk
- 3. sclera
- 4. uvea



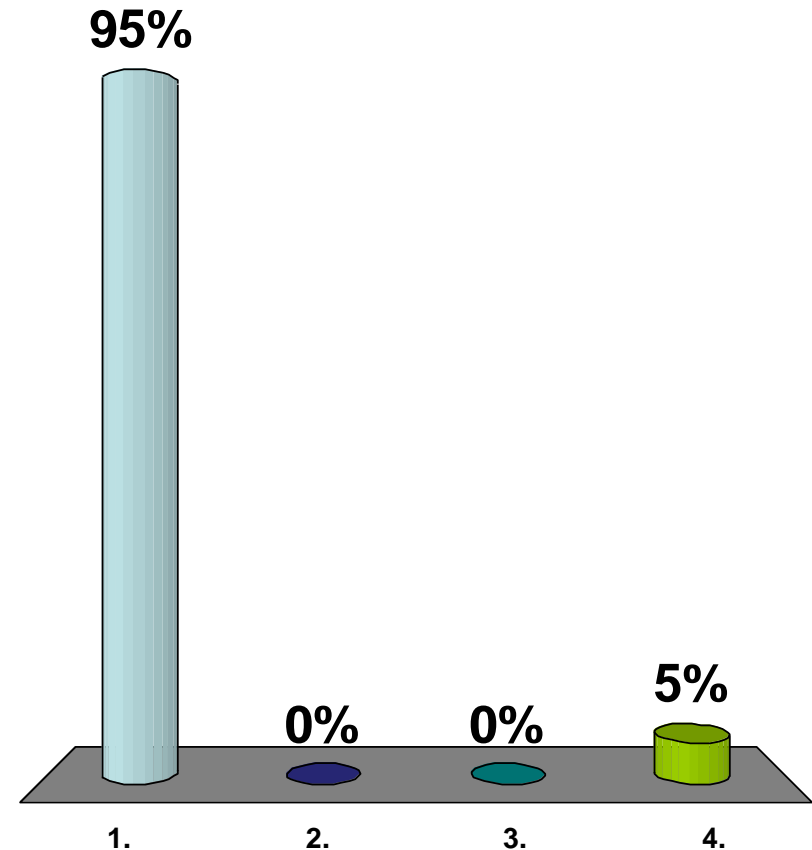
The majority of retinal detachments occur in what quadrant?

1. inferior nasal
2. inferior temporal
3. superior nasal
- ✓ 4. superior temporal



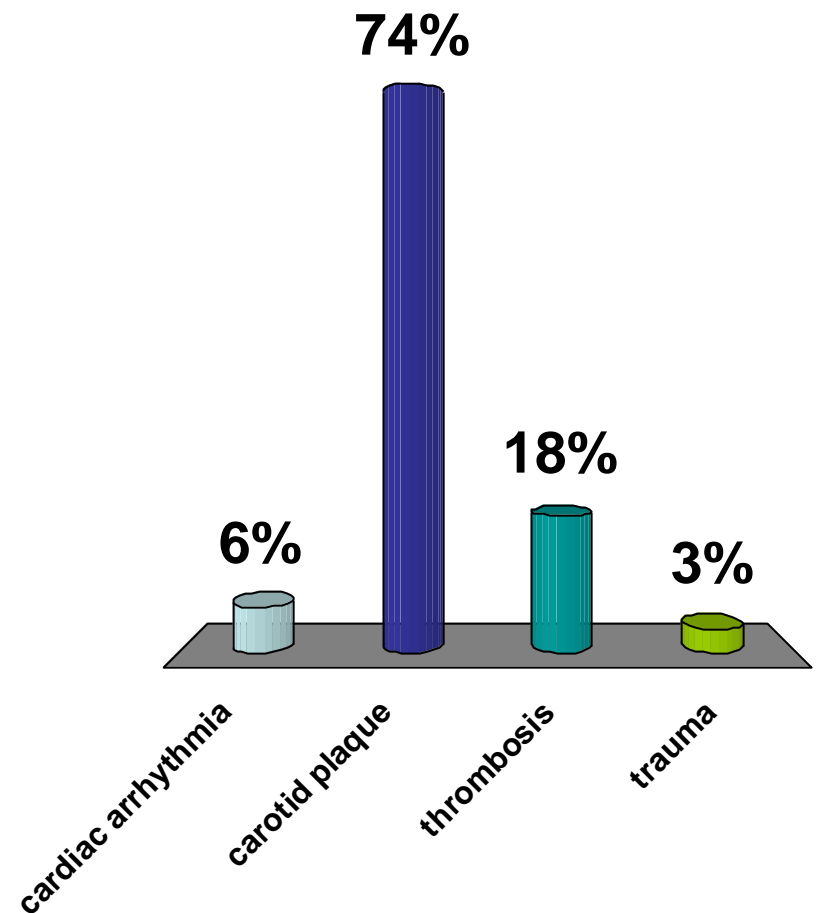
A patient describes a loss of vision as a curtain closing and then re-opening several minutes later. Most likely diagnosis?

- ✓ 1. amaurosis fugax
- 2. central retinal venous occlusion
- 3. open angle glaucoma
- 4. retinal detachment



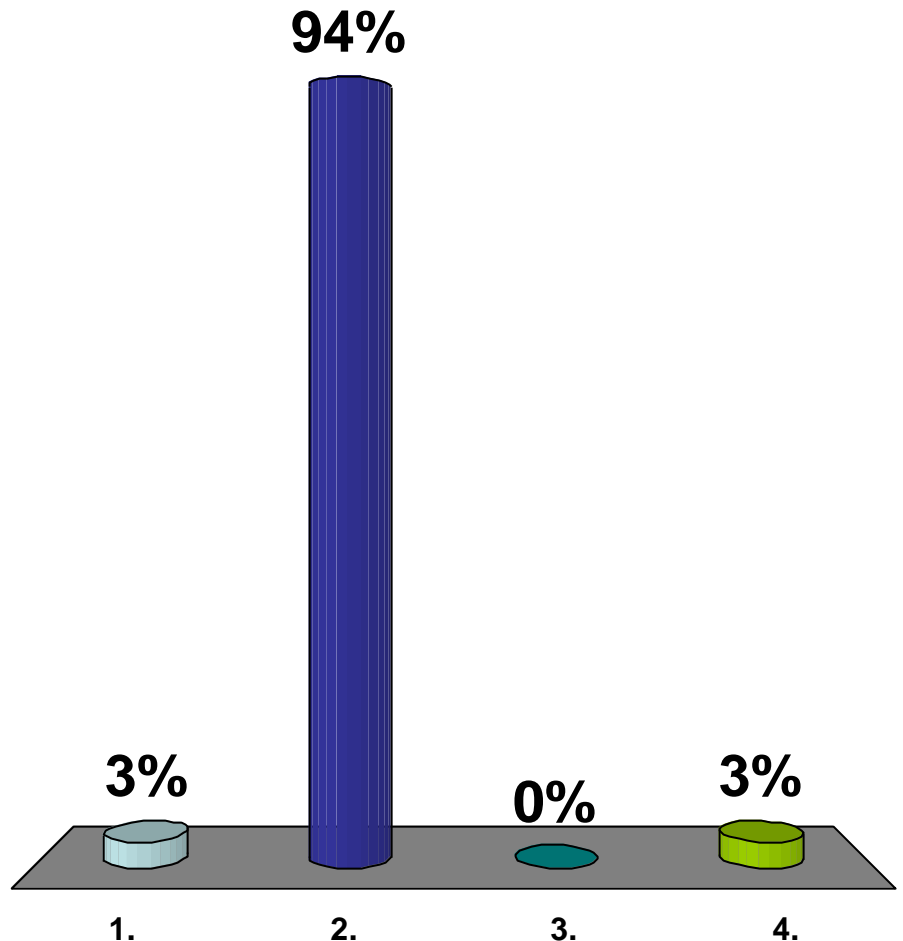
What is the most common cause of retinal artery occlusion?

1. cardiac arrhythmia
- ✓ 2. carotid plaque
3. thrombosis
4. trauma



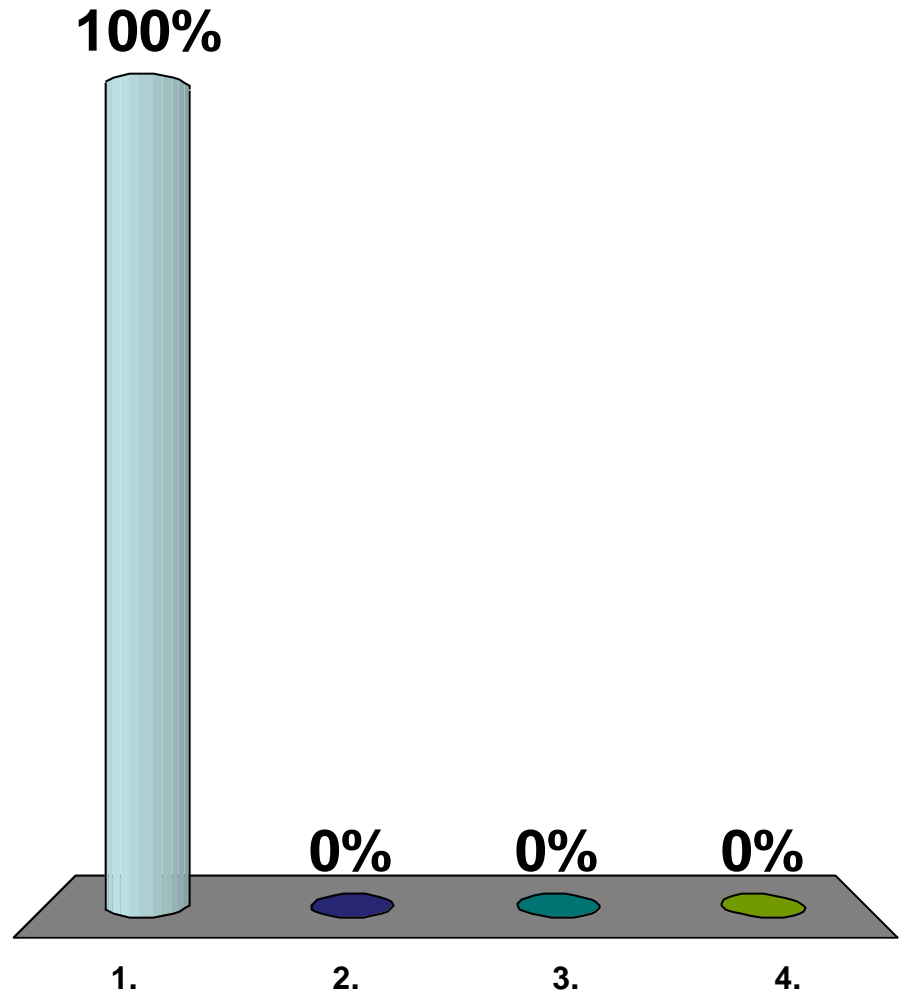
A “blood and thunder” fundus describes which condition?

1. central retinal artery occlusion
- ✓ 2. central retinal venous occlusion
3. diabetic retinopathy
4. hypertensive retinopathy



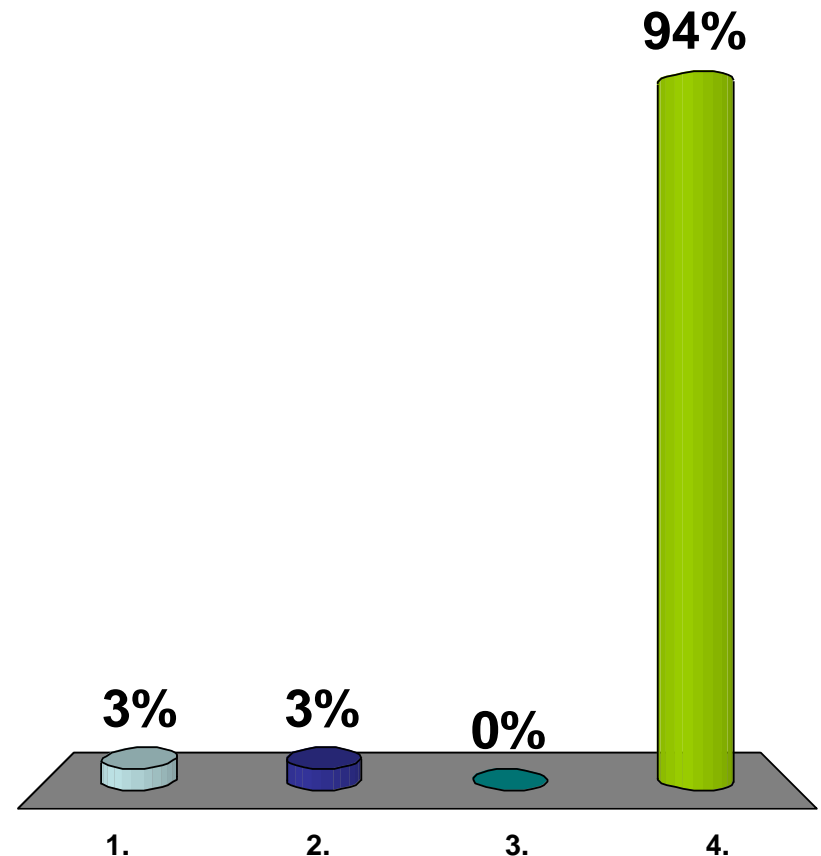
A painful red eye with hazy cornea and fixed pupil describes which condition?

- ✓ 1. acute angle closure glaucoma
- 2. acute retinal detachment
- 3. cortical cataract
- 4. neovascular macular degeneration



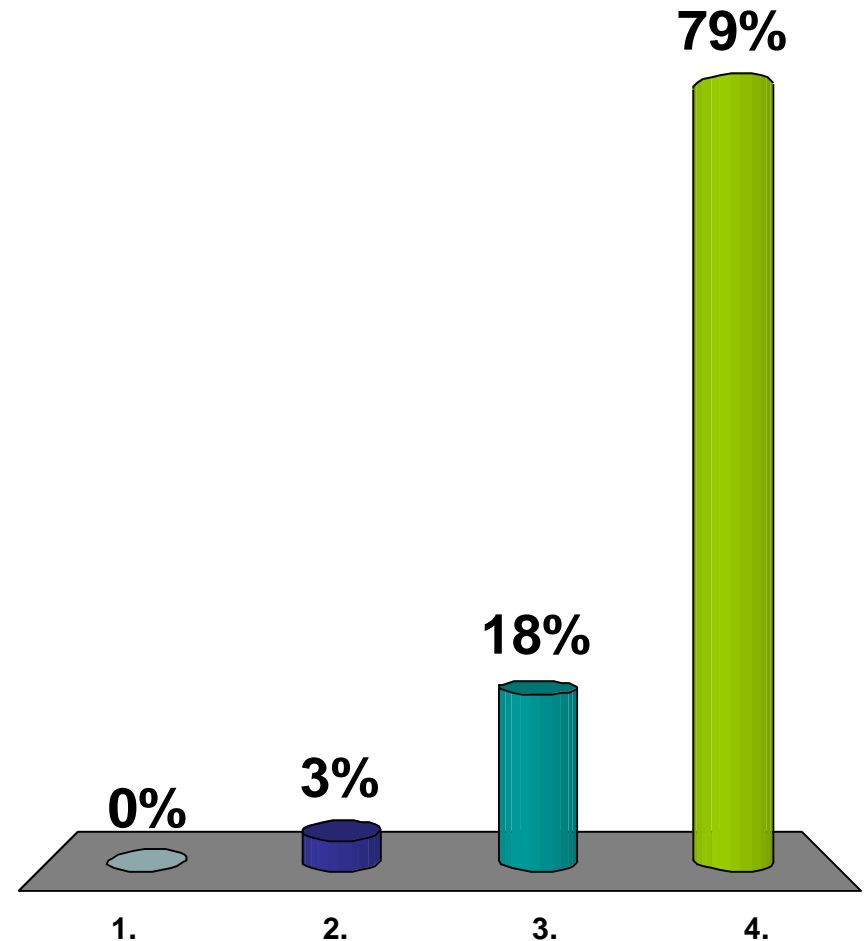
An Amsler grid is helpful to document:

1. contracted visual field
2. intraocular pressure
3. loss of pupillary reflex
- ✓ 4. metamorphopsia



What is the hallmark of wet ARMD?

1. cotton wool spots
2. depigmentation of retina
3. drusen deposits
- ✓ 4. neovascularization



Adnexal Diseases

Blepharitis

Dacryocystitis

Hordeolum

Chalazion

Ectropion, Entropion

Xanthelasma

Epithelial Inclusion Cysts

Orbital Cellulitis



Blepharitis

seborrhea; infection (Staph, Strep); Meibomian gland dysfunction

symptoms	<ul style="list-style-type: none">▪irritation, burning, FB sensation▪tearing, photophobia, intermittent blurry vision
signs	<ul style="list-style-type: none">▪Anterior blepharitis:red-rimmed lid margins, lash loss scurf: dandruff-like deposits collarettes: fibrous scales▪Posterior blepharitis: thick, cloudy meibomian glands▪may lead to stye, chalazion, dec tear production
treatment	<ul style="list-style-type: none">▪scrub daily with dilute baby shampoo; avoid makeup▪remove scurf, collarettes, colonies▪massage to express sections if blocked▪topical antibiotics if recalcitrant (erythromycin, polymixin/bacitracin)▪oral antibiotics: resistant or recurrent events, corneal or conjunctival involvement (doxycycline)

blepharitis



<http://commons.wikimedia.org/wiki/File:Blepharitis.JPG>



Dacryocystitis, Dacryoadenitis

inflammation of lacrimal gland +/- duct; idiopathic, infectious, secondary

symptoms	<ul style="list-style-type: none">▪ pain, swelling, tearing, drainage
signs	<ul style="list-style-type: none">▪ swelling, tenderness, erythema
treatment	<ul style="list-style-type: none">▪ warm to cool compresses▪ oral antibiotics if infectious cause▪ I&D if abscess forms▪ recalcitrant: surgery▪ dacryocystorhinostomy or dacryocystectomy



Hordeolum (stye)

infection of sebaceous gland (Staph)

symptoms	<ul style="list-style-type: none">▪ subacute onset▪ mildly painful nodule or pustule on lid
signs	<ul style="list-style-type: none">▪ often pointed, red, tender▪ external: skin surface▪ internal: conjunctival surface
treatment	<ul style="list-style-type: none">▪ warm compresses <i>[often all needed]</i>▪ topical antibiotics (fluoroquinolones, polymixin/trimethoprim)▪ I&D if fail to heal



internal hordeolum

<http://commons.wikimedia.org/wiki/File:Stye02.jpg>

external hordeolum





Chalazion

chronic granulomatous inflammation of Meibomian gland
may arise post-hordeolum

symptoms	<ul style="list-style-type: none">▪ painless or minimally tender▪ may be associated with chronic blepharitis, conjunctivitis, recurrent stye
signs	<ul style="list-style-type: none">▪ grayish discoloration on conjunctival surface▪ local conjunctival erythema
treatment	<ul style="list-style-type: none">▪ warm compresses▪ triamcinolone injections (<i>may depigment skin</i>)▪ marsupialization if unresolved after 1 month

chalazion



<http://commons.wikimedia.org/wiki/File:Gradowka.jpg>



Ectropion (lids turn outward)

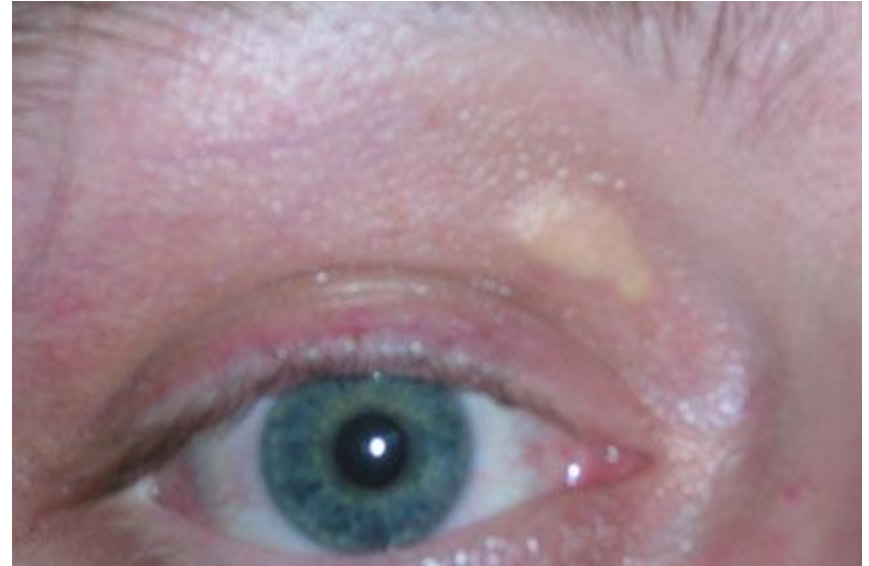
Entropion (lids turn inward)

causes	<ul style="list-style-type: none">▪ involutional (laxity with age)▪ cicatricial (scarring of lid)▪ paralytic (7th nerve palsy)▪ mechanical (mass on lower lid or cheek)▪ congenital (rare)
symptoms	<ul style="list-style-type: none">▪ irritation, burning, FB sensation▪ visible space between globe and lid (ectropion)▪ trichiasis (abrading) (entropion)
treatment	<ul style="list-style-type: none">▪ surgical correction



Xanthelasma

- bilateral plaque-like yellow lesions
- medial upper and/or lower lids
- idiopathic >> hyperlipidemia, diabetes
- middle aged to elderly females
- cosmetic concern
- surgical excision for cosmetic wishes



http://commons.wikimedia.org/wiki/File:Xanthelasma_palpebrarum.jpg



Epithelial Inclusion Cyst

- traumatic implantation of epidermis into dermis or plugged follicle
- rarely—associated with Gardner's syndrome
- slow-growing, white, round, firm
- usually < 1cm
- ddx: neoplasm
- tx: excision, marsupialization



Orbital Cellulitis

secondary to:	<ul style="list-style-type: none">▪ URI, sinusitis (especially children)▪ lid trauma, stye, impetigo, conjunctivitis, dacryocystitis
symptoms	<ul style="list-style-type: none">▪ erythema, low grade fever, decreased vision
signs	<ul style="list-style-type: none">▪ sluggish pupillary reflex▪ proptosis, restricted motility, edema, erythema of lids and surrounding skin▪ retinal hemorrhage, venous congestion, disc edema
diagnostic studies	<ul style="list-style-type: none">▪ increased WBC▪ CT: broad infiltration of orbital fat
treatment	<ul style="list-style-type: none">▪ broad spectrum antibiotics, IV then po, 2-3 weeks <i>ampicillin-sulbactam, cephalosporin, chloramphenicol</i>▪ monitor for local spread, optic nerve damage, meningeal/cerebral infection▪ surgical drainage if large or recalcitrant▪ sinus drainage as indicated

Conjunctival Conditions

Conjunctivitis

viral, bacterial, chlamydial, allergic

Pingueculum

Pterygium



Viral Conjunctivitis

▪basic science	▪adenovirus (epidemic keratoconjunctivitis) ▪rapidly bilateral
▪clinical	▪acute onset ▪redness, mild discomfort ▪ watery discharge , diffuse injection, lid edema ▪+/- follicular response, inner lid usually (photosensitivity) ▪ tender preauricular adenopathy
▪treatment	▪usually self-limiting ▪cold to warm compresses ▪artificial tears, vasoconstrictor/antihistamine drops



Bacterial Conjunctivitis

basic science	<ul style="list-style-type: none">▪ <i>Staph aureus, Haemophilus, Moraxella, Pseudomonas</i>▪ <i>Neisseria</i>: rare but serious, risk corneal perforation
clinical	<ul style="list-style-type: none">▪ red, irritated, discomfort; often bilateral▪ mucopurulent exudate, adhesions▪ erythema, edema of lids▪ <i>Neisseria</i>: copious, purulent, often unilateral
treatment	<ul style="list-style-type: none">▪ broad spectrum antibiotic (drops preferred over ointment)▪ fluoroquinolone, polymixin, sulfa▪ <i>Neisseria</i>: frequent irrigation, topical and systemic Abs, prompt referral



Chlamydial Conjunctivitis

basic science	<ul style="list-style-type: none">▪ serotypes D-K▪ sexually transmitted
clinical	<ul style="list-style-type: none">▪ typically unilateral▪ scant mucopurulent discharge▪ nontender preauricular adenopathy▪ marked follicular response, marked keratitis▪ Giemsa stain: inclusion bodies
treatment	<ul style="list-style-type: none">▪ systemic tetracycline or erythromycin, 3 weeks▪ topical Abx as well, ointment preferred



bacterial conjunctivitis



Chlamydial conjunctivitis
follicular response



viral conjunctivitis

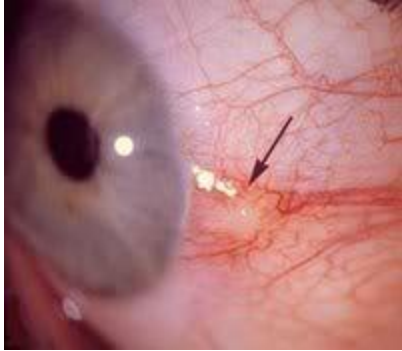


Allergic Conjunctivitis

basic science	<ul style="list-style-type: none">▪ atopic individuals at highest risk▪ typically seasonal
clinical	<ul style="list-style-type: none">▪ mild conjunctival injection, edema▪ stringy mucoid discharge▪ severe edema: photophobia, vision impaired
treatment	<ul style="list-style-type: none">▪ removal of allergen, desensitization▪ systemic antihistamines▪ topical: vasoconstrictor/antihistamine antihistamines (levocabastine) mast cell stabilizers (lodoxamide) nonsteroidal (ketorolac)▪ systemic steroids: control acute, recurrent exacerbations

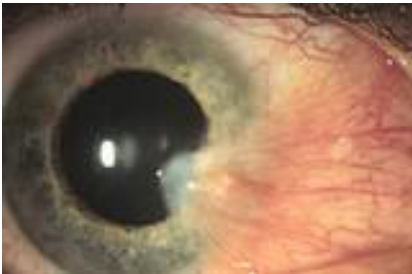


Pinguecula



- elevated, fleshy, yellow to brown conjunctival mass
- nasal side, on sclera *toward* cornea
- causes: chronic sun, repeated trauma, dry or windy conditions
- usually no symptoms, no treatment
- may become inflamed (pingueculitis)

Pterygium



- triangular or wedge-shaped fleshy growth
- vascularized, folds over and *onto* cornea
- interferes with vision
- localized inflammatory process
- most often in tropical climates
- surgical excision, artificial tears, topical NSAIDs or steroids

Corneal Conditions

Dry Eye Syndrome

Herpes Simplex Keratitis

Herpes Zoster Ophthalmicus

Corneal Ulcer

Corneal Abrasions



Dry Eye Syndrome

causes	<ul style="list-style-type: none">▪ idiopathic, aging, contact wearers▪ lid palsy, ectropion, blepharitis, graft-vs-host, collagen vascular diseases (Sjogren's, RA), sarcoidosis, medication side effect (anticholinergics)
clinical	<ul style="list-style-type: none">▪ irritation, dryness, redness, foreign body sensation▪ worsens as day progresses▪ exacerbated by smoke, cold, low humidity, wind▪ mild conjunctival injection, if anything▪ punctate staining of cornea (fluoroscein)
diagnosis and treatment	<ul style="list-style-type: none">▪ Schirmer's test▪ artificial tears, ointments▪ punctal plug to prevent tear outflow▪ cyclosporine drops (Restasis)



Herpes Simplex Keratitis

basic science	<ul style="list-style-type: none">▪98% are unilateral▪HSV-1 >> HSV-2▪direct contact
clinical	<ul style="list-style-type: none">▪irritation, light sensitivity, redness▪pain mild or absent▪mild conjunctival injection▪dendritic lesion (fluorescein)▪advanced: scarring, vascularization
treatment	<ul style="list-style-type: none">▪REFER!▪topical antiviral▪NO steroids—will cause tissue loss, ocular perforation

herpes keratitis



<http://medilinks.blogspot.com/2012/01/photos-for-herpes-simplex-keratitis-hsk.html>



Herpes Zoster Ophthalmicus

basic science	<ul style="list-style-type: none">▪ latent varicella virus▪ trigeminal (5th) ganglion, 1st division
clinical	<ul style="list-style-type: none">▪ pain, headache, photophobia▪ vesicular rash▪ Hutchinson's sign=lesions on tip of nose; indicates ocular involvement (cornea, conjunctivae)▪ <i>complications</i>: uveitis, glaucoma, scleritis, optic neuritis
treatment	<ul style="list-style-type: none">▪ REFER!▪ oral (or IV) acyclovir, famcyclovir, valacyclovir▪ +/- topical steroids
prevention	<ul style="list-style-type: none">▪ Zostavax, \geq 60 year old; 3/11/11: \geq <u>50 years old</u>▪ reduce risk of zoster and post herpetic neuralgia▪ adverse effects: redness, pain, headache



Corneal Ulcer

basic science	<ul style="list-style-type: none">▪infection or inflammation▪history of trauma, poor lid apposition or contact lens use
clinical	<ul style="list-style-type: none">▪pain photophobia, tearing, reduced vision▪dense corneal infiltrate with overlying epithelial defect (fluorescein)▪hypopyon (layering of WBC in anterior chamber)▪ciliary flush is common▪severe: rapid corneal destruction▪fungal: feathery border
treatment	<ul style="list-style-type: none">▪REFER!▪scraping, Gram stain▪treat per causative agent▪avoid contact use



Corneal Abrasion

basic science	<ul style="list-style-type: none">▪ history of mild trauma
clinical	<ul style="list-style-type: none">▪ conjunctival injection, hyperemia▪ photophobia, blepharospasm▪ swollen lids, tearing▪ pain, foreign body sensation▪ epithelial defect (fluorescein)▪ <i>search for foreign bodies</i>
treatment	<ul style="list-style-type: none">▪ topical anesthetic—immediate relief—DO NOT DISPENSE – may retard healing▪ cycloplegic, systemic analgesic▪ antibiotic ointment, pressure patch (max 24 hours)▪ follow up daily till resolved

Trauma

Foreign Bodies

Subconjunctival Hemorrhage

Orbital Fracture (Blow Out)

Hyphema

Radiant Energy Burns

Lacerations, Penetrating Injuries

Chemical Burns



Foreign Bodies

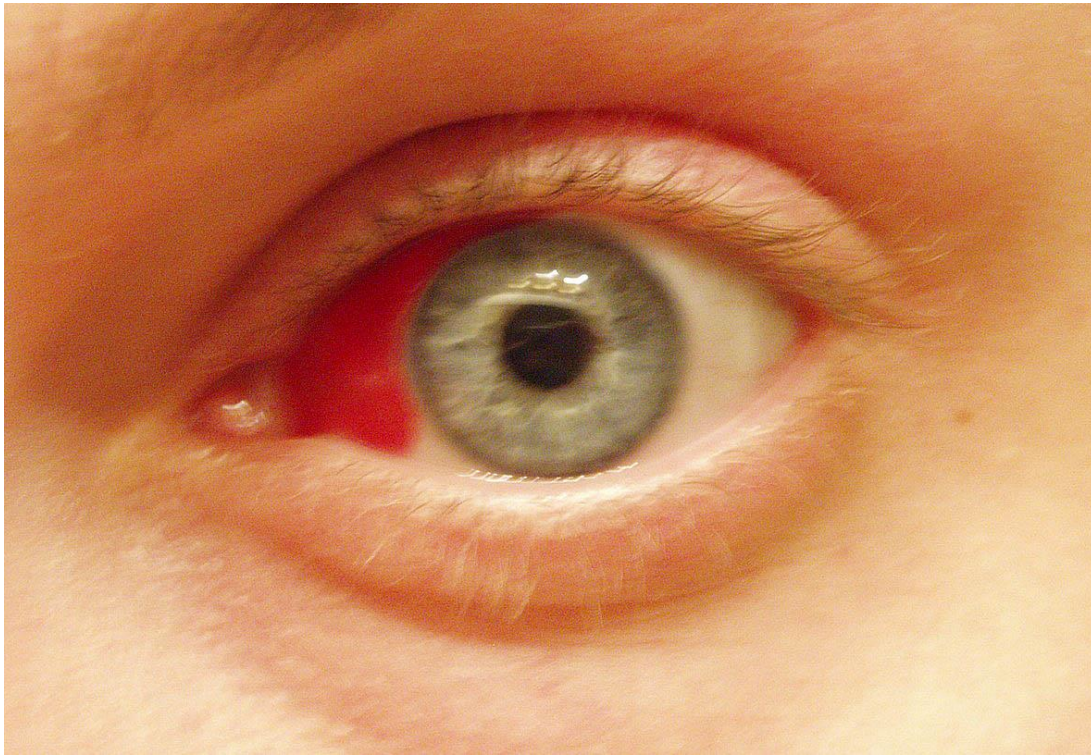
- conjunctiva or cornea (more dangerous)
- tearing, red, irritated, painful
- hyperemia, laceration, obvious FB
- hemorrhage or abrasion may occur
- ***evert lids for exploration***
- remove under topical anesthesia
- irrigate with saline; use forceps or Q-tip
- apply antibiotic ointment after removal
- refer if suspect laceration, globe penetration



Subconjunctival Hemorrhage

causes	<ul style="list-style-type: none">▪spontaneous▪after Valsalva▪associated with conjunctivitis, hypertension, bleeding diathesis, trauma
clinical	<ul style="list-style-type: none">▪acute, dense blood in subconjunctival space▪flat, red spot to massive hemorrhage with edema
treatment	<ul style="list-style-type: none">▪reassurance, 2-3 wks to clear▪artificial tears, relieve discomfort▪refer if suspect clotting disorder, trauma, ruptured globe

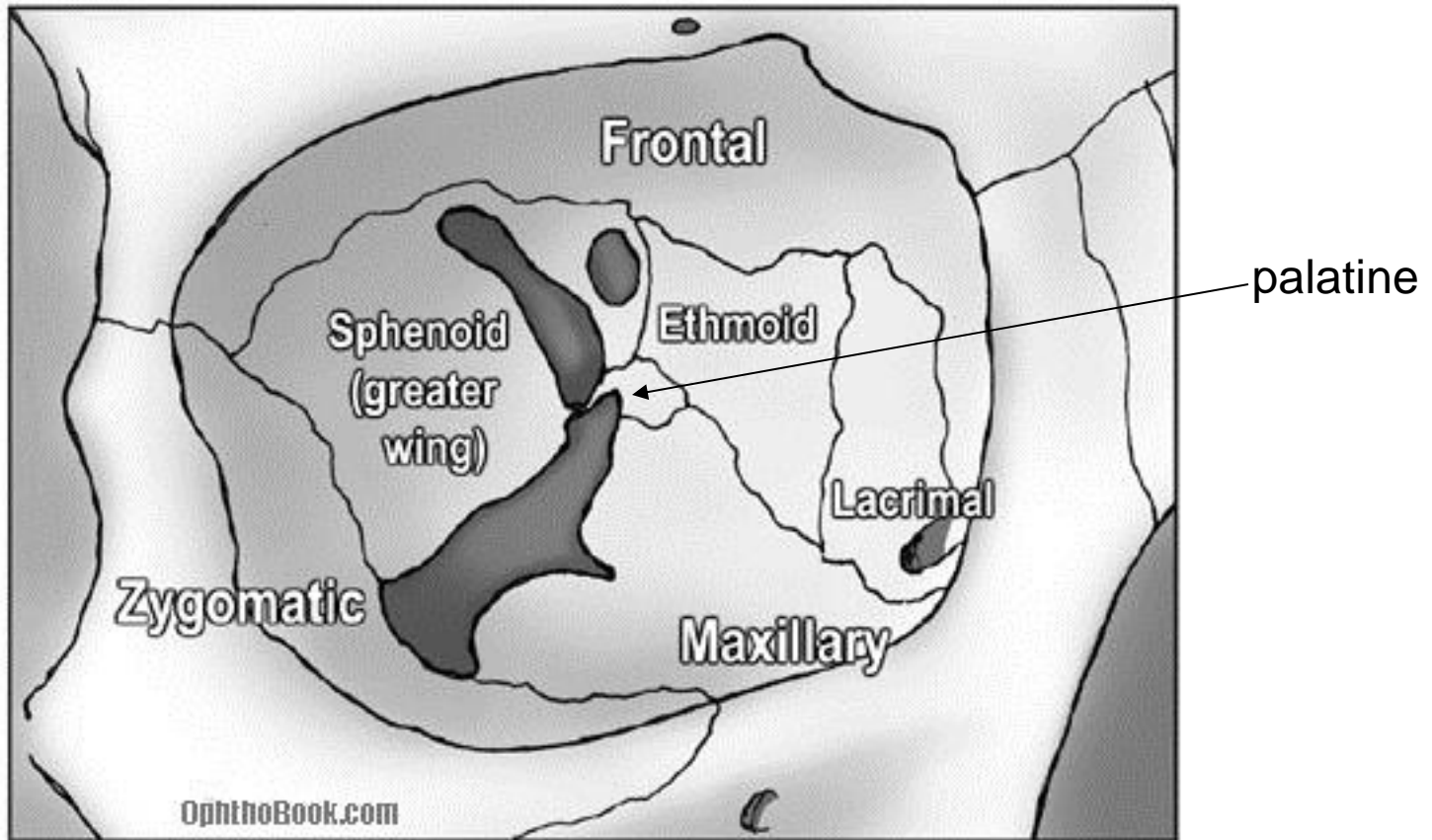
subconjunctival hemorrhage



http://commons.wikimedia.org/wiki/File:Redeye_photograph.JPG



Orbital Fracture



orbital floor = maxillary, zygomatic, palatine

Orbital Fracture

cause	<ul style="list-style-type: none">▪ blunt impact to the orbit; fist, tennis ball, etc.
clinical	<ul style="list-style-type: none">▪ “blow out” into maxillary sinus▪ trapped inferior rectus, inferior oblique → restricted, painful vertical eye movement▪ double vision, edema, subcutaneous emphysema▪ posteriorly displaced globe, proptosis
treatment	<ul style="list-style-type: none">▪ REFER▪ CT: delineate extent of disease▪ <i>risk</i>: increased IOP, retinal detachment, vitreous hemorrhage, lens subluxation, local damage▪ nasal decongestants, antibiotics▪ cold compresses, ice packs, avoid sneezing▪ surgical repair



Hyphema

basic science	<ul style="list-style-type: none">▪ blood in anterior chamber▪ microhyphema (suspended RBCs) to massive hemorrhage▪ history of blunt trauma common
clinical	<ul style="list-style-type: none">▪ pain, blurry vision, red eye▪ examine for further injury, neoplasm, abuse▪ injection, sluggish pupil, iris tears, active bleeding
treatment	<ul style="list-style-type: none">▪ REFER!▪ admit, monitor closely▪ bed rest, eye shield, cyclopegia

hyphema

http://commons.wikimedia.org/wiki/File:Hyphema_-_occupying_half_of_anterior_chamber_of_eye.jpg





Radiant Energy Burn

causes	<ul style="list-style-type: none">▪sunbathing, sunlamps, welding, no protection
clinical	<ul style="list-style-type: none">▪moderate to severe pain▪6-12 hours after the event▪red, tearing, blurry vision, photophobia, blepharospasm▪dense punctate staining of cornea (fluorescein)▪injection, lid edema, corneal edema
treatment	<ul style="list-style-type: none">▪cyclopegic, antibiotic ointment▪pressure patch (max 24 hours)▪systemic analgesic ▪very good prognosis▪risk: cataract



Lid Laceration/Penetrating Injuries

- URGENT REFERRAL
- Surrounding structures at risk

- Keep patient still; avoid pressure
- DO NOT remove embedded objects
- no pressure, no drops or ointments
- start systemic antibiotics

- Surgery will be required

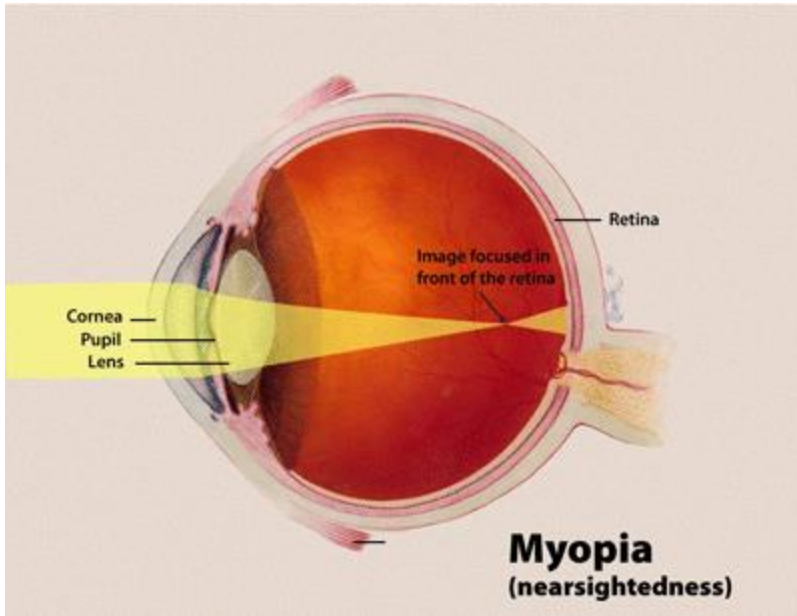


Chemical Burns

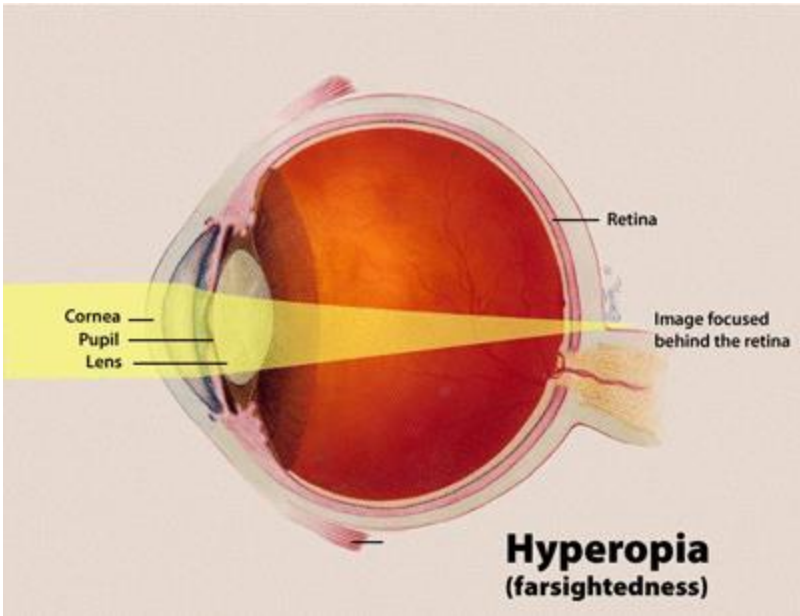
- IRRIGATE! Immediately and Profusely
Eyewash or Tap Water
- Continue until pH normalizes
and Then Irrigate More!
- Severe pain, redness, visual loss, spasm
- Cycloplegics, antibiotic ointment
- Corneal epithelial loss, edema, hemorrhage
- Corneal scarring, blindness



Visual Disorders Refractive Errors



correction: concave lenses



correction: convex lenses

National Eye Institute: www.nei.nih.gov

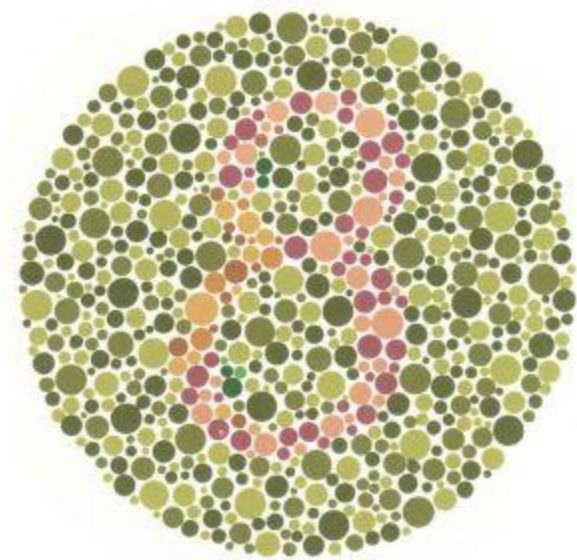


Color Blindness

- usually hereditary (x-linked, others)

[acquired: aging, Parkinson, Alzheimers, glaucoma, mac degeneration, alcoholism, leukemia]

- males (8%) > > females (1%)
- red-green deficiency most common
[blue-yellow deficiency 1/100,000]
- test using **Ishihara plates**





Amblyopia

- Loss of visual acuity not correctable by glasses in an otherwise healthy eye
- Normal eye that is prohibited from developing
- 2% of adult population US affected
- 50% due to strabismus
- others: refractive error, form-deprivation syndrome, occlusion

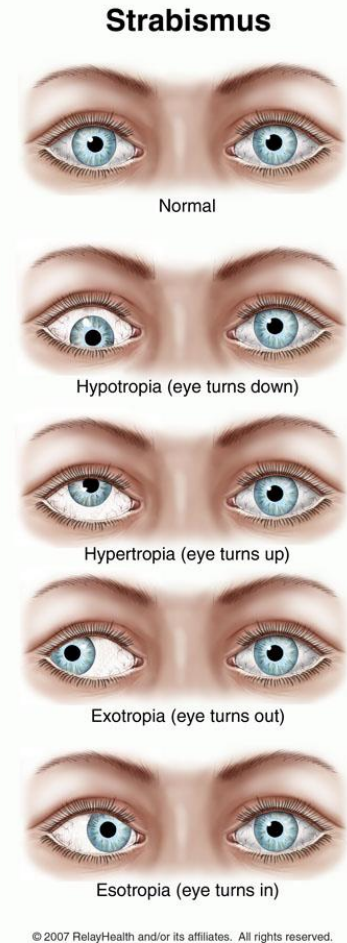


Strabismus

- **concomitant (nonparalytic)**
 - *angle/degree of misalignment is equal in all directions of gaze
 - *more common, congenital/genetic
- **incomitant (paralytic)**
 - *degree of misalignment differs with direction of gaze
 - *more likely due to neurologic disorder or trauma
- **heterophoria** (latent, intermittently apparent)
- **heterotropia** (manifest)

Strabismus

- Misalignment of eye axes
- Hypotropia – downward
- Hypertropia – upward
- Exotropia – outward
- Esotropia – inward



Summit Medical Group

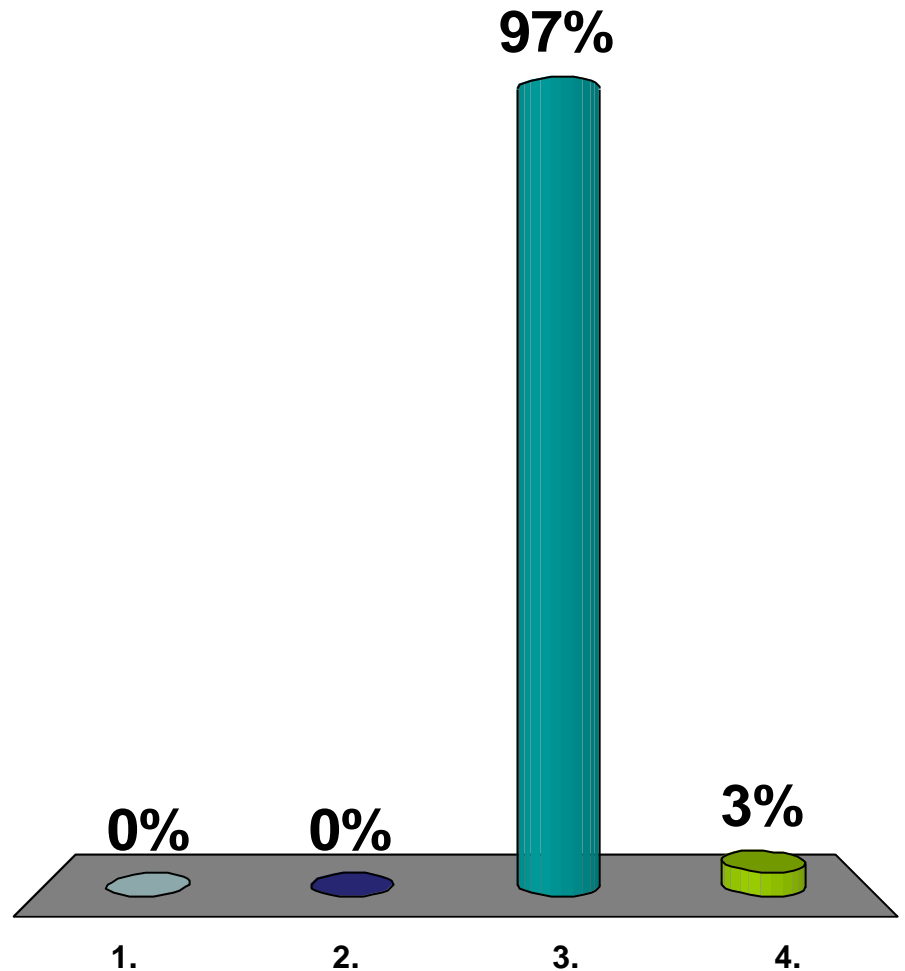
<http://media.summitmedicalgroup.com/media/db/relayhealth-images/strabism.jpg>

Amblyopia and Strabismus

- Cover/uncover test
 - heterotropia (manifest): cover normal eye; affected will move in place
 - heterophoria (latent) cover suspected eye; uncover and misalignment may become apparent
- Treatment basics:
 - amblyopia: patch good eye; start young
 - strabismus: glasses, surgical correction

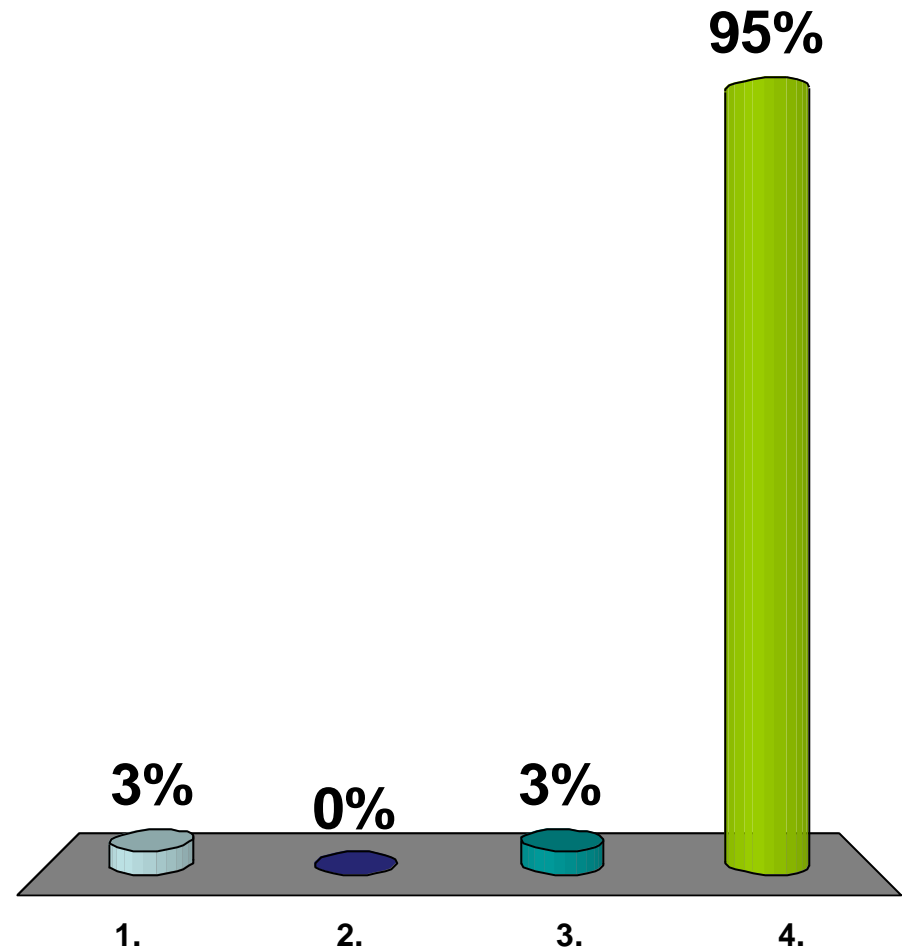
What is the hallmark of a blow-out orbital fracture?

1. afferent pupillary defect
2. anisocoria
- ✓ 3. restricted vertical eye movement
4. subcutaneous emphysema



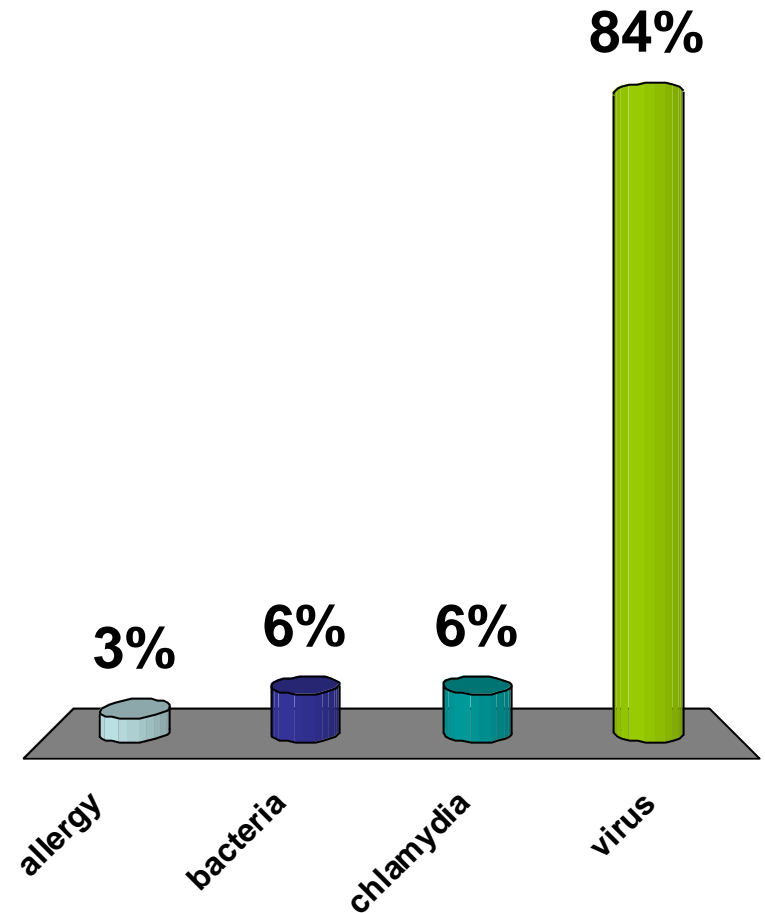
A patient has a pointed, tender, red lesion on the upper lid. Treatment?

1. daily scrubs
2. incision and drainage
3. topical antibiotic
- ✓ 4. warm compresses



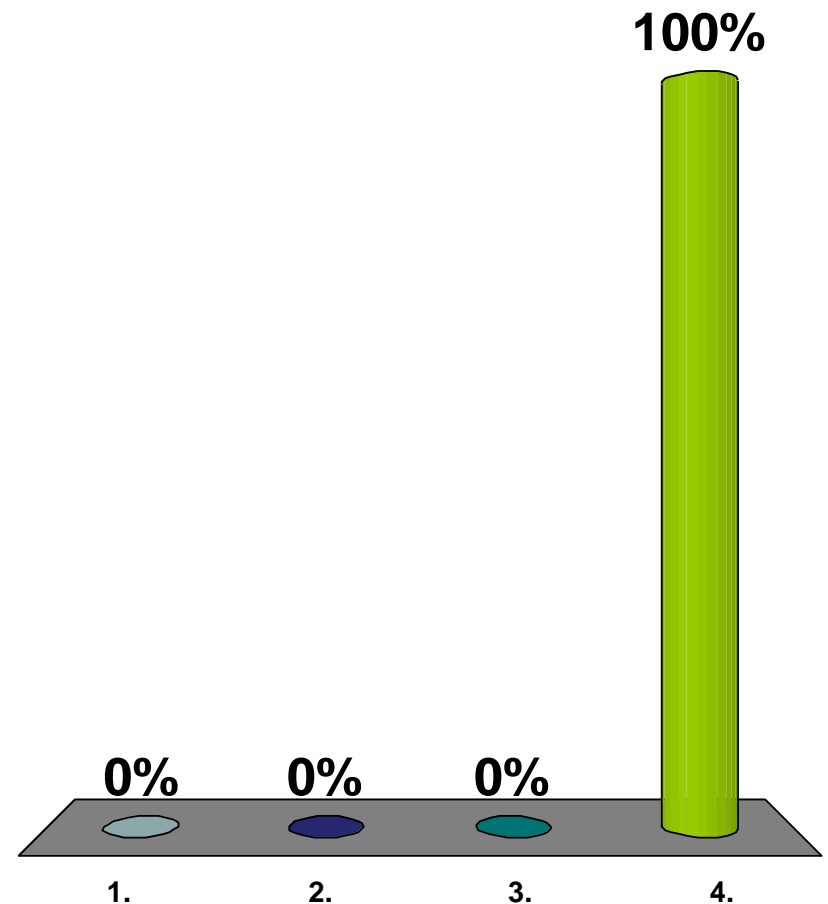
Conjunctivitis that is associated with tender preauricular lymphadenopathy is most likely caused by:

1. allergy
2. bacteria
3. chlamydia
- ✓ 4. virus



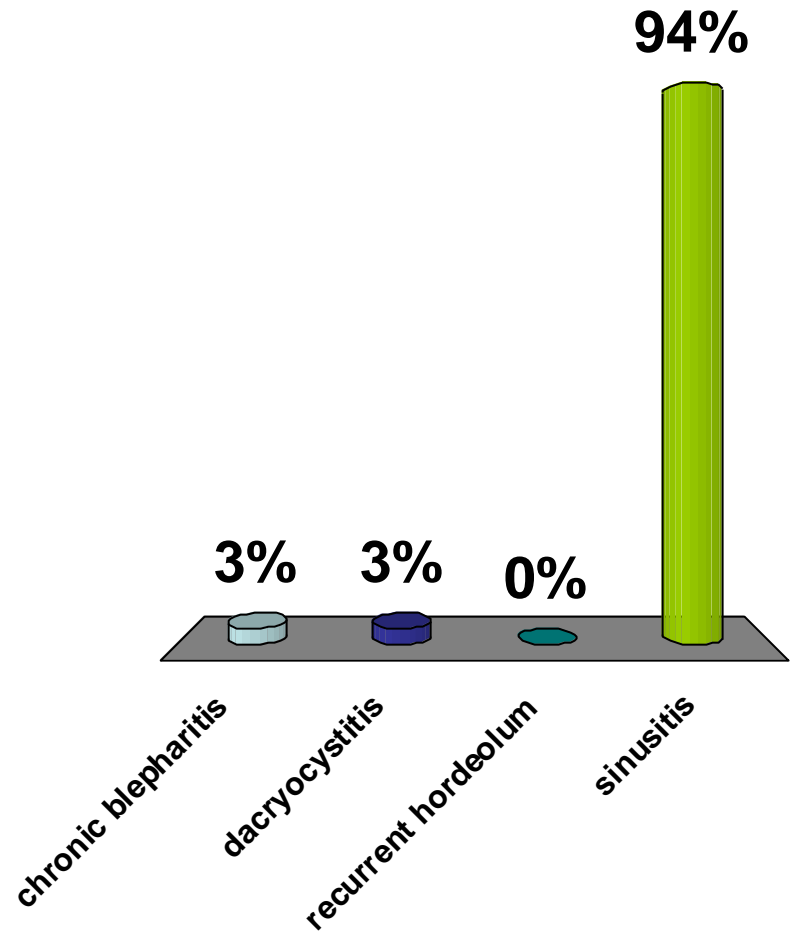
Six hours after a skiing trip a patient complains of severe bilateral pain and photophobia. Diagnosis?

1. atopic conjunctivitis
2. corneal ulcer
3. orbital cellulitis
- ✓ 4. radiant energy burn



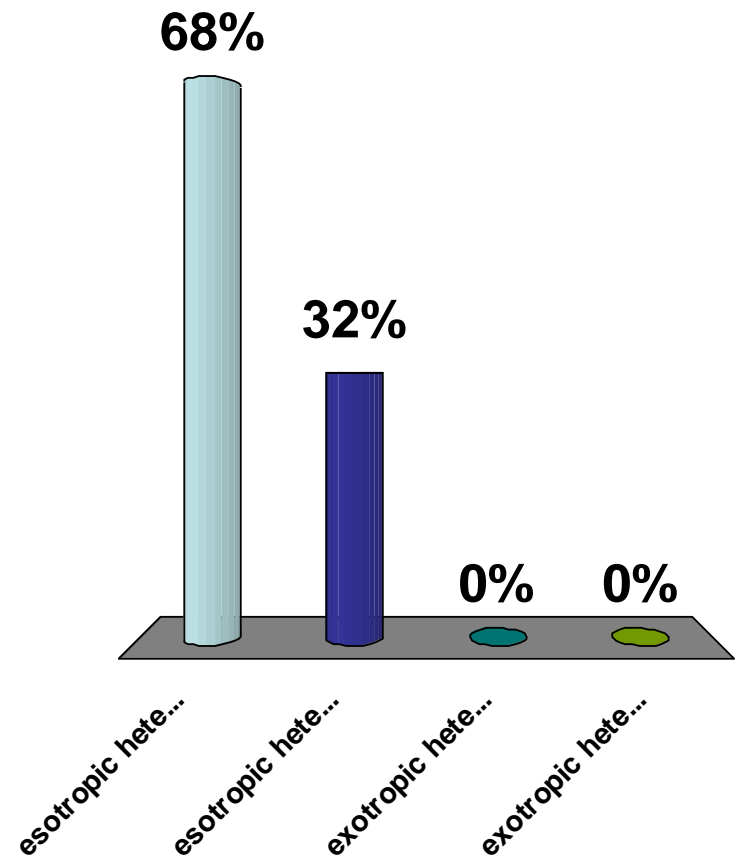
In children, orbital cellulitis is most commonly associated with what underlying disorder?

1. chronic blepharitis
2. dacryocystitis
3. recurrent hordeolum
- ✓ 4. sinusitis



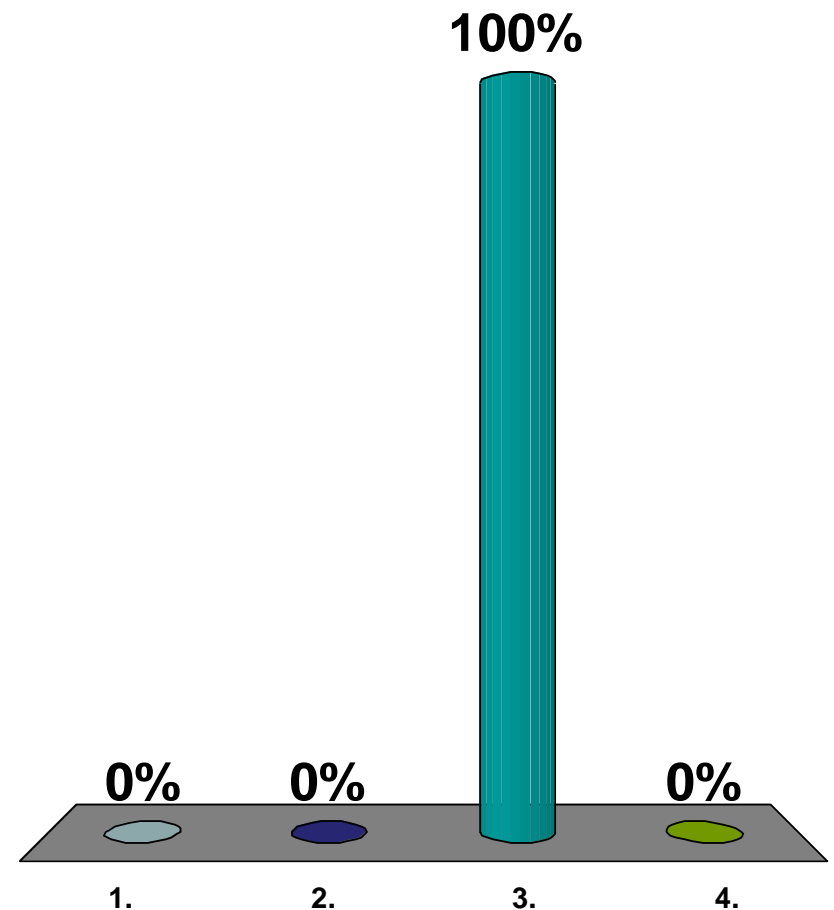
Manifest inward concomitant strabismus is known as:

- ✓ 1. esotropic heterotopia
- 2. esotropic heterophoria
- 3. exotropic heterotopia
- 4. exotropic heterophoria



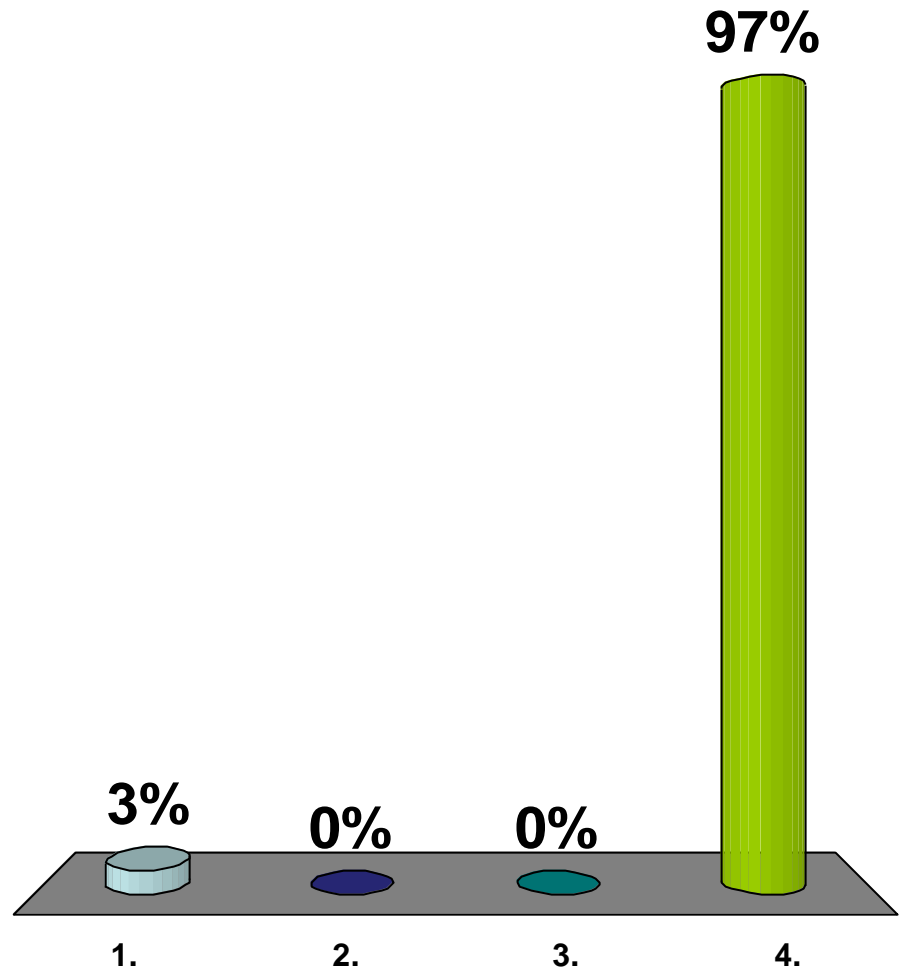
An adolescent complains of irritated lash lines.
Exam reveals red lid margins and flaky debris.
First-line treatment?

1. cyclopegics
2. cortisone preparation
- ✓ 3. daily scrubs with baby shampoo
4. topical antibiotics



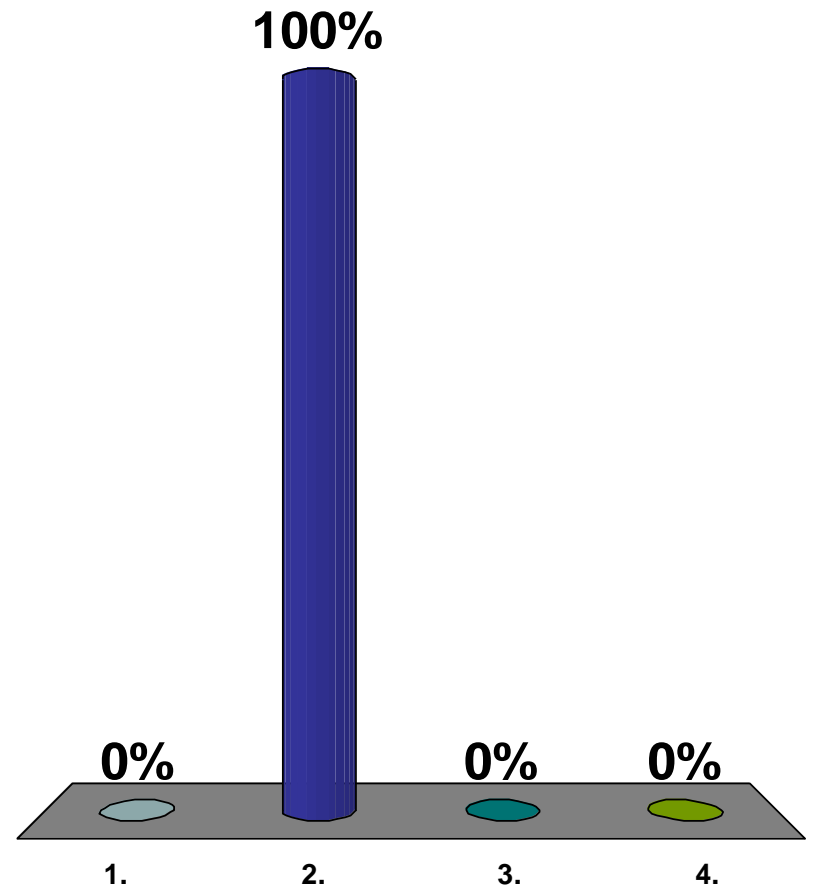
Schirmer's test measures:

1. intraocular pressure
2. corneal pH
3. Meibomian gland function
- ✓ 4. tear production



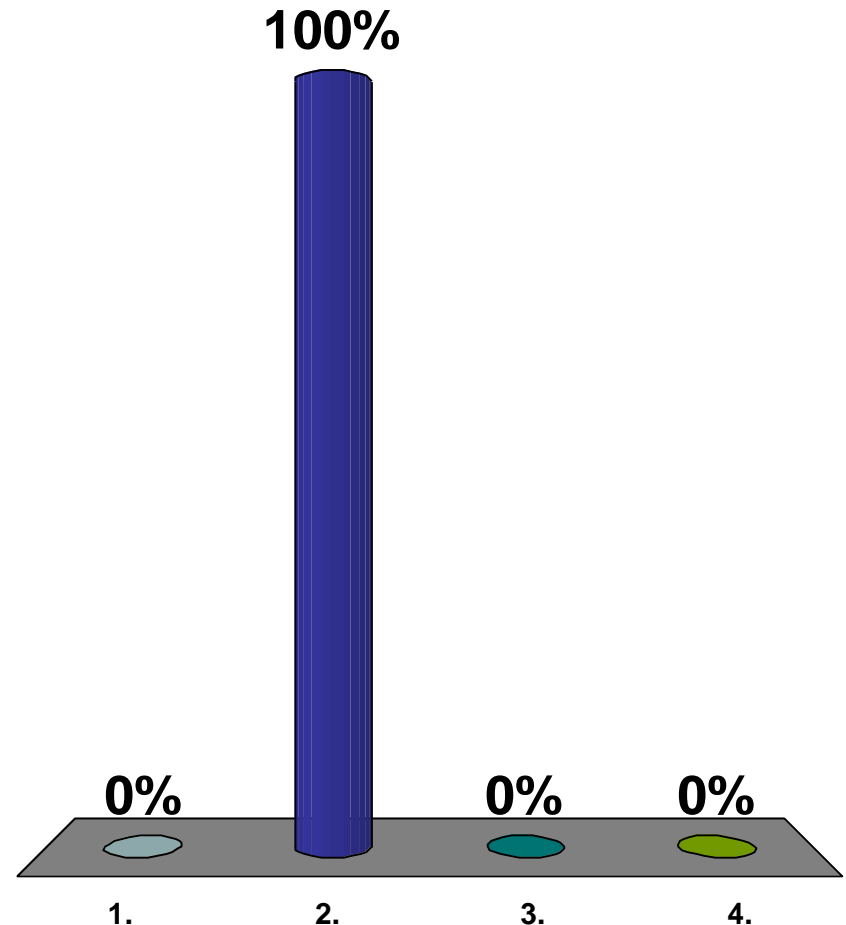
Fluorescein staining reveals a dendritic shaped corneal lesion. Diagnosis?

1. corneal abrasion
- ✓ 2. herpes keratitis
3. mytotic ulcer
4. pterygium



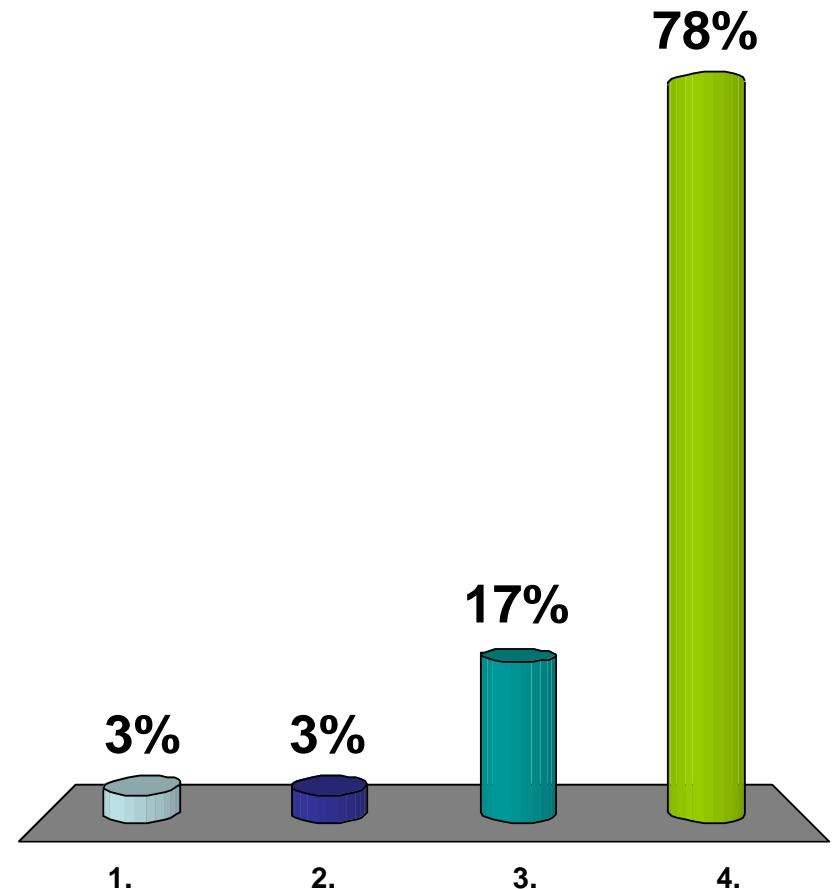
What is the treatment for subconjunctival hemorrhage?

1. intermittent patching
- ✓ 2. reassurance and monitoring
3. topical antibiotic
4. warm compresses



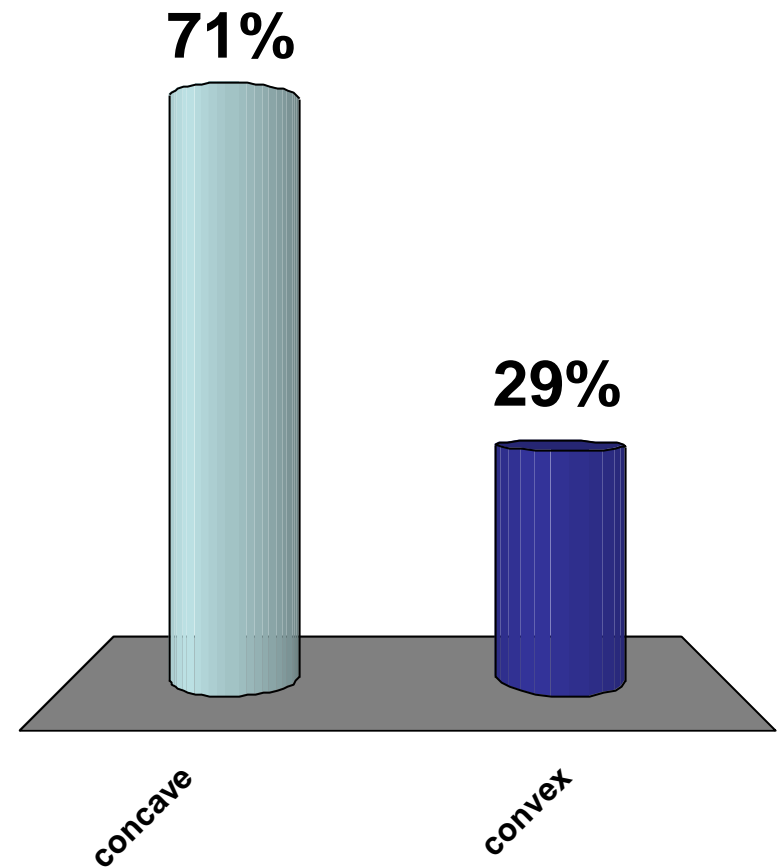
What is scurf?

1. edema of palpebral conjunctiva
2. enlargement of Meibomian glands
3. fibrous scales at lash follicles
- ✓ 4. dandruff-like deposits on lid margins



Persons with myopia require what type of lens to correct vision?

- ✓ 1. concave
- 2. convex



The End!

Good Luck with your Exam!

