جامعة الفرات الأوسط
كلية التقنيات الصحية و الطبية
قسم تقنيات فحص البصر
صحة عينية2 / المرحلة الثانية

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L1&2

National program for control of blindness

Introduction

Blindness affects millions of people worldwide and represents one of the greatest health challenges facing humanity. To address this issue, many countries have launched national programs aimed at preventing and treating blindness. The "National Program for Blindness Prevention" is one such initiative, aiming to raise community awareness, improve access to healthcare, and reduce the prevalence of blindness-causing diseases.

Goals and Importance of the National program for control of blindness

General Goal:

To reduce blindness rates through prevention, early diagnosis, treatment, and rehabilitation.

Main Objectives:

- **Prevention:** Raising awareness about the risks of blindness and the importance of eye health.
- **Early Diagnosis:** Promoting regular eye check-ups.
- **Treatment:** Providing necessary treatments and surgeries for treatable eye conditions.
- **Rehabilitation:** Supporting individuals with blindness to improve their quality of life through vocational and social rehabilitation.

Importance:

- **Reducing Social Burden:** Improving the lives of people with blindness and reducing their dependency on others.
- **Economic Improvement:** Mitigating the impact of blindness on productivity.
- **Promoting Health Equity:** Ensuring access to healthcare in underserved areas.

Definition and Causes of Blindness

What is Blindness?

Blindness is the complete or partial loss of vision, which can result from diseases, injuries, or genetic factors.

Causes of Blindness:

1. **Eye Diseases:**
   - **Glaucoma:** Damage to the optic nerve leading to gradual vision loss.
   - **Cataracts:** Common in older adults and treatable with surgery.
   - **Diabetic Retinopathy:** A complication of diabetes.
   - **Age-Related Macular Degeneration:** A major cause of vision loss among the elderly.
2. **Non-Disease Causes:**
   - Injuries. Genetic factors. Malnutrition (e.g., Vitamin A deficiency).

Types of Blindness:

1. **Treatable Blindness:** Curable through surgery or medication (e.g., cataracts).
2. **Preventable Blindness:** Avoidable through awareness and early treatment (e.g., trachoma).
3. **Absolute Blindness:** Complete and irreversible loss of vision.
4. **Social and Economic Blindness:** The impact of vision loss on social and economic life.

Strategies of the National program for control of blindness

1. Community Awareness:

- Organizing awareness campaigns in schools and local communities.
- Using media to disseminate messages about prevention and the importance of eye care.

2. Improving Access to Healthcare:

- Establishing specialized health centers in remote areas.
- Providing free or low-cost eye examinations and treatments.

3. Training and Education:

- Training doctors and specialists on the latest techniques.
- Offering educational programs to the community on preventing eye diseases and injuries.

4. Promoting Scientific Research:

- Supporting research on eye diseases.
- Collaborating with international organizations to improve diagnostic and treatment techniques.

5. Developing Infrastructure:

- Equipping hospitals and medical centers with advanced tools and technologies.
- Establishing mobile units for eye examinations.

Challenges Facing the Program

1. **Lack of Community Awareness:**

- Limited health literacy in some areas.

2. **Financial Constraints:**

- Difficulty securing adequate funding to expand services.

3. **Shortage of Specialized Personnel:**

- Limited number of trained ophthalmologists.

4. **Geographical Barriers:**

- Difficulty accessing remote areas.

5. **Cultural Challenges:**

- Some beliefs hinder the uptake of medical services.

The Global Vision 2020 Program: The Right to Sight

Introduction:

"Vision 2020" is a global initiative launched by the World Health Organization in collaboration with the International Agency for the Prevention of Blindness to eliminate avoidable blindness by 2020.

Goals:

- Prevent blindness by addressing its major causes.
- Improve access to eye care services.
- Train health workers.
- Raise awareness about the importance of eye health.

Targeted Diseases:

- Cataracts.
- Uncorrected refractive errors.
- Trachoma.
- Glaucoma.
- Diabetic retinopathy.

Achievements:

- Reduced blindness rates caused by treatable conditions.
- Improved healthcare infrastructure.

- Increased number of trained personnel.

Challenges:

- Insufficient funding.
- Limited access to remote areas.
- Persistent disparities in healthcare services among countries.

Beyond 2020:

Although the program has concluded, efforts continue to promote innovation and sustainability in blindness prevention.

Conclusion

The National Program for Blindness Prevention is a crucial step towards improving eye health and quality of life in society. By promoting awareness, providing healthcare, and collaborating with local and international partners, blindness rates can be reduced, paving the way for a brighter future.

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L2&4

Acute loss of vision , differential diagnosis

Acute Visual Loss (AVL)

Definition:

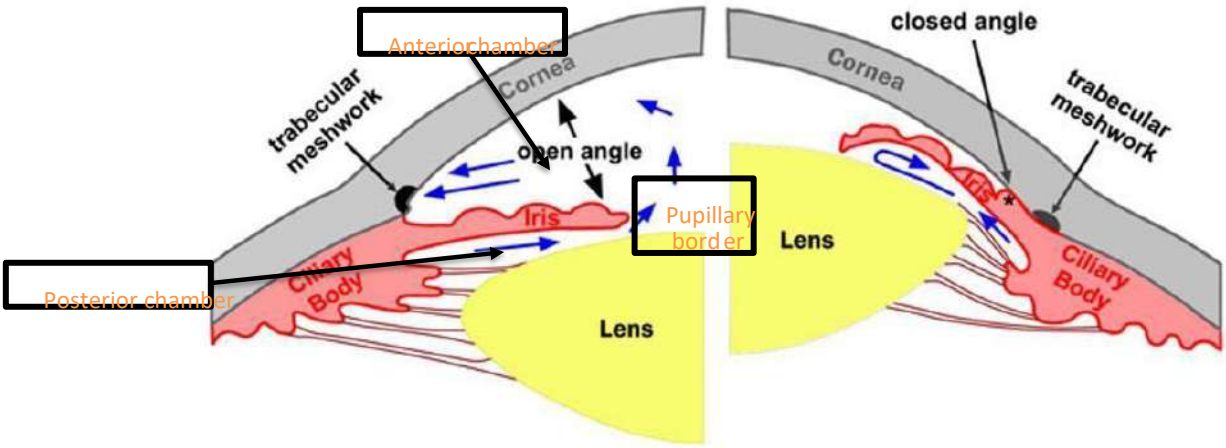
Sudden loss or severe impairment of vision occurring within minutes to a few days. It is a medical emergency requiring rapid evaluation to identify the cause and take appropriate action. It can affect one or both eyes.

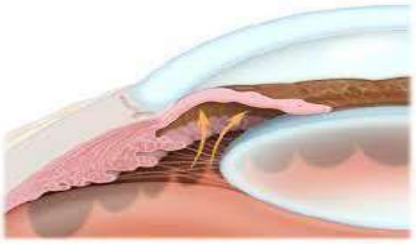
Causes of Acute Visual Loss

Classification Based on Pain:

A. **Painful**:

1. Acute angle-closure glaucoma.





2. Uveitis.
3. Keratitis (infection or inflammation).
4. Traumatic vitreous hemorrhage.
5. Retinal detachment.

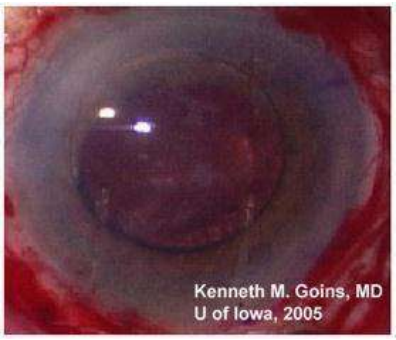
B. **Painless**:

1. Retinal artery or vein occlusion.
2. Optic neuritis.
3. Ischemic optic neuropathy.
4. Stroke.
5. Functional loss with no organic cause.

Classification Based on Affected Structure:

1. **Media Opacities**:

- Corneal conditions (e.g., edema or infection).



Corneal opacity & hypopyon
Complication: corneal ulcer (scarring) & glaucoma.

The most common cause of corneal edema is **increased intraocular pressure** & occurs typically in acute **angle closure glaucoma**

Any acute infection of the cornea by a corneal ulcer may **mimic** corneal edema

2. **Retinal Diseases**:
   - Retinal detachment.
   - Diabetic retinopathy.
3. **Optic Nerve Diseases**:
   - Optic neuritis.
4. **Visual Pathway or Neurological Disorders**:
   - Stroke.
   - Cortical blindness.

Examination and Diagnosis

Key Steps:

1. **Medical History**:
    - Presence of pain.
    - Onset and duration of vision loss (transient, persistent, or progressive).
    - Monocular or binocular.
    - Risk factors like diabetes or trauma.
2. **Clinical Examination**:
    - **Visual Acuity**: Assess the severity of vision loss.
    - **Visual Field Testing**: Detect visual pathway lesions.
    - **Pupillary Reflexes**: Evaluate optic nerve function.
    - **External Eye Examination**: Check for trauma signs.
3. **Additional Tests**:
    - **Direct Ophthalmoscopy**: Assess retina and media opacities.
    - **Intraocular Pressure Measurement**: Exclude glaucoma.
    - **Ultrasound (B-scan)**: For media opacity cases.

Common Causes

Retinal Artery Occlusion:

- Sudden, painless vision loss.
- Characterized by a cherry-red spot on the retina.
- Treated by improving blood flow through ocular massage or vasodilation techniques.

Retinal Vein Occlusion:

- Sudden vision loss with widespread hemorrhage.
- Appears as a "stormy sunset" on ophthalmoscopy.
- Treatment includes anti-VEGF injections or laser therapy.

Optic Neuritis:

- Acute vision loss often with pain on eye movement.
- Common in multiple sclerosis.
- Treated with corticosteroids to accelerate recovery.

Retinal Detachment:

- Presents with floaters or flashes followed by visual field loss.
- Requires urgent surgical intervention.

Treatment

- **Acute Angle-Closure Glaucoma**: Immediate reduction of intraocular pressure.
- **Vascular Occlusions**: Enhance blood flow and reduce edema.
- **Optic Neuritis**: Corticosteroids to prevent recurrence.
- **Retinal Detachment**: Emergency surgical repair.

Final Notes:

- Acute visual loss requires rapid evaluation to prevent complications.
- Accurate diagnosis depends on medical history, clinical examination, and appropriate diagnostic tools.

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L5&6

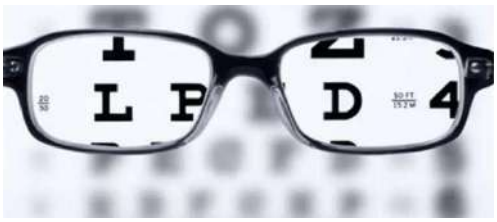
Gradual loss of vision

Introduction

Gradual vision loss is a condition that affects many individuals due to various factors, including aging, chronic diseases, genetic disorders, or exposure to toxins. This visual deterioration can be slow and initially unnoticeable to the patient, but if left untreated, it can lead to permanent vision impairment. In this lecture, we will discuss the different causes of gradual vision loss and the available treatment options.

Main Causes of Gradual Vision Loss

1. Refractive Errors & Presbyopia



Refractive Errors:

These include myopia (nearsightedness) and hypermetropia (farsightedness), whether congenital or developmental. Patients typically complain of deteriorating vision, often accompanied by frontal headaches, eye pain, and blepharitis.

Treatment: The prescription of appropriate corrective glasses.

Presbyopia:

An age-related accommodation anomaly where patients struggle with close-up tasks due to the loss of lens elasticity.

Treatment: Convex lenses are added to the prescribed distance glasses:

- At age 40: +1D
- At age 45: +1.5D
- At age 50: +2D
- At age 55: +2.5D

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2. Acquired Cataract


Caused by aging, trauma, endocrine disorders, or systemic diseases, cataracts lead to progressive vision deterioration due to increased lens opacification.

Treatment:

- Glasses are prescribed as long as they can improve vision.
- When vision impairment becomes severe, surgical removal of the cataract is performed.

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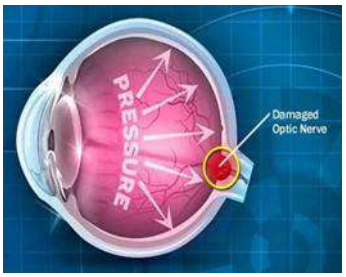
3. Chronic Simple Glaucoma (Primary Open-Angle Glaucoma)

Symptoms:

- Insidious onset
- Mild headaches and eye pain
- Frequent changes in presbyopic glasses due to accommodative weakness
- Visual field defects
- Gradual central vision dimness
- Night blindness due to peripheral retinal involvement
- Increased intraocular pressure
- Optic disc cupping

Treatment:



1. **Medical Therapy** (eye drops for intraocular pressure control):
    - Pilocarpine (0.5-4%)
    - Timolol maleate (0.25-0.5%)
    - Betaxolol (0.5%)
    - Adrenaline (1-2%)

2. **Surgical Treatment** (if medical therapy is ineffective):
    - Laser trabeculoplasty
    - Trabeculectomy
    - Trabeculotomy

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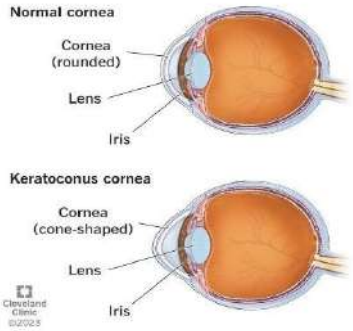
4. Keratoconus

A congenital corneal abnormality where corneal weakness leads to a conical shape, typically appearing in females after puberty.

Treatment:

1. Prescription glasses initially
2. Contact lenses when glasses no longer provide adequate correction
3. Corneal transplant (keratoplasty) in advanced cases



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5. Recurrent Keratopathy

Repeated epithelial ulceration, cellular infiltration, and vascularization lead to progressive vision deterioration, resulting in partial blindness.

Treatment: Keratoplasty (corneal transplant).

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6. Chronic Uveitis

Repeated episodes of anterior or posterior uveitis can lead to complications and permanent vision loss if not treated promptly.

Complications: Posterior or anterior synechiae, secondary cataract, and phthisis bulbi.

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7. Diabetic Retinopathy

Occurs 8-10 years after the onset of diabetes mellitus, initially presenting with microaneurysms and yellow waxy retinal exudates, followed by deeper and superficial hemorrhages.

Treatment: Early diabetes management and regular eye examinations help delay complications.

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8. Retinitis Pigmentosa

A hereditary, progressive degeneration of all retinal layers with pigment proliferation.

Symptoms:

- Night blindness
- Peripheral vision loss
- In later stages, central vision loss, though total blindness rarely occurs

Signs:

- Typical fundus appearance with black pigment deposits resembling bone corpuscles along blood vessels
- Yellow waxy optic disc
- Markedly narrowed retinal arteries
- Annular or ring scotoma in visual field tests

Treatment: No known cure; glasses are prescribed for any coexisting refractive errors.

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9. Age-related Macular Degeneration

Occurs in elderly individuals, affecting one or both eyes. Fundus examination shows pigmentary changes, fine exudates, and small hemorrhages localized to the macular region.

Symptoms:

- Central vision loss, but total blindness does not occur
- Vision loss due to degeneration of the outer nuclear layer, rods, and cones

Treatment: No effective treatment is available.

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10. Chronic Retrobulbar Neuritis (Toxic Amblyopia)

A bilateral condition caused by exogenous toxins affecting retinal ganglion cells. Previously known as chronic retrobulbar neuritis, it is now considered toxic retinoneuropathy due to its primary retinal involvement.

Etiology: Toxic Amblyopia Causes

1. **Tobacco Amblyopia:**
    - Occurs in elderly smokers with poor general health and vitamin B12 deficiency.
    - **Treatment:** Complete smoking cessation, vitamin B1 & B12 supplementation, and general health improvement.
2. **Ethyl Alcohol Amblyopia:**
    - Similar symptoms and treatment as tobacco amblyopia.

3. **Methyl Alcohol Amblyopia:**
    - Caused by drinking wood alcohol or methylated spirits.
    - **Treatment:** Immediate cessation of methyl alcohol intake, high doses of vitamin B1, B6, and B12.
4. **Arsenic and Lead Poisoning:**
    - Leads to gradual vision dimness and optic atrophy.
    - **Treatment:** Removal of toxic substances from the body.

Conclusion:

Various eye diseases contribute to gradual vision loss, requiring accurate diagnosis and timely intervention to preserve visual function and prevent complications.

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L7&8

Painful Eye: Differential Diagnosis

Introduction

Painful eye is a common complaint in medical practice. It can range from mild discomfort due to eye strain or dryness to a severe condition that threatens vision, such as acute glaucoma or optic neuritis. Proper differential diagnosis is essential to identify the underlying cause and provide appropriate treatment.

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1. Classification of Eye Pain

Eye pain can be classified based on:

1. **Location:**
   - **Superficial**: Originating from the conjunctiva, cornea, or eyelids.
   - **Deep**: Originating from the anterior chamber, optic nerve, or retina.
2. **Nature of the Pain:**
   - **Burning or stinging** → Dry eye syndrome
   - **Sharp, stabbing pain** → Corneal abrasion or foreign body
   - **Throbbing pain** → Deep infections, glaucoma, migraines
   - **Pressure sensation** → Sinusitis, glaucoma
3. **Associated Symptoms:**
   - Sudden or gradual vision loss? → Emergency (optic neuritis, retinal detachment)
   - Red eye? → Conjunctivitis, uveitis
   - Headache and nausea? → Acute glaucoma

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2. Causes of Superficial Eye Pain

These causes are related to the outer structures of the eye, including the conjunctiva, cornea, and eyelids.

A) Disorders of the Ocular Surface

1. Conjunctivitis

- **Causes:**
  - Viral (e.g., Adenovirus)
  - Bacterial (e.g., Staphylococcus, Streptococcus)
  - Allergic (seasonal, chemical exposure)
- **Symptoms:**
  - Redness, discharge, swollen eyelids
  - Viral: Watery discharge, highly contagious
  - Bacterial: Thick, yellowish discharge
  - Allergic: Severe itching, watery discharge

2. Dry Eye Syndrome

- **Causes:**
  - Prolonged screen exposure
  - Autoimmune diseases (e.g., Sjögren's syndrome)
  - Aging, Vitamin A deficiency
- **Symptoms:**
  - Grittiness, burning sensation, redness, irritation

3. Keratitis

- **Causes:**
  - Viral (Herpes simplex)
  - Bacterial (Pseudomonas, especially in contact lens users)
  - Fungal (after plant-related injuries)
- **Symptoms:**
  - Severe pain, photophobia, progressive vision loss

4. Episcleritis & Scleritis

- **Episcleritis:**
  - Mild pain, does not affect vision, associated with allergies.
- **Scleritis:**
  - Severe deep pain, may lead to permanent vision impairment, linked to autoimmune diseases (e.g., lupus).

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3. Causes of Deep Eye Pain

These causes are more serious and involve internal eye structures.

A) Acute Angle-Closure Glaucoma

- **Causes:**
  - Sudden increase in intraocular pressure due to blocked drainage angle.
- **Symptoms:**
  - Severe pain, blurry vision, halos around lights, nausea, vomiting
  - Fixed, mid-dilated pupil unresponsive to light

B) Anterior Uveitis (Iritis)

- **Causes:**
  - Autoimmune diseases (Ankylosing spondylitis, lupus)
  - Infections (Syphilis, tuberculosis)
- **Symptoms:**
  - Deep pain, redness, photophobia, iris color changes

C) Optic Neuritis

- **Causes:**
  - Multiple sclerosis
  - Viral infections
- **Symptoms:**
  - Pain during eye movement, sudden central vision loss

D) Migraine & Neuralgia

- **Causes:**
  - Vascular and neurological disorders
- **Symptoms:**
  - Pulsating pain around the eye, light sensitivity, nausea

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4. Traumatic Causes of Eye Pain

A) Corneal Abrasion

- **Causes:**
  - Scratches from fingernails, contact lenses, foreign bodies
- **Symptoms:**
  - Severe pain, excessive tearing, foreign body sensation

B) Foreign Bodies

- **Symptoms:**
  - Pain, redness, irritation, continuous tearing

C) Chemical Burns

- **Causes:**
  - Acid or alkali exposure (e.g., cleaning agents)
- **First Aid:**
  - Immediate irrigation with clean water for 15 minutes

D) Blunt Trauma

- **Causes:**
  - Sports injuries, accidents
- **Potential Complications:**
  - Internal bleeding, retinal detachment, orbital fracture

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5. When is Eye Pain an Emergency?

Immediate medical attention is required in cases of:

- **Sudden or progressive vision loss**
- **Severe pain unresponsive to painkillers**
- **Halos around lights**
- **Direct eye injury or chemical exposure**
- **Pain accompanied by severe headache or neurological symptoms (double vision, muscle weakness)**

Conclusion

Accurate diagnosis of eye pain relies on a thorough history and clinical examination. It is crucial to differentiate between benign conditions that can be treated with topical medications and serious conditions requiring urgent intervention to prevent complications and vision loss.

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L9&10

Red Eye: Differential Diagnosis

Introduction

- Red eye (pink eye) is one of the most common conditions prompting patients to visit ophthalmologists for accurate diagnosis and appropriate treatment.
- The causes of red eye range from simple physiological reactions to serious vision-threatening diseases.
- Accurate diagnosis requires a systematic approach that includes medical history, symptom evaluation, and clinical examination.

Types of Red Eye

There are two main types of red eye:

1. **Physiological Red Eye**
2. **Pathological Red Eye**

Physiological Red Eye

Characteristics:

- Not associated with decreased visual acuity or eye pain.
- Manifests only as eye redness with a feeling of discomfort.

Causes:

- Emotional reactions such as laughing and crying.
- Eye strain due to prolonged computer use.
- After consuming alcohol.
- After showering with hot water.
- Exposure to eye irritants such as incense, tobacco, and perfumes.

Pathological Red Eye

Divided into two categories:

1. **Painless Red Eye**
2. **Painful Red Eye**

1. Painless Red Eye

Causes:

- Dry Eye Syndrome.
- **Conjunctivitis:**
  - *Allergic Conjunctivitis* → Causes itching and watery discharge.
  - *Bacterial Conjunctivitis* → Purulent discharge, treated with antibiotic eye drops.
  - *Viral Conjunctivitis* → Watery discharge, highly contagious, usually self-limiting.
  - *Trachoma* → Chronic infection caused by *Chlamydia trachomatis*.
- **Other Conditions:**
  - Certain blood disorders.
  - Conjunctival tumors.
  - Pterygium (abnormal tissue growth on the conjunctiva).

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2. Painful Red Eye (A medical emergency requiring immediate attention)

Causes:

1. **Foreign bodies in the eye** (Common in industrial areas and workshops).
2. **Chemical burns** (Due to exposure to acids and alkalis).
3. **Corneal ulcers and infections** (Can lead to corneal perforation within 48 hours if untreated).
4. **Increased intraocular pressure** (e.g., Acute angle-closure glaucoma).
5. **Iritis and ciliary body inflammation** (Anterior uveitis).
6. **Eye trauma and contusions.**

Evaluation of Red Eye

Symptoms and Causes

- **Itching** → Allergy (Allergic conjunctivitis).
- **Foreign body sensation** → Foreign body, corneal abrasion, dry eye.
- **Deep, intense pain** → Scleritis, iritis, acute glaucoma.
- **Photophobia** → Iritis, keratitis, corneal abrasion.
- **Halo vision** → Corneal edema (Acute glaucoma, iritis).
- **Discharge:**
  - *Purulent* → Bacterial conjunctivitis.
  - *Watery* → Viral or allergic conjunctivitis.
  - *Mucous* → Dry eye, chlamydial conjunctivitis.
- **Unilateral vs. Bilateral Red Eye:**
  - *Unilateral* → Foreign body, trauma, acute glaucoma, iritis.
  - *Bilateral* → Allergic or viral conjunctivitis, dry eye.

Required Examination

- **Assess visual acuity.**
- **External examination** (Eyelids, conjunctiva, cornea, sclera).
- **Slit-lamp examination** to assess the anterior chamber.
- **Fluorescein staining** to detect corneal abrasions or ulcers.
- **Tonometry** to check intraocular pressure for glaucoma.
- **Pupillary light reflex assessment** (Fixed, dilated pupil in acute glaucoma).

Common Red Eye Disorders and Treatment

1. Eyelid and Adnexal Disorders

- **Hordeolum (Stye) and Chalazion**: Warm compresses, surgical intervention if chronic.
- **Blepharitis**: Managed with eyelid hygiene, topical antibiotics, or oral doxycycline.
- **Orbital Cellulitis**: A serious infection requiring IV antibiotics and urgent consultation.

2. Lacrimal System Disorders

- **Nasolacrimal Duct Obstruction**: Treated with massage or surgery for chronic cases.
- **Dacryocystitis**: Managed with antibiotics; recurrent cases may require surgery.

3. Ocular Surface Disorders

- **Conjunctivitis:**
  - *Bacterial* → Treated with antibiotic eye drops.
  - *Viral* → Highly contagious, self-limiting.
  - *Allergic* → Treated with antihistamines.
- **Subconjunctival Hemorrhage**: A painless red spot, resolves spontaneously.
- **Dry Eye Syndrome**: Managed with artificial tears and cyclosporine drops.

4. Anterior Segment Disorders

- **Iritis (Anterior Uveitis)**: Requires corticosteroid eye drops and systemic treatment.
- **Keratitis:**
  - *Bacterial* → Requires strong topical antibiotics.
  - *Herpetic* → Treated with antiviral therapy.
- **Corneal Ulcer**: Needs urgent intensive antibiotic treatment.
- **Acute Angle-Closure Glaucoma**: Requires immediate intraocular pressure-lowering treatment.
- **Scleritis**: Managed with anti-inflammatory or immunosuppressive therapy.

When to Refer Immediately?

- **Loss of vision.**
- **Severe eye pain.**
- **Photophobia.**
- **Limbal (circumferential) redness.**
- **Corneal edema or ulcer.**
- **Elevated intraocular pressure.**
- **Proptosis or restricted eye movement.**
- **Fixed, non-reactive pupil.**

Conclusion

- The causes of red eye range from mild to serious conditions.
- A doctor's visit is advised in cases of pain or vision changes.
- Prevention plays a crucial role in avoiding complications of red eye.
- Collaboration between primary care physicians and ophthalmologists is essential for effective management.