Eye and Ear

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Lecture No. 10

1-Conjunctivitis

- **Background: Conjunctivitis**
- Conjunctivitis refers to **inflammation of the conjunctiva**, the thin, transparent tissue covering the white part of the eye and the inner surface of the eyelids. The condition is marked by symptoms that include:
    1. **Ocular redness**
    2. **Irritation**
    3. **Itching**
    4. **Discharge**

- **Epidemiology**
- Conjunctival redness and inflammation are recognized as the **most common ophthalmic problems**. Due to its prevalence, conjunctivitis frequently presents in community pharmacy settings.
- Conjunctivitis seems to **affect both sexes equally** and may present in **any age of patient**, although **bacterial** conjunctivitis is more common in **children** and **viral** conjunctivitis more common in **adults**.

1-Conjunctivitis

- **Types of Conjunctivitis**
- Conjunctivitis can have various underlying causes, including:
  1. **Bacterial conjunctivitis**
  2. **Viral conjunctivitis**
  3. **Allergic conjunctivitis**
- All three types of conjunctivitis are essentially **self-limiting**, although **viral conjunctivitis** can be **recurrent** and **persist** for many weeks.

- **Role of Community Pharmacists**
- Community pharmacists often encounter conjunctivitis as the **most prevalent ocular condition** in their practice. Their role involves:
  1. **Recognition of different types of conjunctivitis** based on clinical features.
  2. **Differential diagnosis** to distinguish conjunctivitis from more severe ocular disorders that may require referral to an ophthalmologist.

Aetiology of conjunctivitis

- Pathogens that cause bacterial conjunctivitis vary between adults and children.

- **In adults**,

1. **Staphylococcus species** are most common (>50% of cases),
2. followed by **Streptococcus pneumoniae** (20%),
3. **Moraxella species** (5%) and **Haemophilus influenzae** (5%).

- **In children, Streptococcus**, **Moraxella** and **Haemophilus** are most common.

- The **adenovirus** is most commonly implicated in **viral conjunctivitis**, and

- **Pollen** usually causes **seasonal allergic conjunctivitis**.

Key Questions and Their Diagnostic Relevance

Unilateral or Bilateral Eye Involvement	• Unilateral involvement often suggests a foreign body or trauma. • Conjunctivitis may initially present unilaterally and then spread to both eyes.
Discharge is common in conjunctivitis:	• Watery discharge suggests viral or allergic conjunctivitis. • Mucopurulent discharge is indicative of bacterial conjunctivitis, especially if eyelids are glued together without itching.
Danger symptoms requiring referral include:	• **Reduced visual acuity.** • **Deep, aching pain**. Associated with serious conditions (scleritis, keratitis, uveitis, or acute glaucoma.
Location of Redness	• Redness near the limbus (around the iris) may indicate sinister pathologies such as uveitis. • Generalized redness towards the fornices suggests conjunctivitis. • Localized redness (scleral) may suggest episcleritis or scleritis.
Duration	• Most cases of conjunctivitis resolve within one week. • Persistent redness beyond this duration (except in allergic conjunctivitis or subconjunctival hemorrhage) warrants further investigation.
Photophobia	• Sensitivity to light is associated with more serious pathologies like keratitis or uveitis.
Other Symptoms	• Upper respiratory symptoms point to a viral etiology. • Nausea or vomiting may indicate increased intraocular pressure, suggesting glaucoma.

Clinical features of conjunctivitis

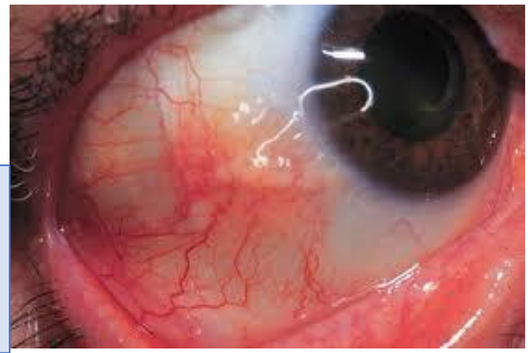
- **Bacterial conjunctivitis** often presents with **purulent discharge** and a **gritty sensation**, without systemic symptoms.
- **Viral conjunctivitis** is accompanied by **watery discharge** and **cold-like symptoms**, often affecting one eye first before spreading.
- **Allergic conjunctivitis** features **itching**, **watery discharge**, and is commonly associated with **rhinitis**.

Symptoms that help distinguish between the different types of conjunctivitis

	Bacterial	Viral	Allergic
Eyes affected	Normally both; occasionally unilateral	Both, but one eye is often affected first	Both
Discharge	Purulent	Watery	Watery
Pain	Gritty feeling	Gritty feeling	Itching
Distribution of redness	Generalized and diffuse	Generalized	Generalized, but greatest in fornices
Associated symptoms	None commonly	Cough and cold symptoms	Rhinitis (may also have family history of atopy)

Table 3.1
Causes of red eye and their relative incidence in community pharmacy

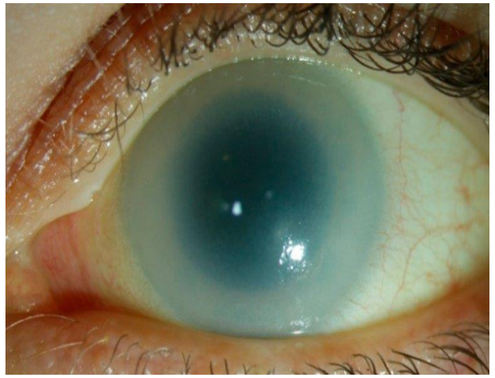
Incidence	Cause
Most likely	Bacterial or allergic conjunctivitis
Likely	Viral conjunctivitis, subconjunctival haemorrhage
Unlikely	Episcleritis, scleritis, keratitis, uveitis, neonatal conjunctivitis
Very unlikely	Acute closed-angle glaucoma



Episcleritis is an inflammatory condition affecting the tissue between the conjunctiva (the membrane that lines the inside of the eyelid) and the sclera

When to refer (red eyes)

1. -**Clouding** of the cornea
2. -Associated **vomiting**
3. -Redness caused by **a foreign body**
4. -Irregular-shaped pupil
5. -**Photophobia**
6. -Eye pain
7. -Distortion of vision
8. -Redness localized around the pupil



Management of Bacterial Conjunctivitis

- **A. Nonpharmacological Advice**

1.Cleanse the eyelids:

- Clean the eyelids with **warm water** to gently remove discharge.

2.Dispose of tissues properly:

- Use tissues to wipe the eyes and **dispose of them immediately** to prevent the spread of infection.

3.Avoid contact lenses:

- Do **not wear contact lenses** until the symptoms have fully resolved to prevent reinfection.

4.Practice hygiene:

- **Wash hands frequently** and avoid sharing personal items such as **pillows** and **towels** to reduce transmission risk.

Management of Bacterial Conjunctivitis

- Bacterial conjunctivitis is regarded **as self-limiting – 65% of people** will have a clinical cure in **2 to 5 days**, with no treatment.
- Yet antibiotics are routinely given by medical practitioners because they are considered **clinically desirable to speed recovery and reduce relapse**.

Pharmacological Therapy for Bacterial Conjunctivitis

1. Chloramphenicol Eye Drops and Ointment

- **chloramphenicol** are commonly used to **speed recovery** and **reduce relapse rates**.
- **2007**: Chloramphenicol eye drops and ointment was also made OTC.

- **Mechanism of Action**
- Chloramphenicol binds to the **50S subunit of bacterial ribosomes**, inhibiting **protein synthesis**.
- This action is primarily **bacteriostatic** but may be bactericidal at high concentrations against some organisms

Pharmacological Therapy for Bacterial Conjunctivitis

- **Dosage and Administration**
- **Eye Drops** (Adults and children aged 2 years and older):
  - **Day 1–2**: Instill **1 drop every 2 hours**.
  - **Day 3–5**: Reduce to **1 drop every 4 hours**.
  - **Key Note**: Sleep need not be interrupted for dosing.
  - **Duration**: (5-7 days) Complete the course even if symptoms improve.
- **Eye Ointment** (if used with drops):
  - Apply **1 cm of ointment** inside the lower eyelid **at night**.
  - Blink several times to spread the ointment.
- **Eye Ointment Alone**:
  - Apply **3–4 times daily**.

Pharmacological Therapy for Bacterial Conjunctivitis

- **Use in Pregnancy and Breastfeeding**
- **Pregnancy**:
  - Manufacturer data is limited, so use is generally not recommended.
  - Hygiene measures are preferred unless absolutely necessary.
- **Breastfeeding**:
  - Can be used if necessary, as systemic absorption is minimal.
- **Treatment Timescale**
- If **symptoms do not improve within 2 days**, refer the patient to a healthcare professional.
- **Adverse Effects**
- **Common side effects**:
  - Mild **stinging** or **burning** upon application.
  - Temporary **blurring of vision**.
- **Referral Criteria**
- **Glaucoma**: Patients with glaucoma or a history of eye surgery/laser treatment in the past six months should be **referred**.

Pharmacological Therapy for Bacterial Conjunctivitis

2- Propamidine and Dibromopropamidine

- Propamidine and dibromopropamidine are **antimicrobial agents** that have been used for decades in the treatment of **bacterial conjunctivitis**.
- They are active against a **broad spectrum of organisms**.
- **Dosage and Administration**
- **Eye drops**: Apply **four times daily**.
- Their use might be better reserved for specific cases **where other options are unsuitable or unavailable.**

B. Allergic Conjunctivitis

- **Nonpharmacological Advice**

1. Apply a **Cold Compress** to the eyes **3–4 times daily** to reduce redness and itching.
2. Minimize or eliminate exposure to the **causative allergen** (e.g., pollen, dust, animal dander).

B. Allergic Conjunctivitis

- **Pharmacological Therapy**

1. **Mast Cell Stabilizers**:
   - **Sodium Cromoglicate**: Helps prevent the release of histamine and other mediators of allergic reactions.
   - 1 drop four times daily
2. **Sympathomimetics**:
   - **Naphazoline**: Reduces redness by constricting blood vessels.
   - 1 drop 3-4 times daily
3. **Antihistamines**:
   - **Antazoline**: Relieves itching and other symptoms by blocking histamine receptors.
   - drop 2-3 times daily
4. **Decongestant–Antihistamine Combinations**:
   - **Naphazoline-Antazoline**: Offers dual action to reduce redness and itching.
   - 1 drop 2-3 times daily

B. Viral conjunctivitis

- It is **self-limiting**, with symptoms typically resolving within **2–3 weeks**.
- **Nonpharmacological Advice**
  - Instruct patients to follow strict hygiene practices:
    - Avoid sharing personal items (e.g., towels).
    - Wash hands frequently to control the spread of infection.
- **Pharmacological Therapy**
- **Ophthalmic Decongestants**:
  - Sympathomimetic agents like **Naphazoline** may help alleviate redness and provide symptomatic relief.

Administration of eye drops

1. Wash your hands
2. Tilt your head backwards until you can see the ceiling
3. Pull down the lower eyelid by pinching outwards to form a small pocket, and look upwards
4. Hold the dropper in the other hand as near as possible to the eyelid without touching it
5. Place one drop inside the lower eyelid, and then close your eye
6. Wipe away any excess drops from the eyelid and lashes with the clean tissue
7. Repeat steps 2–6 if more than one drop needs to be administered

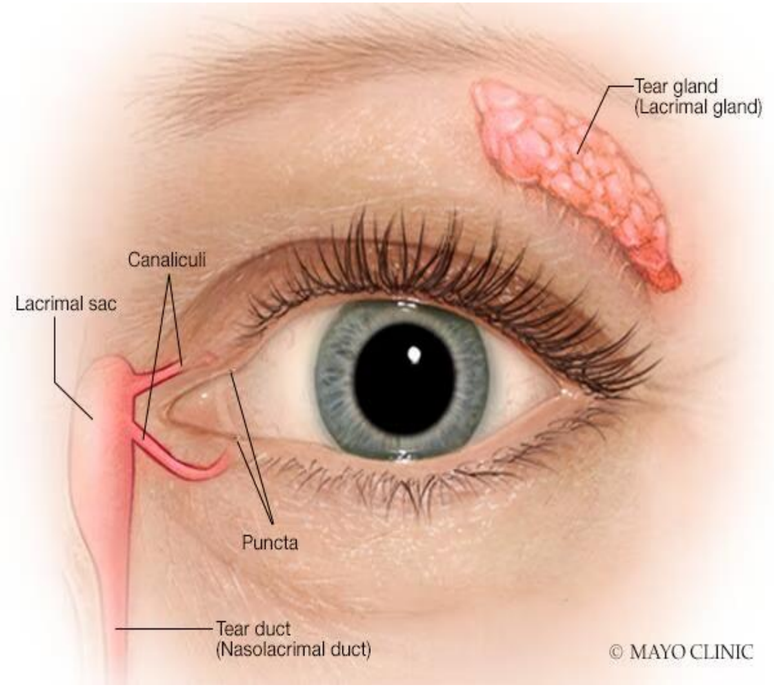
Administration of eye ointment

1. Wash your hands
2. Tilt your head backwards until you can see the ceiling
3. Pull down the lower eyelid
4. Place a thin line of ointment along the inside of the lower eyelid
5. Close your eye, and move the eyeball from side to side
6. Wipe away any excess ointment from the eyelids and lashes using a clean tissue
7. After using ointment, your vision may be blurred but will soon be cleared by blinking

Dry Eye Syndrome

Dry Eye Syndrome

- **Overview**
- Dry eye is a **chronic condition** affecting the **anterior surface of the eye**, commonly resulting from **reduced tear production**, **increased evaporation**, or **altered tear composition**.
- It is prevalent among the elderly and postmenopausal women.



Patient Assessment for Dry Eye

A. Age

- **Commonly Associated**: Aging process and postmenopausal women.
- **Rare in Children**: Requires **referral**.

B. Symptoms

- **Affect both eyes and** symptoms include:
  - Burning or tired eyes.
  - Itchy and irritated sensations.
  - A feeling of grittiness or as if something is in the eye.

C. Clarifying Questions

- Have you had **daily, persistent, troublesome dry eyes**?
- Do you experience a **recurrent sensation of sand** in the eyes?
- A positive response to either question suggests **dry eye syndrome**.

Patient Assessment for Dry Eye

D. Associated Symptoms

- If dry mouth is present, review medications that can cause this side effect (e.g., antihistamines, antidepressants, diuretics).
- If no medication is implicated, consider **autoimmune diseases** (e.g., Sjögren's syndrome).

- **Ectropion**:
  - Outward turning of the lower eyelid leading to overexposure of the conjunctiva.
  - **Referral required**.

Management of Dry Eye

- **Nonpharmacological Advice**

1. Avoid exposure to **dry environments** or irritants.

2. Maintain proper **hydration**.

Management of Dry Eye

- **Pharmacological Therapy**

1. Artificial Tear Preparations

- Stabilize the tear film and decrease tear evaporation.

- **Types**:
  - **Preservative-Containing**: such as **benzalkonium chloride (0.01%)**.
    - Suitable for **short-term use** but may damage the corneal epithelium with long-term use.
  - **Preservative-Free**: Recommended for **long-term use**.

- **Examples**:
  - **Hypromellose**: Tears Naturale® Eye Drops.
  - **Polyvinyl Alcohol**: Liquifilm Tears® Eye Drops.
  - For mild cases: Use **up to 4 times a day**.
  - For moderate-to-severe cases: Use **more frequently**.

Management of Dry Eye

2. Carbomer-Based Gels

- Longer-acting polymers for extended symptom relief.
- Require fewer instillations.
- Examples:
  - Liquivisc® Gel.
  - Viscotears® Gel.

3. Lubricating Ointments

- Contain **white soft paraffin**, lanolin, and liquid paraffin.
- Melt at body temperature and provide prolonged retention in the eye.
- **Usage**: Best used **at bedtime** as they blur vision during the day.
- Example: Lubri-Tears® Eye Ointment.

Management of Dry Eye

- **Treatment Plan**

- **For mild dry eye**: Use artificial tears up to **4 times daily**.

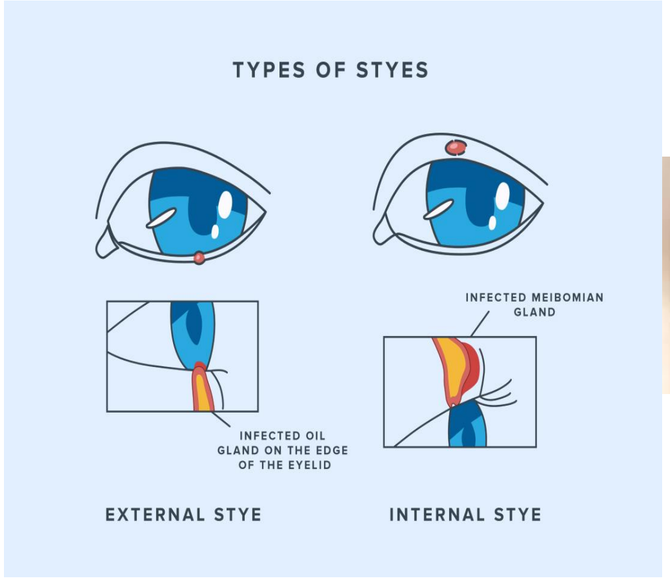
- **For moderate-to-severe dry eye**: Use artificial tears or **carbomer-based gels more frequently**, with lubricating ointments at night.

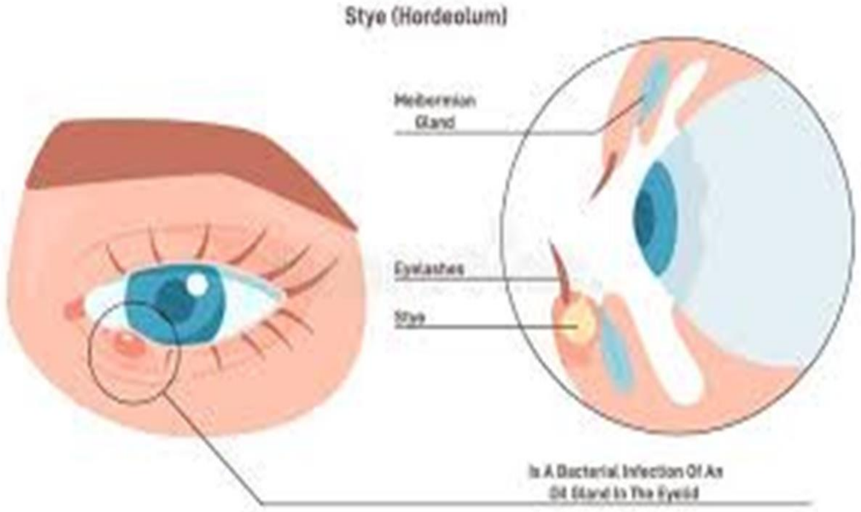
Eyelid Disorders

Eyelid Disorders

A. Stye (Hordeolum)

- **Stye** is an infection of the glands of the eyelid.
- **Types**:
  - **External Stye**: Located on the outer surface of the eyelid, often with a head of pus at the lid margin.
  - **Internal Stye**: Located on the inner surface of the eyelid; tends to have a more prolonged course.
- **Symptoms**:
- **Tender, sore lump** on the eyelid.
- **Head of pus** (usually in external styes).
- **Redness**, **swelling**, and localized **pain**.





Management of Eyelid Disorders

1. Nonpharmacological Measures

- **Hygiene Practices**:
  - Avoid touching the eyes.
  - Wash hands thoroughly after contact with the affected area.
- **Warm Compress**:
  - Apply for **5–10 minutes** 3-5 times daily to encourage drainage and resolution.
  - Most external styes resolve within **48 hours** after drainage.
  - Internal styes may take up to **2 weeks** to resolve.

2. Self-Resolution

- Styes generally resolve spontaneously within **7–14 days** without treatment.

3. Referral Criteria

- Stye does not drain or resolve within **2 weeks**.
- Symptoms worsen or do not improve despite warm compress use.

- **Note**:
- Antibiotic therapy is **not typically required**, as it does not significantly speed symptom resolution.

Chalazion

- **Definition**:
- **Chalazion** is a painless, granulomatous lump caused by blockage of the **meibomian gland**, often following an unresolved internal stye.
- **Symptoms**:
- **Painless lump** on the eyelid.
- Lacks the tenderness and pus head characteristic of a stye.

Meibomian gland dysfunction

Management of **Chalazion**

1. Nonpharmacological Measures

- **Warm Compress**:
  - Apply several times daily for a few minutes to encourage resolution.
  - Approximately **25–50%** of chalazia resolve with this treatment.

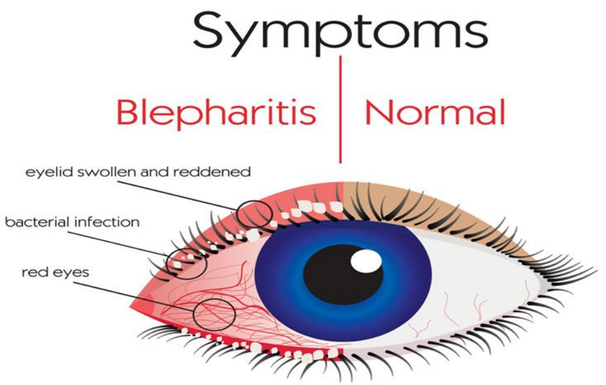
2. Self-Resolution

- Chalazion may take **a few weeks** to resolve completely without intervention.

3. Referral Criteria

- If the chalazion **does not improve after several days of warm compress** therapy.
- If it **interferes with vision** or is associated with **eye pain**.
- The patients should be referred for **surgical removal** when the lump is persistent or bothersome.

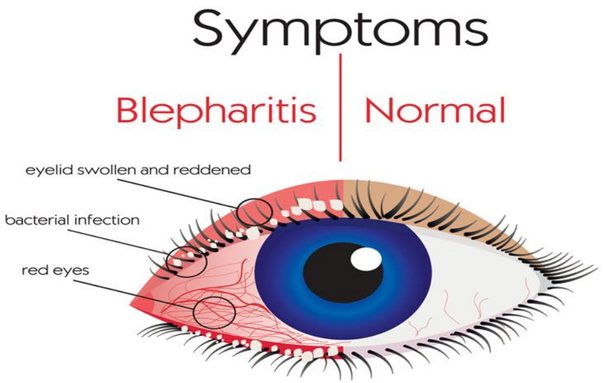
Blepharitis



Blepharitis

- A chronic **inflammation of the eyelid margins**, typically affecting both eyes.
- **Signs and Symptoms**

1. **Bilateral Presentation**: Redness, irritation, burning, and itching along the lid margins.
2. **Scales on Lashes**: Often greasy in seborrheic blepharitis, or excessive crusty debris/flakes around the eyelashes.
3. **Eyelash Changes**:
   - Loss of lashes.
   - Distorted lashes that turn inwards and may rub against the cornea, potentially causing conjunctivitis.



Patient Assessment in Blepharitis

- Often coexists with skin conditions such as **rosacea** or **seborrheic dermatitis**.
- Swollen eyelids with a **systemic feeling of unwellness** which require **referral**.
- Blepharitis is **chronic**, with periods of remission and recurrence.
- **Persistent symptoms** despite medication warrant **referral**.

Management of Blepharitis

- **Goals of Treatment**
- Alleviate discomfort and inflammation.
- Prevent recurrence of severe symptoms.

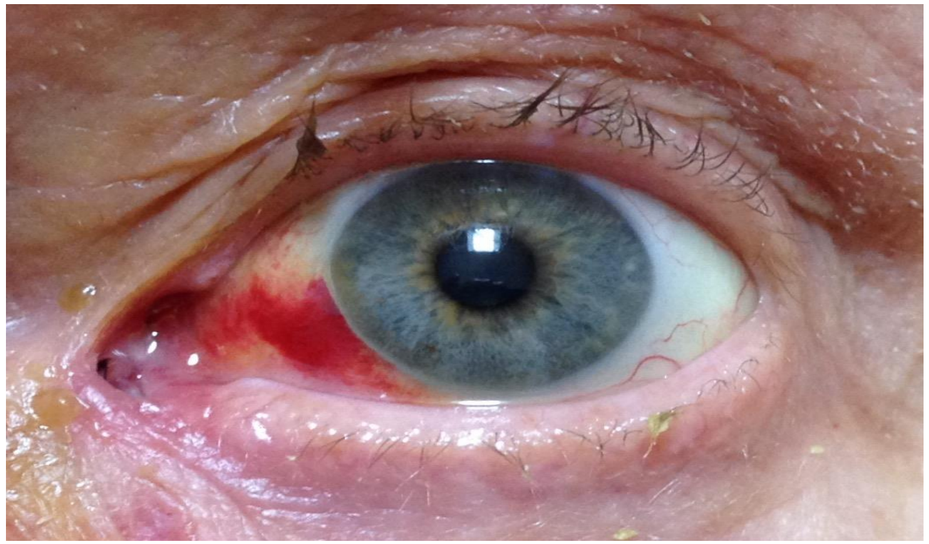
1. Lid Hygiene

- **Warm Compress**:
  - Apply to closed eyelids for **5–10 minutes** to soften gland secretions and open secretory passages.
- **Lid Cleansing**:
  - Use a **dilute baby shampoo solution (1:10)** with warm water applied with a cotton bud.
  - Perform this cleaning twice daily initially, reducing to once daily as symptoms improve.
- **Expected Improvement**:
  Symptoms should improve within **4 weeks**. Failure to improve requires referral.

2. Referral Criteria

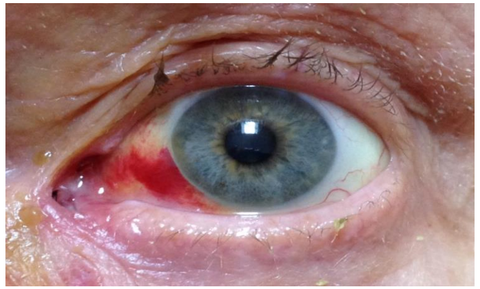
- Symptoms persist or fail to respond to hygiene measures after **4 weeks**.
- Signs of **conjunctivitis**.

Sub-conjunctival Hemorrhage



Sub-conjunctival Hemorrhage

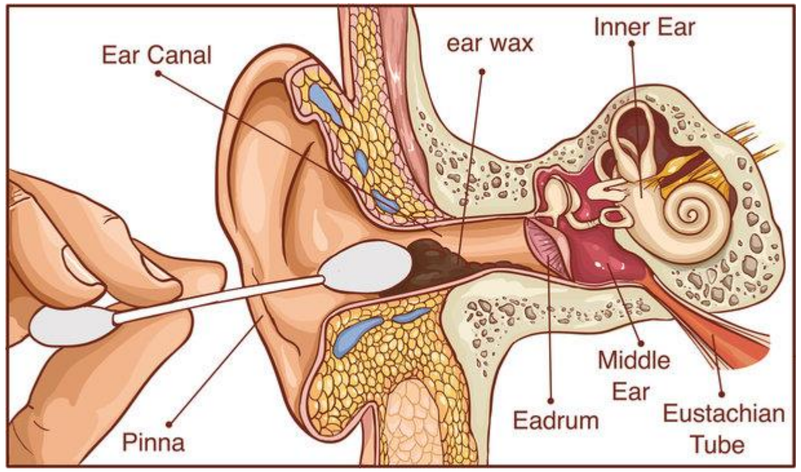
- A rupture of a blood vessel under the conjunctiva, leading to bright red discoloration of the eye.
- **Symptoms**:
- **Bright Red Eye**: May involve part or the entire conjunctiva.
- **No Pain**: Often asymptomatic and noticed only upon looking in the mirror.
- **Causes**:
- **Idiopathic**: Occurs spontaneously in most cases.
- **Triggers**: Coughing, straining, or lifting heavy objects.
- **Medical Conditions**:
  - **Hypertension**: May precipitate the condition.
  - **Anticoagulant/Antiplatelet Drugs**:
  - Medications such as **warfarin**, **aspirin**, or **clopidogrel** can contribute to bleeding.



Management of Subconjunctival Hemorrhage

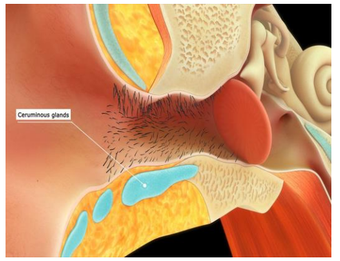
- The condition is typically harmless and resolves within **10–14 days** without treatment.
- **Monitor Blood Pressure**:
  - Advise checking blood pressure to rule out hypertension.
- **Medication Review**:
  - Check for anticoagulant/antiplatelet use.
  - Patients on warfarin should have their **INR (International Normalized Ratio)** monitored.
- **Referral**:
  - History of **trauma** or suspected **ocular injury**.

Ear Wax Impaction



1. Ear Wax Impaction

- Ear wax, also known as **cerumen**, is produced in the external auditory canal by ceruminous glands and serves several important functions:
- **Protective Barrier**:
  - Lubricates the canal.
  - Traps dust and foreign materials.
  - Creates a waxy, waterproof barrier preventing the entry of pathogens.
- **Antimicrobial Properties**:
  - Contains substances like **lysozymes** and has an **acidic pH**, which inhibit bacterial and fungal growth.
- **Self-Cleaning Mechanism**:
  - cerumen naturally migrates outward due to jaw movements (e.g., chewing, talking).
- **Misconceptions**:
  - Many patients incorrectly believe ear wax must always be removed.



- **Predisposing Factors for Impaction**:
  - **Anatomic Features**:
    - Narrow ear canals.
    - Excessive hair growth in the canal.
  - **Device Usage**:
    - Hearing aids or earplugs block normal migration, leading to buildup.
    - Frequent removal and proper cleaning of these devices can help prevent wax impaction.
  - **Aging**:
    - Elderly individuals produce **drier cerumen**, which is harder to expel.

Patient Assessment with Ear Wax Impaction

A. Course of Symptoms

- **Common Symptoms**:

  Sense of **fullness** in the ear.

  Gradual **hearing loss** or **pressure** in the ear.

B. Associated Symptoms

- **Dizziness and Tinnitus**: Rarely caused by earwax; **referral** recommended for inner ear problems.
- **Pain or Discharge**: May indicate infection or trauma; these cases should also be **referred**.

Patient Assessment with Ear Wax Impaction

C. History of Trauma

- Recent attempts to clean the ears (e.g., with cotton swabs) can lead to:
  - **Wax impaction**.
  - **Eardrum perforation**.
  - Trauma symptoms, such as discharge or bleeding, require referral.

D. Use of Medicines

- Failed use of OTC cerumenolytics necessitates referral for:
  - **Ear irrigation**.
  - Further investigation to rule out other conditions.

E. Foreign Bodies

  - Symptoms can mimic earwax impaction but often progress to:
  - **Pain** and **discharge**.
  - Common in children; suspected cases should always be referred.

Treatment Goals

- **Softening and Removing Wax**:
  - Relieve hearing loss.
  - Alleviate associated symptoms.
  - Avoid damaging the ear canal or eardrum during removal.
- **Non-Pharmacologic Therapy**
- **Recommended Method**:
  - Use a wet washcloth over a finger to clean the **outermost part** of the ear canal.
  - **Note**: This method is **preventive and not effective for impacted wax**.

Pharmacologic Therapy (Cerumenolytics)

- Effective for softening cerumen and facilitating removal.
- Safe for all age groups and compatible with most medications.
- May temporarily worsen deafness or cause mild irritation; patients should be informed.

- **Common Ingredients**:
  - **Oils**: Olive, arachis, almond, camphor (lubricate and soften wax).
  - **Glycerol**: Softens and hydrates wax.
  - **Docusate**: Breaks down cerumen structure.
  - **Urea Hydrogen Peroxide**: Releases oxygen to break down wax.
- **Examples of Products**:
  - **Docusate (Dewax®)**:
    - Fill the ear with **5-10 drops** and use a cotton wool plug.
    - Apply **for two consecutive nights** and repeat if needed.
  - **Sodium Bicarbonate**:
    - Instill 2–3 times daily for up to 3 days.

Water-Clogged Ears

- **Overview**:
- Some individuals are **more prone to water retention in the ears** due to the shape of their ear canals or the presence of excessive cerumen. Excessive moisture can result from activities like wimming, bathing, or exposure to humid conditions.
- **Clinical Presentation**
  - Feeling of **fullness** in the ear.
  - Gradual **hearing loss** after water exposure.
- **Complications**:
  - **Tissue maceration** leading to **itching**, **pain**, or **inflammation**.
  - Potential for **secondary infection**.
- **Referral Criteria**:
  - Severe **pain**, **inflammation**, or signs of **infection** require medical attention.

Water-Clogged Ears

- **Treatment Options**
- **A. Nonpharmacologic Therapy**
- **Mechanical Manipulation**:
  - Tilt the affected ear downward and gently manipulate the auricle to allow water to drain out.
  - Recommended after activities such as swimming, bathing, or excessive sweating.
- **Blow-Dryer Use**:
  - Use a blow-dryer on a **low setting** around (not into) the ear immediately after water exposure to help dry the ear canal.

Water-Clogged Ears

- **B. Pharmacologic Therapy**
- **Isopropyl Alcohol 95% in Anhydrous Glycerin 5%**:
  - FDA-approved as a safe and effective ear-drying aid.
  - **Mechanism of Action**:
    - **Alcohol**: Dries moisture in the ear and acts as a disinfectant at concentrations above 70%.
    - **Glycerin**: Prevents excessive drying by acting as an emollient.
  - Recommended for **adults and children over 12 years**.
- **Acetic Acid and Isopropyl Alcohol Mixture (50:50)**:
  - **Properties**:
    - **Acetic Acid (5%)**: Provides bactericidal and antifungal action
    - **Isopropyl Alcohol (95%)**: Assists in drying and cleaning.
  - **Considerations**:
    - May cause mild stinging or burning, particularly if the ear canal is abraded.

Water-Clogged Ears

- **Prevention and Follow-Up**
- Use ear-drying agents after water exposure to reduce moisture in the ear canal.
- Avoid overuse to prevent excessive drying.
- **Referral**:
  - Persistent symptoms despite simultaneous use of ear-drying agents and preventive measures necessitate medical evaluation.

- **Do it now.**
- Sometimes **later** becomes **never.**