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Lecture 1: Eye Problems in Systemic Disorders

Trauma to the Eye, Eyelids, and Foreign Bodies

: Introduction & Relevance

• Why is it important for optometrists?

• Ocular trauma accounts for significant visual impairment worldwide.

• Foreign bodies and lid injuries are common emergency presentations.

• Many systemic disorders (e.g., diabetes, hypertension, connective tissue disease) increase the risk of poor healing or complications.

• Learning objectives:

1. Recognize different types of trauma to the eye and lids.

2. Understand the relation to systemic conditions.

3. Learn initial management and referral criteria.

❖ Ocular Trauma

•The eye is protected from direct injury by the lids, eyelashes, and the projecting margins of the orbit. although it can be injured in a variety of ways: by chemicals, heat, radiation, and mechanical trauma…

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❖ Some key features of ocular trauma:

•It is the number one ocular emergency.

•Leading cause of blindness, irrespective of age, sex, and geographical status (40% of monocular blindness).

• The male & young age group has a greater incidence rate.

•Efficient referral expected from the professionals.

•Every person should know about the importance of a quick response to an ocular injury.

•Prophylactic measures are always better than management.

❖ Classification of Trauma

-Etiological Classification

1. Accidental trauma.

2. Self-inflicted trauma.

3. Occupational trauma.

❖ Classification according to nature

1. Physical trauma.

a. Perforating.

b. Nonperforating.

c. Blunt trauma.

2. Chemical trauma.

a. Acid.

b. Alkali.

c. Dye (Salt of acid or alkali).

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3. Thermal trauma

a. Heat

b. Cold

4. Radiation trauma

a. ionizing agents

b. Ultraviolet rays

c. Laser burn

5. Miscellaneous

- Uniform classification based on primary evaluation; Mechanical trauma to the eye is of two types:

1. Open globe injuries.

-Full-thickness defect of the eye coats.

2. Closed globe injuries.

-Injuries without full thickness of eye coats.

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❖ Assessment:

• History

-should be as detailed as possible

-time & nature of injury

-Missile, blunt,? FB remaining, chemical, etc.

-Past ocular history - VA, lid function

-Immunization history

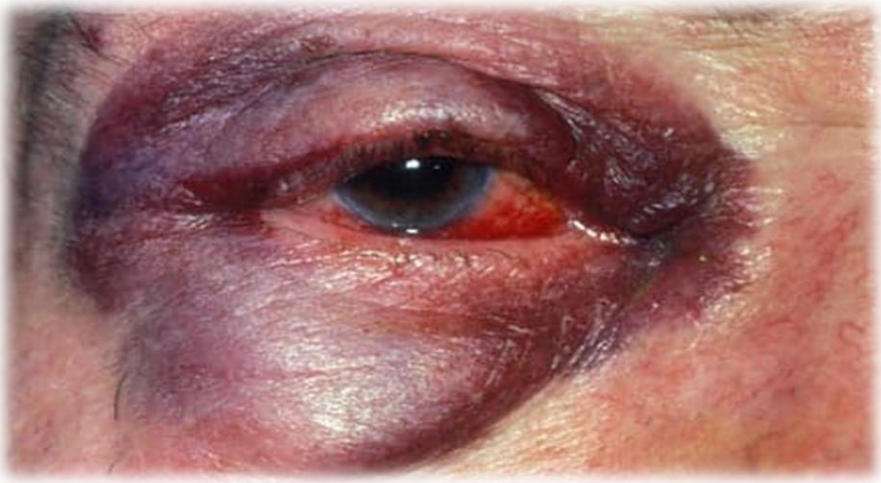
• Rule out life-threatening injuries

• Rule out globe-threatening injuries

• Examine both eyes

• Documentation +/- photograph

• Plan for repair



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2: Trauma to the Eyelids.

- Types of lid trauma:
- Blunt trauma → swelling, ecchymosis (“black eye”)
- Penetrating trauma/lacerations
- Burns (thermal, chemical, electrical)
- Associated systemic considerations:
- Bleeding disorders → exaggerated hematoma
- Diabetes → delayed wound healing

• Optometrist role:

- Assess extent (involving lid margin, canaliculi, globe).
- First aid, lubrication, shield, urgent referral.

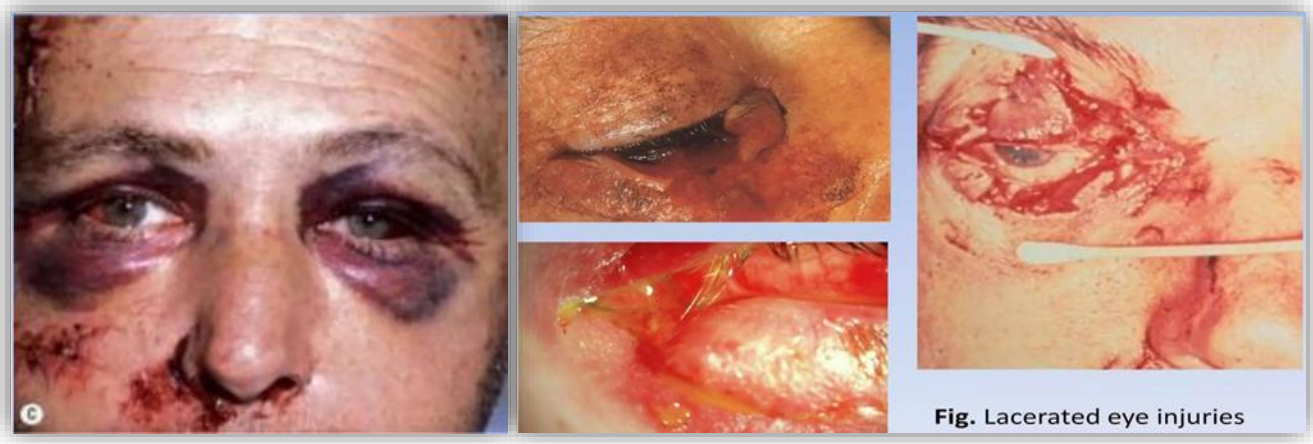

Fig. Lacerated eye injuries

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❖ Repair

-General principles of repair:

1. Clean the wound

2. Remove foreign body

3. Careful handling of tissues

4. Careful alignment of anatomy

•Lid margins, lash line, skin folds, etc.

5. Close in layers

6. Timing - Ideally, within 12-24 hours of injury, but can

•delay up to 1 week; patient's factors, gross swelling

7. Anesthesia

❖ Foreign Bodies (FB).

- Types of FB:
- Superficial: conjunctival, corneal.
- Embedded: intraocular, intraorbital.
- Materials:
- Metallic → rust ring.

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• Organic (wood, plant matter) → higher infection risk.

• Systemic implications:

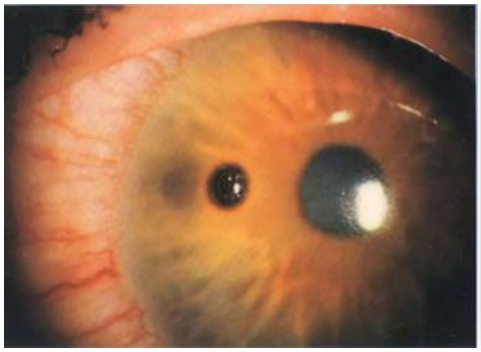
• Immunocompromised patients (HIV, chemotherapy) → higher risk of fungal or bacterial keratitis.

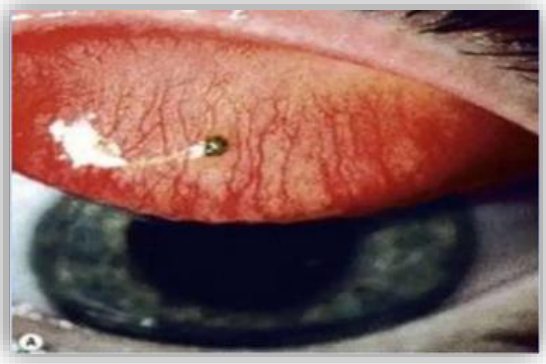
• Optometrist management:

• Removal of superficial FB (with care, under magnification).

• Prescribe lubricants, prophylactic antibiotics.

• Refer if deep/penetrating or vision-threatening.





6: Systemic Disorders & Eye Trauma Outcomes

• Diabetes: Delayed healing, increased infection risk.

• Hypertension: More severe subconjunctival hemorrhage, orbital hemorrhage risk.

• Coagulopathies/anticoagulant use: Prolonged bleeding in lid and subconjunctival trauma.

• Nutritional deficiencies (Vit A, C, Zinc): Impaired wound healing.

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• Autoimmune disorders (Sjögren's, RA): Dryness worsens corneal trauma healing.

Conclusion:

• Optometrists must not only manage the trauma itself but also consider the patient's systemic health.

• Early detection, proper documentation, first aid, and timely referral save vision.

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Eye Problems in Systemic Disorders

Lecture two: Circulatory disorders

Cardiovascular Disease & Effects on the Eye:

- Cholesterol Deposits in or Around the Eyes
- Transient Vision Loss
- Congenital cardiac defects lead to changes in the retinal vascularity
- untreated endocarditis present with Roth spots (fig.2), retinitis, embolic retinopathy, or sub-retinal abscesses

Cholesterol Deposits in or Around the Eyes (Xanthelasma)(Fig.1)

Roth's spots in endocarditis and the leukaemias (Fig.2)

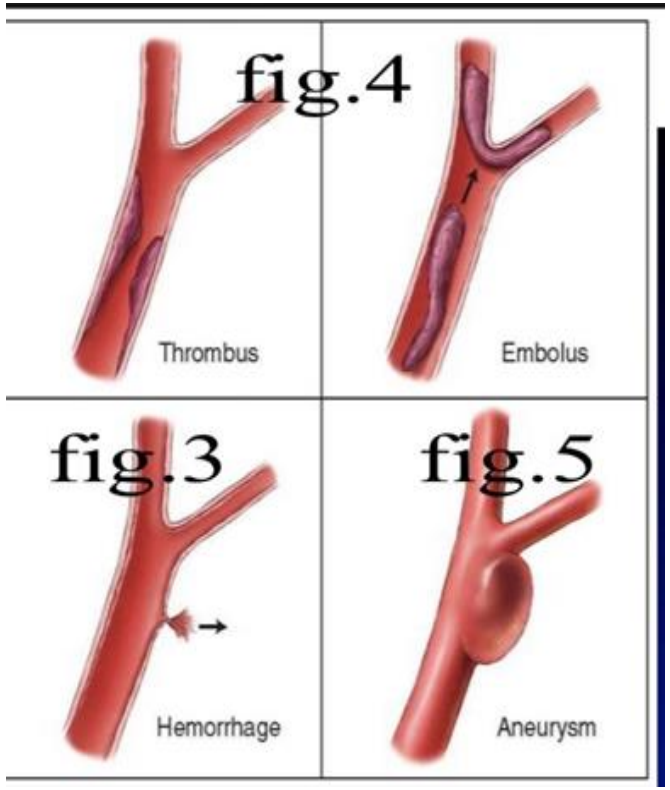
• superficial retinal hemorrhages ovally shaped, with a pale center. It is commonly seen near the optic disk.

➢ Common conditions cause C.D. for the eye :

- Diabetes :(diabetic retinopathy).
- High blood pressure (hypertensive retinopathy).
• The eye is very sensitive to changes in blood flow.
• Note: Smoking can worsen vascular problems.

➢Causes of C.D :

- Traumatic.
- Compressive.
- Occlusive.
- Tumors or malformations.
- Aneurysms.
- Vessel spasms.
- Anemias.
- leukemia.



➢ Anemias are common groups of C.D affecting the red blood cells.

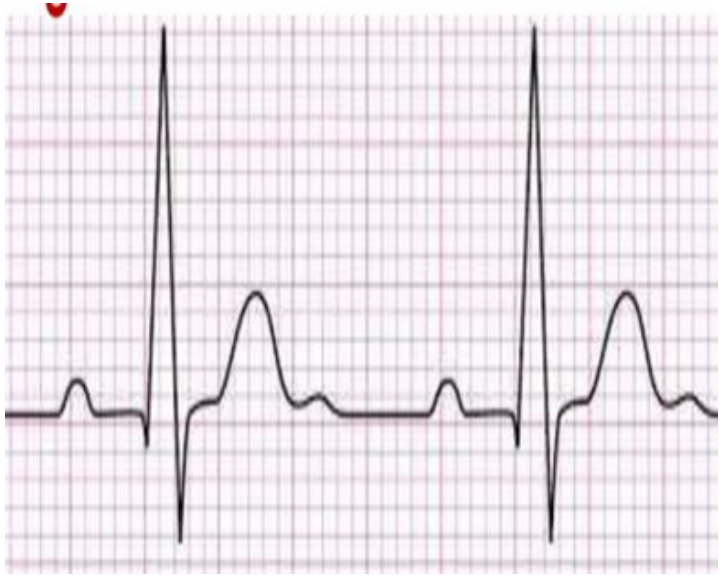
• Ocular features of anemias: Retinopathy, Optic neuropathy.

➢ Leukemia: a group of abnormal proliferation of white blood cells.

• Ocular features of leukemia: all of the ocular structures may be involved.

➢ Diagnostic workup:

• Blood pressure measurement
• Full blood count.
• Lipid profile.
• Diabetes Tests.
• Electrocardiogram (ECG).
• Echocardiography.



- Systemic features:

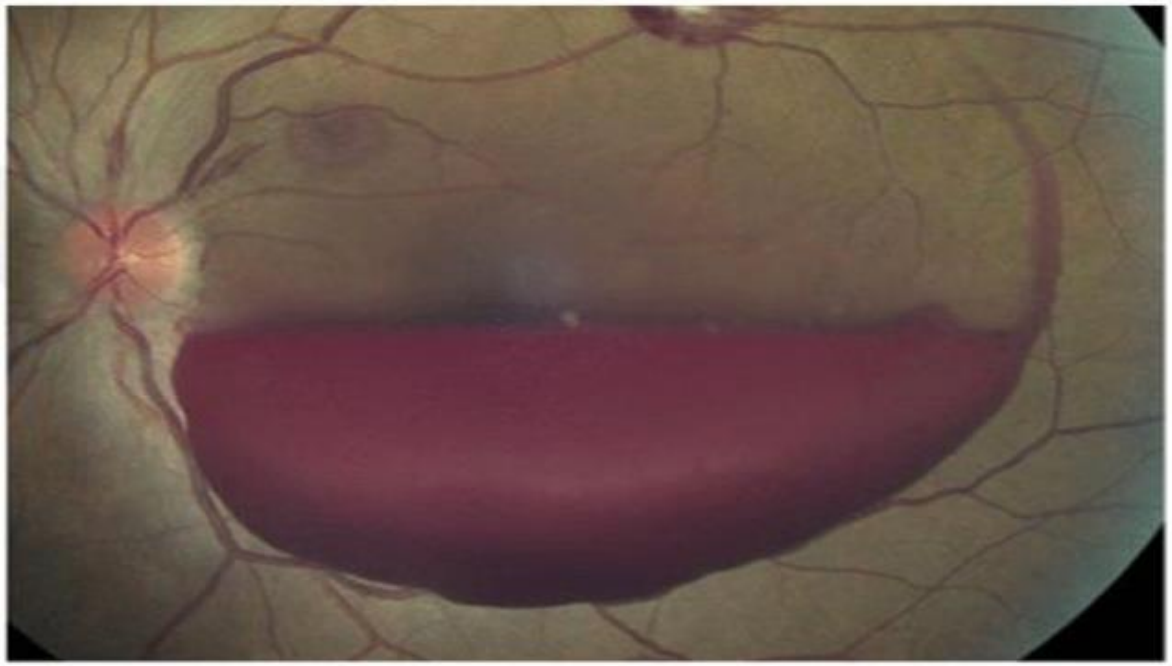
- Headache.
- Weight loss, anorexia, fever, sweats.
- Pain on speaking and chewing.
- Polymyalgia.

- Investigations of carotid disease:
- Physical examination
- Doppler flow analysis.
- Magnetic resonance imaging MRI
- Angiography

- Treatment of carotid disease:
- Medical
- Surgical

➢Terson’s syndrome

- pole hemorrhages occurring as a consequence of subarachnoid or intracranial hemorrhage.



Terson’s syndrome showing a subretinal hemorrhage after an acute intracranial hemorrhage

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Eye Problems in Systemic Disorders

Diabetic eye disease and complications, pathophysiology

Lecture :3

•Diabetes is a serious, long-term condition with a major impact on the lives and well-being of individuals, families, and societies worldwide.
•The global diabetes prevalence in 2019 is estimated to be 9.3% (463 million people), rising to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045.

➢Diabetic eye disease

-Is a term used to describe the common eye complications seen in people with diabetes. It includes:

•Cataracts
•Glaucoma.
•Diabetic retinopathy (including diabetic macular oedema)

-Diabetes is the leading cause of blindness in working-age adults.1 People with type 1 and type 2 diabetes are at risk. It’s possible to be unaware that you have severe diabetic eye disease and suddenly go blind.

➢symptoms of diabetic eye disease

Diabetic eye conditions often have no signs or symptoms, particularly in the early stages. By the time someone with diabetes notices changes in their vision, the condition is quite advanced.

Signs and symptoms may include:

- Blurry, cloudy, or dim vision
- Floaters and flashes
- Poor night vision
- Sensitivity to light and glare
- Double vision, seeing halos around lights
- Trouble reading
- Frequent changes in spectacle and contact lens prescriptions
- Eye pain
- Headaches, nausea, vomiting.

➢Diabetic Eye Disease Anterior Segment.

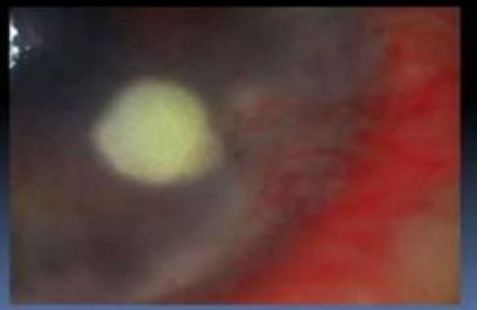
• Manifest refractive changes
- 1.5x more likely to be myopic
- Investigate adult-onset myopia
• Cataract formation
- More commonly, cortical cataract
• Glaucoma
• IIIrd and VIth cranial nerve palsies
- Resolve in 2-6 months
- No pupil involvement
• Recurrent corneal epithelial erosions and reduced corneal sensitivity
• Blepharitis, styes, and chalazion
• Rubeosis Iridis
- Sign of advanced diabetic eye disease
- Growth starts at the pupil margin
- Leads to acute ACG

Diabetic eye disease **Lids**

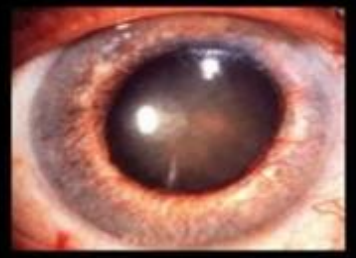
Recurrent styes, xanthalesma & blepharitis

Diabetic eye disease **Conjunctiva & Cornea**

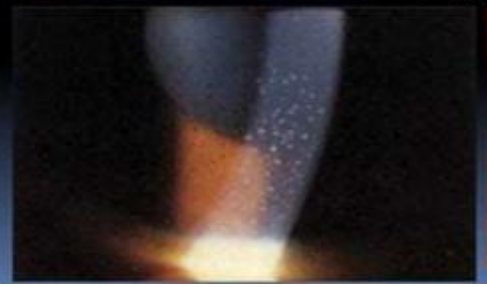
Conjunctivitis & Keratitis



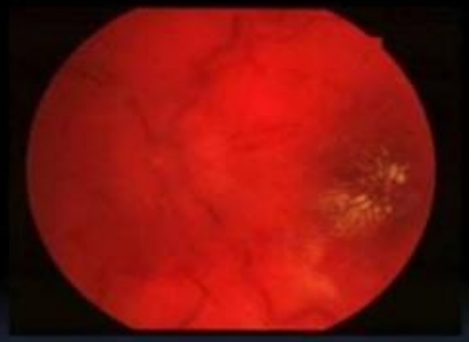
Diabetic eye disease **Iris**



- Rubeosis iridis (complication of PDR)
- Spontaneous Hyphema
- Bleeding also occurs during cataract surgery & iridectomy
- Diabetic iritis
- Pupillary dysfunction



Diabetic eye disease **Optic nerve**



- Retrobulbar neuritis
- Acute papillitis

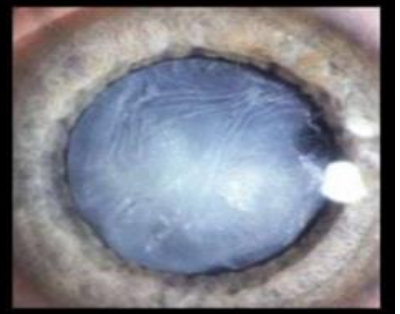
Diabetic eye disease Vitreous

Hemorrhage

Diabetic eye disease Retina

- Diabetic retinopathy
- Lipemia retinalis due to high blood level in uncontrolled cases. Fundus appears pale &retinal vessels are milky

Diabetic eye disease Lens



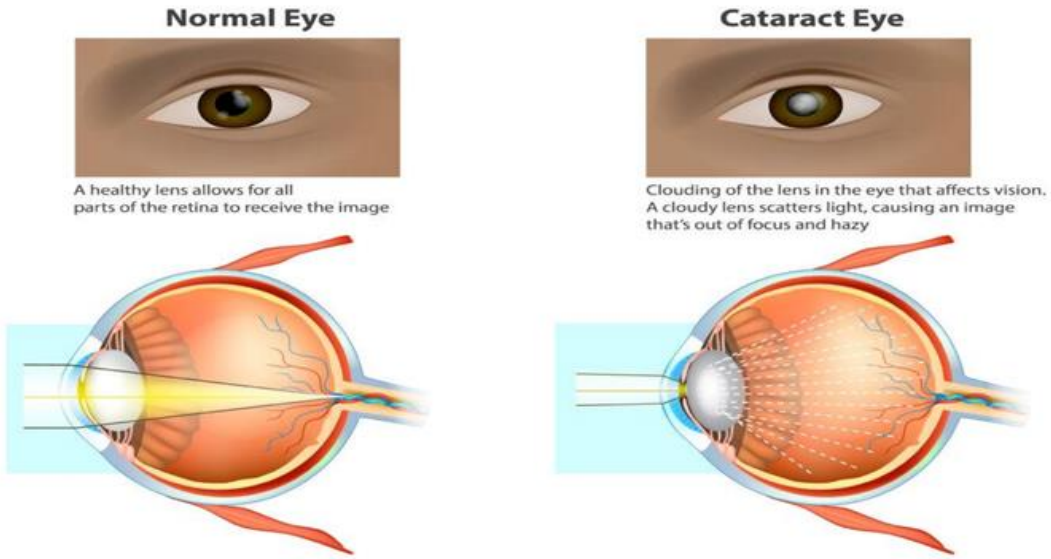
- True diabetic cataract below 30 years
- Pre-senile cataract above 40 years
- Hyperglycemia = index myopia
- Hypoglycemia = index hypermetropia

Diabetic eye disease 6th nerve

Paralytic squint

➢Cataracts

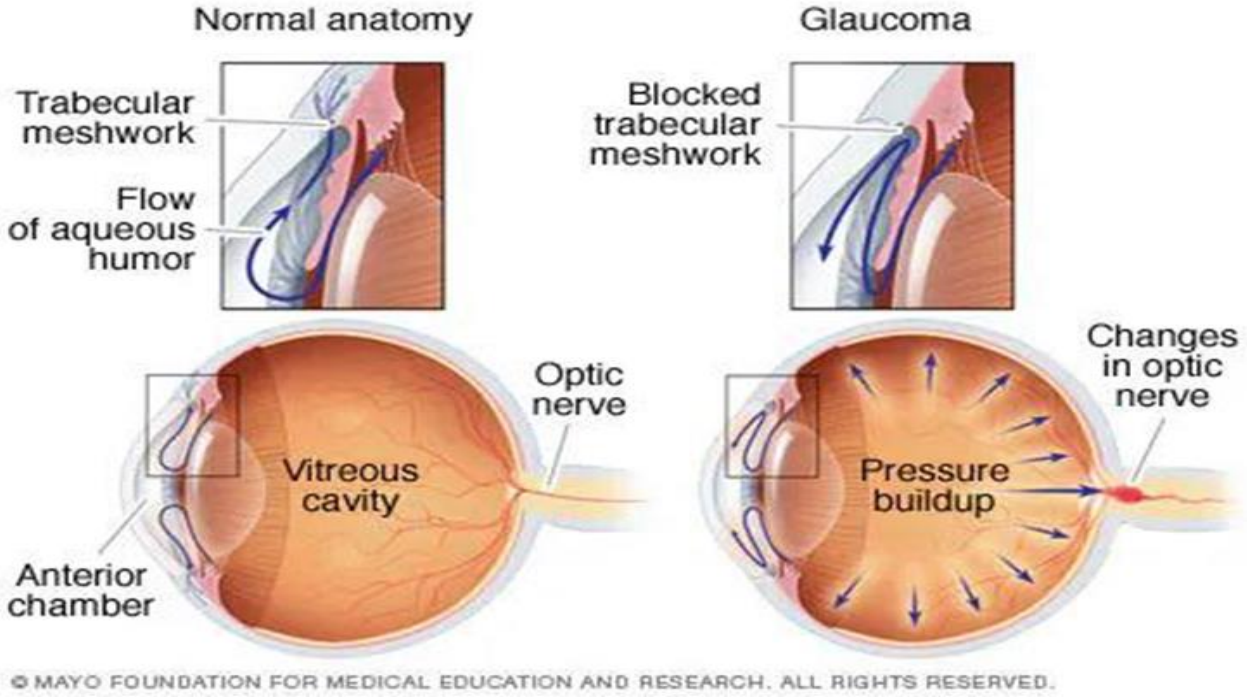
A cataract causes the lens in your eye to become cloudy. Most cataracts are associated with normal changes in your eyes as your age. They are caused by the breakdown of proteins in the lens of your eye. You may experience cloudy or blurry vision, faded colors, halos around lights, difficulty seeing at night, or double vision. Cataracts are more common and occur earlier in people with diabetes.



➢Glaucoma

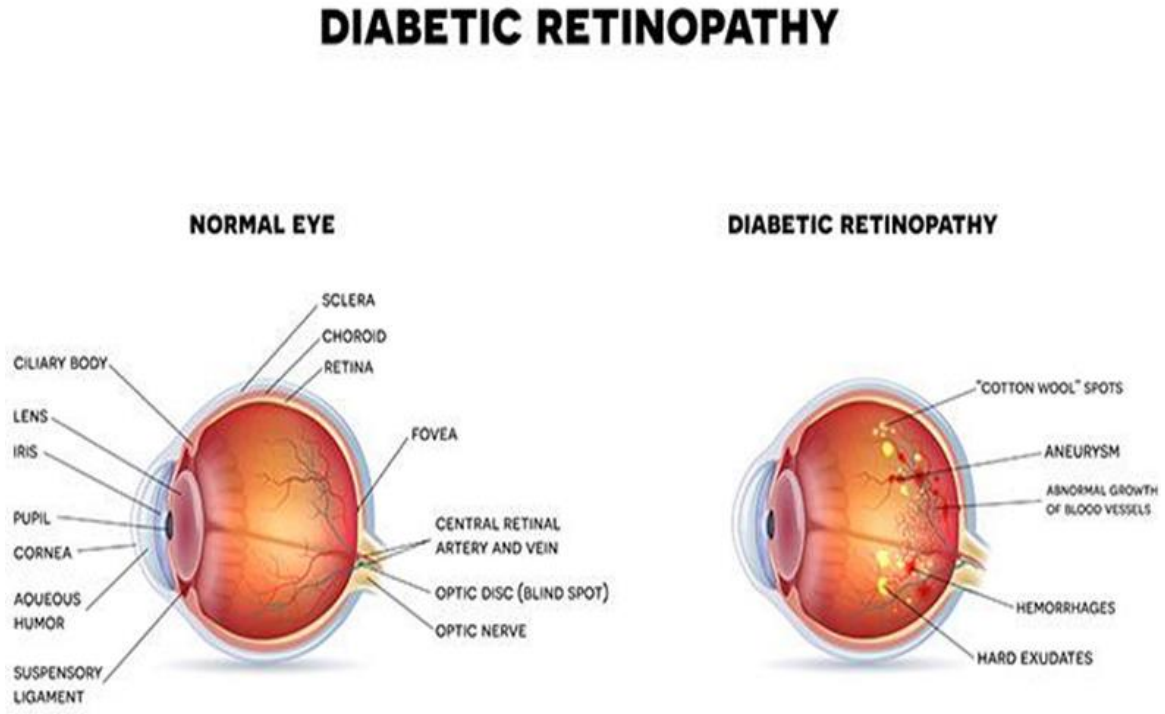
- People living with diabetes are at higher risk of developing glaucoma. Glaucoma occurs when pressure builds up in the eye. This pressure pinches the blood vessels to the retina and optic nerve, damaging both and resulting in vision loss.

- Experience (headaches, eye pain, watery or red eyes, halos or blurred vision).



➢Diabetic retinopathy (Diabetic Macular Edema)

- Diabetic Macular Edema occurs when the tiny blood vessels in the retina leak fluid into the macula, which is where focusing occurs. As the macula swells with fluid, vision blurs and colors may appear washed out.



- Diabetic retinopathy is a complication of diabetes and a leading cause of blindness. It occurs when diabetes damages the tiny blood vessels inside the retina, the light-sensitive tissue at the back of the eye.
- It is the "disease of the retina" caused by microangiopathy due to the long-term effect of diabetes, leading to progressive damage of the retina & blindness.
- Most common cause of severe bilateral visual loss in the working age group.

➢ There are three main types:

1)non-proliferative diabetic retinopathy

This is the early stage of the disease in which capillary damage results in blood and fluid leaking into the retina, causing it to swell. Depending on the number of vessels affected, there is usually minimal or no effect on vision.

2)diabetic macular oedema

Diabetic macular oedema occurs if swelling extends to the macula, which is the part of the retina responsible for central vision. Diabetic macular oedema (swelling) is the usual cause of vision loss related to diabetes and the level of impairment can be significant.

3)proliferative diabetic retinopathy

Proliferative diabetic retinopathy is the advanced stage of the disease. In an attempt to supply the retina with more oxygenated blood, abnormal blood vessels start to grow, but these are fragile and bleed easily. This can lead to the formation of scar tissue. If these new vessels bleed, the person may see ‘floaters’ or even lose all vision. This requires emergency treatment.

Diabetic eye complications

- Complications of diabetes mellitus (DM) are progressive and almost resulting by chronic exposure to high blood levels of glucose caused by impairments in insulin metabolism and biological macromolecules such as carbohydrates, lipids, proteins and nucleic acid.

Common ocular complications

1- Glaucoma

2-Cataracts

3-Retinopathy

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Lecture 4: Eye Problems in Systemic Disorders

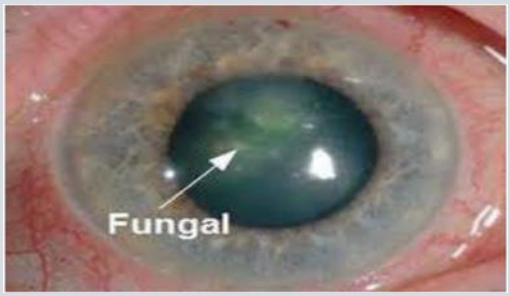
Infection

Eye Manifestations of Systemic Infection

Infection is a harm caused by microorganisms, which are often referred to a ‘germs’ (microbes).

- micro-organisms cause infection:

- Bacterial (fig.2), fungal (fig.1), viral (fig.3) and parasitic pathogens all cause systemic infection and can spread to the eye.



(fig.1) fungal keratitis keratitis

(fig.2) Bacterial

(fig.3) herpes zoster viruses

(fig.4)herpes

➢Eye Manifestations of Systemic Infection

Eye symptoms might indicate the outcome of an underlying infection,

Such as development of retinal ischemia in severe malaria, this is associated with a poor prognosis.

➢Eye Manifestations of Systemic Infection

Ocular presentation can be associated with a number of chronic infections including:

-Tuberculosis - Cat scratch disease

-Syphilis – Leprosy

- Toxoplasmosis - Chlamydial infection-

-AIDS

➢Tuberculosis :(TB)

Tuberculosis is a chronic infection caused by bacteria.

Tuberculosis is primarily involves the lung. Tuberculosis may affect any part of the eye (intraocular, superficial, or surrounding the eye), by hematogenous spread from a distant site or direct invasion by contiguous spread from adjacent structures, like the sinus or cranial cavity.

Ocular Tuberculosis: (TB)

• Posterior uveitis is the most common presentation of intraocular (TB).

• The conjunctiva, cornea, and sclera are sites of primary ocular involvement.

• Drug related ocular toxicity.

- Diagnosis:

Systemic findings consistent with (TB) infection Positive interferon gamma release assay Positive tuberculin skin test in asymptomatic

Individuals.

Toxoplasmosis:

- Toxoplasmosis is a major cause of ocular morbidity and poor vision after congenital or acquired infection.

-Is the most common cause of infectious retinochoroiditis and uveitis

-Typical symptoms of active disease are floaters and blurred vision.

-The causative organism, parasite.

-Cats are the definitive host.

-Exposure to environments where the infectious organism is found.

- uncooked and infected meat contaminated vegetables or water.

Toxoplasmosis:

Toxoplasmosis occurs during primary infection in pregnant women. In the first trimester, the fetal infection up to15–20%, in the second up to 25%, and in the third up to 65–70% . The most compromised fetuses are those who are infected earlier.

Acquired Immune deficiency Syndrome (AIDS):

Cause: human immunodeficiency virus (HIV)

Transmission occurs by:

- sexual contact
- exposure to infected blood
- from an infected mother to fetus

Diagnosis: is made by detection of virusspecific antibodies.

Acquired Immuno deficiency Syndrome (AIDS)

Dry eyes are very common in patients with AIDS, retinal cotton-wool spots) fig 5), cytomegalovirus retinitis, and Kaposi's sarcoma of the eyelid or conjunctiva. (Fig 4)

Cat scratch disease :(bacteria)

- Low-grade fever
- Enlarged, tender lymph nodes
- A papule at the site of the scratch
- Eye infections

Ocular manifestations:

-Neuroretinitis

-uveitis,

-retinitis

-retinal detachment

Leprosy:

Is a chronic inflammatory disease caused by bacteria. Affects the skin,

peripheral nerves and eyes.

Up to 75% of individuals with leprosy have ocular involvement

Ocular manifestations

madarosis, lagophthalmos (fig.6,(keratitis, corneal ulceration, scleritis, conjunctival and scleral lepromas, uveitis, and detachment.

(fig.6) Lagophthalmos

Fungal infections of the eye

may lead to severe inflammation, their presence suggests immune deficiency or intravenous drug use.

Chlamydia trachomatis infection:

-is a common sexually transmitted disease (STD)

-conjunctivitis in infants and adult.

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Meningitis , Syphilis, Encephalitis

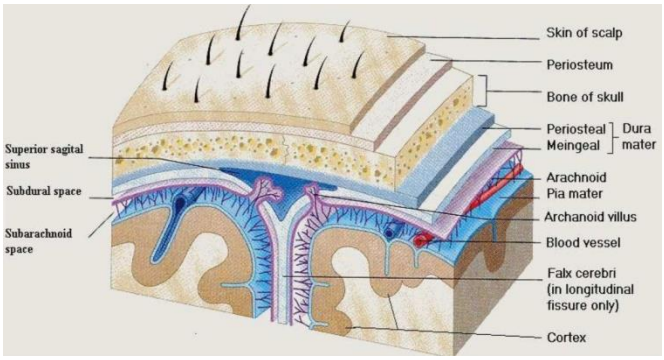
L5

Meningitis

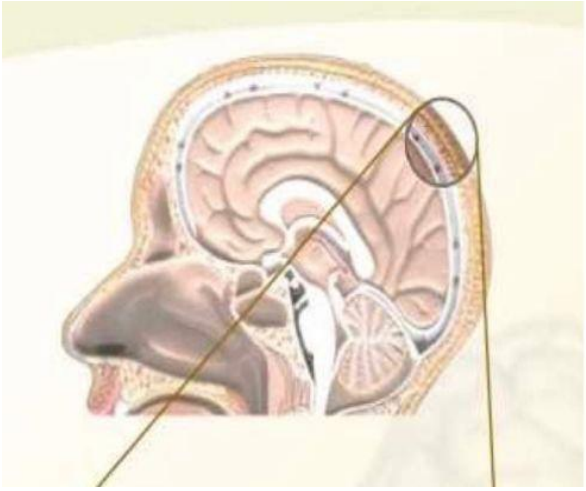
Meninges

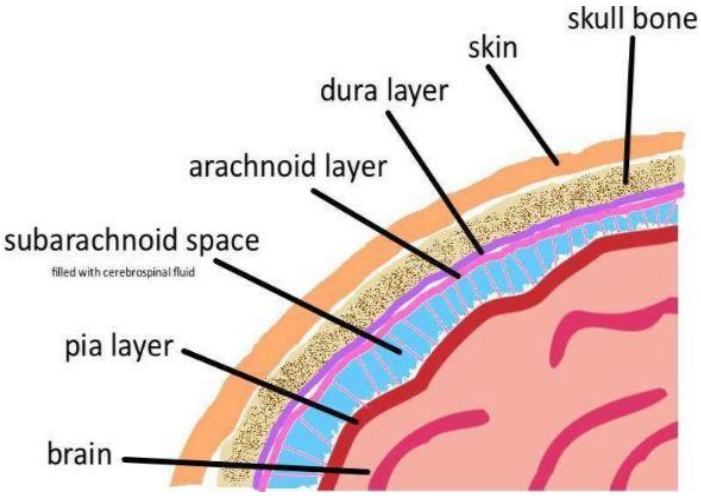
The meninges are the system of membranes which envelops the central nervous system. It has 3 layers:

1. Dura mater
2. Arachnoid mater
3. Pia mater



Subarachnoid space: is the space which exists between the arachnoid and the pia mater, which is filled with cerebrospinal fluid.





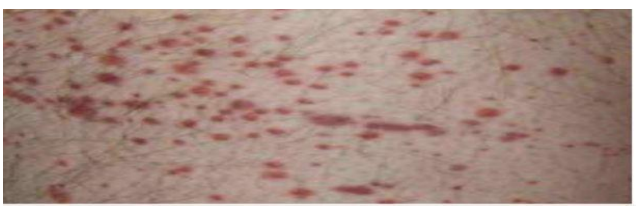
Definition of Meningitis:

Meningitis is an acute infection or inflammation of the meninges of the central nervous system.

- Meningitis can occur at all ages, but it is commonest in infancy.
- 95% of the cases take place between 1 month 5 years of age .
- It is more common in males than females

- **Etiology:** Bacterial, Viral, Fungal, Parasite and Non-infectious (Cancer, Trauma to head or spine)
- **CLINICAL SYMPTOMS:**

- Fever, headache, neck stiffness photophobia, skin rashes.



• Signs & Symptoms of meningitis in Neonates/infants

- Neck stiffness, Jaundice, Abnormal temperature (hypo/hyperthermia)
- Poor feeding /weak sucking, a high-pitched cry, bulging fontanelles, seizures, vomiting.

• Eye symptoms :

- Photophobia
- Venous congestion of ocular fundi
- Unequal pupils, Pupil dilation
- Sluggish reaction to light

- **Diagnoses:**
- **History taking**
- **Physical assessment**
- **MRI Or CT**
- **Blood culture and sensitivity**
- **Lumbar puncture** best initial test and most accurate?

- **When Is a Head CT the Best Initial Test?**

Papilledema, Seizures, Focal neurological abnormalities, Confusion

- **Papilledema**

Fundal photograph showing severe papilledema.

Treatment:

1. Fluid.
2. Oxygenation.
3. Monitoring of cardiovascular function
4. Monitoring intracranial pressure, mannitol to reduce cerebral edema.
5. Antibiotics

- **Prevention**

• There are vaccines that protect against some forms of meningitis

SYPHILIS

SYPHILIS is a contagious bacterial infection; caused by spirochetal bacterium (Treponema Pallidum) is almost always transmitted through sexual contact or congenitally through the placenta to a fetus or at birth from an infected mother.

CLASSIFICATION OF SYPHILIS

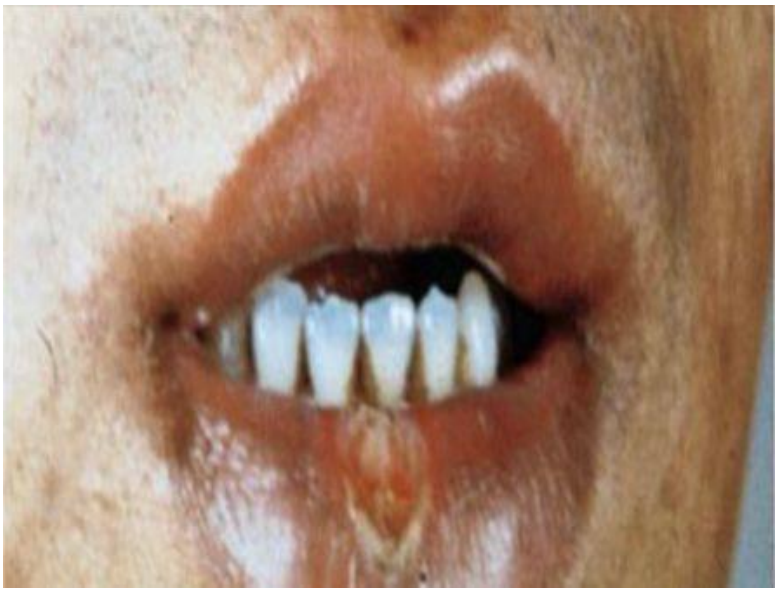
1- Acquired syphilis

- Primary Syphilis
- Secondary Syphilis
- Tertiary Syphilis

2- Congenital Syphilis

- PRIMARY SYPHILIS

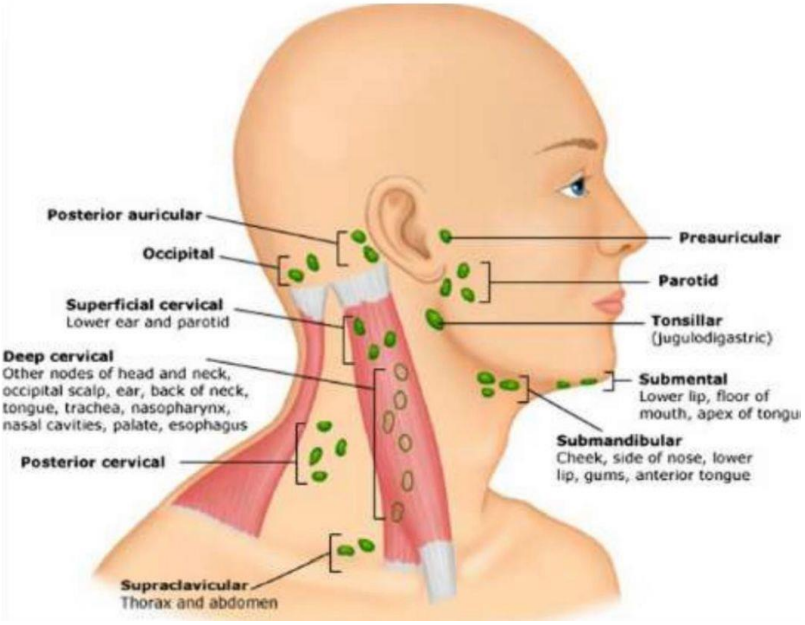
  Symptoms not all people show visible signs of the disease at the beginning Primary Stage



It’s the first stage after infection painless & localized ulcer single or multiple. Appear 2-3 weeks after contact. Most common site is cervix, anogenital and mouth. Lymph nodes become enlarged.

Without treatment the bacteria is still multiplying

LYMPH NODES BECOME ENLARGED



- **SECONDARY SYPHILIS**

FIGURE . Secondary syphilitic rash on palm and sole.

Starts 2-12 weeks of development of primary syphilis

- fever, malaise , sore throat.
- headache .
- Rash involving entire trunk and the extremities palm and soles.
- 25% of pts have abnormal CSF SECONDARY SYPHILIS rash

- **TERTIARY SYPHILIS**

• There may be an interval of 1 - 20 yrs from acute infection to clinical onset of tertiary SYPHILIS

- **Diagnosis of syphilis**

Hard to diagnose

• Primary stage - physical examination, symptoms, fluid from chancre taken and examined

• Secondary stage - blood tests

• Tertiary stage - spinal tap may be required in case of neurosyphilis

- **Diagnosis of syphilis**
- **direct antigen detection tests** ,as gold standards for test evaluation
- **VDRL**(veneral disease research laboratory test)
- **TREPONEMAL TESTS FTA-ABS: confirmatory** tests.

OCULAR MANIFESTATIONS

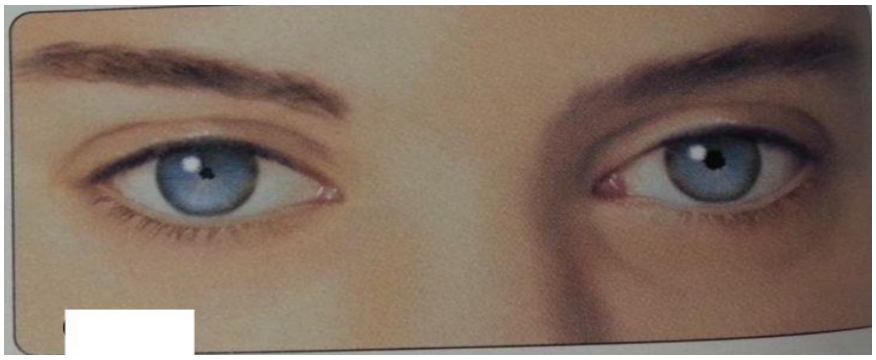
Ocular involvement in primary syphilis is rare and mainly limited to chancres of the eyelids and the conjunctiva due to direct inoculation from contaminated fingers or secretions.

Ocular manifestations occur in about 2% of all patients with syphilis at any stage of the disease. Every part of the eye can be involved.

OCULAR MANIFESTATIONS

- Common: madarosis(loss of eyelashes) and keratitis.

- Uncommon: uveitis and retinitis.
- Rare: optic neuritis, Argyll Roberston pupils and ocular motor nerve palsies.



Argyll Robertson pupil

Have four characteristic findings:

(1) Bilateral involvement.

(2) Small pupils that fail to dilate fully in dim light.

(3) No light reaction.

(4) Brisk constriction to near vision and brisk reaction to far vision

OCULAR SYPHILIS TREATMENT

- Recommended regimen:
- Penicillin G 18-24 mu IV daily administered as 3-4 million units IV q 4 hr for 10 -14 days
- Alternative regimen:
- Procaine Penicillin G 2.4 mu IM daily plus Probenecid 500 mg PO q d, both for 10-14 days
- **CONGENITAL SYPHILIS**

Infection of the fetus can occur translucently

- **features include:**
  - Failure to thrive, rash, mucosal ulcers, fissures around the lips, deafness, and saddle-shaped nasal deformity.

  - Most common ocular manifestation of congenital syphilis is bilateral keratitis, retinitis and secondary glaucoma.

TREATMENT OF SYPHILIS

- Primary and secondary syphilis: single intramuscular injection of penicillin, Oral doxycycline if penicillin allergic.
- Tertiary syphilis: intravenous penicillin.
- HIV serology is recommended for all patients with syphilis

Encephalitis

Encephalitis

Is an inflammation of the brain that is caused especially by infection with a virus (such as herpes simplex or West Nile virus) or less commonly by bacterial or fungal infection or autoimmune reaction.

- Can be acute or chronic .

Types:

- **Primary encephalitis-** It occurs when a virus directly infects the brain and spinal cord.
- **Secondary encephalitis-** It occurs when an infection starts elsewhere in the body and then travels to the brain.

Cause:

- Often unknown, but the most cause common is a viral infection. The viruses that can cause encephalitis: Herpes simplex virus (HSV).
- **Type 1** associated with cold sores and fever blisters around your mouth.
- **Type 2** associated with genital herpes.

- Type 1is rare but can result in significant brain damage or death.

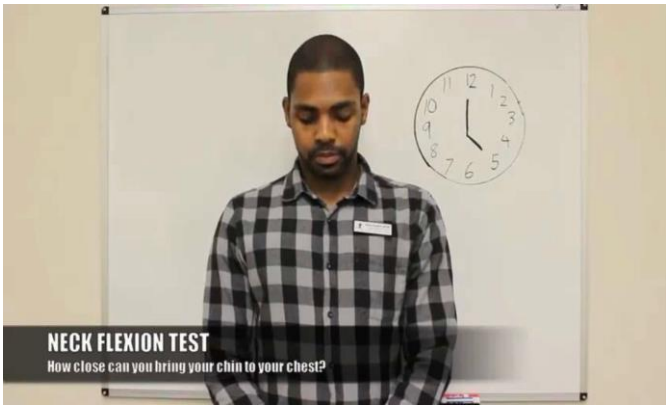
- Other herpes viruses. These include the Epstein- Barr virus, which commonly causes infectious mononucleosis, and the varicellazoster virus, which commonly causes chickenpox and shingles.
- **Risk Factors:**

➢ **Age:** Some types of encephalitis are more common or more severe in certain age groups. In general, children and older adults are at greater risk of viral encephalitis.

➢ **Weak immune system:** AIDS, take immune-suppressing drugs , condition causing a weakened immune system

Features: COMMON

- Severe headache.
- Coma.
- Stiff neck
- Mental changes behavior, and personality changes.
- Fever



- **Other features**

- Irritability, Weakness, Seizures.
- Nystagmus.
- Photosensitivity.
- Swollen or protruding eyes.
- Visual field defects.
- Decreased extraocular movements.
- Nausea and/or vomiting.
- Dysphagia

- **Diagnostic**

- History
- Physical Examination
- Diagnostic Tests.
    - CBC.

- Polymerase chain reaction (PCR) tests for viruses.
- Lumbar puncture (Culture).
- Electroencephalogram (EEG).
- CT scan.
- Magnetic resonance imaging (MRI) Diagnosis.

- **Treatment**

- Acyclovir is the best initial therapy for herpes encephalitis.

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Hypertension

L6

It is one of the most common diseases ,sustained elevation of blood pressure.

- Systolic blood pressure(SBP) ≥ 140 mm Hg
- Diastolic blood pressure (DBP) ≥ 90 mm Hg
- Normal: SBP <120, DBP <80 mm/hg.
- BP is the force of blood against the artery wall.
- BP is regulated by the renal ,hormonal, vascular & neurologic systems.

Classification

Classification (JNC7)	Systolic pressure mmHg	Diastolic pressure mmHg
Normal	90–119	60–79
High normal or prehypertension	120–139	80–89
Stage 1 hypertension	140–159	90–99
Stage 2 hypertension	≥160	≥100
Isolated systolic hypertension	≥140	<90

Etiology

❖ **Primary** (Essential) HTN-Elevated BP with unknown cause-90% to 95% of all cases, Idiopathic

❖ **Secondary** HTN Its due to:

- Endocrine ,Neurogenic , Kidney disease and Adrenal gland tumors
- Increased salt intake
- Tobacco and Alcohol
- Stress , Certain medications
- Obesity (BMI >30)

SIGNS & SYMPTOMS

- Usually asymptomatic (that’s why it's called silent killer)

❖ Patient can have following symptoms:

- Breathlessness, Headache
- Bleeding from nose, Fatigue & sleepiness
- Profuse sweating
- Blurred vision
- Dizziness , Palpitations, Dyspnea

Hypertension Diagnosis

• Diagnosis requires several elevated readings over several weeks (unless >180/110)

•BP measurement in both arms

- Use arm with higher reading for subsequent measurements

•Ambulatory BP Monitoring

- For “white coat” phenomenon ,hypotensive or hypertensive episodes ,apparent drug resistance

COMPLICATIONS

- Heart
- Brain
- Kidney
- Eyes: Loss or reduced vision

CONTROL HTN

Highlight Treatment

- SBP <130 and <80 mm Hg
  - Don’t treat
- SBP ≥130-140 or DBP ≥80-90 mm Hg
  - Treat if any of the following:
- History of CVD, DM, or CKD
- Age ≥65 years and SBP ≥130

- SBP ≥140 or DBP ≥ 90, mm Hg
  - Treat all

Treatment Goals

- Goal is to reduce overall cardiovascular risk factors and control BP by the least intrusive means possible
- BP < 140/90
- In patients with diabetes or renal disease, goal is < 130/80