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World Glaucoma Week

DON'T CUT CORNERS WITH GLAUCOMA

GET YOUR EYES CHECKED REGULARLY!

#DefeatGlaucoma

What is Glaucoma?

Glaucoma is a **progressive eye disease** that damages the **optic nerve**, which is responsible for transmitting visual signals from the eye to the brain. This damage is primarily caused by **elevated intraocular pressure (IOP)** due to improper fluid drainage from the eye. If left untreated, glaucoma leads to **irreversible vision loss**.

How does Glaucoma develop?

AQUEOUS HUMOR PRODUCTION AND DRAINAGE

- The eye continuously produces a fluid called **aqueous humor**, which maintains eye pressure and nourishes internal structures.
- This fluid drains through the **trabecular meshwork** in the **anterior chamber angle** of the eye.
- In glaucoma, this drainage is **impaired**, causing a build-up of fluid and **increased intraocular pressure (IOP)**.

O IC NERVE DAMAGE

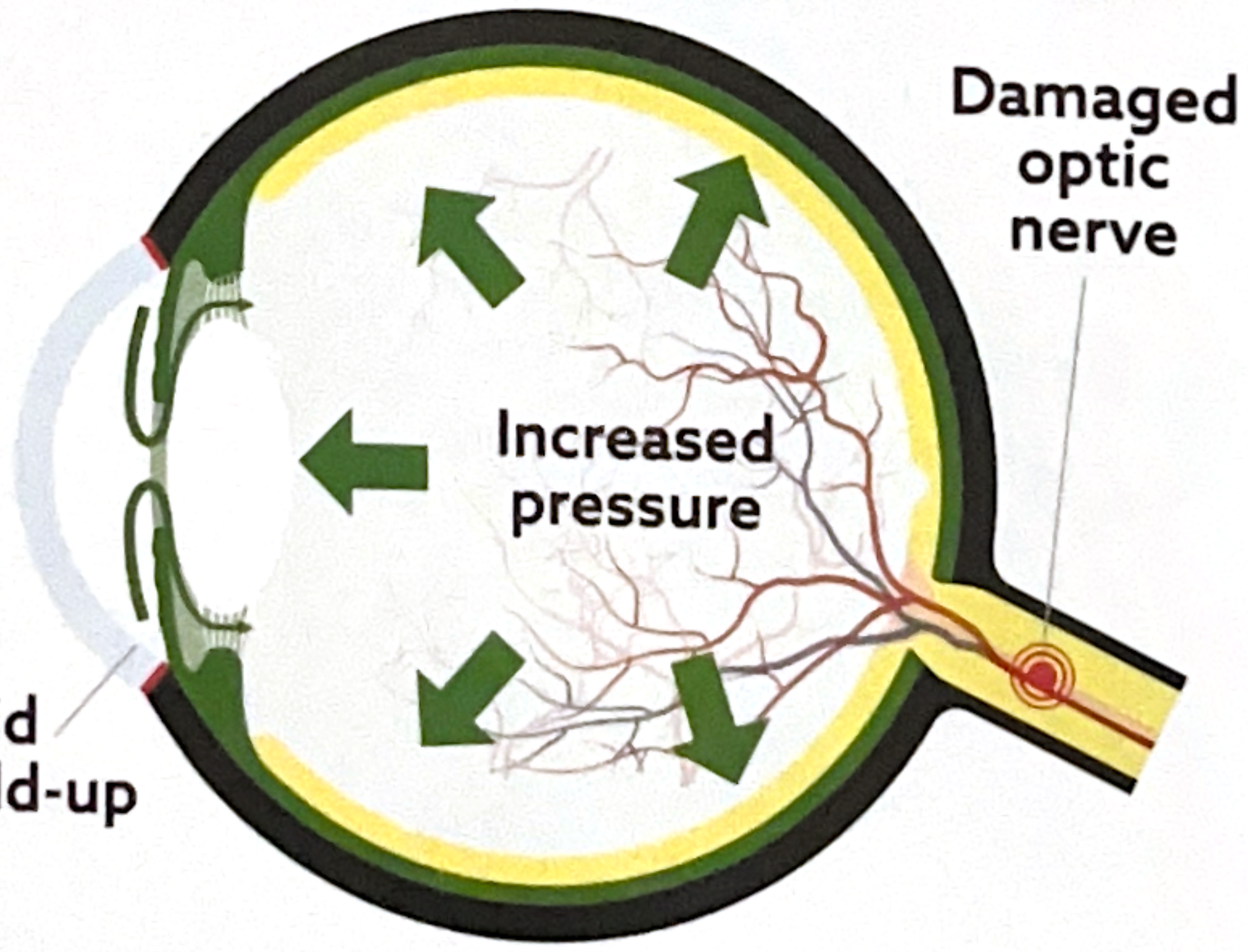
- vated IOP compresses the **optic nerve fibres**, ading to **progressive nerve fibres loss**.
- his results in **peripheral vision loss**, which often goes unnoticed in early stages.

Over time, if untreated, it leads to **tunnel vision** and eventually **blindness**.

Dietze J, Blair K, Havens SJ. Glaucoma [Internet]. PubMed. Treasure Island (FL): StatPearls Publishing; 2024. Available from: https://www.ncbi.nlm.nih.gov/books/NBK538217/

WHAT HAPPENS IN GLAUCOMA?

Just like an overinflated tire, high pressure in eyes damages the optic nerve



Eye Pressure (Ocular Hypertension) - NYC Eye Doctor - Ophthalmologist [Internet]. Manhattan Eye Doctors & Best Rated Specialists in NYC. Available from: https://www.eyedoctorophthalmologistnyc.com/treatment/eye-pressure-ocular-hypertension/

INTRAOCULAR PRESSURE (IOP) – THE EYE'S INTERNAL PRESSURE

What is IOP?

- Your eye constantly makes aqueous humor. As new aqueous flows into your eye, the same amount should drain out. The fluid drains out through an area called the drainage angle. This process keeps pressure in the eye (IOP) stable.

GLAUCOMA RISK

- IOP **above 21 mmHg** increases the risk of optic nerve damage.
- In some cases, **normal IOP** can still cause nerve damage **(Normal-Tension Glaucoma - NTG).**[1]

HOW DOES ELEVATED IOP CAUSE GLAUCOMA?

- If the drainage angle is blocked, fluid cannot flow out of the eye and builds up. As a result, pressure inside the eye rises, damaging the optic nerve.[2]

References 1. Gosling D, Meyer JJ. Normal Tension Glaucoma [Internet]. PubMed. Treasure Island (FL): StatPearls Publishing; 2022. Available from: https://www.ncbi.nlm.nih.gov/books/NBK576377/
2. Boyd K. What is glaucoma? [Internet]. American Academy of Ophthalmology. 2023. Available from: https://www.aao.org/eye-health/diseases/what-is-glaucoma.

PERIPHERAL VISION LOSS

The vision loss is slow and gradual, so you don't notice until it's too late

PERIPHERAL VISION LOSS - THE BRAIN'S WRONG SIGNAL TRICK

HOW GLAUCOMA AFFECTS VISION

- In glaucoma, high eye pressure damages nerve cells in the retina and optic nerve. This damage usually starts in your peripheral vision—the edges of your visual field—before moving toward the centre.

WHY IT GOES UNNOTICED

- Your brain merges input from both eyes to form a complete image. When glaucoma causes gaps in peripheral vision, the brain fills them with surrounding information, so you don't realize what's missing.
- If both eyes are affected in the same area, the brain continues to fill in information around the gap, without you knowing the gap is there. That's why glaucoma is symptomless.

DIAGNOSIS

- **Visual Field Testing (Perimetry)** detects blind spots early.

WHY IT MATTERS

- Since the brain fills in **missing peripheral vision,** patients may not notice glaucoma until it's too late.

https://glaucoma.uk/wp-content/uploads/2020/10/GlaucomaUK_Insight_Autumn2020_Digital.pdf

THIN CORNEA: A WEAK PROTECTIVE SHIELD

A thin cornea makes it harder to detect glaucoma early

THIN CORNEA – THE HIDDEN RISK FACTOR

WHAT IT IS

- The **cornea** is the clear front layer of the eye that helps focus light.

GLAUCOMA RISK

Thin corneas (<555 µm):

- **Underestimate IOP readings** (risk of misdiagnosis).
- **Higher risk of nerve damage** even at normal IOP levels.

Thicker corneas (>600 µm):

- **Overestimate IOP readings**, but offer some protective effect.

MEASUREMENT

- **Pachymetry (Ultrasound or Optical Pachymeter).**

WHY IT MATTERS

- Patients with **thin corneas** need **closer monitoring** for glaucoma even if their IOP appears normal.

https://glaucoma.org/articles/the-importance-of-corneal-thickness

CUP-TO -DISC RATIO

As the cup grows, the optic nerve shrinks, and so does your vision

CUP-TO-DISC RATIO - A MEASURE OF OPTIC NERVE HEALTH

WHAT IS THE OPTIC CUP?

- The optic nerve carries signals from the retina to the brain. It is made up of millions of nerve fibres that pass through the optic disc at the back of the eye. The centre of the optic disc, called the "cup," is normally small compared to the disc.

WHAT IS OPTIC NERVE CUPPING IN GLAUCOMA?

- In glaucoma, increased eye pressure or reduced blood flow causes these nerve fibres to die, making the cup larger in proportion to the disc. This is known as optic nerve cupping, which worsens as more fibres are lost.

MONITORING CUPPING

- Both healthy eyes and eyes with glaucoma can show cupping. However, in glaucoma, the cup-to-disc ratio is usually larger, with a ratio over 0.6 often raising suspicion.

DETECTION

- **Fundoscopy or OCT (Optical Coherence Tomography)** helps track changes.

Optic Nerve Cupping - Glaucoma Research Foundation [Internet]. 2024. Available from: https://glaucoma.org/articles/optic-nerve-cupping

THE FINAL STAGE: BLINDNESS

Without treatment, glaucoma leads to irreversible blindness

FINAL STAGE – TOTAL BLINDNESS IF LEFT UNTREATED

WHAT HAPPENS

- Untreated glaucoma leads to **complete optic nerve damage**
- This results in **permanent blindness**, as **optic nerve cells do not regenerate**

IS IT REVERSIBLE?

- **No.** Vision lost due to glaucoma cannot be restored.

WHY IT MATTERS

- **Glaucoma is the leading cause of irreversible but preventable blindness worldwide.**

PREVENTION

- **Early diagnosis and treatment** (eye drops, laser, surgery) **can slow progression**
- **Regular eye checkups** help detect glaucoma before the vision is lost.

Dietze J, Blair K, Havens SJ. Glaucoma [Internet]. PubMed. Treasure Island (FL): StatPearls Publishing; 2024.
Available from: https://www.ncbi.nlm.nih.gov/books/NBK538217/

RISK FACTORS OF GLAUCOMA

40+ Age
Higher risk with age

Thin Cornea
Harder to detect early

High Eye Pressure (IOP)
Key risk factor

Steroid Use
Long-term medication increases the risk

Diabetes or BP
Affects optic nerve

Ethnicity Risk
For African, Asian, and Hispanic groups

Eye Injury/ Surgery
May block drainage

Family history
Inherited risk

DONT CUT CORNERS WITH GLAUC(O)MA

Coleman AL, Miglior S. Risk factors for glaucoma onset and progression. *Surv Ophthalmol.* 2008;53 Suppl1:S3-10.

MANAGEMENT OF GLAUCOMA

Take Your Medications Regularly

Skipping doses can increase eye pressure

Use Proper Lighting

Avoid glare, especially at night

Exercise Safely

Walking and yoga help, but avoid head-down poses.

Wear UV-Protective Sunglasses

Sun exposure can worsen glaucoma.

Limit Caffeine and Smoking

Both can spike eye pressure.

Stay Hydrated, But in Small Sips

Drinking too much water at once raises IOP.

Maintain a healthy Weight Diet

To lower your risk of high blood pressure, which can contribute to glaucoma-related vision loss.

10 Things To Do Today To Prevent Vision Loss From Glaucoma.
Adapted from https://www.aao.org/eye-health/tips-prevention/easy-steps-to-prevent-vision-loss-from-glaucoma accessed on 21st January 2025

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about glaucoma

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