Glaucoma

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Disclosure

• Nothing to disclose.
• Anatomy and pathophysiology
• Epidemiology
• Screening
• Treatment

Glaucoma: What is it?
• Progressive optic neuropathy
• Characteristic optic nerve changes
• Characteristic visual field changes
• Elevated intraocular pressure is one (the most important?) risk factor.
How is eye pressure controlled?

Normal Trabecular Meshwork

Author: Tun Soe/Neomedix Corporation
Glaucoma: What is it?

- Progressive optic neuropathy
- Characteristic optic nerve changes
- Characteristic visual field changes
- Elevated intraocular pressure is one (the most important?) risk factor.
What is a narrow angle?

FAQ

• I have glaucoma, can I use this over-the-counter cold medication?

Diphenhydramine = anticholinergic
Pseudophedrine = sympathomimetic
FAQ

- People with narrow angles do not usually know that they are at risk of angle closure.
- Patients with a known diagnosis of glaucoma have had their angles evaluated and should not be at risk.

Glaucoma Risk Factors

- Age
- Race
- Family history
- Intraocular pressure
### Glaucoma Risk Factors

- **Intraocular pressure: Baltimore Eye Survey**
  - IOP 16-18: RR 2.0 (2 x the baseline risk)
  - IOP 19-21: RR 2.6
  - IOP 22-24: RR 12.8
  - IOP 25-29: RR 12.8
  - IOP 30-34: RR 39.0
  - IOP ≥ 35: RR 40.1

### What about low pressure glaucoma?

- Approximately 50% of individuals developing glaucoma never have a statistically “high” eye pressure.
Are there other contributing factors?

- Optic nerve head blood flow
- CSF pressure
- Neurodegenerative predisposition
- Abnormal connective tissue support
• Glaucoma and elevated eye pressure are linked but not the same.

• Anatomy and pathophysiology
• Epidemiology
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## How big of a problem is it?

- Prevalence estimates average 3.5% in North America, similar worldwide.
- Total number with disease (age 40-80) in North America is approximately 3.4 million.
- Some estimates indicate that up to half of cases are undiagnosed.


## How common is blindness?

- Visual field less than 20 degrees
- Visual acuity less than 20/200
- Prevalence estimates range from 8% to 27% in patients with glaucoma
What are other complications?

- Decreased quality of life
- Increased incidence of falls
- Loss of driving ability
- Decreased reading speed
- Impaired sleep

- Anatomy and pathophysiology
- Epidemiology
- Screening
- Treatment
### Screening

- Most patients are asymptomatic until they have very advanced vision loss

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- General population based screening is not felt to be cost effective at this time
  - Intraocular pressure is only one risk factor
  - Generally slow progression
  - Visual field loss can be hard to detect and becomes manifest relatively late in the disease
Screen based on risk factors.

- Age greater than 50
- African American race
- First degree relative with glaucoma
• Anatomy and pathophysiology
• Epidemiology
• Screening
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### Glaucoma Risk Factors

- Age
- Race
- Family history
- Intraocular pressure

- Eye pressure lowering therapy is proven to slow the progression of glaucoma
Medical therapy

- Inexpensive*
- Can be stopped
- Effective
- It is an eye drop
- Requires patient dexterity and compliance
- Variable local and systemic absorption

- Prostaglandins
  › Latanoprost
  › Travoprost
  › Bimatoprost
  › Tafluprost
- Enhanced uveoscleral outflow

Blausen.com staff. "Blausen gallery 2014", Wikiversity Journal of Medicine. DOI:10.15347/wjm/2014.010. ISSN 20018762. CC BY 3.0
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<th>Beta-blockers</th>
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<p>| Contraindications | Pulmonary conditions \ Heart block \ Systemic beta blocker use |</p>
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<th>Alpha agonists</th>
<th>Brimonidine</th>
<th>Iopidine</th>
<th>Decrease aqueous production</th>
<th>Increase outflow?</th>
<th>Neuroprotection?</th>
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<tr>
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<td>Dorzolamide</td>
<td>Brinzolamide</td>
<td>Acetazolamide (oral)</td>
<td>Methazolamide (oral)</td>
<td>Decrease aqueous production</td>
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• Contraindications
  › Sulfa cross-reactivity

FAQ

• What is marijuana’s effect on glaucoma?
FAQ

- Marijuana lowers eye pressure
- The effect is very short-lived, making it an ineffective medical treatment for most patients.

Laser Trabeculoplasty
Laser Trabeculoplasty

- About 25-30% lowering
- Equivalent to a single medical agent

Trabeculectomy

Image courtesy of National Eye Institute, National Institutes of Health
Conclusions

• Glaucoma is a common cause of blindness
• Therapy is aimed at reducing eye pressure
• Screening should be done on patients at risk
  › Older than 50 years of age
  › African American
  › Family history of glaucoma