

# Screening for Glaucoma

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**G**laucoma is a chronic progressive degeneration of the optic nerve that may cause irreversible visual field damage and ultimately blindness. Open-angle glaucoma is the most common type of the disease and a leading cause of blindness, affecting more than 60 million people worldwide [1].

The main diagnostic tools for characterizing a glaucoma patient typically include optic nerve evaluation, and detection of visual field loss and elevated intraocular pressure. Modern glaucoma management has shown that a substantial proportion of glaucoma patients have normal-to-low intraocular tension; therefore, high IOP is no longer required for glaucoma diagnosis. Managing glaucoma has also shown us that the optic nerve may be damaged in a glaucomatous optic neuropathy pattern much earlier than the appearance of visual field defects [2]. The diagnosis of GON prior to the appearance of visual field defects has been termed pre-perimetric glaucoma. Thus, visual field damage is also not a requirement for a definite glaucoma diagnosis. However, GON has a pathognomonic pattern that enables the diagnosis of glaucoma based solely on optic nerve evaluation.

Glaucomatous damage to the optic nerve is irreversible. End-stage glaucoma has huge quality-of-life implications, and this is where our intervention may prevent deterioration to advanced debilitating

stages. Early treatment has been shown to prevent further nerve fiber loss and atrophy, saving or slowing the optic nerve from ongoing deterioration. Early detection of GON can therefore prevent severe visual loss and blindness. Glaucoma treatment is aimed not only at preventing severe visual impairment but also at maintaining the patient's visual abilities for a better quality of life. Therefore, the prevention of early-stage deterioration may be of great importance.

The literature shows that only about 50% of glaucoma cases are identified, suggesting that about 50% are completely undiagnosed [3]. The main reasons for this include the fact that this disease remains asymptomatic and unnoticed until its advanced stages, when visual disturbances interfere with daily life. Also, there is no single definite test to screen mass populations for glaucoma. Therefore, implementing screening-based programs to detect this disease is not an easy, rapid and efficient undertaking. What's more, the severe cases often seek medical care, while the milder cases remain undiagnosed.

A full eye examination focused on glaucoma includes: best corrected visual acuity, a full slit-lamp and fundus examination, including IOP measurement. Following the results of these tests further examinations include: functional tests: visual field test (the Humphrey Standard Automated Perimetry device in Israel), structural tests, optic nerve imaging (Optic Coherence Tomography imaging device in Israel), and stereo photography of the optic nerve head.

A good glaucoma screening program would involve a process for assessing a population for glaucoma, including those without ocular or visual symptoms and those not at high risk for developing glaucoma. Many health authorities around

the world tried to confront this challenge. In the United States a U.S. Preventive Services Task Force recently systematically reviewed data sources and clinical trials mainly of population-based studies, only to conclude: "Diagnosis of glaucoma is usually made on the basis of several tests that, when combined, evaluate the biologic structure and function of the optic nerve and intraocular pressure" [4]. One of the main "take-home" messages is that because a meaningful proportion of glaucoma patients may have normal pressures in the eye, measuring IOP should not be considered the only or even the main screening test for glaucoma detection. It has to be combined with the other tests for a conclusive diagnosis. Most tests that are available in a primary care setting do not have acceptable accuracy to detect glaucoma. These recommendations are based on cost-effectiveness issues and involve the health authorities [5]. In the meantime, the ophthalmic community, especially glaucoma expert circles, continue to search for improved and efficient screening tools. An alternative to non-efficient screening programs is increasing glaucoma awareness among health care professionals, particularly the primary health care providers, combined with proper education for both medical staff and patients.

In 2008 the World Glaucoma Association launched an international annual "World Glaucoma Day" and recently modified it to the "World Glaucoma Week" with the intention of getting the message across with regard to glaucoma awareness in more than 100 countries across the world, including Israel.

I would like to congratulate Dr. Neshet for collecting the data from the various centers that run the glaucoma week screening program, in Israel, as published in this issue

IOP = intraocular pressure  
GON = glaucomatous optic neuropathy

of IMAJ [6]. This study demonstrates that more than 10% of the screened population had ocular hypertension, pre-perimetric glaucoma, or glaucoma. Not only is this finding important, but this study shows also that the yield of the screening programs increased significantly with age, in cases with diabetes and in those with a family history of glaucoma. The most important conclusion of the long-lasting debate on glaucoma screening was the agreement regarding its objectives and implementation. The major purpose of such programs is not necessarily to diagnose incident new cases, but rather to achieve a comprehensive awareness by the public to seek early and regular checkups with their ophthalmologist. This becomes even more critical when targeting people with risk factors such as a

family history of glaucoma. The American Academy of Ophthalmology adopted the recommendation for a complete eye examination every 5 years, including tests for glaucoma, depending also on age and other risk factors for eye diseases [7]. In conclusion, since early detection of glaucoma prevents irreversible damage and visual disability, physicians should urge their patients to visit their ophthalmic health provider regularly.

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### References

1. Quigley HA, Browman AT. The number of people with glaucoma worldwide in 2010 and 2020. *Br J*

*Ophthalmol* 2006; 90: 262-7.

2. Kerrigan-Baumrind LA, Quigley HA, Pease ME, et al. Number of ganglion cells in glaucoma eyes compared with threshold visual field tests in the same persons. *Invest Ophthalmol Vis Sci* 2000; 41: 741-8.
3. Quigley HA, Vitale S. Models of open-angle glaucoma prevalence and incidence in the United States. *Invest Ophthalmol Vis Sci* 1997; 38: 83-91.
4. U.S. Preventive Services Task Force. Screening for glaucoma. Clinical summary of U.S. Preventive Services Task Force recommendation. 2013; AHRQ Publication No. 10-05182-EF-5.
5. Stoutenbeek R, de Voogd S, Wolfs RCW, et al. The additional yield of a periodic screening program for open-angle glaucoma: a population-based comparison of incident glaucoma cases detected during screening. *Br J Ophthalmol* 2008; 92: 1222-6.
6. Neshner R. Prevalence of intraocular pressure and optic disk cupping: multicenter glaucoma screening in Israel during the 2009 and 2010 World Glaucoma Weeks. *IMAJ* 2014; 16: 483-6.
7. The American Academy of Ophthalmology Recommendations: Glaucoma Screening 2014. Article Link: <http://www.webmed.com/eye-health/tc/glaucoma-screening-topic-overview>.