



To Dilate or Not To Dilate: There Is No Question

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Type 1 diabetic since 1968**

The undeniable standard of care for ocular examination of patients with diabetes includes dilation of the pupils to facilitate optimal examination of the retina and other ocular structures. Current ADA, ophthalmologic and optometric guidelines recommend that all Type 1 patients receive dilated eye examination within 3-5 years after diagnosis and each year thereafter, and that all Type 2 patients be dilated upon diagnosis and each subsequent year. Upon diagnosis of retinopathy in particular, the frequency of subsequent dilated examinations may be greater, depending upon the degree of severity.

Nonetheless, recent CDC analysis demonstrates that as many as 40% of diagnosed diabetics do not receive annual dilated eye exams. A 2000 paper appearing in the *Journal of the American Medical Association*ⁱ suggested that annual dilated examination of many “low risk” diabetics could not be justified based on cost/benefit analysis, and recommended a laxer protocol, a position which the ADA panel of ophthalmic experts has rejected in its most recent position statement.ⁱⁱ Given this backdrop, it is useful to consider some of the key issues surrounding pupillary dilation in general, and for persons with diabetes in particular.

The typical pupil is 3-4mm in diameter in normal room illumination, whereas a dilated pupil is 7-8mm. This difference yields a three to seven times greater area through which to examine the internal eye; this means that the entire retina can be visualized through a dilated pupil with relative ease, while examination of the entire retina is very difficult, at best, through undilated pupils. Perhaps more important is the fact that dilated pupils allow the examiner to obtain three-dimensional, stereoscopic views of the retina and optic nerve, something critical in the detection and management of both diabetic macular edema and glaucoma.

Pupillary dilation of diabetic patients is especially important for detection and appropriate treatment of all diabetic eye disease, save extraocular muscle palsy associated with diabetic cranial neuropathy. The case for detection of retinopathy, retinal vascular occlusive disease and optic nerve disease (both glaucoma and ischemic optic neuropathy) is obvious. For both diabetic keratopathy (corneal disease) and cataract, a dilated pupil provides greater anatomic access (in the case of the crystalline lens and cataract) and an ideal visual background for viewing certain types of cataract and many corneal abnormalities (i.e. the optically “dark” pupil improves the visibility of abnormalities within the transparent ocular media).

Moreover, many patients with diabetes have smaller than average pupils (due to both normal aging and sympathetic pupillary autonomic neuropathy), a factor that makes dilated examination all the more obligatory. It must also be noted that diabetics are no less susceptible to many “non-diabetic” eye diseases than the general population (e.g. age-related macular degeneration and retinal break/detachment), that much eye pathology is age-related, and that a majority of diabetic patients are over the age of 60 years. For all these reasons, routine dilated examination of all patients is indicated, but most especially for those with diabetes.

Patients frequently voice concern about the after-effects of pupillary dilation, which include blurred vision (especially for farsighted persons), light sensitivity, and diminished depth perception.

Instillation of eye drops typically stings (including, paradoxically, topical anesthetics), and some patients are, of course, quite phobic about anything near their eyes. Occasionally, patients experience hypersensitivity and, very rarely, true allergic reactions. Many of these concerns can be allayed with good patient education and preparation, and through good technique coupled with optimal selection of pharmacologic agents.

Dilating drops may be broadly classified as “sympathomimetic” (e.g. phenylephrine, cocaine, and hydroxyamphetamine) or “parasympatholytic” (e.g. tropicamide and atropine). The former drugs stimulate the iris dilator muscles, while the latter block action of the iris sphincter muscle - as well as the ciliary muscle responsible for near focus (accommodation). A common strategy is to employ both for maximal pupillary dilation (for example, tropicamide is frequently administered with phenylephrine). For detection of eye disease, dilation (mydriasis) is required, but not loss of accommodation (cycloplegia).

The duration of action and degree of cycloplegia may be controlled by manipulating drug selection and concentration. I have had particularly good results with a combination agent called *Paramyd* (hydroxyamphetamine, an indirect acting sympathomimetic, in combination with a mere 0.25% short-acting parasympatholytic, tropicamide) in tandem with the commonly used sympathomimetic, 2.5% phenylephrine; this duo results in relatively fast onset, ample dilation of most (but not all) pupils, and minimal cycloplegia. From personal and clinical experience, I have noted that phenylephrine (especially at a 10% concentration) raises blood glucose levels and may precipitate tachycardia, effects that may be minimized by occluding patients’ punctal openings (thereby limiting nasopharyngeal absorption via the tear ducts).

It is incumbent upon eye care providers to warn patients, prior to examination and prior to drop instillation, about the effects of pupillary dilation. Patients should be encouraged to bring dark glasses for photophobia, a driver, or ideally, both. Most visually bothersome effects of routine dilation dissipate within two hours, and patients should be discouraged from driving until they feel safe to do so. A new pharmacologic agent that shortens anticholinergic recovery from topical ocular agents is also available (dipiprazole, trade named *RevEyes*). Provision of disposable dark glasses and thorough patient education emphasizing the highly beneficial risk/benefit ratio of pupillary dilation goes a long way toward turning anxious patients into enthusiastic allies in the dilation process.

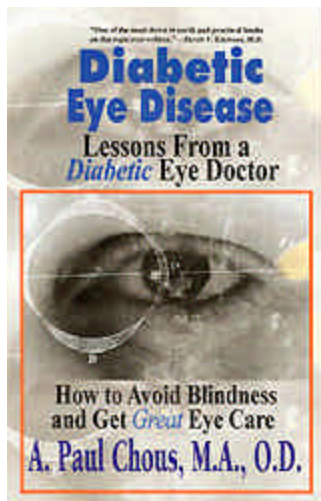
ⁱ Vijan S, Hofer TP, Hayward RA: Cost-utility analysis of screening intervals for diabetic retinopathy in patients with type 2 diabetes mellitus. *JAMA* 283:889–896, 2000

ⁱⁱ *Diabetes Care* 26:S99-S102, 2003

About the Author

Dr. Paul Chous is the recent author of a critically acclaimed book for patients and health care providers on diabetes and the eye, ***Diabetic Eye Disease: Lessons From A Diabetic Eye Doctor – How To Avoid Blindness and Get Great Eye Care*** (Fairwood Press). He may be reached via his web site at <http://www.diabeticeyes.com>.

Dr. Paul Chous received his undergraduate education at *Brown University* and the *University of California at Irvine*, where he was elected to *Phi Beta Kappa* in 1985. He received his Masters Degree in 1986 and his Doctorate of Optometry in 1991, both with highest honors from the *University of California at Berkeley*. Dr. Chous was selected as the *Outstanding Graduating Optometrist* in 1991. He has practiced in Renton, Kent, Auburn and Tacoma, Washington for the last 12 years, emphasizing diabetic eye disease and diabetes education. Dr. Chous has been a Type 1 diabetic since 1968. He lives in Maple Valley, Washington with his wife and son.



Book Description

Diabetes affects every part of the eye, not just the retina. Presenting critical information about seven different kinds of diabetic eye disease as well as important steps all diabetics must take to preserve vision, Dr. Chous clearly and comprehensively guides you through the fundamentals of good diabetes management and great eye care. Written by an eye doctor, diabetes educator and patient advocate, this book is dedicated to helping you or someone you love avoid blindness and other complications by taking charge of your diabetes

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