



# Current Concepts in Ophthalmology

## Diabetic Retinopathy and the Primary Care Physician

*Diabetic retinopathy remains the leading cause of vision impairment and blindness in working age adults in spite of improved medical care of persons with diabetes and its associated disorders. This review highlights the opportunities for primary care physicians to play a key role in the prevention of vision impairment as summarized in Table 1.*

First, prevention of vision loss is vastly superior to any means of treatment, so prevention of complications should begin at the time of diabetes diagnosis. The metabolic and cellular processes that ultimately lead to vision impairment begin shortly after the onset of diabetes and perhaps during the period of insulin resistance associated with pre-diabetes. Indeed, about 8% of persons with pre-diabetes already have mild retinopathy<sup>1</sup>. These changes include leakage of retinal capillaries, death of retinal neurons, and chronic, low-grade inflammation that includes increased levels of pro-inflammatory cytokines and immune cells within the retina<sup>2</sup>. These changes occur before the onset of clinically evident diabetic retinopathy such as hemorrhages and microaneurysms. The Diabetes Control and Complications Trial (DCCT) clearly showed that early prevention of retinopathy is more successful than intervention of established retinopathy<sup>3</sup>. Thus, the greatest therapeutic opportunity exists when patients have no detectable retinopathy or other complications.

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**Thomas W. Gardner, MD, MS**

Jack and Nancy Turner

Professor of Ophthalmology and  
Cellular & Molecular Physiology

Penn State College of Medicine  
Hershey, PA

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### Table 1

#### Opportunities for Primary Care Physicians to Reduce the Risk of Vision Loss in Persons with Diabetes

- Focus on prevention of complications from the diagnosis of diabetes
- Treat systemic cardiovascular risk factors
- Communicate bi-directionally with ophthalmologists
- Recommend canes or other devices to minimize the risk of falls and fractures

This approach is important because even when vision is reduced just two lines of visual acuity chart from 20/20 to 20/30, patients often have significant impairment of visibility to read, drive and perform their essential functions.

Secondly, the treatment for established diabetic retinopathy, ranging from microaneurysms, retinal hemorrhages, macular edema and neovascularization requires stringent

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## Table 2

### Modifiable Systemic Risk Factors for Development and Progression of Diabetic Retinopathy

- Metabolic (glycemic control)
- Blood pressure
- Serum Lipids
- Renal function
- Anemia
- Chronic foot and oral infections

control of the modifiable systemic risk factors for its development, including glycemic control, hypertension and hyperlipidemia control, management of renal impairment, correction of anemia, and treatment of chronic infections such as foot ulcers or gingivitis (Table 2). These risk factors are the same as cardiovascular risk factors in general and their treatment maximizes the chance to avoid complications. These systemic interventions are complimented by ocular treatments such as laser photocoagulation and/or intraocular administration of anti-inflammatory agents such as corticosteroids or anti-vascular endothelial growth factor (VEGF) antibodies. Together, these direct and adjunctive approaches can stabilize or preserve vision in many cases.

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777 East Park Drive, PO Box 8820  
Harrisburg, PA 17105-8820  
(717) 558-7750 phone  
(717) 558-7841 fax

Medical Editors: Kenneth P. Cheng, MD  
Karl R. Olsen, MD  
Staff Editor: Kristi Spargo

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All medical content correspondence should be directed to Thomas W. Gardner, MD, MS, at Milton S. Hershey Medical Center, Dept. of Ophthalmology, PO Box 850, Hershey, PA 17033-0850.

All other correspondence should be directed to the Staff Editor, Kristi Spargo, at pao@pamedsoc.org

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Third, the administration of these various interventions often requires the input of multiple physicians and ophthalmologists so communication between all parties, including the patient, is very helpful to achieve the desired outcome.

Finally, it is important to recall that patients who are visually impaired from diabetes often have dysfunction of their posterior spinal columns with impaired balance and joint-position sense. Those who are overweight, and have arthritis and/or limited muscle strength have a high risk for falls and fractures<sup>4</sup>. Therefore, the use of a cane can be very helpful to limit the risk of additional disability.

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