Indian Health Diabetes Best Practices:

Eye Care and Diabetes

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What is eye care?

People with diabetes have special issues with their eyes. The complications associated with diabetes can cause several visual disorders that may lead to vision loss or blindness, such as retinopathy, cataracts, and glaucoma. For these reasons, eye care is an essential element of a diabetes program.

Why is eye care important?

Complications of diabetes include several visual disorders, such as retinopathy, cataracts, and glaucoma, which may lead to vision loss or blindness. Approximately 15–40% of people with type 2 diabetes have retinopathy (i.e., damage to the small blood vessels in the retina) at the time diabetes is diagnosed. This retinopathy may be due to the extended period of time these individuals have diabetes, but remained undiagnosed and uncontrolled. The risk factors associated with the severity of retinopathy include high mean fasting blood sugar, high A1c level, elevated systolic blood pressure, high urinary albumin-to-creatinine ratio, kidney failure requiring dialysis, dyslipidemia, abdominal obesity, anemia, and duration of diabetes.

American Indians and Alaska Natives with diabetes are at increased risk of developing eye complications and vision loss due to retinopathy, cataracts, and glaucoma. The prevalence of retinopathy among American Indian and Alaska Native adults in Oklahoma and among Pima Indian adults with diabetes ranged from 18–49.3% (West *et al*., 1980). Among the Sioux Tribe in South Dakota, the prevalence of retinopathy among adults with diabetes was 45.3% (Berinstein *et al.*, 1997). Overall, the prevalence of diabetic retinopathy in American Indians and Alaska Natives is 2.2 times greater than the general U.S. population as a whole (CDC, 2005).

Consider these facts:

- Diabetic eye disease is the leading cause of new blindness in the U.S. for people between the ages of 20 and 74 (CDC, 1994).
- People with diabetes have 25 times the likelihood of becoming blind as compared with people without diabetes (CDC, 1991).
- The prevalence of retinopathy increases with duration of diabetes. After approximately 20 years of the disease, more than 90% of patients with diabetes will have some degree of retinopathy (WHO, 1994).
- Diabetes blinds someone every 15 minutes (CDC, 2002).

Fortunately, eye complications can be safely and effectively treated when identified early. Furthermore, controlled trials demonstrate that: (1) early and appropriate treatment substantially reduces the risk of vision loss due to diabetic macular edema and proliferative diabetic retinopathy; and (2) control of blood sugar level, serum lipids, blood pressure, kidney function, anemia, and abdominal obesity reduces the risk of onset and progression of diabetic retinopathy.

Best practices for eye care and diabetes

The best practice for eye care describes the best methods for:

- Evaluating patients for diabetic retinopathy.
- Recognizing *early* when to refer patients for immediate treatment.
- Providing visual rehabilitation for patients with vision loss.
- Monitoring risk factors and treatments.
- Providing education patients and their families.

Table 1 summarizes the best practices for eye care and diabetes.

Table 1. Best practices for eye care for people with diabetes.

Provider Recommendations	Best Practices
1. **Evaluate patients** for diabetic retinopathy	***Who?*** An ophthalmologist or optometrist can conduct an evaluation of diabetic retinopathy. ***Why?*** Early detection and treatment of eye disease can prevent vision loss and blindness. ***How?*** – Conduct a qualifying retinal examination for diabetic retinopathy shortly after the diagnosis of diabetes. • Dilated and comprehensive eye examination. • Seven standard field color stereoscopic photographic method using the Early Treatment Diabetic Retinopathy Study (ETDRS) methodology. • Validated photographic method based on ETDRS methodology. – Repeat qualifying retinal surveillance annually. – Conduct eye examinations more frequently if retinopathy is progressing. – Among women who have diabetes and become pregnant (i.e., women with pregestational diabetes, *not* gestational diabetes), conduct a comprehensive eye examination in the first trimester and follow closely throughout pregnancy.

(Table 1 continued on next page)

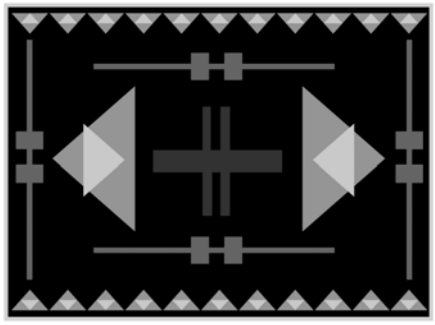
Table 1. Best practices for eye care for people with diabetes. (continued)

Provider Recommendations	Best Practices
2. Recognize *early* when to **refer patients for immediate treatment**	***Why?*** Controlled clinical trials demonstrate that appropriate treatment (e.g., laser photocoagulation) substantially reduces the risk of vision loss due to proliferative diabetic retinopathy and diabetic macular edema. Early referral for patients with severe nonproliferative diabetic retinopathy is critical because laser treatment at this stage is associated with a significant reduction in the risk of moderate and severe visual loss and vitrectomy (ETDRS Research Group, 1991; ETDRS Research Group, 1985). ***How?*** – Refer patients immediately if they have any level of diabetic macular edema, severe or more advanced nonproliferative diabetic retinopathy, or any level of proliferative diabetic retinopathy. – Provide care by an ophthalmologist knowledgeable and experienced in managing and treating diabetic retinopathy.
3. Provide **visual rehabilitation** for patients with vision loss	***Why?*** Vision rehabilitation services can help maximize vision, allow for gainful employment, and help people perform daily living tasks (Goldzweig *et al*., 2004). ***How?*** – Refer the patient to an optometrist or ophthalmologist trained in vision rehabilitation and low-vision care.
4. Monitor **risk factors and treatments**	***Why?*** Adherence to demonstrated standards of care—including control of blood sugar, serum lipids, blood pressure, kidney function, anemia, and abdominal obesity—reduces the risk of onset and progression of diabetic retinopathy, and thereby maximizes and preserves vision (Aiello *et al*., 2001; Chase *et al*., 1990; Chew *et al*., 1996; Cruickshanks *et al*., 1993; DCCT Research Group, 1993; Fong *et al*., 2004; Fong *et al*., 1999; Klein *et al*., 1995; Klein *et al*., 1993; Klein *et al*., 1988; Marshall *et al*., 1993; Sjolie *et al*., 1997; UKPDS, 1998a; UKPDS, 1998b). ***How?*** – Monitor blood sugar control with a goal A1c of <7.0% (DCCT Research Group, 1995c). – Monitor blood pressure control with a goal blood pressure of <130/80 (UKPDS, 1998b).

(Table 1 continued on next page)

Table 1. Best practices for eye care for people with diabetes. (continued)

Provider Recommendations	Best Practices
5. Provide **education to patients and their families**	***Why?*** Eye complications are frequently asymptomatic and go unrecognized by the patient (Giusti, 2001; Taylor *et al*., 2004). ***How?*** Educate patients and family members about eye guidelines and reinforce the education during visits. The goal and content of the education should emphasize: – The need to maintain blood sugar and blood pressure levels as close to normal as possible. – Importance of an annual dilated eye exam (or qualifying retinal surveillance) by an optometrist or ophthalmologist. – Importance of not smoking. – Information about when the patient should seek eye care (e.g., any change in vision, blurred vision, difficulty reading signs or books, seeing double, seeing floaters or spots, apparent distortion or bending of straight lines, loss of side vision, eye pain in one or both eyes, prolonged eye redness, pressure feeling in the eyes, and pregnancy or planned pregnancy).



Best practices for health care organizations

A health care organization that wants to improve diabetes eye care must be motivated and prepared for change throughout the entire organization. The organization's leadership must identify diabetes eye care improvement as important work. They must also develop clear improvement goals, policies, and effective improvement strategies. This will help encourage the entire organization to make changes that will help improve diabetes eye care.

Table 2 describes the best practices for health care organizations.

Table 2. Best practices for health care organizations.

Organization Recommendations	Best Practices
System and programmatic changes	***Why?*** Improvements in the organization of the health care delivery system may improve the delivery of appropriate diabetes eye care. ***How?*** The following activities may help improve diabetes eye care: – Support a culture for quality evaluation and improvement. – Create incentives for improved eye care practices. – Provide programmatic time for continuous quality improvement. – Dedicate resources. – Commit to improve eye health and reduce the burden of diabetic eye complications. – Develop specific eye care practice goals and objectives. – Adhere to the established and commonly accepted practice guidelines for diabetic retinopathy (e.g., American Diabetes Association (ADA), American Academy of Ophthalmology (AAO), or American Optometric Association (AOA) guidelines) (Fong *et al*., 2004). – Incorporate validated, novel diabetic retinopathy surveillance methods. – Support information technology with appropriate resources to document and track compliance with diabetic retinopathy standards of care for diagnosis and treatment. – Commit to recruit, retain, and promote staff with the willingness and capacity to effectively implement best practice programs. – Increase capacity to conduct audits that monitor diabetic retinopathy diagnostic and treatment practice.

Essential elements of best practice eye care programs

High quality eye care involves implementing six essential elements* in your health care organization. These elements are:

- Community resources and policies.
- Health care organization leadership.
- Patient self-management support.
- Delivery system design: Services, programs, systems, and procedures.
- Decision support: Information and training for providers.
- Clinical information systems: Collecting and tracking information.

Table 3 summarizes how these elements apply to basic, intermediate, and comprehensive eye care programs for patients with diabetes.

*Adapted from the Chronic Care Model, which was developed by the MacColl Institute for Healthcare Innovation at the Group Health Cooperative. For more information on the Chronic Care Model, visit their website at www.improvingchroniccare.org.

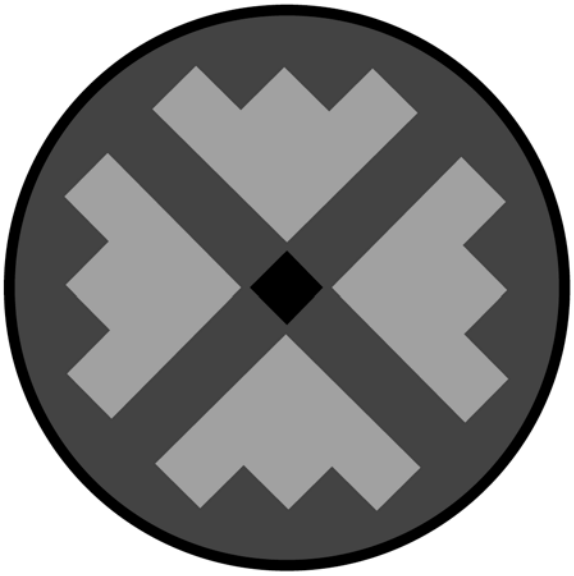


Table 3. Essential elements of basic, intermediate, and comprehensive best practice eye care programs for patients with diabetes.

Basic Eye Care Programs	Intermediate Eye Care Programs Basic program *plus*:	Comprehensive Eye Care Programs Basic and intermediate programs *plus*:	Examples
Community resources and policies			
– Ensure access to appropriate specialists and sub-specialists for consultation and treatment. – Provide training for home-care nurses, community health representatives, and public health nurses. – Give presentations at public health forums about the importance of eye health and care.	– Develop a defined community resource network for eye care referral and treatment.	– Develop a defined community resource network for diabetic retinopathy care referral and treatment.	– Train homecare nurses, community health representatives, and public health nurses. – Make presentations at public education forums. – Form partnerships with organizations like the Commission for the Blind and Lions Club.
Organization leadership			
– Define and empower the performance improvement mechanism by focusing on results, using a system viewpoint to health care, and establishing partnerships. – Assign leadership for the performance improvement program.	– Develop specific eye care practice goals and objectives consistent with established standards of care.	– Cascade specific outcome measures into annual performance-based evaluations.	– Provide programmatic time for continuous quality improvement. – Dedicate appropriate resources. – Adhere to established and accepted practice guidelines. – Incorporate validated, novel surveillance methods. – Develop the capacity to conduct audits that monitor diabetic retinopathy diagnostic and treatment practice.

(Table 3 continued on next page)

Table 3. Essential elements of basic, intermediate, and comprehensive best practice eye care programs for patients with diabetes. (continued)

Basic Eye Care Programs	Intermediate Eye Care Programs Basic program *plus*:	Comprehensive Eye Care Programs Basic and intermediate programs *plus*:	Examples
Patient self-management support			
– Provide appropriate and individualized patient education. – Document patient education. – Develop or adopt diabetes eye care education materials. – Ensure that patients and families have the opportunity to ask questions and obtain answers. – Provide patient education in the community or home.	– Develop or adopt a defined curriculum for patient education.	– Provide patient education outreach programs. – Document patient education, readiness to learn, level of understanding, and capacity to participate in care.	– Use customized Patient Care Component (PCC+) forms with education code boxes. – Ensure patients have access to educators and personnel skilled in diabetes and eye care education (e.g., eye technicians, registered nurses, and certified diabetes educators). – Develop a comprehensive diabetes case management program (e.g., staff, technology, and protocols). – Provide patients with the opportunity to ask questions and provide room to accommodate families. – Link education objectives to identified patient priorities and abilities. – Use motivational interviewing to identify and resolve conflicts over appropriate care. – Provide education in the community or home.

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Table 3. Essential elements of basic, intermediate, and comprehensive best practice eye care programs for patients with diabetes. (continued)

Basic Eye Care Programs	Intermediate Eye Care Programs Basic program *plus*:	Comprehensive Eye Care Programs Basic and intermediate programs *plus*:	Examples
Delivery system design: Services, programs, systems, and procedures			
– Establish a diabetes team that meets regularly. – Define a mechanism for referral for diagnosis of diabetic eye conditions and treatment of sight-threatening disease. – Ensure that patients have access to optometry, ophthalmology, and ancillary ophthalmic services.	– Establish a hospital information system with patient scheduling and recall application, as well as a patient mining function for identifying patients who have failed standards of care.	– Provide patient outreach. – Dedicate information technology staffing and hardware support to technology-based diabetes management. – Establish a hospital information system and web-based diabetes case management program.	– Establish a diabetes and eye care team with designated leadership. – Establish a referral and consultative services network. – Develop specific action plans to address identified needs to increase compliance with standards of care. – Use a facility-based appointment system with a patient mining function. – Establish diabetes and eye care clinics. – Provide appropriate and adequate intramural or referral eye care services (including clinical and surgical services).

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Table 3. Essential elements of basic, intermediate, and comprehensive best practice eye care programs for patients with diabetes. (continued)

Basic Eye Care Programs	Intermediate Eye Care Programs Basic program *plus*:	Comprehensive Eye Care Programs Basic and intermediate programs *plus*:	Examples
Decision support: Information and training for providers			
– Train providers to adhere to commonly accepted evidence-based clinical practice guidelines within the established standards of care for patients with diabetes (including diagnosis and risk categorization). – Train providers in risk assessment and education principles.	– Use detailed clinical practice guidelines for eye care.	– Use web-based and other telehealth distance learning modalities for patient and provider education.	– Use the AAO/AOA Preferred Practice Guidelines for Diabetic Retinopathy. – Offer in-service training for non-eye care providers. – Reinforce basis, methods, and expected outcomes of compliance with established standards of care.
Clinical information systems: Collecting and tracking information			
– Use a diabetes database that provides accurate denominator data. – Conduct annual diabetes audits. – Monitor retinal evaluations for qualifying features. – Update the diabetes database with annualized data.	– Use hospital information system applications for patient data mining and referral for diabetic retinopathy surveillance. – Implement PCC+ and electronic health record with diabetic retinopathy templates.	– Use diabetes case management systems. – Use web portals for patient and provider access to the diabetes case management system.	– Use the Resource and Patient Management System (RPMS) or other electronic health record. – Use diabetes case management programs. – Use PCC+ eye forms. – Generate risk-level-appropriate patient and provider reminders.

Evaluating your eye care program

Evaluation is important because it helps you see what is working and what is not working in your eye care program for people with diabetes. It will show you if adjustments or changes need to be made in order to improve your program. Evaluation also provides you with information that you can use to share your successes with patients, providers, tribal leaders, administrators, the community, funders, and other stakeholders.

Consider the following when developing your evaluation plan:

- Diabetic retinopathy evaluation and patient education.
- Prevalence of moderate vision loss among individuals with diabetes (n.b., this may require the creation of new ICD-9 codes).
- Prevalence of blindness among individuals with diabetes.
- Laser interventions for sight-threatening diabetic retinopathy from all sources (e.g., direct care, contract health services, and patient initiated care).
- Prevalence of unknown diabetes.
- Availability and logistic requirements for consultative and referral services.
- Availability and logistic requirements for support services.

Sustaining your eye care program

Often, for care goals to be reached, programs must be in place for more than a few years. Here are some helpful tips for sustaining the program:

- Obtain financial commitment from the organization administration for technology-based or other enhanced diabetes eye care programs.
- Obtain financial commitment from the organization administration for the maintenance and evolution of health care technology.
- Create and obtain support for the infrastructure needed to provide patients living in remote areas with technology-based solutions.

Contacting others for help

Contacting other people involved in diabetes eye care is important because they can help you get started. Your peers at other health care organizations can share their expertise, materials, and ideas, and can also tell you what has worked for them and what has not. This can help you avoid reinventing the wheel. Here are some tips on how to connect with others:

- Ask your Area Diabetes Consultant for the names of people who may be able to help you.
- Contact the Indian Health Service (IHS) Division of Diabetes Treatment and Prevention for ideas. They may be able to point you in the right direction.
- Ask the IHS Integrated Diabetes Education Recognition Program for suggested contacts. They have names and contact information for people who work with IHS-accredited diabetes education programs.
- Review resources from the National Diabetes Education Program (NDEP). NDEP offers materials that will help your program get started, including information specifically for American Indians and Alaska Natives. You can access these resources at the website: www.ndep.nih.gov

Real-world best practice programs

Comprehensive Diabetes Management Program

Joan Perkins

joan.perkins@joslin.harvard.edu

This evidence-based program integrates web-based case management using patient data, patient behavioral health assessments, and education to optimize care.

IHS/JVN (Joslin Vision Network) Teleophthalmology Program

Mark Horton, OD, MD

mark.horton@mail.ihs.gov

This well-established, scalable program uses telemedicine to increase compliance with diabetic retinopathy surveillance standards of care.

Phoenix Indian Medical Center Visiting Professional Program

David Civic, MD

david.civic@mail.ihs.gov

This program has a long history of successful outreach to bring specialty services to locations with documented barriers to access.

Helpful websites

Agency for Healthcare Research and Quality: *Diabetes Care Quality Improvement Resource Guide and Workbook*

- www.ahrq.gov/qual/diabqualoc.htm

American Academy of Ophthalmology Preferred Practice Pattern: Diabetic Retinopathy

- www.aao.org/education/library/ppp/dr_new.cfm

American Diabetes Association

- www.diabetes.org

American Telemedicine Association Recommendations and Guidelines for Telemedicine

- www.atmeda.org/ICOT/diabeticretionpathy.FINAL.pdf

Diabetes National Plan for Action

- http://aspe.hhs.gov/health/NDAP/NDAP04.pdf

Joslin Clinical Guidelines

- www.joslin.org/managing_your_diabetes_joslin_clinical_guidelines.asp

National Eye Institute Diabetes Retinopathy Homepage

- www.nei.nih.gov/health/diabetic/retinopathy.asp

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