EVIDENCE-BASED CLINICAL PRACTICE GUIDELINE

# DIABETES

**Effective March 1, 2015**
**Revised February 21, 2021**
**Revised June 16, 2021**
**Revised February 21, 2025**

ALBERTA college of OPTOMETRISTS

# Diabetes Clinical Practice Guideline

The objective of this Clinical Practice Guideline (CPG) is to provide guidance to Doctors of Optometry on the assessment, diagnosis, co-management and referral of patients with Diabetes Mellitus and Diabetes Insipidus. It is based on the best available and most current optometric and medical clinical evidence and research. It is not intended to replace professional discretion and judgment; nor is it intended to be used as an all-encompassing clinical manual. Optometrists must base their diagnostic, co-management and referral regimens on the specific needs of the patient.

We wish to acknowledge the Canadian and American Associations of Optometry, as well as the American Academy of Ophthalmology for their previously published CPGs used in the development of this guideline.

Diabetes Mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects of insulin secretion, increased cellular resistance to insulin, or both. It is a chronic disease that can affect every organ in the body on a microvascular level, causing long-term systemic and ocular complications.

Type 1 diabetes accounts for approximately 10% of diabetes cases and is characterized by autoimmune pancreatic β-cell destruction that usually leads to absolute insulin deficiency. Type 2 diabetes accounts for approximately 90-95% of diabetes cases and is characterized by a mix of insulin resistance and insulin secretory defect (β-cell exhaustion). Gestational diabetes occurs in about 5 % of all pregnancies and can result in current and future complications to the fetus and mother. Diabetes Insipidus (DI) refers to a completely separate and different condition than Diabetes Mellitus and is caused by totally unrelated mechanisms. Although blurred vision may occur in rare circumstances, patients who present with possible signs and symptoms of DI (excessive thirst and excretion of urine) should be referred to their family physician, internist or endocrinologist for appropriate follow-up care.

Although, the majority of people with well-controlled diabetes only suffer from minor eye disorders, they all face a higher risk of blindness than people without diabetes. In fact, diabetes is the leading cause of blindness in adults aged 20 – 74. Ocular complications of diabetes may include:

- Diabetic retinopathy
- Macular edema
- Glaucoma
- Cataracts
- Refractive changes
- Cranial nerve palsies
- Ocular surface disease
- Permanent loss of visual acuity or blindness

The Alberta College of Optometrists recommends that all people with diabetes receive a dilated ocular health examination yearly and comprehensive eye examination on a regular basis as determined by their Doctor of Optometry.

## Goals

**It is the goal of every optometrist to:**

1. **Identify those patients at risk for developing diabetes, educate the patient on the damaging systemic and ocular effects of diabetes, and discuss ways to prevent damage in order to preserve a patient's vision and health for as long as possible.**

2. **Collaborate and communicate with patients, legal guardians and/or other health care practitioners in order to:**
    - **Increase access to competent vision care services,**
    - **Maximize a patient's visual status and quality of life,**
    - **Improve patient compliance and outcomes,**
    - **Reduce the possibility of duplication of tests and services**
    - **Provide vision care services in the most efficient and effective manner.**

## General Guidelines

1. **An annual dilated health examination and a comprehensive eye exam every two years is recommended for all patients with diabetes with consideration given for more frequent assessments where appropriate. Refer to Appendix 1 for recommended frequency of examination and referral time according to stage of retinopathy.**

2. **As diabetes is a multi-organ, chronic condition, optometrists should communicate with other health care practitioners involved in the patients care as per Section 1.8 of the ACO Standards of Practice to ensure appropriate and optimal patient care.**

## Specific Initial Diagnosis Guideline

**In addition to those tests and procedures conducted during a comprehensive eye examination, the following specific history / procedures should be performed and documented when deemed necessary for patients who are at risk or showing early signs of developing diabetes.**

- **Family and personal (ocular and general) health history.**
- **Relevant information and data from previous assessments.**
- **Type and onset of diabetes.**
- **Measure of blood sugar control (i.e. recent blood sugar and/or HbA1c readings).**

- **Time blood sugars are spent in range, if available.**
- **Current medications and compliance with treatment.**
- **Where applicable, name of physician monitoring patient's diabetic care to allow for appropriate co-management and communication.**
- **Visual acuity.**
- **Extra-ocular muscle versions and pupil responses.**
- **Intra-ocular pressure.**
- **Assessment of the cornea and tear film for signs of dry eye disease, corneal defects indicative of poor wound healing, and/or reduced corneal sensitivity due to peripheral neuropathy.**
- **Assessment of the iris and anterior chamber angle for neovascularization and/or obstruction.**
- **Assessment of the retina and optic nerve (a dilated fundus exam is considered the current standard of care).**
- **Scanning laser imaging of the macular area detection of macular edema (OCT or similar instrument).**
- **Retinal photography for future monitoring and/or referral purposes. (Retinal photography does not replace the need for a thorough dilated fundus exam).**
- **Any other supplemental testing as per the professional discretion of the optometrist appropriate to that specific patient.**

## Specific On-Going Management Guideline

**Depending on the severity and progression of diabetes, the following procedures should be performed and documented when deemed necessary on diabetic patients on a regular basis as part of their regular monitoring:**

- **Refraction (if clinically necessary) and visual acuities.**
- **Extra-ocular muscle versions & pupil responses.**
- **Intra-ocular pressure.**
- **Assessment of the cornea and tear film.**
- **Assessment of the iris and anterior chamber angle.**
- **Dilated fundus examination as deemed necessary.**
- **Scanning laser imaging and retinal photography for continued monitoring and comparison to previous testing.**
- **Any other supplemental testing as per the professional discretion and judgment of the optometrist appropriate to that specific patient.**

## Summary

**Optometrists, as primary eye and health care providers, need to take an active role in the assessment, diagnosis, co-management, on-going care, treatment and referral of patients with diabetes. It should be the goal of the entire patient's health care team to continually educate patients (or legal guardians) on:**

- **Healthy lifestyle choices.**
- **Possible current and future complications of diabetes.**
- **The chronic nature of the disease and the need for constant, daily monitoring for the duration of the patient's life.**
- **The need for at minimum, an annual dilated ocular assessment and comprehensive eye exam every two years.**

# Appendix 1: Recommended Frequency of Eye Examination for Patients with Diabetes

| Stage of Retinopathy | Diagnostic Criteria | DME | Frequency of Examination (with OD or OMD if referred) | Referral Timing (after diagnosis of retinopathy) |
|---|---|---|---|---|
| No retinopathy | No abnormalities | None | Every 12 months | No referral necessary |
| Mild NPDR | MA or DBH only | None | Every 6-12 months | No referral necessary |
| | | DME | Every 4-6 months | No referral necessary |
| | | CSME | Every month | Within 1 month |
| Moderate NPDR | 1 MA or DBH, and at least one of the following:<br>• Increasing DBH<br>• VB<br>• CWS | None | Every 6-12 months | No referral necessary |
| | | DME | Every 3-6 months | No referral necessary; monitor carefully for CSME |
| | | CSME | Every month | Within 1 month |
| Severe or very severe NPDR | Any one of the '4-2-1 Rule':<br>• DBH in all 4 retinal quadrants<br>• VB in at least 2 quadrants<br>• IRMA in at least 1 quadrant<br><br>Very severe NPDR: At least 2 of the '4-2-1' Rule | None | Every 3-4 months | Within 1 month if severe |
| | | DME | Every 2-4 months | Within 1 month if severe |
| | | CSME | Every month | Within 1-2 weeks |
| PDR | NVD<br>NVE<br>VH<br>PRH | None | Every 2-4 months | Within 1-2 weeks |
| | | DME | Every 2-4 months | Within 1-2 weeks |
| | | CSME | Every month | Within 1-2 weeks |

Definitions:
Diabetic macular edema (DME) is defined as: Retinal thickening or exudates detected through examination of the posterior pole, but not within the criteria set for clinically significant macular edema (CSME); CSME is defined as: Retinal thickening at or within 500 microns of the centre of the macula; and/or exudates at or within 500 microns of the centre of the macula with adjacent retinal thickening; and/or retinal thickening of one disc-diameter in size, at least part of which is within one disc-diameter of the centre of the macula.

Abbreviations:
NPDR, non-proliferative diabetic retinopathy; PDR, proliferative diabetic retinopathy; MA, microaneurysm; DBH, dot-blot hemorrhage; VB, venous beading; CWS, cotton wool spot; IRMA, intraretinal microvascular abnormality; NVD, neovascularization of the disc; NVE, neovascularization elsewhere; VH, vitreous hemorrhage; PRH, preretinal hemorrhage.