STANDARDS OF PRACTICE

DIABETES CLINICAL PRACTICE

Name: Diabetes Clinical Practice
Date Approved: 09/30/2016
Date Updated:
Number: SP-C-7
Type: Clinical Standards (C)
Reference:

It is not intended to replace professional discretion; nor is it intended to be used as an all-encompassing clinical manual. Clinicians must base their diagnostic, co-management and referral regimens on the specific needs of the patient.

We wish to acknowledge the Canadian Diabetes Association, Alberta Association of Optometrists, and the Canadian and American Associations of Optometry for their previously published CPG's used in the development of this standard.

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects of insulin secretion and/or increased resistance to insulin. It is a chronic disease that can affect every organ in the body with long term systemic and ocular complications and ramifications.

Type 1 (formerly called juvenile diabetes)
Type 1 diabetes accounts for approximately 5-10% of diabetes cases and occurs when the body's immune system attacks and destroys insulin producing beta-cells located in the pancreas thus leading to insulin deficiency. Type 1 diabetics rely on exogenous sources of insulin. While Type 1 diabetes is typically thought of as occurring in children, it can occur at any age and may be caused by genetic, environmental, or other factors such as viral infections. There is currently no known way to prevent it.

Type 1 and ½ Diabetes: Latent Autoimmune Diabetes of Adults (LADA)
LADA is a slow progressing form of autoimmune diabetes that occurs because the pancreas stops producing adequate amounts of insulin. Unlike Type 1 Diabetes, with LADA, patients typically do not require insulin for months or even years after they are diagnosed. As a result of the pancreas still producing some insulin, these patients are often misdiagnosed as having Type 2 Diabetes.

Type 2 (formerly called adult-onset or non-insulin dependent diabetes)
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). Type 2 diabetes develops more frequently in adults than children; however, the prevalence in children is increasing, especially in high risk ethnic groups such as Native Americans, Hispanics, and African Americans.

Pre-Diabetes

A classification for individuals whose blood glucose levels are higher than normal, but fall short of the diagnosis of diabetes. They have an increased risk for developing type 2 diabetes, heart disease, and stroke.

Gestational Diabetes

Refers to any degree of glucose intolerance during pregnancy. It is caused by hormones secreted during pregnancy or by a shortage of insulin. Native Americans, Hispanics, and African Americans are at a higher risk to develop this type of diabetes. Gestational diabetes affects approximately 5-10% of pregnancies. Women that experience gestational diabetes during their pregnancy have a 35-60% chance of developing type 2 diabetes within 20 years.

Risk Factors for Diabetes

*Anyone over the age of 40 should be tested for diabetes every three years. Anyone who has one or more risk factors should be tested more frequently.

- Having a parent, brother, or sister with diabetes
- Being a member of a high-risk group (Aboriginal, Hispanic, South Asian, Asian, or African decent)
- Having health complications that are associated with diabetes
- Having given birth to a baby that weighed more than nine pounds
- Having had gestational diabetes
- Having been diagnosed with pre-diabetes high blood pressure
- High cholesterol or other fats in the blood
- Being overweight, especially if that weight is mostly carried around the tummy
- Polycystic ovary syndrome
- Acanthosis nigricans (darkened patches of skin)
- Psychiatric disorders: schizophrenia, depression, bipolar disorder
- Obstructive sleep apnea
- Taking a glucocorticoid medication

Signs and Symptoms of Diabetes

*It is important to recognize, however, that many people who have type 2 diabetes may display no symptoms.

- Unusual thirst
- Frequent urination
- Weight change (gain or loss)
- Extreme fatigue or lack of energy
- Blurred vision
- Frequent or recurring infections
- Cuts and bruises that are slow to heal
- Tingling or numbness in the hands or feet
- Trouble getting or maintaining an erection

Early Detection and Prevention

The Diabetes Prevention Program showed that weight loss through moderate diet changes and physical activity can delay and prevent type 2 diabetes. People that have pre-diabetes who lose 5-7% of their body weight and participate in at least 150 minutes a week of moderate physical activity can reduce the risk of developing type 2 diabetes by 58% over four years. However, the risk reduction drops to 34% after 10 years.

Diabetes Diagnosis

2hPG, 2-hour plasma glucose; *A1C*, glycated hemoglobin; *FPG*, fasting plasma glucose; *OGTT*, oral glucose tolerance test; *PG*, plasma glucose.

FPG ≥7.0 mmol/L

Fasting = no caloric intake for at least 8 hours

or

A1C ≥6.5% (in adults)

Using a standardized, validated assay in the absence of factors that affect the accuracy of the A1C and not for suspected type 1 diabetes (see text)

or

2hPG in a 75 g OGTT ≥11.1 mmol/L

or

Random PG ≥11.1 mmol/L

Random = any time of the day, without regard to the interval since the last meal

In the absence of symptomatic hyperglycemia, if a single laboratory test result is in the diabetes range, a repeat confirmatory laboratory test (FPG, A1C, 2hPG in a 75 g OGTT) must be done on another day. It is preferable that the same test be repeated (in a timely fashion) for confirmation, but a random PG in the diabetes range in an asymptomatic individual should be confirmed with an alternate test. In the case of symptomatic hyperglycemia, the diagnosis has been made and a confirmatory test is not required before treatment is initiated. In individuals in whom type 1 diabetes is likely (younger or lean or symptomatic hyperglycemia, especially with ketonuria or ketonemia), confirmatory testing should not delay initiation of treatment to avoid rapid deterioration. If results of 2 different tests are available and both are above the diagnostic cutpoints, the diagnosis of diabetes is confirmed.

Diabetic Retinopathy

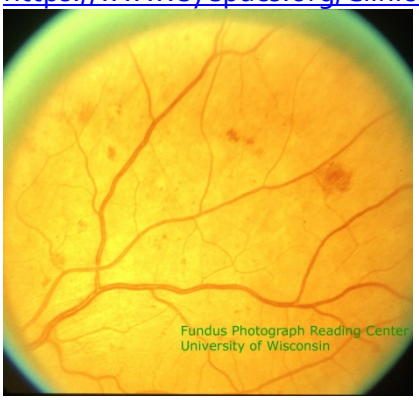
Diabetic retinopathy and/or diabetic macular edema is the most common microvascular complication of diabetes. Diabetic retinopathy remains a leading cause of moderate and severe visual loss among working-aged adults in industrialized countries. Diabetic retinopathy is often symptomatic early in the disease and visual loss is due to vitreous hemorrhage, macular edema, or tractional retinal detachment. Duration of diabetes and sustained hyperglycemia are among the primary risk factors for the development of diabetic retinopathy.

Classifications of Diabetic Retinopathy

The following classification of diabetic retinopathy and diabetic macular edema is based on the Early Treatment Diabetic Retinopathy Study (ETDRS) which uses standard photographs 2A, 6A and 8A.

Reference photos located at the following links:

https://www.eyepacs.org/Clinical/grading/Ref2a.jpg



https://www.eyepacs.org/Clinical/grading/Ref6a.jpg

https://www.eyepacs.org/Clinical/grading/Ref8a.jpg

No Apparent Retinopathy

Mild Non-Proliferative Diabetic Retinopathy

At least one retinal hemorrhages or microaneurysm < than standard photo 2A

Moderate Non-Proliferative Diabetic Retinopathy

Intraretinal hemorrhages, microaneurysms or venous beading that does not reach the severity of the standard photographs 2A, 6A and 8A. → in 1 to 3 retinal quadrants and/or presence of soft exudates, venous beading, or IRMA

Severe Non-Proliferative Diabetic Retinopathy

Any one of the following:
Hemorrhages or microaneurysms ≥ standard photograph 2A in at least 4 quadrants
Venous Beading ≥ standard photograph 6A in at least 2 quadrants
Intra-retinal microvascular abnormalities (IRMA) ≥ standard photograph 8A in at least one quadrant

Very Severe Non-Proliferative Diabetic Retinopathy

2 or more of the Severe NPDR characteristic met in the absence of neovascularization

Proliferative Retinopathy

Any neovascularization of the retina, disc, iris or anterior chamber angle
Preretinal hemorrhage
Vitreous hemorrhage

**Reference photographs obtained from Fundus Photograph Reading Center Department of Ophthalmology and Visual Sciences, University of Wisconsin*

Macular Edema

Diabetic Macular Edema (DME) is the collection of intraretinal fluid in the macular area of the retina with or without lipid exudates or cystoid changes. Macular edema is defined as retinal thickening within two disk diameters of the center of the macula. The term clinically significant macular edema (CSME) was introduced to signify an increased risk for visual loss.

Clinically Significant Macula Edema

- Retinal thickening at or within 500 microns from the center of the macula, or
- Hard exudates at or within 500 microns from the center of the macula with thickening adjacent, or
- Retinal thickening greater than 1 disc area in size within 1500 microns of the center of the macula

Goals

- Identify those patients at risk for developing diabetes, minimize the damaging systemic and ocular effects of diabetes and preserve a patient's vision for as long as possible.
- Collaborate and communicate with patient's (or legal guardians) and 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 duplication of tests and services
- Provide vision care services in the most efficient and effective manner

General

- An annual, comprehensive eye and fundus examination with dilation is recommended for all diabetic patients with consideration given for more frequent assessments where appropriate.

Initial Diagnosis

In addition to those tests and procedures conducted during a comprehensive eye examination, the following 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).
- Current medications and compliance with treatment.
- Where applicable, name of physician monitoring patient's diabetic care to allow for appropriate co-management and communication.
- Intra-ocular pressure.
- Assessment of the iris for neovascularization.
- Assessment of the retina and optic nerve (dilated fundus exam is considered the current standard of care).
- Scanning laser imaging of macular area for patients who show signs and/or symptoms of possible macular edema (OCT or similar instrument).
- Retinal photography for future monitoring and/or referral purposes.
- Any other supplemental testing as per the professional discretion of the optometrist appropriate to that specific patient.

Ongoing Management

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

- Refraction (if deemed necessary) and visual acuities
- Extra-ocular muscle versions & pupil responses
- Intra-ocular pressure
- Assessment of the iris
- Dilated fundus examination
- Scanning laser imaging and retinal photography

- Any other supplemental testing as per the professional discretion of the optometrist appropriate to that specific patient

Exam Frequency Recommendations

Mild NPDR – annually provided there are no coincident medical risk factors that may predispose patients to progression
Moderate NPDR – every 6-8 months in the absence of medical risk factors that may predispose patients to progression
Severe or Very Severe NPDR – every 2-3 months in consultation with an ophthalmologist experienced in the management of diabetic retinal diseases
Proliferative Retinopathy – consultation with an ophthalmologist experienced in the management of diabetic retinal diseases
CSME or Diabetic Macular Edema - consultation with an ophthalmologist experienced in the management of diabetic retinal diseases

Summary

Optometrists, as primary eye and health care providers, need to take an active role in the diagnosis, co-management, ongoing 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 including smoking cessation
- 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 annual comprehensive eye examinations with dilation