



Clinical Practice Guideline: Diabetes Mellitus

INTRODUCTION

Diabetes is a chronic illness that requires continuing medical care and ongoing patient self-management education and support to prevent acute complications and to reduce the risk of long-term complications. Diabetes care is complex and requires that many issues, beyond glycemic control, be addressed. Our goal is to improve and facilitate safe and effective care.

Classification of diabetes

The classification of diabetes includes four clinical classes:

- Type 1 diabetes – results from cell destruction, usually leading to absolute insulin deficiency
- Type 2 diabetes – results from a progressive insulin secretory defect on the background of insulin resistance
- Other specific types of diabetes due to other causes, e.g., genetic defects in cell function, genetic defects in insulin action, diseases of the exocrine pancreas (such as cystic fibrosis) and drug or chemical-induced (such as in the treatment of HIV/AIDS or after organ transplantation)
- Gestational diabetes mellitus (GDM) – diabetes diagnosed during pregnancy that is not clearly overt diabetes

CRITERIA FOR DIAGNOSIS

The criteria for a diagnosis of diabetes includes:

- Fasting plasma glucose (FPG) level of ≥ 126 mg/dL (preferred test to diagnosis diabetes in children and non-pregnant women)
- Random plasma glucose level of ≥ 200 mg/dL with symptoms of disease
- Two hour plasma glucose level of ≥ 200 mg/dL during an oral glucose tolerance test (OGTT)

Each test must be confirmed on a subsequent day unless unequivocal symptoms of hyperglycemia are present. Testing and results of HgbA1c of 6.5 or greater is a means of diagnosing diabetes when using a method certified by the National Glycohemoglobin Standardization Program (NGSP) and standardized or traceable to the Diabetes Control and Complications Trial (DCCT) reference assay.

These are indicators for when patients are at a greater risk to be diabetic. For example if their impaired glucose tolerance (IGT) results are within the parameters listed, then they are more likely to be diabetic. Categories of increased risk for diabetes (pre-diabetes)* include:

- Impaired fasting glucose (IFG) where FPG levels are 100-125 mg/dL (5.6-6.9 mmol/L) OR
- Impaired glucose tolerance (IGT) where two-hour plasma glucose Oral Glucose Tolerance Test (OGTT) values are 140-199mg/dL (7.8-11.0 mmol/L) OR
- Glycated hemoglobin (Hg A1c) 5.7-6.4 percent

*For all three tests, risk is continuous, extending below the lower limit of the range and becoming disproportionately greater at higher ends of the range.

LAB VALUES TO OBTAIN

Obtain the following lab values:

- HgA1c – a value of < 7.0 percent is acceptable: Test every 3 to 6 months
- See recommendations in “Flow sheet for diabetes” for toddlers to young adults located in Table 16 at the end of this document.
- HgA1c – a value of < 8.0 percent is acceptable if the patient is frail, life expectancy <5 years or high risk of hypoglycemia, polypharmacy or drug interaction
- Fasting lipid profile: annual
- HDL: >40 mg/dL in males and >50 mg/dL in females
- LDL: <100 mg/dL
- Triglycerides: <150 mg/dL
- Fasting lipid profile for children age 10 and older after glucose control established
- Urine Microalbumin for adults: annual. Urine Microalbumin screening for children initiated once the child is 10 years old and has had diabetes for 5 years: annual
- Liver function tests
- Serum creatinine and calculated Glomerular Filtration Rate (GFR) when ACE inhibitors, angiotensin receptor blockers, or diuretics are used
- Screening for Celiac Disease in type I diabetics and as indicated in type II diabetics
- In type 1 diabetes, screen for thyroid peroxidase and thyroglobulin on initial diagnosis and check Thyroid Stimulating Hormone (TSH) every 1 to 2 years and as clinically indicated.

HISTORY AND PHYSICAL EXAMINATION

Obtain the following information during a patient history and physical examination:

- Interval history with depression screening
- Ophthalmologic exam should be obtained once the child is 10 years old and has had diabetes for 3 to 5 years: annual
- Diabetic retinal eye exam: annual; where access to qualified eye specialists is limited, use of digital images of patient’s retina transmitted electronically to a qualified practitioner is acceptable
- Foot exam: annual
- Blood Pressure (BP) for adults: each visit. BP target of <140/90
- Treatment of high to normal BP in children (systolic or diastolic BP consistently above the 90th percentile for age, sex and height) as indicated by a health care professional.
- Weight/Body Mass Index (BMI)/height: each visit
- Children: BMI by weight, height, age appropriate
- Diabetic kidney disease screening for adults: annual
- Diabetic kidney disease screening for children once the child is 10 years old and has had diabetes for 5 years: annual
- Neuropathy screening: annual
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IMMUNIZATIONS

The following immunizations should be given to diabetic patients:

- Influenza vaccine: annual
- Pneumococcal polysaccharide vaccine to all diabetic patients ≥2 years of age; a one-time revaccination is recommended for individuals >64 years of age previously immunized when

they were <65 years of age if the vaccine was administered >5 years ago; other indications for repeat vaccination include nephritic syndrome, chronic renal disease and other immunocompromised states, such as after transplantation

- Hepatitis B vaccination to unvaccinated adults

PATIENT EDUCATION AND THERAPY

The following resources should be recommended for patient education and therapy:

- Smoking cessation
- Moderate intensity physical activity
- Medication adherence
- Self-monitored blood glucose: self-monitored blood glucose not necessary in patients who have mild diabetes in good control on present medications
- Preconception and pregnancy counseling
- ACE inhibitors/Angiotensin Receptor Blocker (ARB)/Statin Therapy
- Metformin therapy for prevention of type 2 diabetes for those with impaired glucose tolerance, impaired fasting glucose or an A1C 5.7-6.4 percent, especially for those with BMI >35 kg/m², aged <60 years and women with prior gestational diabetes mellitus
- Insulin therapy with or without additional agents for newly diagnosed type 2 diabetes and symptomatic and/or elevated A1c levels.
- Aspirin
- Weight management
- Medical nutrition therapy
- Certified diabetes educator
- Psychosocial counseling
- Sick day protocol

MEASUREMENT OF COMPLIANCE

Medical record review (MRR) as an annual assessment of practitioner compliance with the guidelines is conducted.

The following MRR measurements will be used to assess compliance with this guideline:

**** History/Physical/Assessment****

- 1 - History/Physical Exam (must include documentation weight/height/BP/BMI)
- 2 - Annual Neuropathy screening(must include documentation of assessment for numbness and/or tingling in hands or feet, balance, dizziness, erectile dysfunction in males).
- 3 - Annual diabetic kidney disease screening (must include documentation that creatinine was ordered)
- 4 - Annual Retinal eye exam (must include documentation of referral to ophthalmologist for annual retinal eye exam or documentation that exam was declined by member).
- 5 - Annual Foot exam (must include documentation of assessment of skin and nails, check for foot ulcers and/or recent podiatry visit).

****Labs/Immunizations****

- 6 - Documentation that an HbA1C was ordered at a minimum of twice per year.
- 7 – Documentation that an annual Fasting Lipid Profile was ordered
(Note: If results are available, do they align with CPG guidelines?)
- 8 - Documentation that an annual Urine Micro albumin screening was ordered
- 9 – Documentation of annual Influenza vaccine or that Influenza vaccine was offered

****Appropriate Medications/Adherence/Education****

- 10 Educated members on self-monitoring of blood glucose levels.
- 11 Educated members on nutrition/diet/weight management.
- 12 Educated members on the use of Aspirin (anti-platelet therapy).

REFERENCES

American Diabetes Association, Standards of Medical Care in Diabetes – 2016.
http://care.diabetesjournals.org/content/suppl/2015/12/21/39.Supplement_1.DC2/2016-Standards-of-Care.pdf



Flow sheet for diabetes

Name:		Birth date:				
Allergies:		Phone #:				
Examination/test	Schedule	Date of onset				
Laboratory						
<ul style="list-style-type: none"> HgA1c <7.0 percent acceptable HgA1c <8 percent, if frail, life expectancy <5 years, high risk of hypoglycemia, polypharmacy or drug interaction HgA1c <7.5 for all pediatric groups 	Every 3 to 6 months	Date				
		Result				
<ul style="list-style-type: none"> Fasting lipid profile: HDL: >40 mg/dL in males and >50 mg/dL in females LDL: <100 mg/dL Triglycerides: <150 mg/dL Children LDL: <100 mg/dl Liver Function Serum Creatinine Calculated GFR Celiac Disease TSH in Type 1 	Annual Every 5 years if within the accepted levels; if abnormal, annually Annual Annual Annual If indicated Every 1 to 2 years					
<ul style="list-style-type: none"> Urine microalbumin-random spot urine for microalbumin: 30ug/mg creatinine Children 	Annual First at age 10 and with diabetes for 5 years: annual					
History and physical examination						
<ul style="list-style-type: none"> Interval history with depression screening 	Annual	Date				
<ul style="list-style-type: none"> Diabetic retinal eye exam 	Annual – less frequent exam (2 to 3 years) may be considered with the advice of an eye professional for normal eye exam	Comment				
<ul style="list-style-type: none"> Children age 10 with diabetes 3 to 5 years 	Annual					
<ul style="list-style-type: none"> Foot Exam Children 	Each visit visual, annual comprehensive foot exam Annual comprehensive foot exam at start of puberty or age 10 with type 1 diabetes for 5 years	Date				
		Comment				
<ul style="list-style-type: none"> Adult BP <140/90 mmHG Children with BP consistently above the 90th percentile for age, sex and height 	Each visit, annual As indicated by a health care professional					
<ul style="list-style-type: none"> Weight/BMI/height Overweight=BMI 25 – 29.9 Obesity=BMI ≥30 Children by BMI percentile 	Each visit Each visit					



Name:		Birth date:					
Allergies:		Phone #:					
Examination/test	Schedule	Date of onset					
age, height and weight							
<ul style="list-style-type: none"> Diabetic kidney disease screening for adults Diabetic kidney disease screening for children once the child is 10 years old and has had diabetes for 5 years 	Annual						
<ul style="list-style-type: none"> Neuropathy screening 	Annual						
Patient education and therapy	Initial and at clinician's discretion	Date					
<ul style="list-style-type: none"> Smoking cessation Moderate intensity physical activity Medication adherence Self-monitored blood glucose Preconception and pregnancy counseling ACE inhibitors/ARB/Statin therapy Metformin therapy Insulin therapy Aspirin Weight management Medical nutrition therapy Certified diabetes educator Psychosocial counseling Sick day protocol 		Comment					
Immunizations	Annual		Date				
<ul style="list-style-type: none"> Influenza vaccine Pneumococcal polysaccharide vaccine to all diabetic patients' ≥2 years of age. A one-time revaccination is recommended for individuals >64 years of age previously immunized when they were <65 years of age if the vaccine was administered >5 years ago. Other indications for repeat vaccination include nephritic syndrome, chronic renal disease and other immunocompromised states, such as after transplantation. Hepatitis B vaccination to unvaccinated adults 			Comment				
OTHER				Date			
			Comment				

American Diabetes Association, Standards of Medical Care in Diabetes – 2016.
http://care.diabetesjournals.org/content/suppl/2015/12/21/39.Supplement_1.DC2/2016-Standards-of-Care.pdf

Table 16 – Plasma blood glucose and A1C goals for type 1 diabetes across all pediatric age groups

Plasma blood glucose goal range (mg/dL)				
Before meals		Bedtime and overnight	A1C (%)	Rationale
	90-130	90-150	<7.5 percent	<ul style="list-style-type: none"> A lower goal (<7.0%) is reasonable if it can be achieved without excessive hypoglycemia
<p>Key concepts in setting glycemic goals:</p> <ul style="list-style-type: none"> Goals should be individualized and lower goals may be reasonable based on benefit risk assessment. Blood glucose goals should be modified in children with frequent hypoglycemia or hypoglycemia unawareness. Postprandial blood glucose values should be measured when there is a discrepancy between preprandial blood glucose values and A1C levels and to help assess glycemia in those on basal/bolus regimens. 				

Source: Excerpted from American Diabetes Association. Clinical Practice Recommendations 2016. Standards of Medical Care in Diabetes – 2016. Vol. 39 S1 Table 11.1