



Diabetes Mellitus Guidelines

Virginia Premier Health Plan, Clinical Practice Guideline-Diabetes

1. Population screening

a. Indications

i. Adults of any age with body mass index greater than or equal to 25 (23 for Asian American), plus one or more additional risk factor for diabetes, including

1. First degree relative with diabetes,
2. High risk race/ethnicity, including; African American, Latino, Native American, Asian American, Pacific Islander,
3. Physical inactivity,
4. Women who delivered a baby weighing greater than 9 pounds or who were diagnosed with gestational diabetes,
5. Hypertension,
6. HDL cholesterol less than 35,
7. Triglyceride greater than 250,
8. Women with polycystic ovary syndrome,
9. Previous test abnormalities including hemoglobin A1c greater than 5.7, impaired glucose tolerance or impaired fasting glucose on previous testing,
10. Other conditions associated with insulin resistance including severe obesity, acanthosis nigricans,
11. History of *Atherosclerotic cardiovascular disease*

ii. In patients with no risk factors, testing should begin at age 45 years

b. Frequency

i. Repeat testing at least at 3-year intervals

c. Screening tests used are the same as listed below under criteria for diagnosis

2. Criteria for diagnosis

a. Hemoglobin A1c greater than or equal to 6.5, OR

b. Fasting plasma glucose greater than or equal to 126, OR

- c. Two-hour plasma glucose greater than or equal to 200 during an oral glucose tolerance test, OR
 - d. Classic symptoms of hyperglycemia with random plasma glucose greater than or equal to 200, AND
 - e. A confirmation study using the same test, or a confirmation using a different test from the above list. If the confirmatory test chosen is a different test than the initial abnormal, and is normal, then a third test utilizing the initial abnormal study should be repeated. (Examples, if the hemoglobin A1c is greater than 6.5 and fasting plasma glucose greater than 126, the diagnosis is confirmed. If hemoglobin A1c is greater than 6.5 and fasting plasma glucose less than 126, then a repeat hemoglobin A1c is needed, which, if greater than 6.5, confirms the diagnosis)
3. Clinical evaluation and disease surveillance
- a. History (including current visit and previously obtained elements) should include
 - i. Detailed history regarding diabetes course including age and characteristics of onset,
 - ii. Review of previous treatment regimens and response to therapy,
 - iii. Current treatment including medications and medication adherence,
 - iv. Current meal plan, physical activity pattern and assessment of readiness for behavior change,
 - v. Results of glucose monitoring and patient's use of results, hypoglycemic events,
 - vi. History of diabetes related complications including
 - 1. Microvascular such as retinopathy, diabetic kidney disease, neuropathy (including peripheral sensory, and autonomic such as sexual dysfunction and gastroparesis),
 - 2. Macrovascular including coronary artery disease, cerebrovascular disease, peripheral arterial disease,
 - vii. Other complications including psychosocial problems and dental disease

1. Psychosocial assessment and care recommendations include
 - a. Attitudes about illness, expectations for medical management and outcomes,
 - b. Affect and mood,
 - c. General and diabetes-related quality of life,
 - d. Resources including financial, social and emotional support
 - e. Psychiatric history,
 - f. Screening for depression, eating disorders and cognitive impairment when self-management is poor
- b. Physical examination should include
 - i. Height, weight and body mass index,
 - ii. Blood pressure,
 - iii. Thyroid examination,
 - iv. Skin examination,
 - v. Peripheral vascular examination,
 - vi. Neurologic examination including
 1. Presence/absence of patellar and achilles reflexes,
 2. Sensory examination including proprioception, vibration and monofilament sensation.
- c. Laboratory evaluation should include
 - i. When using A1C to diagnose diabetes, it is important to recognize that A1C is an indirect measure of average blood glucose levels and to take other factors into consideration that may impact hemoglobin glycation independently of glycemia including age, race/ethnicity, and anemia/hemoglobinopathies Fasting lipid profile, at least annually, and more frequently if needed to assess changes in treatment regimen
 - ii. Liver function tests, at least annually
 - iii. Urine albumin to creatinine ratio or microalbumin, at least annually
 - iv. Serum creatinine and calculated GFR, at least annually

- v. TSH in type 1 diabetes, dyslipidemia or women over 50, at least annually
- d. Referrals to include
 - i. Eye care professional for dilated annual examination
 - ii. Registered dietitian for medical nutritional therapy
 - iii. Dentist for comprehensive periodontal examination
- 4. Disease management for type 2 diabetes
 - a. General principles
 - i. The management plan should emphasize a collaborative approach utilizing a care team and engaging the patient in self-management. The care team should include members responsible for clinical decision making, tracking patient progress toward treatment goals, and diabetes education. Using principles of patient-centered care, primary care practices treating diabetics should develop roles and responsibilities for members of the care team, which may include physicians, mid-level providers, nurses, pharmacists, behavioral health specialists and educators. When involvement of medical-surgical specialists is indicated, the care team is also responsible for tracking the patient's involvement with specialists and the assimilation of specialty evaluation and treatment into the patient's individual care plan.
 - b. Ongoing assessment of glycemic control
 - i. Hemoglobin A1c, at least every 6 months, and when target levels are not achieved, or treatment changes are made, every 3 months is appropriate to guide clinical decision making
 - ii. Self-monitoring of blood glucose (SMBG)
 - 1. Patients on multiple-dose insulin (MDI) should perform SMBG at least prior to meals, occasionally postprandially, at bedtime, prior to exercise, when they suspect hypoglycemia and prior to crucial tasks such as driving.
 - 2. SMBG may be useful to guide treatment decisions and self-management for patients on single dose insulin or non-

insulin therapies. Ongoing education which directs patients to proper action steps when SMBG is out of target range is recommended.

3. Continuous glucose monitoring (CGM) may be a useful supplemental tool in those with frequent hypoglycemia or hypoglycemia unawareness.
4. Use of continuous glucose monitoring (CGM) in adults with type 1 diabetes has been expanded to all adults (18 and above) who are not meeting glycemic targets

c. Medication management

- i. Initiate metformin therapy along with lifestyle interventions, unless metformin is contraindicated,
- ii. In newly diagnosed type II diabetic with markedly symptomatic and/or elevated blood glucose levels, consider insulin therapy with or without additional agents from the outset,
- iii. If non-insulin monotherapy at maximal tolerated dose does not achieve or maintain A1c target over 3-6 months, add a second oral agent, a GLP-1 receptor agonist, or insulin
- iv. insulin is the preferred agent for the management of type 1 and type 2 diabetes in pregnancy
- v. A table of medication algorithms indicated for control of type 2 diabetes is found in Attachment A, which can also be accessed by following the link:

https://care.diabetesjournals.org/content/38/Supplement_1/S41

d. Nih

- e. Evaluation for the presence of, and treatment of coexisting cardiovascular risk factors including

- i. Current tobacco use
 - 1. Current tobacco user should receive counseling regarding the adverse health consequences of smoking and encouraged to quit
- ii. Hypertension
 - 1. Guidelines from the American Diabetic Association, Standards of Medical Care in Diabetes – 2016, state:
People with diabetes and hypertension should be treated to a systolic blood pressure (SBP) goal of ,140 mmHg.
 - b Lower systolic targets, such as ,130 mmHg, may be appropriate for certain individuals, such as younger patients, if they can be achieved without undue treatment burden.
 - c Individuals with diabetes should be treated to a diastolic blood pressure (DBP) ,90 mmHg.
 - d Lower diastolic targets, such as ,80 mmHg, may be appropriate for certain individuals, such as younger patients, if they can be achieved without undue treatment burden.(This is new information)
 - 2. Inhibitors of the renin angiotensin system may have unique advantages for initial or early treatment in patients with coexisting diabetes and hypertension.
 - 3. Consider mineralocorticoid receptor antagonist therapy in patients with resistant hypertension
- iii. Lipid disorder
 - 1. Lifestyle recommendations for lipid-lowering include reduction of total calories consumed, reduction in proportion of calories from saturated fat, trans-fat and cholesterol with increase in omega-3-fatty acids, viscous fiber and plant stanols-sterols.
 - 2. Statin therapy should be added to lifestyle therapy regardless of lipid levels for diabetic patients with overt

Atherosclerotic cardiovascular disease, and in patients over age 40 with one or more additional cardiovascular risk factor.

3. Consider adding ezetimibe to moderate-intensity statin provides additional cardiovascular benefits for select individuals with diabetes.
4. Consider adding non-statin LDL-lowering therapies for patients with diabetes and ASCVD who have LDL cholesterol 70 mg/dL despite maximally tolerated statin dose.

iv. Anti-thrombotic therapy

1. Consider aspirin (75-162 mg per day) as a primary prevention strategy in diabetics with increased risk of *Atherosclerotic cardiovascular disease*; i.e. those with a 10 year risk calculation exceeding 10%. This includes most men and women over 50 who have at least one additional major risk factor such as family history of *Atherosclerotic cardiovascular disease*, hypertension, smoking, dyslipidemia or albuminuria.
2. Women with type 1 and type 2 diabetes to should take low-dose aspirin starting at the end of the first trimester to lower the risk of preeclampsia.
3. Use aspirin (75-162 mg per day) as a secondary prevention strategy in diabetics with *Atherosclerotic cardiovascular disease*.

f. Assessment of common comorbid conditions. For patients with risk factors, signs or symptoms, consider assessment and treatment for common diabetes associated conditions including:

- i. Hearing impairment,
- ii. Obstructive sleep apnea,
- iii. Fatty liver disease,
- iv. Low testosterone in men,
- v. Periodontal disease,

- vi. Osteoporosis,
- vii. Cognitive impairment,
- viii. Cancers including liver, pancreas, endometrium, colorectal, breast and bladder.

5. Diabetes self-management education (DSME)

- a. People with diabetes should receive DMSE according to national standards and diabetes self-management support at the time of diagnosis and as needed thereafter,
- b. Effective self-management and quality of life are the key outcomes of DMSE and should be measured and monitored as part of care,
- c. DMSE should address psychosocial issues since emotional well-being is associated with positive diabetes outcomes,
- d. Physical activity recommendations include
 - i. At least 150 min. per week of moderate intensity aerobic exercise spread over at least 3 days per week and,
 - ii. Resistance training at least twice per week, in the absence of contraindications
- e. Medical nutritional therapy
 - i. Weight loss is recommended for all overweight or obese diabetics. Either low carbohydrate, low-fat calorie restricted or Mediterranean diet may be effective.
 - ii. Physical activity and behavior modification are important components of weight loss programs and are most helpful in maintenance of weight loss.
 - iii. The mix of carbohydrate, protein and fat may be adjusted to meet the metabolic goals and individual preferences of the person with diabetes.
 - iv. Monitoring carbohydrate, whether by carbohydrate counting, choices or experience-based estimation, remains a key strategy in achieving glycemic control.
 - v. Reducing trans-fat intake lowers LDL cholesterol and increases HDL cholesterol.

- vi. Adults who choose to use alcohol should do so in moderation, one drink per day for women, 2 drinks or less per day for adult men.

6. Immunizations

- a. Influenza vaccine annually,
- b. Pneumococcal polysaccharide vaccine upon diagnosis and one-time revaccination at age 65, or 5 years after initial vaccine, whichever comes last
- c. *Hepatitis B vaccine is recommended for all diabetics age 19-59 years, and should be considered in those age > 60 years.*

7. Clinical Quality Measures

- a. HEDIS 2012 Comprehensive Diabetes Care
 - i. Hemoglobin A1c > 9.0, < 8.0, <7.0
 - ii. Retinal eye exam within the past 2 years
 - iii. LDL cholesterol testing within one year and less than 100
 - iv. Microalbumin testing within one year
 - v. Blood pressure less than 140/90
 - vi. Blood pressure less than 130/80
- b. Healthy People 2020 Diabetes Objectives
 - i. Reduce the annual number of new cases of diagnosed diabetes in the population
 - ii. Reduce the death rate among the population with diabetes
 - 1. Reduce the all-cause mortality rate among diabetics
 - 2. Reduce cardiovascular death rates among diabetics
 - iii. Reduce the rate of lower extremity amputations among diabetics
 - iv. Improve glycemic control among the population with diagnosed diabetes
 - 1. Reduce the proportion with A1 C value > 9.0
 - 2. Increase the proportion with A1 C value < 7.0
 - v. Improve lipid control among persons with diagnosed diabetes
 - vi. Increase the proportion of diabetics whose blood pressure is under control

- vii. Increase the proportion of diabetics who have an annual dental examination
- viii. Increase the proportion of diabetics who have an annual foot examination
- ix. Increase the proportion of diabetics who have an annual dilated eye examination
- x. Increase the proportion of diabetics with at least 2 A1c measurements per year
- xi. Increase the proportion of diabetics who have an annual urinary microalbumin
- xii. Increase the proportion of diabetics who perform self blood glucose monitoring at least daily
- xiii. Increase the proportion of diabetics who receive formal diabetes education
- xiv. Increase the proportion of persons with diabetes whose condition has been diagnosed
- xv. Increase prevention behaviors in persons at high risk for diabetes
 - 1. Increase the proportion of pre-diabetics who report increasing their activity level
 - 2. Increase the proportion of pre-diabetics who report reducing the amount of fat or calories in their diet

8. References

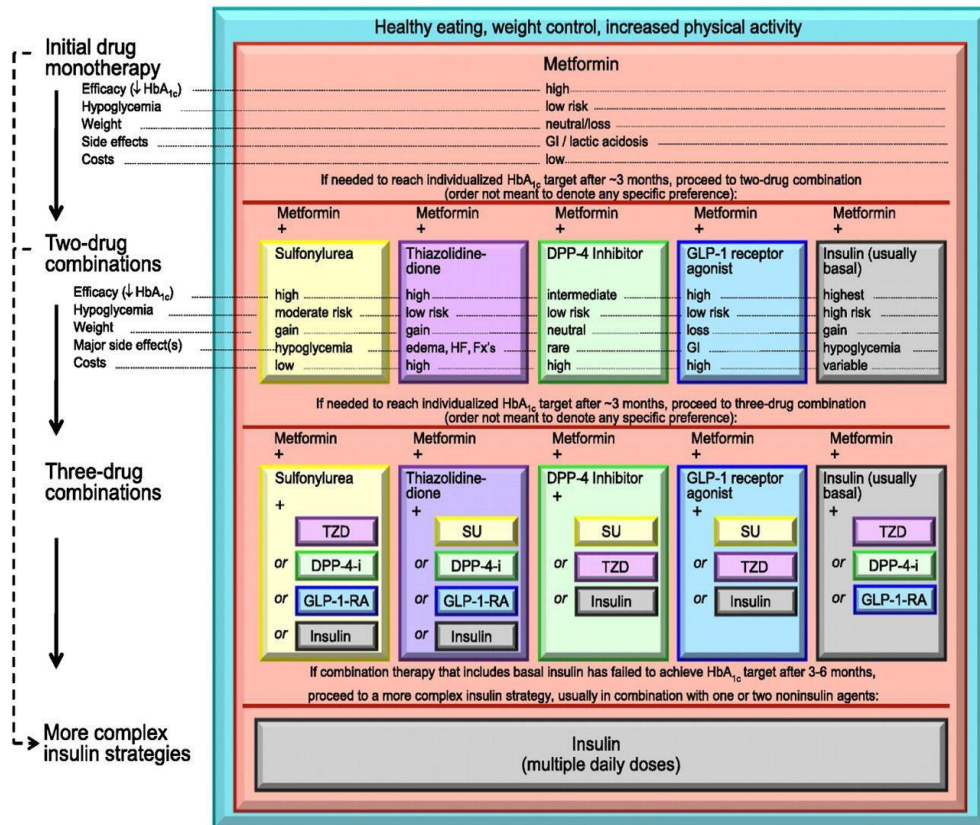
- a. American Diabetes Association, *Diabetes Care*, Standards of Medical Care in Diabetes-2016 , doi: 10.2337/dc15-S003 Diabetes Care January 2015 vol. 38 no. Supplement 1 **S1-S93**
https://care.diabetesjournals.org/content/suppl/2015/12/21/39.Supplement_1.DC2/2016-Standards-of-Care.pdf US Department of Health and Human Services, National Diabetes Education Program, Guiding Principles for Diabetes Care <https://www.niddk.nih.gov/health-information/communication-programs/ndep/health-professionals/guiding-principles-care-people-risk-diabetes>
- b. American Medical Association, 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults - Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8)
<http://jama.jamanetwork.com/article.aspx?articleid=1791497>

9. Patient Resources

- a. US Department of Health and Human Services, National Diabetes Education Program, 4 Steps to Control Your Diabetes. For Life.
<http://ndep.nih.gov/publications/PublicationDetail.aspx?PubId=4>
- b. US Department of Health and Human Services, Physical Activity Guidelines for Americans, Be Active Your Way: A Guide For Adults
<https://www.hhs.gov/fitness/be-active/physical-activity-guidelines-for-americans/index.html>
- c. US National Library of Medicine, National Institutes of Health, MedlinePlus, Diabetes Diet-Type II,
<http://www.nlm.nih.gov/medlineplus/ency/article/007429.htm>
- d. United States Department of Agriculture, USDA, choosemyplate.gov, Let's Eat for the Health of It,
<https://www.uaex.edu/health-living/food-nutrition/guidelines/Lets%20Eat%20for%20the%20Health%20of%20It.pdf>
- e. American Diabetes Association, Learning How to Change Habits,
<http://www.bsw hjcraft.com/Documents/ada-making-a-plan.pdf>

Attachment A

Antihyperglycemic therapy in type 2 diabetes: general recommendations.



American Diabetes Association Dia Care 2014;37:S14-S80