Management of Diabetes Mellitus in Adults 18 - 75 Years of Age

CARE MANAGEMENT OVERVIEW

Diabetes mellitus (DM) is a group of metabolic diseases in which a person has high blood sugar. This high blood sugar produces the symptoms of frequent urination, increased thirst, and increased hunger. Untreated, diabetes can cause many complications. Acute complications include diabetic ketoacidosis (high blood sugar) and/or hypoglycemia (low blood sugar). Serious long-term complications include heart disease, kidney failure, and small blood vessel disease resulting in circulation problems, leading to poor wound healing, and damage to the retina (and potential blindness). It is estimated that diabetes affects 382 million people worldwide, and the prevalence is increasing in every country. Among adults in the United States, the estimated overall prevalence of diabetes ranges from 5.8 to 12.9 percent (median 8.4 percent). Using data from a national survey for people aged 20 years or older, the prevalence of type 2 diabetes in the United States from 2007 to 2009, was as follows: Native Americans (as high as 33.5%), Non-Hispanic Blacks (12.6%), Hispanics (11.8%), Asian Americans (8.4%), and Non-Hispanic Whites (7.1%). In the early 1990s, type 2 diabetes represented about 3 percent of pediatric diabetes in the United States. By 2003, type 2 diabetes represented about 20 percent of pediatric diabetes, and, depending on locale, nearly half of the cases of diabetes among adolescents 15 to 19 years of age.

Major Diabetes Complications

- Retinopathy - damage to blood vessels in the retina.
- Cerebrovascular disease - a condition that affects the circulation of blood to the brain.
- Coronary heart disease - a disease in which plaque builds up inside the coronary arteries.
- Nephropathy – kidney damage.
- Peripheral vascular disease - the obstruction of large arteries, often affecting the lower limbs.
- Neuropathy - nerve damage in the peripheral nervous system.
- Ulceration and amputation - for diabetic foot.

Normal Regulation of Glucose

Normally, the level of glucose in the blood is carefully regulated by insulin and glucagon. Glucagon raises blood glucose levels and insulin lowers blood glucose levels. After a meal, blood glucose levels rise and the glucose enters the pancreatic beta-cells. In the pancreatic beta-cells, glucose sensors trigger a sequence of events that releases insulin. The release of insulin lowers blood sugar in two ways: it decreases glucose production by the liver or it increases glucose uptake by skeletal muscle and fatty tissues.

Glucagon is a naturally occurring hormone that is also produced in the pancreas. The main function of glucagon is to react to a situation where there is a low level of blood glucose present. The release of glucagon into the bloodstream helps to restore blood glucose levels back to a point that is considered acceptable for the general function of the body.
The Liver and Diabetes

The liver acts as the body’s glucose (or fuel) reservoir, and helps to keep circulating blood sugar levels and other body fuels steady and constant. The liver both stores and manufactures glucose depending upon the body’s need. The need to store or release glucose is primarily signaled by the hormones insulin and glucagon. During a meal, the liver stores glucose as glycogen for a later time when the body needs it. High levels of insulin and suppressed levels of glucagon during a meal promote storage of glucose as glycogen. Depending on whether you need more or less glucose, your body will convert glycogen to glucose, or convert glucose into glycogen and store it in the liver.

Management of the Three Types of Diabetes

Diabetes is due to either the pancreas not producing enough insulin, or because the body does not respond properly to the insulin that is produced. Click each tab on the left to find out more about the three types of diabetes.

Type 1. Results from the body's failure to produce insulin. This form was previously referred to as “insulin-dependent diabetes mellitus” (IDDM) or “juvenile diabetes.” Must be managed with insulin as the pancreas is no longer able to manufacture a sufficient amount of insulin. A pancreas transplant may be considered for people with type 1 diabetes who have severe complications of their disease.

Type 2. Results from insulin resistance, a condition in which cells fail to use insulin properly. This form was previously referred to as non-insulin-dependent diabetes mellitus (NIDDM) or “adult-onset diabetes.” May be treated with medications, with or without insulin. Bariatric surgery (gastric bypass, lap-band or sleeve procedures) has been successful in many with severe obesity and type 2 diabetes management.

Gestational. The third main form and occurs when pregnant women, without a previous diagnosis of diabetes, develop a high blood glucose level. Gestational diabetes usually resolves after the birth of the baby.

Prevention and treatment often involves a healthy diet, physical exercise, avoidance of tobacco and maintaining an appropriate body weight (BMI). Because diabetics have an increased risk for myocardial infarction and stroke, blood pressure control is also important. Due to circulatory problems in diabetics, wounds do not heal as well and skin ulcers can develop. For this reason, proper foot care is also important for people with the disease.

Type 2 Diabetes

Type 2 diabetes is due primarily to lifestyle factors and genetics. A number of lifestyle factors are known to be important to the development of type 2 diabetes, including obesity (BMI>30), lack of physical activity, poor diet, stress, and living in cities. Dietary factors also influence the risk of developing type 2 diabetes. Consumption of sugar-sweetened drinks in excess is associated with an increased risk. The type of dietary fats is also important, with saturated and trans fatty acids increasing the risk. Eating lots of white rice appears to also play a role in increasing risk. A lack of exercise is believed to cause 7% of cases. In the early stage of type 2, the predominant abnormality is reduced insulin sensitivity. At this stage, high blood glucose can be reversed by a variety of lifestyle changes (diet, exercise, weight loss) and medications that improve insulin sensitivity or reduce glucose production by the liver.

When is Diabetes Diagnosed?

Hemoglobin. Hemoglobin A1c is equal to or greater than 6.5 percent - OR - <click next situation>

FPG. FPG is > 125 mg/dl - OR - <click next situation>

OGTT Glucose Level. OGTT glucose level is equal to or greater than 200 mg/dl - OR - <click next situation>

Hyperglycemia Symptoms. In a patient with classic symptoms of hyperglycemia, a random blood glucose level is equal to or greater than 200 mg/dl.
Treatment of Adults with Diabetes

Treatment of adults with diabetes may include:
- Target A1c level to 7 or lower (but may be higher in older adults); medications initially may include Metformin, Insulin and/or Sulfonylurea
- Treat cardiovascular risk factors (smoking cessation, use aspirin, treat HBP, reduce high cholesterol levels)
- Weight reduction and dietary modifications
- Exercise

Treatment Options Based on HbA1c Level

If HbA1c is ≥7% and <8%, or above the individualized goal for 6 or more months:
- Review and clarify the management plan with the patient with attention to:
  - meal plan
  - activity program
  - medication administration schedule, technique and practices
  - self-monitoring blood glucose (SMBG) schedule and technique
  - treatment for hypoglycemia and hyperglycemia sick day management practices
- Reassess goals and adjust medication as needed
- Communicate individualized glycemic goals to patient
- Referral to diabetes educator (DE) for evaluation, DSME and ongoing consultation
- Consider referral to registered dietitian (RD) for medical nutrition therapy (MNT)
- Schedule follow-up appointment within 3-4 months or more frequently as situation dictates

If HbA1c is ≥8%:
- Review and clarify the plan as previously noted
- Assess for psychosocial stress
- Refer patient to DE for evaluation, DSME and ongoing consultation. Document reason if no referral initiated.
- Intensify therapy
- Refer patient to RD for MNT
- Communicate individualized glycemic goals to patient

Tests for Diabetes

Hemoglobin A1c (glycated hemoglobin) is a form of hemoglobin that measures the average blood glucose level over periods of time. Normal levels of glucose produce a normal amount of glycated hemoglobin. As the average level of blood glucose increases Hemoglobin A1c increases in a predictable way.

Fasting Plasma Glucose (FPG) is a measured blood glucose level after 8 hours of no caloric intake.

Oral Glucose Tolerance Test (OGTT) tracks blood glucose levels over two hours following a glucose load.

The American Diabetes Association recommends the following criteria for asymptomatic adults:
- Testing should be considered in all adults who are overweight (BMI ≥ 25 kg/m2) and have additional risk factors:
  - Physical inactivity
  - First-degree relative with diabetes
  - High-risk ethnic populations (African American, Latino, Native American, Asian American, Pacific Islander)
  - Women who delivered a baby weighing ≥ 9 lb or were diagnosed with GDM
  - Women with a history of hypertension (≥ 140/90 mmHg or on therapy for hypertension)
  - HDL cholesterol level <35 mg/dl (0.90 mmol/l) and/or a triglyceride level >250 mg/dl (2.82 mmol/l)
  - Women with polycystic ovary syndrome
  - A1C ≥ 5.7%, IGT, or IFG on previous testing
  - Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)
- history of CVD
- In the absence of the above criteria, testing diabetes should begin at age 45 years.
- If results are normal, testing should be repeated at least at 3-year intervals, with consideration of more frequent testing depending on initial results and risk status.

Note: At-risk BMI may be lower in some ethnic groups.

Changes in Diabetes-Related Complications

In the U.S. between 1990-2010, there has been a general decline in the rate of diabetic complications, including acute myocardial infarction, stroke, amputation, end stage renal disease, and death from hyperglycemic crises. However, the number of adults diagnosed with diabetes has risen from 6.54 M to 20.68 M; absolute numbers of cases have increased.

Behavioral Health and Diabetes

Diabetics with a Behavioral Health diagnosis are 2-3 times more costly than diabetics without a BH diagnosis.

Sexual Dysfunction. The prevalence of erectile dysfunction increased progressively with age, from 6 percent in men aged 20 to 24 years, to 52 percent in men aged 55 to 59 years. In addition to increasing age, the main factors associated with erectile dysfunction were peripheral or autonomic neuropathy, retinopathy, long duration of diabetes, and poor glycemic control. Not surprisingly, men with diabetes who develop erectile dysfunction (ED) experience a significant decline in quality-of-life measures as well as an increase in depressive symptoms. Conversely, depression is a well-recognized contributor to ED. Unfortunately, ED may go undetected as many clinicians do not inquire about sexual health. As an example, a large epidemiologic survey reported that the majority of men with diabetes and erectile dysfunction had never been asked by their clinicians about their sexual function and, therefore, did not receive treatment. Thus, erectile dysfunction can result from local nerve damage (e.g., neuropathy or surgical trauma), impaired blood flow to the penis, or psychological factors; several of these factors are present in most cases. Several treatments for men with erectile dysfunction are available, none of which is specific for diabetes.

Identifying the underlying etiology, including drugs such as antidepressants or antihypertensive agents that may be causing or contributing to the erectile dysfunction (ED). For example, ED due to selective serotonin reuptake inhibitor (SSRI) may be helped by the addition of a second agent, buproprion. Identifying and treating cardiovascular risk factors such as smoking, obesity, hypertension, and dyslipidemia, as both lifestyle measures and pharmacotherapy for risk factor reduction are sometimes effective for prevention and treatment of ED. For first-line therapy, phosphodiesterase-5 (PDE-5) inhibitors have efficacy, ease of use, and favorable side effect profile. However, PDE-5 inhibitors are contraindicated in men taking nitrates and should be used cautiously in men receiving an alpha-adrenergic blocker Sildenafil, vardenafil, tadalafil, and the newest available agent, avanafil, appear to be equally effective, but tadalafil has a longer duration of action and avanafil may have a more rapid onset.

Smoking and Diabetes. The diabetic population has a higher rate of quit attempts, and a lower rate of cigarette smoking than the general population. Quitting smoking was the single best risk reduction strategy for diabetics, and improves survival more than any other modifiable risk factor.

Depression. Rates in diabetes average 25%, but are often under-diagnosed. Signs and symptoms of depression include:

- Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). In children and adolescents, this may be characterized as an irritable mood.
- Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day.
- Significant weight loss when not dieting or weight gain (e.g., a change of more than 5 lbs of body weight in a month), or decrease or increase in appetite nearly every day.
- Insomnia or hypersomnia nearly every day.
- Psychomotor agitation or retardation nearly every day.
- Fatigue or loss of energy nearly every day.
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- Feelings of worthlessness or excessive or inappropriate guilt nearly every day.
- Diminished ability to think or concentrate, or indecisiveness, nearly every day.
- Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.

Anxiety. At least 6 months of "excessive anxiety and worry" about a variety of events and situations. Generally, "excessive" can be interpreted as more than would be expected for a particular situation or event. Most people become anxious over certain things, but the intensity of the anxiety typically corresponds to the situation. There is significant difficulty in controlling the anxiety and worry. If someone has a very difficult struggle to regain control, relax, or cope with the anxiety and worry, then this requirement is met. The presence for most days over the previous six months of 3 or more (only 1 for children) of the following symptoms:

- Feeling wound-up, tense, or restless
- Easily becoming fatigued or worn-out
- Concentration problems
- Irritability
- Significant tension in muscles
- Difficulty with sleep

The following screening tools are available on the Substance Abuse and Mental Health Services Administration (SAMHSA) website at http://www.integration.samhsa.gov/clinical-practice/screening-tools or http://www.phqscreeners.com/

- PHQ-9 (also available in Spanish, as well as in a modified version for adolescents)
- GAD – 7 Anxiety Screening Tool

Principles of Integrated Treatment

Management of diabetes involves:
- Lifestyle changes
- Monitoring of Hemoglobin A1c
- Medications for control of blood glucose
- Other significant changes in health status (e.g., higher risk of cardiovascular and behavioral health complications)
- Screening for medical and behavioral complications
- Preventing progression of diabetic complications

RECOMMENDATIONS AND COMPONENTS OF COMPREHENSIVE EVALUATION

At each visit until therapeutic goals are achieved, providers should make the following recommendations:
- ACE Inhibitor as indicated for any degree of albuminuria and to delay the progression of nephropathy, regardless of the presence or absence of hypertension. (For those patients with hypertension who are intolerant to ACE Inhibitors, consider ARB therapy).
- Statin therapy for primary prevention against macro-vascular complications in patients with diabetes who are ≥ age 40 or who have an LDL-C > 100 mg/dl
- An anti-platelet agent for primary prevention of CVS disease unless contraindicated
- Pneumococcal and influenza vaccinations, as appropriate
- Consider the use of antidepressants as clinically appropriate
- Treatment of hypertension to achieve a target of < 130/80 for adults

Components of the Comprehensive Diabetes Evaluation includes the following:

- Medical History including age and characteristics of onset of diabetes (e.g., DKA, asymptomatic laboratory finding), eating patterns, physical activity habits, nutritional status, and weight history; growth and development in
children and adolescents. Providers should obtain the member’s diabetes education history and review previous treatment regimens and response to therapy (A1C records).

- **Current treatment of diabetes, including medications, meal plan, physical activity patterns, and results of glucose monitoring and patient’s use of data.** Information should include DKA frequency, severity, and cause, as well as hypoglycemic episodes (including hypoglycemia awareness and any severe hypoglycemia), frequency and cause. Other tests may include psychosocial problems (e.g., to identify a depressed mood, anxiety, an eating disorder, cognitive impairment, substance abuse and/or dependence) and dental disease*. Providers should learn the history of diabetes-related complications. For example:
  - *Microvascular:* retinopathy, nephropathy, neuropathy (sensory, including history of foot lesions; autonomic, including sexual dysfunction and gastroparesis); dilated eye examination by an eye-care profession (optometrist or ophthalmologist) for the screening and early intervention of retinal disease
  - *Macrovascular:* CHD, cerebrovascular disease, PAD
  - *Cardiovascular:* identify modifiable risks for cardiovascular disease: (smoking, hypertension, dyslipidemia, sedentary lifestyle, stress)

- **Physical Examination** should include weight, height and body mass index (BMI) as well as patient’s blood pressure (including orthostatic measurements when indicate with a goal of < 130/80 mmHg), fundoscopic examination*, thyroid palpation, skin examination (for acanthosis nigricans and insulin injection sites), comprehensive foot examination (including monofilament testing), and palpation of dorsalis pedis and posterior tibial pulses. Providers should look for the presence / absence of patellar and Achilles reflexes as well as determining proprioception, vibration, and monofilament sensation.

- **Laboratory Evaluation** may include A1C levels (if results not available within past 2–3 months) with a hemoglobin A1c (HbA1c) goal of < 7%. If tests not performed or available within past year, providers should include the following tests:
  - Fasting lipid profile, including total, LDL- and HDL cholesterol and triglycerides – goal LDL<100 mg/dl, HDL>40 mg/dl (men), HDL>50 mg/dl (women)
  - Liver function tests
  - Test for urine albumin excretion with spot urine albumin/creatinine ratio (screening for nephropathy)
  - Serum creatinine and calculated GFR
  - TSH in type 1 diabetes, dyslipidemia, or women over age 50 years
  - Screen for thyroid peroxidase and thyroglobulin antibodies (hypothyroidism)

* 1-4 times per year, based on individual therapeutic goals and previous test results

- **Referrals** may include an annual dilated eye exam, family planning for women of reproductive age, registered dietitian for MNT; diabetes self-management education (DSME), dental examination and behavioral health professional, if needed.

**MEMBER EDUCATION, COUNSELING AND RISK FACTOR MODIFICATION**

Upon diagnosis, and as needed, each patient should receive written management plans that are reviewed and revised annually with the assistance of a diabetic team consisting of the physician, certified diabetic educator, and registered dietitian. The management plan should incorporate the following facets of care:

- Blood glucose management and frequency of self-monitoring of blood glucose (SMBG) determined by severity
- Nutrition counseling, including role of weight in insulin resistance and importance of progress toward ideal body weight, as recommended by registered dietitian
- Blood pressure management
- Regular exercise program
- Training in self-management skills and problem solving, if appropriate, refer to diabetic education classes and WellCare’s Diabetes Disease Management Program
- Self-care of feet
• Cardiovascular risk reduction
• Smoking cessation program and avoiding secondhand smoke

SPECIAL POPULATIONS

Transition Between Pediatric and Adult Care

Providers should pay careful attention to issues that can arise during the critical transition period:
• Differences between pediatric and adult care
• Poor control of glycemia and other risk factors
• Loss to follow-up
• Increased risk for acute complications
• Psychosocial issues
• Sexual and reproductive health issues
• Alcohol, smoking and drug abuse
• Emergence of signs of chronic diabetes complications

The following are ADA recommendations that providers should note during the transition period:
1. Prepare the teen patient for upcoming transition at least one year prior.
2. Preparation should include a direct focus on diabetes self-management education including the patient and parent(s); the goal is to gradually transfer diabetes care responsibilities from the parent or guardian to the teen. Areas of focus include glucose self-monitoring and insulin administration and should include scheduling appointments and ensuring a proper supply of medications and supplies.
3. Inform patients of the differences between pediatric and adult providers in their approaches to care, as well as education regarding health insurance options and how to maintain coverage.
4. Provide a written summary to the patient and future adult care provider including an active problem list, compilation of medications, assessment of diabetes self-care skills, summary of past glycemic control and diabetes related comorbidities, as well as a summary of any mental health problems and referrals.

In addition, please refer to Diabetes in Children (HS-1004) for additional information on pediatric care and diabetes.

Pregnant Women

The following is a general summary of gestational diabetes. For more information, please refer to WellCare’s Clinical Practice Guideline Pregnancy Guidelines. A risk assessment should be conducted during the initial prenatal visit to determine if testing for gestational diabetes (GD) should occur prior to 24-28 weeks gestation. Risk factors for GD include:
• Having a previous pregnancy with gestational diabetes
• Having a baby born weighing over 9 pounds
• Being overweight or obese
• Are more than 25 years old
• Have a family history of diabetes
• Are African American, Hispanic, American Indian, Alaska Native, Native Hawaiian, or Pacific Islander
• Are being treated for HIV
• Presence of glycosuria (glucose in the urine)
• Diagnosis of polycystic ovary syndrome (PCOS)

HEDIS AND STAR MEASURES

CMS has published the following metrics pertaining to diabetes:

Diabetes Care – Blood Sugar Controlled. Members with diabetes should have an annual A1c lab test to confirm that average blood sugar is under control.
Diabetes Care – Cholesterol Screening. Members with diabetes should have an annual cholesterol test to detect “bad” (LDL) cholesterol (or less than 100).

Diabetes Care – Cholesterol Controlled. Members with diabetes should have an annual cholesterol test showing an acceptable level of “bad” (LDL) cholesterol (or less than 100).

Diabetes Care – Eye Exam. Members with diabetes should have an annual eye exam to check for damage related to diabetes.

Diabetes Treatment – High Blood Pressure Monitoring. Members should be monitored for high blood pressure and prescription medication recommended.

Diabetes Care – Kidney Disease Monitoring. Members with diabetes should be monitored for kidney function annually.

Medication Adherence for Diabetes Medications. Ensuring member medication adherence is important. Talk with members about how they can remember to take their medication as directed and fill their prescription(s). Prescribed drug therapy across classes of diabetes medications includes: biguanides, sulfonylureas, thiazolidinediones, and Dipeptidyl Peptidase (DPP)-IV Inhibitors, incretin mimetics, and meglitinides.

NOTE: “Diabetes medication” means a biguanide drug, a sulfonylurea drug, a thiazolidinedione drug, a DPP-IV inhibitor, an incretin mimetic drug, or a meglitinide drug. Plan members who take insulin are not included.

NCQA has published the following standard metrics related to diabetes:

Comprehensive Diabetes Care. Members 18–75 years of age with diabetes (type 1 and 2) should have the following:
- Hemoglobin A1c (HbA1c) testing
- HbA1c poor control (>9.0%)
- HbA1c control (<8.0%)
- HbA1c control (<7.0%) for a selected population*
- Eye exam (retinal) performed
- Medical attention for nephropathy.
- BP control (<140/90 mm Hg)

* Additional exclusion criteria are required for this indicator that will result in a different eligible population from all other indicators. This indicator is only reported for the commercial and Medicaid product lines.

Diabetes Screening for People With Schizophrenia or Bipolar Disorder Who Are Using Antipsychotic Medications. Members 18 to 64 years of age with schizophrenia or bipolar disorder who were dispensed an antipsychotic medication should have an annual diabetes screening.

Diabetes Monitoring for People With Diabetes and Schizophrenia. Members 18 to 64 years of age with schizophrenia and diabetes should have an annual LDL-C test and HbA1c test.

RELATED CLINICAL PRACTICE GUIDELINES

In addition to the information contained in this document, please reference the following CPGs: Cholesterol Management (HS-1005), Diabetes in Children (HS-1004), Hypertension (HS-1010), and Smoking Cessation (HS-1035).

REFERENCES


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MEDICAL POLICY COMMITTEE HISTORY AND REVISIONS

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