

DIABETES CARE FOR CLIENTS IN BEHAVIORAL HEALTH TREATMENT

People with mental illness, substance use disorders (SUDs), or both are at increased risk for developing diabetes, a chronic metabolic disease with numerous long-term health consequences. Untreated behavioral health disorders can exacerbate diabetes symptoms and complications. In addition, companion features of behavioral health disorders—such as poor self-care, improper nutrition, reduced physical activity, and increased barriers to preventive or primary health care—can adversely affect management of co-occurring diabetes.

This *Advisory* provides a brief overview of diabetes and an introduction to the reciprocal relationship between diabetes and behavioral health disorders. It also discusses ways in which behavioral health treatment providers can help minimize consequences of diabetes for their clients by screening for the disease, providing referrals to care as needed, and coordinating care with other providers. Counselors also can play an important role supporting clients to simultaneously manage their diabetes and their recovery from mental illness or an SUD.

What Is Diabetes?

Diabetes is a chronic disease characterized by elevated blood glucose levels. It occurs when glucose digested from food is unable to enter the body's cells to be used for energy. The hormone *insulin* is necessary for the cells to absorb glucose. In type 1 diabetes, the pancreas does not make enough insulin or stops making insulin completely; glucose remains in the bloodstream rather than transferring into the cells. A person with type 1 diabetes must be given insulin to live. This form of diabetes most often begins early in life and appears to have both genetic and environmental causes.

Type 2 diabetes is far more common than type 1.¹ In the individual with type 2 diabetes, insulin becomes less effective at helping transport blood glucose into cells. If the disease is untreated, over a period of years the cells become progressively more resistant to insulin, even as the pancreas makes increasingly larger amounts of the hormone to compensate. The overworked pancreas can deteriorate to the point where it stops producing insulin altogether.

A family history of diabetes is a significant risk factor for type 2 diabetes, suggesting a strong genetic component. Other risk factors for type 2 diabetes include being overweight, having had gestational diabetes (diabetes that is diagnosed for the first time during pregnancy), lack of physical activity, and being a member of certain races/ethnicities including African American, Hispanic/Latino American, American Indian, and some Asian American and Native Hawaiian or other Pacific Islander groups.¹ Taking atypical antipsychotic medications is another known risk factor for type 2 diabetes.^{2,3}

In previous decades, type 2 diabetes primarily affected people who were middle-aged or older. However, as obesity, poor diet, and lack of physical activity have become more common, the type 2 diabetes rate has soared for all age groups. Between 1980 and 2011, the percentage of the population with diagnosed diabetes increased 167 percent for people ages 44 and younger and between 118 percent and 140 percent for those in other age groups.⁴

In the United States, diabetes now affects 11.3 percent of the population ages 20 and older—nearly 26 million people¹ (see Exhibit 1). Another 35 percent have *prediabetes* (approximately 79 million adults).¹ This is a condition in which blood glucose levels are higher than normal but not yet high enough for a diagnosis of diabetes. Prediabetes increases the risk for type 2 diabetes.

Exhibit 1. Diabetes Prevalence Among People Ages 20 and Older, United States, 2010¹

Demographic	Number of People	Percent of Population
Age ≥ 20 years	25.6 million	11.3%
Age ≥ 65 years	10.9 million	26.9%
Men ≥ 20 years	13.0 million	11.8%
Women ≥ 20 years	12.6 million	10.8%
Non-Hispanic Whites ≥ 20 years	15.7 million	10.2%
Non-Hispanic Blacks* ≥ 20 years	4.9 million	18.7%

*Sufficient data are not available to estimate the total prevalence of diabetes for other U.S. racial/ethnic minority populations.

What Are the Signs and Symptoms of Diabetes?

The signs and symptoms of type 1 diabetes include:⁵

- Frequent urination.
- Unusual thirst.
- Extreme hunger.
- Unusual weight loss.
- Extreme fatigue and irritability.

Many people with type 2 diabetes have no symptoms of the disease, or symptoms can be very mild.⁵ If symptoms do occur, they can include:

- Any of the type 1 diabetes symptoms.
- Frequent infections.
- Blurred vision.
- Cuts and bruises that are slow to heal.
- Tingling or numbness in the hands or feet.
- Recurring skin, gum, or bladder infections.

If left undiagnosed or untreated, over time diabetes can damage nerves and blood vessels, leading to serious problems such as cardiovascular disease, kidney disease, nerve damage, blindness, hearing loss, gum disease, impaired circulation that can sometimes result in lower-limb amputations (most often of feet and toes), and erectile dysfunction. In addition, diabetes can trigger acute symptoms that can be mistaken for intoxication but that can be life-threatening if immediate medical attention is not received (see Exhibit 2).

How Is Diabetes Diagnosed and Managed?

The tests recommended to diagnose diabetes all involve a blood draw, and the sample is sent to a laboratory for analysis (see Exhibit 3). The most convenient test is the A1C (also called the hemoglobin A1c, the HbA1c, or the glycohemoglobin test). The A1C test does not require the patient to fast before testing, and it can be administered at any time of day; however, depending on which analysis method is used, results can be unreliable for certain persons such as those with chronic kidney disease, liver disease, or anemia. The most commonly used test, the fasting plasma glucose (FPG) test, requires fasting for a minimum of 8 hours and is most accurate when given in the morning. A third test is the oral glucose tolerance test (OGTT), which also requires fasting; it is more sensitive than FPG, but it is also slightly less convenient and more expensive. When OGTT indicates high blood glucose levels, a confirmatory test is necessary, unless the patient has obvious symptoms of diabetes.⁶

An important part of disease management for type 1 and type 2 diabetes is glycemic control. This means keeping blood glucose levels within a targeted range, which is individually determined based on when the diabetes was diagnosed, the patient's age and life expectancy, and whether the patient has a comorbid condition such as cardiovascular disease. Glycemic control is achieved through a diet that regulates carbohydrate intake (type and amount), physical activity, and frequent checking of blood glucose levels using a blood glucose monitor.

Exhibit 2. Acute Diabetes Symptoms

Hypoglycemic episodes: Hypoglycemia results when blood glucose levels are too low; it is the most common complication of insulin therapy.⁷ Hypoglycemia also may be triggered by extended binge drinking* with little food consumption.⁸ Initial symptoms include headache, excessive perspiration, rapid heartbeat, lightheadedness, dizziness, and confusion. Symptoms usually recede with the ingestion of sugar (e.g., candy, juice, glucose tablets). If symptoms do not resolve quickly, immediate medical attention is required, because untreated hypoglycemia can lead to diabetic seizures, coma, and death.^{7,8}

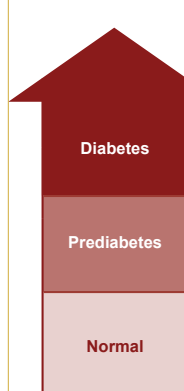
Hyperglycemic episodes: Episodes of very high blood glucose levels can occur for many reasons, such as when diabetes is undiagnosed or unmanaged, as a result of infection, or when triggered by substance use (including alcohol consumption). They also occasionally occur despite good efforts at control.

Hyperglycemic episodes can lead to a serious condition called *ketoacidosis*. It occurs when the blood contains high levels of ketones, which are substances produced when cells break down fat for energy because they cannot obtain glucose. High levels of ketones can be toxic. People with type 1 diabetes are at particular risk for ketoacidosis. Signs and symptoms include those described in the main text for type 1 diabetes as well as fruity-smelling breath, nausea, vomiting, abdominal pain, rapid heartbeat, and difficulty breathing. Confusion, lethargy, and coma (sometimes leading to death) also may occur.^{7,9} This condition, which can be mistaken for inebriation, calls for immediate medical attention.

*Binge drinking—drinking so much within about 2 hours that the level of blood alcohol concentration increases to 0.08g/dL. Typically, this may occur after four drinks for women and after five drinks for men.¹⁰

Management also may involve use of medications taken via pills, insulin injections, or insulin pumps.¹¹ People with type 1 diabetes must take insulin daily; people with type 2 diabetes may be prescribed insulin if the disease cannot be managed by other means. In people who have prediabetes and are overweight, onset of type 2 diabetes and its progression may be prevented or delayed through modest weight loss achieved by dietary changes and increased physical activity, treatment with an oral diabetes medication, or both.¹²

Exhibit 3. Blood Test Levels for Diagnosis of Diabetes and Prediabetes^{6,13}



	A1C (percent)	Fasting Plasma Glucose (mg/dL)	Oral Glucose Tolerance Test (mg/dL)
Diabetes	6.5 or above	126 or above	200 or above
Prediabetes	5.7 to 6.4	100 to 125	140 to 199
Normal	About 5	99 or below	139 or below

Definitions: mg = milligram, dL = deciliter

For all three tests, within the prediabetes range, the higher the test result, the greater the risk of diabetes.

How Is Diabetes Linked to Mental Illness?

Diabetes has a complex and reciprocal relationship with mental illness and shares metabolic features with certain mental disorders. For example, insulin resistance and impaired glucose regulation, which are features of diabetes, have been separately observed in patients with mental disorders such as schizophrenia¹⁴ and depression.¹⁵ Mental illness reduces the likelihood that a person with diabetes will be properly treated, just as mental illness is associated with other disparities in care.¹⁶

Rates of severe psychological distress are twice as high in people with diabetes compared with the rates among those without the disease.¹⁷ In addition, severe psychological distress is negatively associated with processes of diabetes care (e.g., access to prevention services) and outcomes.¹⁸ For young people with type 1 diabetes, previous psychiatric referral is a significant risk factor for death from acute diabetes-related events such as hypoglycemia or coma.¹⁹

Relationships between diabetes and some specific mental illnesses are described below.

Depression

Diabetes increases risk for depression and depressive symptoms.²⁰ CDC reports that people with diabetes have roughly a doubled risk of also having depression compared with those who do not have diabetes. Similarly, a person with depression faces a 60-percent increase in risk for type 2 diabetes.¹ A depressive disorder typically precedes a type 1 diagnosis and follows a type 2 diagnosis.¹⁵ Long-term use of antidepressant medications has been implicated in higher risk for type 2 diabetes,^{21,22} although these findings remain controversial.²³

Among all people with depression, recurrence and longer episodes are more common in people with diabetes than in those without the disease.²⁴ Even at mild levels, depression can adversely affect glycemic control and a person's ability to perform diabetes self-care.²⁴

Anxiety disorders

People with diabetes have an elevated risk for anxiety disorders compared with the general population.²⁴ Anxieties may be triggered by the burdens of having a chronic disease and by diabetes-specific factors such as having to inject insulin and living with the threat of acute diabetic symptoms and long-term complications. Such stressors may trigger generalized anxiety, obsessive-compulsive behavior, or phobic avoidance of activities necessary to managing diabetes such as checking blood glucose levels or injecting insulin.²⁴

Schizophrenia

People with schizophrenia have higher rates of hyperglycemia and type 2 diabetes than the general population, and diabetes is a leading cause of illness and death for people affected by schizophrenia-related disorders.²⁵ Antipsychotic medications used to treat schizophrenia and, increasingly, nonpsychotic emotional disorders, are associated with increased risk for type 2 diabetes.^{3,25}

Deficits in learning, attention, memory, and other cognitive functions have been detected in type 1 and type 2 diabetes

patients through neurocognitive testing.²⁶ Deficits may result from a variety of factors, including hypoglycemia, hyperglycemia, and insulin resistance. These cognitive effects can be exacerbated in people who also have schizophrenia, which presents its own risks to cognition.²⁷

Eating disorders

Compared with the general public, people with diabetes are more likely to develop eating disorders, which are more likely to occur in young women.²⁴ Eating disorders increase the risk for poor glycemic control and resulting acute diabetes symptoms.

How Is Diabetes Linked to Stress?

Stress, which can be experienced without a diagnosis of a mental disorder, increases risk for diabetes symptoms and complications. Hormones that are activated in response to stress (e.g., epinephrine, norepinephrine, cortisol, growth hormone) cause blood glucose levels to increase. Substantial evidence exists that stress can adversely affect the course of diabetes (whether it also can trigger the onset of diabetes is not established).²⁴ Stress also can interfere with diabetes self-management, although the effects may depend on how the stress is perceived (that is, as positive or negative) and whether psychosocial or psychological support is available.²⁸

How Is Diabetes Linked to Substance Use Disorders?

Some substances of abuse (e.g., nicotine, amphetamine) induce a chemical process in the body, *advanced glycation end-product reaction*, that contributes to the development of diseases such as diabetes.²⁹ Certain substances (e.g., methylenedioxymethamphetamine [MDMA, "ecstasy"], ketamine, cocaine) have immediate metabolic effects that can trigger acute diabetes symptoms in people with the disease.³⁰

Increased insulin resistance is associated with heroin use among men ages 49 and older.³¹ In a prospective study of women with or at risk for HIV, past or current heroin or methadone use was associated with increased risk of diabetes. The risk was independent of potential confounders such as HIV status, infection with hepatitis C, or treatment with antiretroviral medications for HIV.³²

A decreased prevalence of type 2 diabetes is associated with marijuana use, possibly due to its anti-inflammatory properties, according to an analysis of cross-sectional data from the National Health and Nutrition Examination Survey III. The association is stronger for light use (one to four times per month) compared with heavy use (five or more times per month).³³ However, use of marijuana—as with use of any illicit substance—can impair judgment, which can cause patients not to seek or participate in routine care.

Substance use also can impede personal diabetes management (e.g., causing patients to fail to check blood glucose levels, forgo insulin injections, skip meals or, alternatively, consume sugary snacks).^{30,34} An individual with diabetes and a co-occurring SUD may have a reduced likelihood of receiving laboratory tests or clinical examinations for monitoring the disease.³⁵ Previous substance use has been identified as a significant risk factor in young people with type 1 diabetes who die from acute diabetes-related symptoms.¹⁹

Substance use can indirectly affect risk of diabetes. For example, people who have injected drugs are at an increased risk of contracting hepatitis C.³⁶ The hepatitis C virus may induce insulin resistance, which is a predisposing factor for developing type 2 diabetes.³⁷ Substance use and having diabetes both increase risk for certain conditions. For example, heavy alcohol use increases risk of liver injury, such as fatty liver, alcoholic hepatitis, and cirrhosis.³⁸ People with diabetes also are at heightened risk for these liver conditions.³⁹

Relationships between diabetes and two substances of abuse are described below.

Alcohol

Available research suggests a U-shaped relationship between alcohol consumption and risk of type 2 diabetes. According to a meta-analysis of 20 cohort studies, the protective effect of alcohol is greatest at 24 grams per day for women and 22 grams per day for men, while deleterious effects emerge at just under 50 grams per day for women and at about 60 grams per day for men.⁴⁰ (A standard U.S. drink contains about 14 grams of alcohol.⁴¹)

However, observational studies such as those that contributed to the above findings are subject to significant limitations, including unmeasured confounding variables and problems with generalizability. There are no randomized clinical trials documenting the potential benefits of moderate alcohol consumption for reducing the risk of new-onset diabetes.

According to the 2010 U.S. Dietary Guidelines, “It is not recommended that anyone begin drinking or drink more frequently on the basis of potential health benefits because moderate alcohol intake also is associated with increased risk of breast cancer, violence, drowning, and injuries from falls and motor vehicle crashes.”⁴² For the person with diabetes, the potentially protective effects of modest alcohol consumption may be outweighed by other negative effects that can compound health problems.⁴⁰

Clients With Alcohol Use Disorders and Diabetes Face Particular Risks

- Based on the 2006 to 2010 National Surveys on Drug Use and Health, more than one-third of people with diabetes ages 18 to 25 engage in past-month binge drinking,⁴³ which puts them at risk for acute and long-term diabetes complications.
- In a study of nearly 66,000 adults with diabetes, adherence to diabetes self-care behaviors was inversely correlated with alcohol consumption; rates of nonadherence among people who drink increased starting at just one drink per day, compared with the rates for people who do not drink or have stopped drinking.⁴⁴

Long-term alcohol use in the person with diabetes can worsen blood glucose control. Nonadherence with diabetic diet and medication regimens, resulting from drinking, can lead to uncontrolled blood glucose levels. Combined alcohol and food consumption can elevate blood glucose levels, leading to hyperglycemia. Conversely, drinking without eating (such as during a binge episode) can depress blood glucose levels, leading to hypoglycemia. Recovery to healthy blood glucose levels may take longer for people with diabetes who experience hypoglycemia following drinking. Heavy drinking, especially for people with diabetes, can lead to ketoacidosis. In addition, heavy alcohol consumption can worsen diabetes-related complications, such as cardiovascular disease and neuropathy.⁴⁵

Long-term alcohol abuse can trigger pancreatitis, a potentially fatal inflammation of the pancreas that can present acutely or chronically.⁴⁶ Pancreatitis adversely affects blood glucose levels and therefore plays a role in the development of type 2 diabetes. People with an alcohol use disorder and type 2 diabetes are at heightened risk for acute pancreatitis, although diabetes medications reduce risk.⁴⁷

Nicotine

Smoking is associated with an increased incidence of diabetes.⁴⁸ The association is dose-related: heavy smokers are at a greater risk for diabetes compared with lighter smokers, and current smokers are at a greater risk than former smokers. Further research is needed to determine whether the relationship is causal (e.g., smoking may interfere with insulin function) or due to shared risk factors (e.g., lack of physical activity, lower socioeconomic status, stress). Smoking is a major cause of heart disease and impaired circulation, making both of these complications more likely and more severe in the person with diabetes who smokes. Quitting smoking may reduce risk for developing type 2 diabetes; risk decreases over time until it becomes similar to that for nonsmokers.⁴⁹

How Can Diabetes Care Be Integrated Into Behavioral Health Treatment?

Some clients entering behavioral health treatment may already know they have diabetes; their need to manage the disease may be a factor prompting them to seek help. However, other clients may have prediabetes or diabetes but not know it—their entry into recovery presents an opportunity to address their whole health. To support diabetes care for all clients, behavioral health treatment programs can consider several service-level adaptations, described below.

Screen for diabetes and refer

Treatment programs that conduct physical evaluations at intake and perform routine physical monitoring can consider adding diabetes screening to these activities. Clients identified with prediabetes or diabetes may need assistance from the treatment program in accessing medical care. They will need to see a healthcare provider on a regular basis for assessment of the diabetes treatment plan, medication monitoring, blood checks, and assessment for complications.

Educate staff about diabetes

People with hypoglycemia may appear to be under the influence of alcohol, even when they have had nothing to drink. Similarly, some of the signs of hyperglycemia also may be confused with intoxication, drug toxicity, or withdrawal. Inservice trainings can be used to provide staff with information on how to recognize acute diabetes symptoms and emergencies. Staff also can be provided with information on how mental illness and SUDs are each linked with diabetes and on how to help clients integrate management of their diabetes into their behavioral health recovery. The American Association of Diabetes Educators provides online resources for locating diabetes educators and diabetes education programs (see the Resources section of this publication).

Support clients who inject insulin

Inpatient treatment centers can consider adopting procedures that allow clients private space for blood glucose testing, insulin injections, refrigerated storage of their insulin, storage of syringes, and disposal of syringes after use. Clients with a history of injection drug use may need extra support to overcome relapse triggers associated with needle use.

Arrange for mutual support

Programs may want to coordinate with local chapters of mutual-help organizations to establish groups specifically for people in recovery who have diabetes. Programs also can refer clients to educational and support activities sponsored by local diabetes organizations. The American Diabetes Association Web site has a searchable feature, “In My Community,” to find local activities (see Resources).

Coordinate with providers of diabetes care

A diabetes care team typically includes at minimum a primary care provider and a diabetes educator (e.g., registered nurse, registered dietician, certified diabetes educator). To monitor for and treat complications of diabetes, the diabetes team also may include specialists such as an ophthalmologist, podiatrist, or nephrologist. The various professionals may operate as a collaborative care team, which includes a care manager who is a physician or under physician supervision; such teaming has been found to improve outcomes and quality of life for patients with depression who have a co-occurring condition such as diabetes.⁵⁰ With the client’s permission, the behavioral health treatment provider can participate in a client’s diabetes care team to:

- Explain that injecting insulin and having needles is a risk factor for relapse for the client with an SUD that has involved drug injection. The patient may need an insulin pump or other considerations.
- Contribute information about the challenges the client faces managing both diabetes and his or her specific behavioral health disorder.

- Advise the other care providers on how they can support the client’s maintenance of recovery, which is crucial to diabetes management.
- Increase awareness of the impact of substance use on diabetes, including the fact that for clients who have poor glycemic control or acute diabetes symptoms, relapse to substance use (e.g., use of MDMA, ketamine, cocaine) may be an undisclosed but underlying factor.
- Coordinate treatment sessions and mutual-help meetings.
- Ensure that prescribing professionals are aware of medications the client is taking for SUDs or mental disorders, to prevent any adverse drug actions or interactions.

How Can Counselors Support Clients With Diabetes?

A survey of 201 people with type 2 diabetes and co-occurring serious mental illness found low levels of knowledge regarding diabetes, especially regarding diet; a follow-up survey completed 5 years later by 95 of those original respondents found no improvement in diabetes knowledge.⁵¹ Given this lack of knowledge, behavioral health treatment counselors can play an important role in conveying diabetes information and reinforcing diabetes management behaviors. Some clients may have cognitive difficulties stemming from their behavioral health disorder, diabetes, or both. Such clients can benefit from repeated instruction offered in a calm and structured setting, free of distractions and offered in a variety of formats (e.g., discussion, print and mobile products, video).

Actions counselors can take include the following:

- Learn about diabetes (e.g., from other members of the care team for a client with diabetes or from diabetes organizations and educators) so as to be able to talk with clients in an informed manner about diabetes prevention, screening, diagnosis, and management (see Resources).
- Include diabetes management in the treatment plan for any client with diabetes, to keep it as an ongoing topic

during the course of treatment for mental illness or an SUD.

- Reinforce with clients who have diabetes the importance of steady adherence to their diabetes treatment plan (in terms of monitoring blood glucose levels, taking medications and insulin, and engaging in physical activity), to avoid triggering acute diabetes symptoms. Motivational interviewing and cognitive-behavioral therapy may help clients enhance their diabetes self-management skills.
- Emphasize to clients the importance of eating according to their diabetic meal plan at regular times and choosing healthy foods to manage weight, maintain glycemic control, and reduce the risk of diabetes complications while also supporting recovery (see Resources for diabetic diet information). Confer with a nutritionist to determine how to help clients starting antipsychotic medications avoid weight gain, which can be a significant side effect.
- Reinforce education regarding the potentially adverse effects of alcohol use, especially binge drinking, on blood glucose levels. Help clients think through strategies to decrease risks of life-threatening diabetes symptoms if a relapse occurs (e.g., frequent blood glucose monitoring before and after the substance use, eating during relapse to keep blood glucose levels steady, letting friends know they have diabetes, wearing a medical alert bracelet).⁵²
- Coach clients to address the psychosocial issues related to living with diabetes by using problem-focused coping (identifying a specific source of stress and determining ways to reduce or eliminate it). Remind them that controlling stress can help them improve their glucose control and advance their recovery from behavioral health disorders.

Resources

Academy of Nutrition and Dietetics

<http://www.eatright.org/>

American Association of Diabetes Educators

<http://www.diabeteseducator.org/>

American Diabetes Association

<http://www.diabetes.org>

Centers for Disease Control and Prevention, Diabetes Public Health Resource

<http://www.cdc.gov/diabetes/>

National Diabetes Education Program

<http://www.ndep.nih.gov>

National Diabetes Information Clearinghouse

<http://diabetes.niddk.nih.gov>

National Institute of Mental Health

<http://www.nimh.nih.gov>

Notes

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