

# tips from the Doc

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*This is the latest in a series of articles that will review some of the medical conditions most frequently seen in life insurance underwriting, and highlight the information required to obtain the most favorable underwriting assessment.*

## **Underwriting Type 2 Diabetes Mellitus**

Diabetes mellitus is frequently encountered in life insurance underwriting because the most common form, type 2 diabetes mellitus, is very common in the US population. The prevalence of type 2 diabetes in this country has paralleled the rising incidence of obesity, because excess body fat is one of the most important risk factors for developing diabetes. Diabetes mellitus is a chronic disorder of glucose metabolism, characterized by elevated blood sugars (glucose) due to either a deficiency of insulin, resistance to the effect of insulin, or both. All cells in the human body metabolize glucose as the primary source of energy. *Insulin* is a hormone secreted by specialized cells in the pancreas and is required for other cells of the body to take up glucose from the blood stream. Diabetes mellitus causes abnormally high blood glucose levels because other

organs in the body are not able to take up and metabolize glucose appropriately. The excess glucose remains in the bloodstream and can spill into the urine.

There are two primary forms of diabetes mellitus. Although both result in abnormally elevated blood sugars, they have different causes and are essentially different diseases:

■ **Type 1 diabetes mellitus** (formerly known as *juvenile-onset or insulin dependent diabetes mellitus*) is caused by auto-immune destruction of the cells in the pancreas that produce insulin, leading to insulin deficiency. This gradual loss of insulin-producing cells is thought to be triggered by a viral infection in susceptible individuals, usually during childhood. Type 1 diabetes mellitus always requires insulin treatment.

■ **In contrast, type 2 diabetes mellitus** (formerly known as *adult-onset or non-insulin dependent diabetes mellitus*) is not caused by a deficiency of insulin, but rather a relative resistance to the effect of insulin (insulin resistance), a condition that can be triggered by excessive fat stores. The treatment for type 2 diabetes mellitus consists initially of measures to decrease insulin resistance, such as

calorie restriction, exercise and weight reduction. Although type 2 diabetes mellitus can be improved with these lifestyle measures, long-term compliance is difficult, so most patients will eventually require oral medications. Some medications for type 2 diabetes mellitus work by increasing production of insulin in the pancreas. Examples of these include Micronase®, Glucotrol®, and Prandin®. Other medications, such as Avandia®, Actos® and metformin (Glucophage®) work by decreasing insulin resistance, which improves the ability of muscle and other organs to take up glucose from the bloodstream. Another oral agent, acarbose (Precose®) lowers blood sugar by slowing down digestion of complex carbohydrates in the small intestine. Insulin is prescribed for individuals with type 2 diabetes mellitus only when they are not adequately controlled on oral medication. Risk factors for developing type 2 diabetes mellitus include family history, obesity, aging, prior history of gestational diabetes (a transient form of diabetes induced by pregnancy), and impaired glucose tolerance, which is present when blood sugars are elevated but fall below the cutoff for

making a diagnosis of diabetes. When an individual with impaired glucose tolerance also has abdominal obesity, certain lipid abnormalities (high triglyceride/low HDL) and borderline to elevated blood pressure, he may be diagnosed with a condition called *metabolic syndrome*, which, like diabetes mellitus, is associated with increased risk of mortality from cardiovascular disease. This increased risk of developing cardiovascular disease is the primary reason that most applicants with diabetes mellitus are rated for life insurance. Chronically elevated blood sugar leads to inflammation and damage to blood vessels in all organs throughout the body, which can result in coronary artery disease, kidney disease, strokes, and/or blindness. This damage to the blood vessels is accelerated in the presence of other risk factors, even mild hypertension. Type 2 diabetes mellitus develops gradually and is usually asymptomatic until blood sugars are very elevated, or excess blood sugar spills into the urine to cause enough fluid loss to produce symptoms of dehydration such as excessive thirst, weight loss and blurred vision. Unfortunately, the typical patient with type 2 diabetes mellitus has had the disease and the risk of cardiovascular complications for at least 5-7 years by the time the diagnosis is made and treatment is started. Glucose molecules in the bloodstream can bind to various blood proteins. Elevated blood glucose results in a higher-than-

normal amount of protein molecules with glucose molecules attached. Diabetes control is followed with a blood test called *Hemoglobin A1c (HbA1c)*, which measures the concentration of hemoglobin (a protein found in red blood cells) that is bound to glucose. HbA1c reflects the average blood glucose during the preceding 2-3 months. The normal level of HbA1c in a non-diabetic is < 6 %, so the goal of diabetes treatment is to maintain the HbA1c as close to normal as possible in order to decrease the risk of cardiovascular disease mortality.

Our underwriters assess applicants with type 2 diabetes mellitus with the following in mind:

■ **How well-controlled is the diabetes? What treatments are required? Are the records adequate to determine the degree of long-term control?**

The likelihood of end organ damage from diabetes is directly related to degree of blood sugar elevation and the length of time that the blood sugars have been elevated. A current favorable HbA1c reading is good (especially <7%), but should be accompanied by favorable readings that go back several years to confirm long-term control.

■ **Is there evidence of end organ damage?** Damage to the blood vessels of the eyes (retinopathy), numbness in the hands and feet (neuropathy), or protein/albumin in the urine (nephropathy) all suggest poor control in the past, which increases the risk of cardiovascular disease even if the diabetes has been well controlled

recently. Any impairment of kidney function, as evidenced by an elevated serum creatinine or protein in the urine, indicates significant kidney damage.

■ **Are there any factors present that can accelerate end organ damage from diabetes?** Tobacco use, elevated blood pressures, and poorly controlled lipids are all unfavorable. Prevention of diabetes complications requires aggressive control of all cardiovascular risk factors such as hypertension and hyperlipidemia.

■ **Any history of other diabetic complications?** Recurrent infections, foot ulcers and any hospitalizations for diabetic complications are all associated with increased risk.

■ **Assuming there is no evidence or suspicion of cardiovascular disease, has any additional testing been performed that would decrease the likelihood of asymptomatic cardiovascular disease?** Because the extra mortality risk in diabetics is primarily due to the increased risk of cardiovascular disease mortality, favorable results of cardiac testing such as stress tests are extremely helpful. Our underwriting guidelines consider all the above factors. The "best case" type 2 diabetic could potentially be assessed as a standard risk. This would be an older non-smoker with a well-documented history of excellent control going back several years, consistently normal blood pressures, normal urine microalbumin levels, no complications of diabetes and no known cardiovascular disease.