

## MODULE 2.4

## The Factors That Increase the Risk of Diabetes

**T**ype 1 diabetes is an autoimmune disease, caused predominantly by variants of human leukocyte antigen (HLA) genes, as well as minor “risk genes” or gene regions.<sup>1</sup> As with other autoimmune diseases, there is the possibility that environmental factors, such as certain viruses or foods may play a role in triggering the initiation of autoimmune activity. In the case of type 1 diabetes, this activity would be the autoimmune destruction of pancreatic beta cells.<sup>1</sup>

Viruses that may trigger type 1 diabetes include coxsackievirus B, cytomegalovirus, adenovirus, rubella, and mumps.<sup>1</sup> Some research suggests exposure to certain foods during infancy may either protect from or play a role in the development of type 1 diabetes. For example, breast milk or milk formulas that are supplemented with vitamin D may reduce the risk of developing type 1 diabetes, whereas dietary intake of cow’s milk or cereal proteins may increase the risk.<sup>1</sup>

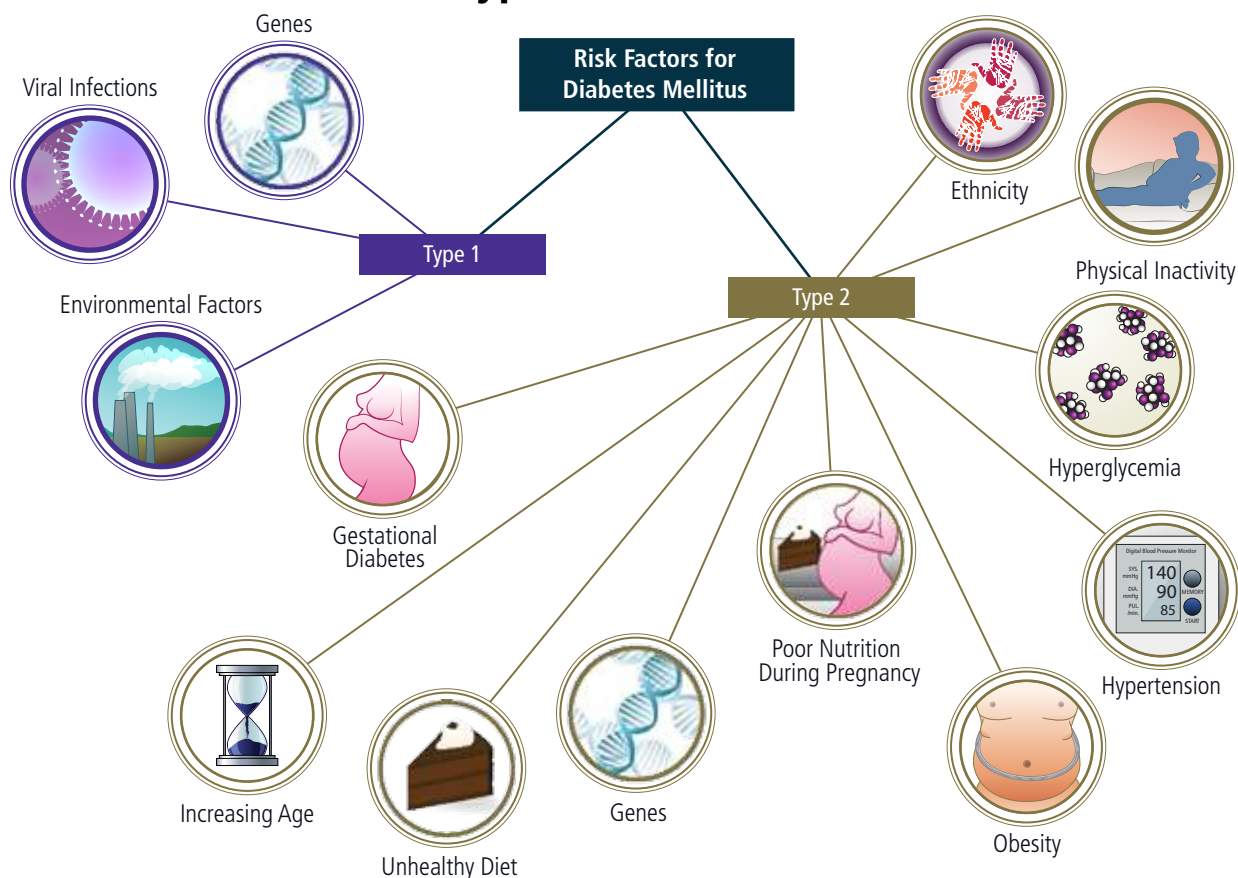
Genetic susceptibility is believed to be an important factor in the development of type 2 diabetes. Researchers have identified gene variants associated with type 2 diabetes

that affect insulin production or the tendency to become overweight.<sup>1</sup> The potential role of genes is reinforced by the increased prevalence of type 2 diabetes among family members and identical twins, as well as certain ethnic groups, such as:

- African Americans
- Alaskan natives
- American Indians
- Hispanic/Latinos
- Native Hawaiians
- Pacific Islander Americans
- Some Asian Americans

Although the susceptibility to type 2 diabetes may depend on the presence of particular genes, many risks factors are environmental and modifiable.<sup>1</sup> In addition to a family history of diabetes or an ethnicity prone to type 2 diabetes, the two main contributors to type 2 diabetes are physical inactivity and obesity, particularly abdominal obesity.<sup>1</sup> Excess “belly fat” results in insulin resistance, the first step on the road to impaired glucose regulation and diabetes.<sup>1</sup>

## Risk Factors for Types 1 and 2 Diabetes Mellitus



Another leading risk factor for type 2 diabetes is gestational diabetes. Gestational diabetes is a form of glucose intolerance that develops in the second or third trimester of pregnancy, often resulting in a neonate with a birth weight of 9 pounds or more.<sup>1</sup> Woman with a history of gestational diabetes, as well as children exposed in utero to the effects of gestational diabetes, are at increased risk of developing type 2 diabetes.<sup>2</sup>

Although associated with individuals 45 years old and older, type 2 diabetes is occurring with increasing frequency among children and adolescents, especially those in susceptible ethnic groups.<sup>2</sup>

In summary, risk factors associated with the development of type 2 diabetes include:<sup>3</sup>

- Family history of diabetes
- Ethnicity
- Physical inactivity
- Overweight
- Unhealthy diet
- Impaired glucose tolerance (IGT)
- Increasing age
- High blood pressure
- History of gestational diabetes
- Poor nutrition during pregnancy

### References

1. National Institute of Diabetes and Digestive and Kidney Disease. *Causes of Diabetes*. Bethesda, MD: National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health; 2014. NIH Publication No. 14-5164. [http://diabetes.niddk.nih.gov/dm/pubs/causes/Causes\\_of\\_Diabetes\\_508.pdf](http://diabetes.niddk.nih.gov/dm/pubs/causes/Causes_of_Diabetes_508.pdf). Accessed October 14, 2015.
2. Centers for Disease Control and Prevention. *National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States, 2014*. Atlanta, GA: US Department of Health and Human Services; 2014. [www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf](http://www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf). Accessed October 13, 2015.
3. International Diabetes Foundation. Diabetes risk factors. [www.idf.org/about-diabetes/risk-factors](http://www.idf.org/about-diabetes/risk-factors). Accessed October 13, 2015.