**Diabetes Mellitus Information Sheet**

Diabetes mellitus (diabetes; DM) is an endocrine disorder in which the body’s blood glucose (sugar) levels are homeostatically imbalanced due to a deficit in insulin production or an abnormal response to the insulin the pancreas produces. In its normal function, the insulin hormone regulates blood sugar levels, allowing the body to use glucose for energy. However, abnormalities in insulin production or use implicate a diabetes disease state.

Concerningly, diabetes is among the most rapidly growing disease diagnoses worldwide, in which 1 in 11 adults possesses the condition. In the U.S., it is among the top 10 leading causes of death, affecting 38 million Americans. Notably, diabetes is not a singular disease state; instead, there are multiple categories thereof (e.g., type 1 diabetes mellitus, type 2 diabetes mellitus, gestational diabetes, etc.), all of which are hallmarked by the presence of elevated blood glucose levels (i.e., hyperglycemia). In the early stages of the disease, there may be symptom overlap between disease subtypes, as common symptoms associated with hyperglycemia include excessive thirst (polydipsia), increased urine output (polyuria), and excessive hunger (polyphagia). Other reported symptoms include blurred vision, drowsiness, nausea, diminished endurance/fatigue, etc.

The leading diabetes subtypes are type 1 and type 2. Type 1 diabetes mellitus (T1D; T1DM) is a chronic autoimmune disorder, often considered insulin-dependent diabetes. As an autoimmune condition, the immune system unrightfully unleashes an attack on insulin-producing beta cells within the pancreas, ultimately destroying them. Beta cell destruction renders the pancreas unable to produce insulin (or enough insulin), resulting in glucose build-up in the blood, which can then spill over into the urine. For blood sugar regulation, type 1 diabetes treatment requires insulin therapy. Unfortunately, research has yet to unearth a specific trigger for type 1 onset and means for disease prevention.

The most prevalent diabetes subtype is non-autoimmune type 2 diabetes mellitus (T2D; T2DM), comprising 90-95% of diagnosed cases. Unlike individuals with type 1, people with type 2 produce insulin. However, with this form, fat, liver, and muscle cells that would otherwise store glucose for energy do not properly respond to secreted insulin. Such insulin resistance leads to a hypoglycemic state. Notably, chief risk factors for type 2 development include:

* a previous diagnosis of prediabetes (a condition in which blood glucose levels are moderately above normal, but not high enough for diabetes classification) or gestational diabetes (diabetes during pregnancy);
* age 35 or older;
* infrequent exercise (sedentary lifestyle);
* obesity/overweight;
* high blood pressure, high cholesterol, cardiovascular disease, fatty liver disease, or polycystic ovary disease;
* family history of type 2; and
* identification as African American, Hispanic or Latino, American Indian, or Alaska Native (some Pacific Islander and Asian Americans may also be at risk)

Interestingly, type 2 diabetes can be prevented or thrust into remission with lifestyle changes (e.g., improved diet, increased exercise, and weight loss), oral medication, or a combination of both. Insulin injections may be warranted for type 2 individuals if other treatments and healthy lifestyle changes are unable to manage blood sugar levels.

Individuals presenting diabetes-related symptoms and those who are asymptomatic but are at risk of diabetes should undergo the screening tests. A blood glucose measurement can be monitored via a fasting blood draw. A diabetes diagnosis is determined if fasting blood sugar levels are ≥ 126mg/dL (normal range: ≤ 99mg/dL; prediabetes: 100 – 125mg/dL). Alternatively, diabetes can be diagnosed in a non-fasting scenario if blood sugar levels are ≥ 200mg/dL. Additionally, an A1C test indicates average blood sugar levels over the 3-month period prior to testing, with 3 months being the timeframe required for red blood cell regeneration. Assuming blood glucose remains high over extended periods, sugar molecules inevitably begin to attach to hemoglobin (an iron-containing oxygen transport protein in red blood cells) at an overwhelming rate. Appropriately, the A1C test measures trends in the percentage of red blood cells harboring glucose-laden hemoglobin. Specifically, individuals with A1C levels ≥ 6.5% are deemed diabetic (normal range: ≤ 5.7%; prediabetes: 5.7 – 6.4%). Moreover, to differentiate type 1 diabetes from type 2 or other forms, an insulin autoantibody blood panel can identify individuals who possess autoantibodies which indicates the body’s immune system is in attack-mode against the insulin-producing beta cells of the pancreas. Additional diagnostic tests may be recommended (e.g., during pregnancy).

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