

## — Metabolic & Endocrine Health

The endocrine system is the collection of glands, each of which secretes different types of hormones that regulate metabolism, growth and development, tissue function, sexual function, reproduction, sleep and mood, among other things.

The endocrine system is made of eight major glands, which are groups of cells that produce and secrete chemicals. A gland selects and removes materials from the blood, processes them, and secretes the finished chemical product for use somewhere in the body. Almost every organ and cell in the body is affected by the endocrine system.

A group of glands that signal each other in sequence are usually referred to as an axis. One example is the hypothalamic-pituitary-adrenal axis, which coordinates interactions among the hypothalamus, the pituitary gland and the adrenal, also called "suprarenal" glands, which are small, conical organs on top of the kidneys.

The endocrine system sends signals throughout the body, much like the nervous system, but unlike the immediate responses triggered by the nervous system, the effects can take a few hours or weeks. Hormones released from endocrine tissue into the bloodstream where they travel to target tissue to elicit a response.

Endocrine glands are vascular and generally do not have ducts, using intracellular vacuoles, or granules, to store hormones. They differ from, exocrine glands – salivary glands, sweat glands and glands within the gastrointestinal tract – which have ducts or a hollow lumen.

The endocrine system gets some help from organs such as the kidney, liver, heart and gonads, which have secondary endocrine functions. The kidney, for example, secretes hormones such as erythropoietin and renin.

## Diabetes & Insulin Resistance

Insulin resistance is a condition in which the body produces insulin but does not use it effectively. When people have insulin resistance, glucose builds up in the blood instead of being absorbed by the cells, leading to type 2 diabetes or pre-diabetes. Most people with insulin resistance don't know they have it for many years—until they develop type 2 diabetes, a serious, lifelong disease. The good news is that if people learn they have insulin resistance early on, they can often prevent or delay diabetes by making changes to their lifestyle.

When people that do not have diabetes eat, the pancreas automatically produces the right amount of insulin to move glucose from blood into the cells. In people with diabetes, however, the pancreas either produces little or no insulin, or the cells do not respond appropriately to the insulin that is produced. Glucose builds up in the blood, overflows into the urine, and passes out of the body in the urine. Thus, the body loses its main source of fuel even though the blood contains large amounts of glucose. The three main types of diabetes are: type 1 diabetes, type 2 diabetes and gestational diabetes

