

## Polycystic Ovary Syndrome

PCOS is a common syndrome of insulin resistance. Insulin stimulates the growth and multiplication of cells in the ovary, in particular those that make up the bulk of the ovary in which the eggs are embedded. Insulin resistance leads to a vicious cycle of hormonal imbalances which result in the symptoms of PCOS. The receptors for insulin in the ovary are different from those in other tissues, in that the ovary does not turn down insulin receptor numbers or reduce their activity when blood insulin levels are high. Therefore, the action of insulin continues unabated in ovarian tissues. The cells grow and multiply, at the same time increasing their metabolic activity. The result is excessive production of both testosterone as well as estrogen. When the body is functioning healthily, men and women produce both sorts of hormones although in vastly different proportions. Normally, the ovary makes testosterone and then converts it to estrogen. However, excessive stimulation of the ovary overwhelms its capacity to fully undertake this conversion, with the result that excess testosterone spills over into the blood. The uncharacteristically high testosterone levels in the blood then bring about "male" characteristics in women, such as hirsutism and weight gain. Excess insulin and sex hormones also work together to stimulate an area in the brain called the hypothalamus, making it more sensitive. It "pulses" more frequently than normal, inducing the pituitary gland to secrete more LH. LH stimulates the ovary's hormone production even more - and a vicious cycle is up and running.

Excess insulin has even more consequences. It stimulates the conversion of weak male and female hormones to the more potent forms - estrogen and testosterone. And, finally, it reduces the level of the protein that binds testosterone in the blood, allowing more of the active form of the hormone to become available to the tissues.

Testosterone is called an anabolic hormone because it is involved in building up new tissues, especially muscles. This muscle-building potential is the main reason men have more muscle mass than women. In women with PCOS, however, excess testosterone and other male hormones contribute to excessive weight gain and "masculinisation".