

A lighthouse costs less than shipwrecks.



Prevention costs less than disease.

## The National Insulin Resistance Council

A not-for-profit disease prevention organization

### Metabolic Syndrome and PCOS

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*Metabolic syndrome* can strike anyone while *PCOS* is the female version. The symptoms of *PCOS* and *metabolic syndrome* are caused by hormonal imbalances, the turf of endocrinology, one of medicine's most rarified specialties. Internists, pediatricians and gynecologists are likely to be the doctors who first identify patients, and can often treat them, but complex cases usually require an endocrinologist's care. *PCOS* is sometimes the source of show-stopping fertility issues, so fertility doctors must be alert for it, and not merely treat fertility-related symptoms, but the underlying problem.

*PCOS* stands for *polycystic ovary (or ovarian) syndrome*. Polycystic literally means *many cysts*. In the case of ovaries, cysts are just immature eggs, not infections. Instead of being periodically released down the fallopian tubes and into the uterus as they are in women with normal menstrual cycles, the cysts collect in the ovaries. The differences between *metabolic syndrome* and *PCOS* all relate to the special hormone dysfunctions that occur only in women.

These syndromes are not merely sets of inconveniences. They are the equivalent of brightly flashing yellow lights warning of serious diseases that potentially lay ahead. Hypertension, a common *metabolic syndrome* and *PCOS* symptom, is a primary ingredient for strokes, for example. For women, long-term shutdown of the menstrual cycle is linked to endometrial cancer. As bad as those outcomes are, others are both bad and far more common, including diabetes and heart disease.

*PCOS* and *metabolic syndrome* are umbrella terms for a menu of symptoms, some visible to all, some only visible to doctors during an examination, and some that can only be seen in the lab reports of simple blood tests.

Visible symptoms for people with *metabolic syndrome* include significant weight gain and defiant weight retention, a waistline larger than the hips, unexplained fatigue, skin discoloration on the trunk, and an exaggerated body odor. Visible symptoms for women include all of those plus menstrual dysfunction, hair growth on unlikely body parts like the chest and face, dramatic hair thinning and even baldness of the head. Many patients have just one or two of these symptoms, some have more, and some have no visible symptoms at all.

Routine in most any doctor's physical examination of a patient are checks for blood pressure and sugar (glucose) levels present in urine. High blood pressure, hypertension, is an important *metabolic syndrome* symptom, and so is an elevated sugar level. A gynecologist conducting a pelvic exam should notice enlarged ovaries. If enlargement is found, the doctor may also want a sonogram for more information. Ironically, getting a lab report on a person's fasting insulin level is easy, but not routine. An elevated insulin level is certainly indicative of *insulin resistance* whether or not any *metabolic syndrome* or *PCOS* symptoms are present.

LH (luteinizing hormone) is produced by a woman's pituitary gland. In a healthy woman, the LH level rises and falls in a predictable relationship with the level of FSH (follicle stimulating hormone), made by her ovaries. The ratio of the LH level to the FSH level is one of the important clues doctors look for in a lab report. When a woman's LH:FSH ratio is four or more, **PCOS** is highly suspect. In addition to making FSH, women's ovaries also normally make some testosterone, the "male" hormone, usually just before menstruation. If LH levels are higher than normal, over-stimulated ovaries produce too much testosterone. Evidence of elevated testosterone in the lab report is, therefore, all but confirmation of **PCOS**. It is the elevated testosterone that triggers "male" genetics in a woman that are normally dormant, accounting for the facial/chest hair growth and male pattern baldness symptoms. Finding an elevated fasting glucose level in a urine test or in a blood test is another sign of the effect that the underlying cause, insulin resistance, has induced a pre-diabetic condition or perhaps even a full-blown case of diabetes.

For a number of reasons, it is possible and even likely for a person to have **metabolic syndrome** or **PCOS** and not know it. One sad reason is that few doctors routinely test for them or their cause, and some don't recognize it even when some symptoms are present. Of course, many people don't go to doctors if they can avoid it, and others can't afford to, especially when they seem well enough. This is so true that the Centers for Disease Control estimates that there are probably 10 million undiagnosed cases of diabetes. There would logically be a far greater number of undiagnosed cases of **metabolic syndrome**, **PCOS** and **insulin resistance**. Obesity is a very obvious signal that triggers questions about whether **metabolic syndrome** or **PCOS** is present. But since it is possible to have **insulin resistance** yet not be overweight at all, many thin victims are overlooked.

**PCOS** and **metabolic syndrome** are just labels for their grab-bag of symptoms, neither their cause nor the cause of more advanced problems. Even in the likely millions of undiagnosed cases where symptoms are not visible, that cause – **insulin resistance** – is still at work.

Again, women have special risks. Birth-control pills achieve their primary objective by tightly regulating ovarian behavior, in effect overriding LH levels. This results in the suppression of significant **PCOS** symptoms that would otherwise correctly draw attention. Some doctors prescribe birth-control pills as a treatment for menstrual dysfunction, while others directly induce menstrual cycles with specific hormones. When they do either, patients should be sure that doctors are also confronting any underlying problem of **insulin resistance** rather than just masking warnings that **insulin resistance** is sending by suppressing the resulting menstrual dysfunction.

If **insulin resistance** only caused **metabolic syndrome** and **PCOS**, it would be bad, but not the often silent monster that it is. [See our **Insulin Resistance** background paper, click [here](#)].

The goal of the National Insulin Resistance Council (NIRC) is to **prevent** millions of non-infectious disease cases tied to **insulin resistance** including diabetes, heart failure, stroke and recently-linked Alzheimer's. It sponsors, operates, and collaborates with others on programs that lead to **early identification** of affected individuals and fosters targeted **active prevention** programs.