

INVESTMENT IN RESEARCH SAVES LIVES AND MONEY

# Polycystic Ovary Syndrome (PCOS)

Polycystic ovary syndrome (PCOS) is a health condition in women that can occur any time after puberty and involves a reproductive hormone imbalance which affects the ovaries, causing issues such as irregular menstrual cycles, ovarian cysts, and infertility. The precise cause of PCOS is still unknown, but it is believed that genetics, high levels of sex hormones, and high insulin levels may be risk factors. Many other conditions are commonly seen together with PCOS, such as diabetes, depression, and anxiety, as well as endometrial cancer, but researchers are still investigating whether these issues cause PCOS or vice versa.<sup>1</sup>

## TODAY

PCOS affects approximately **6-12%** of women of reproductive age in the U.S.<sup>2</sup>

Over **50%** of patients with PCOS develop type 2 diabetes by age 40.<sup>2</sup>

PCOS is the most common cause of female infertility, and the most common endocrine disorder in women.<sup>3,4</sup>

## COST

**\$1.16 Billion:**

Estimated annual medical costs in the U.S. associated with PCOS<sup>5</sup>

**80%**

of women with PCOS experience infertility.<sup>6</sup> Further, PCOS causes 80% of anovulatory infertility cases (i.e., when the ovaries do not release an egg).

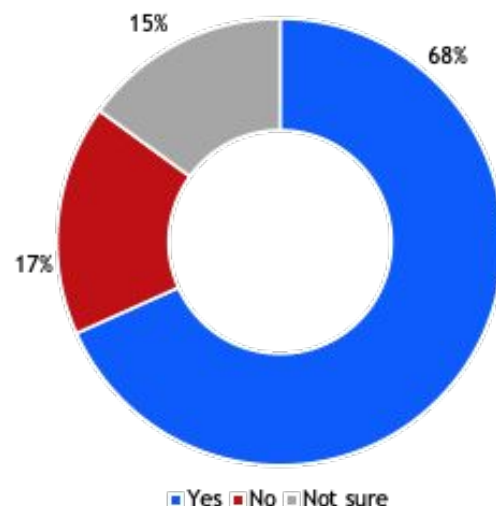
## Research Delivers Solutions

Gonadotropin-releasing hormone (GnRH) is the key regulator of sex hormones in the body.<sup>7</sup> Research has shown that patients with PCOS have increased pulses of GnRH, which leads to unbalanced sex hormones that often prevents ovulation.<sup>8</sup> This finding made GnRH a desired drug target for treating PCOS. Currently, elagolix, a drug which blocks GnRH and is FDA-approved to treat endometriosis, is in a phase II clinical trial for use as a treatment for PCOS.<sup>9,10</sup>

A study in 2001 showed that 24% of the mothers of patients with PCOS, as well as 32% of the patients' sisters, also had PCOS.<sup>11</sup> This reaffirmed the notion that PCOS is a heritable condition and implied that genetics play a major role.<sup>11,12</sup> In 2018, scientists performed a genome-wide analysis of 100,000 European patients with PCOS and identified three new risk variants (genetic abnormalities) associated with PCOS, as well as genetic links with depression.<sup>13</sup> Identifying common genetic abnormalities in PCOS patients may reveal key drug targets and diagnostic markers.

A study in 1995 demonstrated that women with PCOS have more difficulty maintaining normal blood sugar levels compared with patients without PCOS.<sup>14</sup> This is the hallmark of type two diabetes, a common co-diagnosis for patients with PCOS.<sup>15</sup> Metformin, the most widely prescribed drug for diabetic patients, reduces the amount of sugar released by patients' livers into their blood.<sup>16</sup> At the moment, metformin is not approved by the FDA to treat PCOS but researchers are actively examining how this commonly used drug may be useful to treat blood sugar irregularities in patients with PCOS.<sup>15,17</sup>

Would you be willing to pay \$1 per week more in taxes if you were certain that all of the money would be spent on additional medical research?



Source: A Research!America poll of U.S. adults conducted in partnership with Zogby Analytics in January 2020

# Polycystic Ovary Syndrome (PCOS)

## Then. Now. Imagine.

### THEN

In 1990, the first international diagnostic criteria of PCOS was established during an NIH-sponsored conference on PCOS.<sup>18</sup>

### NOW

Advancements in hormonal tests and ultrasound techniques have improved diagnosis of PCOS, allowing more patients to be accurately diagnosed and treated.<sup>18</sup>

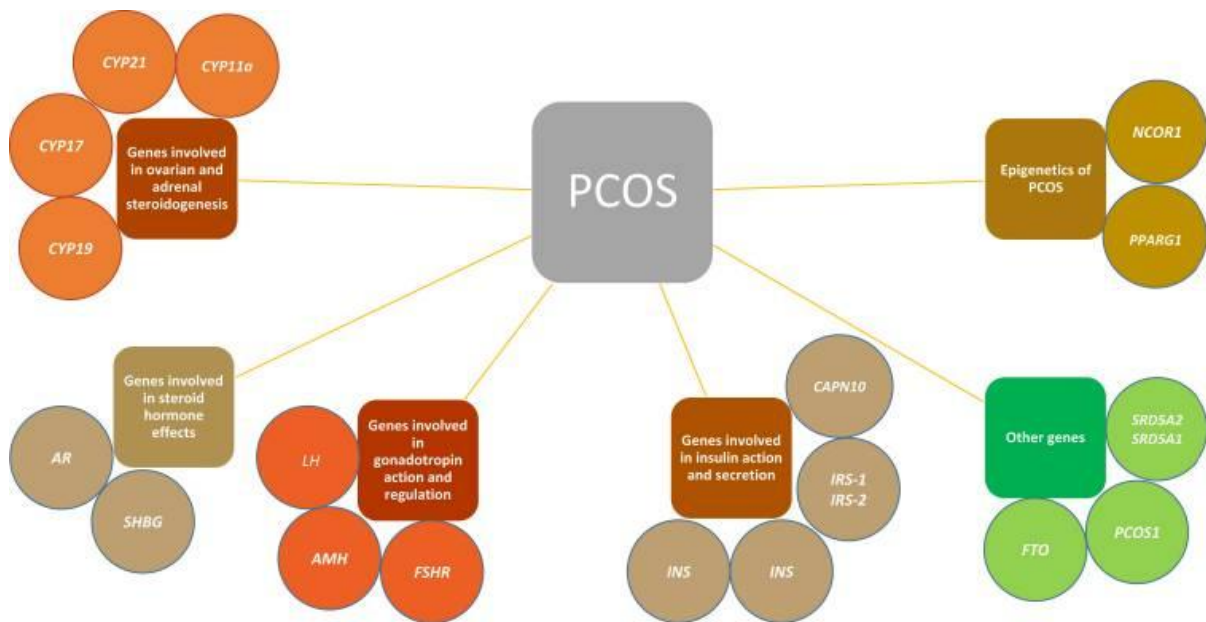
### IMAGINE

A world without PCOS

## PCOS and Pregnancy

PCOS can lead to fertility problems, which can be devastating for women hoping to start a family. While PCOS is one of the most common causes of infertility, it is treatable.<sup>1</sup> Physicians can use the following treatments to assist patients with fertility problems: clomifene, a fertility medication that can help induce ovulation, laparoscopic ovarian drilling (LOD), a surgical procedure that can restore ovulation, and in vitro fertilization (IVF).<sup>19</sup> Women with PCOS who do become pregnant are at increased risk for miscarriage, gestational diabetes, and preeclampsia.<sup>1</sup>

## Summary of the genes involved in PCOS



SOURCE: Put Khan et al. "Genetic Basis of Polycystic Ovary Syndrome: Current Perspectives" Appl Clin Genet. 2019.

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