

THE  
PCOS  
Diet Plan

A Natural Approach to Health for  
Women with Polycystic Ovary Syndrome



Hillary Wright, M.Ed, RD

Foreword by Alice Domar, PhD,  
Director of Mind / Body Services at Boston IVF

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## Foreword

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I distinctly remember the date when Hillary Wright had her first day as the director of nutrition at the Domar Center for Mind/Body Health—it was May 1, 2006. The only reason I remember it so well is because May 1 is my birthday, and a momentous thing happened that day. We were having a staff meeting, partially to welcome Hillary, and someone had brought in a lovely chocolate cake to surprise me. I cut slices of cake for everyone, they were distributed, and then the room went still. Not a fork was lifted, and all eyes were locked on Hillary. There was no way anyone was going to eat a crumb of cake until we saw what our new nutritionist was going to do. And what did she do? She picked up her fork and took a healthy bite. With a sigh of relief, the rest of us followed suit. I am sure we all had the same thought: “Thank heavens she is not a fanatic about every calorie and seems to have a wonderful attitude toward food!”

Hillary’s attitude that day is reflected in every page of her excellent new book. Her commonsense but scientifically-backed approach to helping her readers become healthier women who happen to have PCOS, rather than at-risk scared patients, comes through on every page. There are literally millions of women in this country who have no idea how to eat and live, in fact thrive, while living with PCOS, and this book will lead them through the steps carefully, accurately, and compassionately.

Many people have the expectation that there is a pill that will treat—if not cure—many diseases. Sadly, not only is this not the case with many chronic illnesses, it is also not the case for PCOS. Modern medicine has yet to discover that magic bullet. However, research does show that women who learn to eat in a different way, exercise sensibly, and keep their stress levels at a manageable level can in fact control and in some cases eliminate their symptoms. This successful holistic approach makes sense for many reasons—there are no risks or side effects, and in addition to helping you become healthier, it also helps you feel more in control of a condition which can be bewildering and confusing.

I also remember the very first patient of mine who received a diagnosis of PCOS. It was many years ago and when she first told me about her diagnosis, I was embarrassed because I didn’t know much about the syndrome. I had heard the term in graduate school, and vaguely knew the symptoms. But to be honest, I felt helpless to do much to support her. So there she sat, in my office, looking at me and clearly expecting a wealth of information. I felt like I was failing her since my role in our relationship was to provide stress relief and coping skills, yet I had no idea what she had to deal with and even less of an ability to teach her how to live a healthier life. Until now, there was no resource which encompassed it all—information on the physiology of PCOS, risk factors, nutritional explanations, and incredibly straightforward and easy-to-follow meal and lifestyle plans.

Fast-forward about twenty years, and I now have the tools I need to educate my patients with PCOS because I have read this book cover to cover. Too late for my patient of years ago, but definitely not too late for you.

—Alice Domar, PhD, executive director of the Domar Center for Mind/Body  
Health and director of Mind/Body Services at Boston IVF

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Without the support and encouragement of so many people, this book never would have come to be. I'd like to thank my agent, Judith Riven, who saw us through some tricky and unanticipated situations, and my editor, Sara Golski, and the staff at Ten Speed Press who showed so much respect for my work and what I was trying to produce. Thank you to my cousins Rachel Prindle and Maura Sheehan, whose guidance was invaluable and so appreciated; the very talented David Parmentier and Monica DeSalvo for bringing their artistic eyes to my manuscript; Dr. Alice Domar, Dr. Alison Zimon, and all my colleagues at the Domar Center for Mind/Body Health and Boston IVF who have helped me realize my dream, and Dr. Natalie Schultz, Larry Lindner, and Dr. Margo Woods for professional advice and encouragement in the early days of this project.

My PCOS patients have provided the ultimate inspiration for writing this book—thanks for teaching me so much; thanks also to my “Arlington girls” and my Dana Farber “team” for your wonderful friendship and support when I felt overwhelmed by life at times; thank you to my pal and professional guiding light, Elizabeth Ward, MS, RD, who's always showed by example (and with humor!) what's possible in the nutrition world.

I'd also like to thank my parents, Alan and Marie, who have always been my biggest fans; my in-laws, Jack and Nancy Holowitz; my sister, Alison, and my brothers, John, Chris, Brian, and Michael, and their families; and my amazingly supportive husband, Tony, and my beautiful boys—John, Matt, and Brian—thanks for helping me make room in my life for this. I love you.

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# Introduction

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The first time a woman with polycystic ovary syndrome (PCOS) showed up in my office, I had no idea what to do for her. In addition to enduring many troubling symptoms of the condition, she was also struggling with infertility. It was early 2000 and I had just returned to work from maternity leave after having my third son. I'd had no problems conceiving my first child, but it had taken almost a year and a half to get pregnant with my second son after treatment for secondary infertility three years earlier. As a fertility patient myself, I understood what she was going through. I'd been through all the tests—hormone tests, an endometrial biopsy, a hysterosalpingogram (a procedure that involves blasting dye through the fallopian tubes to make sure they're open, which in some cases actually paves the way for conception even if no blockages are found), and serial HCG (pregnancy hormone) tests once I got a positive pregnancy test. The barrage of tests left my arms looking like those of an IV drug addict. Fortunately, the solution to my secondary infertility had been some relatively simple hormonal tweaking, and, interestingly, I hadn't required any intervention for my third child. But I was well aware how complicated the quest to have a child could get. This woman's course was likely to be much more complicated than mine: she was overweight, her hormones were out of whack, and her stress level was through the roof. Her treatment would involve more than a few well-timed hormone shots.

Given my personal experience with fertility challenges, I was thrilled that Dr. Natalie Schultz was interested in developing a partnership between the fertility and nutrition departments at the large medical practice in Boston where I worked as a nutritionist and she as a fertility specialist. I'd received my medical care from Natalie, and we had become close during my treatment. Besides being a fantastic physician, she was a big fan of the nutritionists in the practice, so when she also started to see women with PCOS, she looked to us for help. As nutritionists we were definitely flattered, but at the time we weren't confident that we knew how to help these women.

Back then, I had no idea what this strange-sounding condition was, never mind how diet and lifestyle could potentially affect it. But Natalie was confident that we'd make a great team and could ultimately make a difference in these women's lives. She patiently explained PCOS to me and answered my questions, as I tried to piece together some sort of diet therapy. I had my own team of nutritionists for collaboration. First was my biochemistry whiz nutritionist colleague, Ann Stawaris, who loves nothing more than debating the virtues of enzymes and chemical pathways. Next I found New York dietitian Martha McKittrick, who willingly shared what she knew about the condition with me. I also consulted what I consider the bible on PCOS, Samuel Thatcher's *PCOS: The Hidden Epidemic*.<sup>1</sup>

The key to figuring out how to manage PCOS nutritionally was learning that in most cases the driving force behind the condition is insulin resistance, something I knew a lot about. Growing up, two of my five siblings had type 1 diabetes, which is caused by a lack of the pancreatic hormone insulin. Insulin resistance, a condition characterized by inefficient use of this hormone, is the cause of the more common form of diabetes in the United States, known

as type 2 diabetes. This early exposure to the world of diabetes care got me interested in becoming a dietitian in the first place.

Using my knowledge of how to manage insulin resistance, I began to treat women with PCOS. Initially there were just a few patients, but over time the number has grown to several hundred. One thing became clear: the women with PCOS had many symptoms and complaints in common, and most of them felt fairly underserved by the medical profession. I realized that many nutritionists knew little about this condition, and a number of them began to look to me for guidance. I developed a presentation on managing PCOS for dietitians in my area, and time and again, I would receive the same feedback: “I really know nothing about this” and “Oh my God, I think I have it!” This wasn’t surprising, given that more than 97 percent of registered dietitians are female!

As we began to see more women with PCOS in our medical practice, the nutritionists at the fertility and endocrinology department began running group support classes for women with PCOS, many of whom were thrilled to have a place to finally talk about their health. A common thread for many of these women was knowing for *years* that something was wrong but never being able to get much satisfaction—or symptom relief—from their physicians. PCOS is a hormonal problem, and women would accordingly describe a wide range of physical and emotional symptoms. Many intuitively felt that their symptoms were connected but unfortunately they frequently reported being brushed off by their doctors. Instead, they were told for the umpteenth time to lose weight and were given the impression that perhaps the problems were all in their head.

In the medical establishment’s defense, at the time there just was not as much awareness of the prevalence of polycystic ovary syndrome. For these women to finally land in the hands of a health-care team that got it was an amazingly affirming experience. As positive as this sense of validation can be, however, it is unnerving to learn about the reality of what a diagnosis of PCOS can mean to a woman’s overall health and fertility. Many women felt overwhelmed by the diet and lifestyle changes necessary to reduce the risks of a number of scary health problems, including diabetes and heart disease. In my experience, many women were first diagnosed with PCOS after seeking medical advice to find out why they weren’t getting pregnant. It’s easy to understand why they’d feel overwhelmed and stressed.

The PCOS support group we established was incredibly diverse: we had young women and older women (who were just figuring out the diagnosis despite years of fertility treatments!), straight women, gay women, teenage girls and their moms, women trying to get pregnant and women with no interest in kids but a strong interest in avoiding diabetes. Although the diversity did make for some challenging dynamics, we kept the group going for a couple of years until the clinicians left the practice (Natalie moved to the Midwest) and the demands of our own jobs as nutritionists led to the support group’s demise.

I continued to see a steady stream of PCOS patients until I left the practice in 2006 to take a part-time job at Boston’s Dana Farber Cancer Institute. At this point I also established a private nutrition counseling practice that would ultimately be absorbed by the Domar Center for Mind/Body Health at Boston IVF, one of the nation’s oldest and most successful fertility treatment practices in the country. I was recruited by Dr. Alice Domar, an international expert on the application of mind-body medicine to women’s health issues, specifically for m

expertise in the nutrition management of PCOS. I've been blessed to work alongside some amazing therapists, acupuncturists, clinicians, and support staff—all of whom are vested in the Domar Center's philosophy of providing comprehensive care that is "grounded in science and inspired by compassion."

That motto nicely frames my intentions for this book, *The PCOS Diet Plan*: to provide diet and lifestyle information that is backed by science and designed to empower women diagnosed with this condition. When applied soundly to one's own life, this information can initiate broad health and life-enhancing effects. As intimidating as it can be, PCOS is a condition that can absolutely be influenced in a positive way by diet and lifestyle. The strategies described in this book are not overrestrictive or off the wall, and they can easily be followed by anyone interested in healthy living. They require a little education on how female bodies work—or, more specifically, how women's bodies were *designed* to work—and how we can adjust diet and lifestyle to work *with* our genetic makeup in an environment that often colludes against it.

One important point to keep in mind throughout this book: learning to take better care of your health is not about "dieting." It's about modifying your behavior to incorporate lifelong healthy habits, while occasionally enjoying things that diets often tell us are forbidden. If you follow the recommendations in this book, I guarantee you'll feel better and more energetic; you'll lower your risk of diabetes and heart disease, and you'll feel more in control of your health. All this without feeling like food is the enemy but, rather, one of life's great pleasures.

**PART 1**

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**Defining  
Polycystic  
Ovary Syndrome**

## The Mystery of PCOS

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Many people are unfamiliar with the strange-sounding condition of polycystic ovarian syndrome (PCOS). From infertility to heart disease, the broad reach of PCOS can intimidate and overwhelm even the most health-conscious women who are up to speed on the connection between their diet, lifestyle, and health. There's a lot to learn, and a lot we still don't understand about the syndrome. Common reactions to a diagnosis of PCOS include the following:

- *Confusion.* What exactly is this condition that has the potential to affect so many aspects of my health, but that many health-care providers seem to know so little about?
- *Frustration.* Why, after complaining about my symptoms to health-care providers for years, am I just now finding out what this is? (For those trying to get pregnant, the timing couldn't be worse.) Now I have to figure out how to manage this complex condition in the hope a new diet and lifestyle will help me get pregnant.
- *Stress.* All the information is confusing, and none of it sounds good. Feeling like I have to change so many things about my lifestyle to get better is overwhelming and even paralyzing.
- *Relief.* Even though I'm not happy about having PCOS, now at least I know what I'm dealing with.
- *Motivation.* PCOS could have lasting effects on my health and fertility. I want to get a grip on my symptoms and participate fully in my care.

Although certainly no one *hopes* for a diagnosis of PCOS, if you've finally received the diagnosis, rest assured that this is a condition you can do something about. The diet and lifestyle changes that can help you manage your PCOS are not extreme recommendations. If more Americans in general (both men and women, old and young) adopted these recommendations, we'd see a decline in nearly every chronic health problem: heart disease, diabetes, obesity, high blood pressure, cancer, and possibly many others. Eating well and leading an active lifestyle have such far-reaching effects on one's health and quality of life: more energy, improved mood, better sleep, improved self- and body image, better sex, and less stress, to name just a few benefits.

A certain amount of the stress many people feel comes from the knowledge that they're not doing all they can to protect their health. Starting to chip away at the list of things we know we should be doing offers a certain amount of relief in itself. The diet and lifestyle recommendations outlined throughout this book are solid, healthful ideas that anyone can follow. With a diagnosis of PCOS, you just have more of an incentive to make these changes.

## The Facts about PCOS

PCOS is the most common female hormonal disorder and the primary cause of anovulatory infertility (infertility caused by lack of regular ovulation). The syndrome has been recognized as having damaging lifelong health effects. PCOS is estimated to affect 5 to 10 percent of women during their reproductive years. According to the 2000 U.S. Census, there are more than 140 million females in the United States—that's up to 14 million women who may develop the condition during their lifetime. Research suggests that up to 30 percent of women experience some symptoms of the disorder, referred to as nonclassic or variant PCOS. With the dramatic increase in childhood obesity, which often leads to earlier onset menstruation, PCOS is starting to show up in younger girls. That means more years to live with the damaging health consequences of this syndrome that never goes away. It is a lifelong, chronic condition.

The cause of PCOS is not clearly understood, but it's believed to be a complex genetic disorder likely involving multiple genes. The genes involved may be those that regulate function of the hypothalamus, the pituitary gland, and the ovaries, as well as those genes responsible for insulin resistance, which is believed to be the driving force for most of the signs and symptoms of the disorder. In fact, women with PCOS experience similar risk for the development of metabolic and cardiovascular problems as those diagnosed with metabolic syndrome, another common and complex health problem that is escalating in the U.S. population and driving the national epidemic of diabetes and heart disease. This makes sense because insulin resistance is a contributing factor in both conditions.<sup>1</sup>

Depending on the research you read, anywhere from 50 to 80 percent of women with PCOS are overweight or obese. The incidence of PCOS in the U.S. population has paralleled the increase in obesity, suggesting a strong connection between body weight and the severity of the condition. Although obesity has not been identified as a cause of PCOS, carrying around excess weight worsens its signs and symptoms. Women with the syndrome often store fat around the middle, known as visceral adiposity, which basically means that they tend to wrap excess body fat around their internal organs. This type of body fat storage is genetically known to aggravate insulin resistance, and raise blood pressure and the risk of heart disease.

PCOS can also trigger a host of physical symptoms, most of which are caused by excessive production of androgens, or male-type hormones, like testosterone. The hallmark of insulin resistance is higher circulating levels of insulin, which can have a seriously toxic effect on hormone production in the ovaries. Higher circulating insulin levels increase the release of an important reproductive hormone called luteinizing hormone (LH) from the pituitary gland. Both LH and insulin then stimulate the theca cells in the ovaries to produce testosterone, which is toxic to egg development. Production of testosterone doesn't make you any less of a woman. All women make some testosterone (and all men produce some estrogen), but in the ovaries estrogen should predominate over testosterone. When excess insulin stimulates a cascade effect where testosterone predominates over estrogen, eggs don't develop normally. Physical signs that androgen levels may be atypical include excess hair growth on the face, chest, and back (male-pattern growth); thinning of the hair on the crown of the head; acne; and a tendency to gain much-maligned "belly fat" (an apple-shaped body as opposed to the healthier pear-shaped body, where body fat is stored more in the buttocks and thighs).

Women with PCOS are also at greater risk of a number of life-threatening chronic health

problems. Most concerning is the connection between PCOS and type 2 diabetes. Diabetes is exploding in the U.S. population. Type 2 diabetes has increased 40 percent since the early 2000s. Undiagnosed diabetes is seven times more likely in women with PCOS, compared with similar-age women without the condition. In fact, 30 to 40 percent of women with PCOS have prediabetes (that is, they don't yet have full-blown diabetes, but they are already showing signs of insulin resistance, which causes type 2 diabetes). As many as 10 percent of women with PCOS develop full-blown diabetes by age forty.<sup>3</sup> A recently released report published in the journal *Diabetes Care* suggests that over the next twenty-five years, the number of Americans living with diabetes will nearly double, increasing from 23.7 million in 2009 to 44.1 million in 2034. Over the same period, spending on diabetes will almost triple, rising from \$113 billion to \$336 billion, even with no increase in the prevalence of obesity.<sup>4</sup>

Heart disease continues to be the number-one killer of both women and men in the United States, and women with PCOS have a four to seven times higher risk of heart attack than women of the same age without the syndrome.<sup>5</sup> Endometrial cancer is also a risk for women with PCOS. The hormone estrogen triggers the growth of cells that line the uterus, which are usually shed once a month due to the opposing effect of the hormone progesterone. But in cases of PCOS, where periods are inconsistent or absent, the lining of the uterus builds up, raising the risk of endometrial hyperplasia (overgrowth of the endometrium), which down the road may lead to endometrial cancer. Hyperinsulinemia (elevated blood levels of insulin due to insulin resistance) is common in PCOS and can encourage the growth of potential cancerous cells. If left untreated, research suggests that endometrial hyperplasia advances to endometrial cancer in as many as 30 percent of cases.<sup>6</sup>

With many women having children later in life, the number of women requiring fertility treatment is also on the rise, and the hormonal changes seen in PCOS have been recognized to be a major player in the world of infertility. If a woman with PCOS does become pregnant, she's at higher risk of gestational (pregnancy-induced) diabetes, which presents a risk to both the mother and the developing baby. Some research suggests that women with PCOS are three times more likely to miscarry than women without the disorder.

Another threatening aspect of PCOS is that although 5 to 30 percent of women may have PCOS or some of its symptoms, awareness about the syndrome—even among many health care providers—remains inadequate. The emergence of information on the prevalence of the syndrome is very much like what happened with fibromyalgia and hypothyroidism in the 1990s. Prior to these disorders being recognized as affecting large numbers of women, many women—and clinicians—failed to recognize the symptoms as a collection of complaints caused by one underlying health problem. Today, both disorders are widely recognized and treatable, as is PCOS.

## A Historical Look at PCOS

In the medical literature the earliest mention of polycystic ovary syndrome dates back more than 150 years to France, where the first official description of polycystic-appearing ovaries was made in 1845. In the early 1900s a few isolated reports began to emerge describing a procedure called a wedge resection (the removal of a section of the ovary) used to treat



cystic changes in the ovaries, but knowledge was still very much isolated to treating the ovarian cysts. An understanding of the systemic reach of the condition was still years away. In 1935 the American gynecologists Irving Stein and Michael Leventhal published a paper on their findings in seven women with amenorrhea (the absence of menstruation), hirsutism (excessive thick hair growth in male-pattern areas), obesity, and cystic-appearing ovaries. This was one of the first descriptions of the complex condition known today as PCOS, which at the time was termed Stein-Leventhal syndrome after the trailblazing physicians who had first tied the symptoms together.<sup>8</sup> Because of the ovary's cystic appearance, Stein and Leventhal referred to the condition as polycystic ovarian *disease*, but as more was learned about PCOS, the term “syndrome” began to emerge.

Although it is appropriately named a syndrome, the fact that PCOS is a syndrome as opposed to a disease contributes to much of the confusion around diagnosing it. What is the difference between a syndrome and a disease? Let's start by looking at technical definitions of the two terms: a *disease* is a pathological condition of a part, organ, or system of an organism resulting from various causes and characterized by an identifiable group of signs and symptoms; a *syndrome* is a group of symptoms that collectively indicates or characterizes a disease or another abnormal condition, the cause of which may or may not be known, and for which no single test is diagnostic.

While these definitions basically sound the same, the difference is in the details. A disease has an “identifiable group of signs or symptoms” that you either have or you don't. To be diagnosed with a disease, you have to meet all the criteria. A syndrome is different in that there could be a number of signs and symptoms that vary between individuals, and they potentially indicate a condition, but not all signs and symptoms have to be met to make a diagnosis. In other words, there may be a list of potential signs and symptoms, and if you have enough of them, your clinician may say you have the condition. (A similar condition is IBS, irritable bowel syndrome, where physicians generally rule out more serious gastrointestinal diseases and end up with a diagnosis of IBS.) It is critical to be evaluated by a physician who's used to seeing patients with PCOS—his or her clinical judgment and experience seeing hundreds of women presenting with a similar constellation of symptoms may allow the physician to pull together a clinical picture that might not be as apparent to someone with less experience diagnosing the condition. That doesn't mean all those doctors who missed the diagnosis were bad doctors; they likely weren't used to seeing a lot of women with PCOS. In their defense, it's only been since the early 2000s or so that the prevalence and importance of treating this syndrome has come to light.

### **Symptoms of PCOS and Getting a Diagnosis**

A woman may see her doctor for several reasons that may ultimately result in a diagnosis of PCOS. Her menstrual periods may not come on a regular basis—or at all—a condition called amenorrhea. Or she's been trying to get pregnant without success. She may be experiencing unwanted hair growth, severe acne, or weight problems—all of which are negative symptoms affecting her body image and self-esteem. She may have been diagnosed with some metabolic abnormality, such as elevated blood sugar (glucose), high cholesterol, or high blood pressure.



often at a young age. She may just have a feeling that “something isn’t right” with her body and she’s hoping a doctor can pull it together for her.

Scientists don’t know exactly what causes PCOS. No single factor can account for the array of abnormalities seen in the syndrome, but research suggests that the underlying primary cause in most cases is insulin resistance—a condition that responds strongly to weight loss, exercise, a healthful diet, and medications when necessary. We do know that PCOS is a genetic condition, likely complicated by ovarian and metabolic abnormalities that, when taken together, can create a potential firestorm of health risks. This is particularly true when environmental factors like obesity, an unhealthy diet, and a sedentary lifestyle are stirred into the mix. Further complicating matters, it appears there are different phenotypes or genetically different forms of PCOS.<sup>9</sup> Some phenotypes are at higher risk of diabetes and other metabolic problems (those with apple-body obesity and signs of insulin resistance), and others appear at lower risk (thin women with PCOS and no evidence of androgen excess). Women with classic PCOS—those with spotty or absent periods and androgen excess—are more likely to have more severe insulin resistance and other metabolic problems.

There are differing opinions on the criteria for a diagnosis of PCOS. Regardless of criteria used, the first step is to rule out related disorders, such as Cushing’s Syndrome and Congenital Adrenal Hyperplasia (CAH). The main criteria used to diagnose the syndrome tends to run along continental lines, with physicians in the United States preferring criteria set during the 1990 National Institutes of Health (NIH) International Conference on PCOS. European physicians tend to favor the more recent 2003 consensus developed by the European Society for Human Reproduction and Embryology and the American Society for Reproductive Medicine, called the Rotterdam Criteria, named after the city in which the criteria were drafted. In 2006 an international organization called the Androgen Excess and PCOS Society weighed in with their own criteria that attempted to meld together the NIH and Rotterdam Criteria, basically concluding that hyperandrogenism is the cornerstone of PCOS but also conceding the possibility that there are forms of PCOS without blatant evidence of hyperandrogenism that need more study.<sup>10</sup>

### *1990 NIH Criteria for PCOS*

To be diagnosed with PCOS you must meet all the following criteria:		
Hyperandrogenism	Oligo-ovulation	Exclusion of related disorders

### *2003 Rotterdam Criteria for PCOS*

To be diagnosed with PCOS you must have two of the following criteria:		
Oligo-ovulation or anovulation	Clinical or biochemical signs of hyperandrogenism	Polycystic ovaries

For the 1990 criteria the NIH held an international conference on PCOS and basically took

a show of hands on what the audience and speakers thought should be included in the criteria. The consensus was, to be diagnosed with PCOS, after other disorders were ruled out, a woman had to have these two complaints: (1) chronic oligoanovulation (few or no periods) and (2) biochemical or clinical signs of excess androgen (excess hair growth, thinning of the hair on the head, and so on). Interestingly, having polycystic ovaries visible on ultrasound was not required to be present for diagnosis, which was basically a nod to the belief that ovaries were only *part* of the picture, despite the syndrome's name.

In an effort to be more inclusive—and to recognize that the diagnosis may be broader than these two criteria—the Rotterdam Criteria expanded the diagnosis of PCOS to women if they met two of the following three conditions: (1) oligoanovulation or anovulation, (2) the clinical or biochemical diagnosis of androgen excess, and (3) polycystic ovaries visible on ultrasound. Because the Rotterdam Criteria uses the presence of cystic ovaries as one of the criteria that can be present to diagnose PCOS, it opens the diagnosis pool up to women with normal periods and fertility but who have signs of androgen excess and polycystic ovaries on ultrasound as well as to women who have irregular periods and polycystic ovaries but no signs of androgen excess. This expanded criterion is believed to increase the number of women who could be diagnosed with PCOS by about 20 percent. Although this categorization sounds confusing, it may clarify the confusion for women who might doubt their PCOS diagnosis because they're thin (many of the books and online information women read about PCOS suggest they're more likely to be overweight if they have PCOS) and without signs of androgen excess but have irregular periods and cystic ovaries on ultrasound.

In addition to adding phenotypes beyond “classic PCOS,” the Rotterdam Criteria include many more women who have milder PCOS symptoms and are less likely to be overweight, many of whom are probably less affected by the metabolic abnormalities (insulin resistance, high cholesterol, and so on) seen in classic PCOS. The 2006 Androgen Excess and PCOS Society criteria are worth mentioning, although they don't change the picture much. The position accepts the NIH criteria with some modifications based on the concerns of the Rotterdam Criteria, basically concluding that hyperandrogenism is the cornerstone of PCOS but also conceding the possibility there are forms of PCOS without blatant evidence of hyperandrogenism that need more study. Acknowledging the criteria will evolve over time as new findings emerge, they officially concluded that until more is known, all three of the following criteria should be present to diagnose PCOS: (1) hyperandrogenism (excess hair growth and/or blood tests suggesting high androgens); (2) ovarian dysfunction (lack of regular periods and/or polycystic ovaries); and (3) exclusion of other androgen excess related disorders.

Particularly if you're looking for a reason *not* to have PCOS, it can be overwhelming and confusing. But identifying all these different “types” of PCOS begs the question, do we treat women who have a diagnosis of PCOS but who don't have all the classic signs and symptoms the same? And what about the fact that gaining or losing weight could move a woman in or out of criteria because of its effect on ovulation and androgen production? Until we know more about the degree to which these less-classic cases of the syndrome may be affected by insulin resistance—the primary abnormality affecting women with PCOS—the prudent thing to do is to assume some increased risk and fine-tune diet and lifestyle accordingly. If we look at irregular periods, excess androgens, and polycystic ovaries as three variables to be mixed

and matched, it's possible there may be differences in how women should be treated based on their life and health goals. Scientists say some degree of insulin resistance can be assumed once someone's Body Mass Index (BMI) drifts over 30 (the clinical definition of obesity). According to a 2005–2006 survey from the Centers for Disease Control and Prevention (CDC), 35.3 percent of women in the United States are obese—all of whom would benefit from the information presented in this book (even without a diagnosis of PCOS).

## **The Clinician and PCOS Diagnosis**

It's important to be fully evaluated by a health-care provider who has considerable PCOS experience. This may be your primary care provider—be it a medical doctor, a physician assistant, or a nurse practitioner—or an endocrinology specialist. According to PCOS expert Dr. Samuel Thatcher, in no other gynecological condition is a thorough medical history more important than in PCOS. Knowing what questions to ask—and a willingness to listen as you tell your story—is critical to helping piece together whether you have PCOS. No one knows your history better than you. You're looking to form a partnership, so don't settle for being brushed aside by a busy clinician looking to cut to the chase. The sidebar on [this page](#) written by reproductive endocrinologist Dr. Alison Zimon, includes information on obtaining a comprehensive medical evaluation for PCOS. Zimon outlines the type of information your doctor will gather from your medical history and physical exam as well as the tests you might expect and medications that might be helpful depending on your circumstances.

## **Using Medications to Manage PCOS**

My goal is to help you manage your health and hormones as naturally as possible through diet and lifestyle change (by boosting activity, taking sensible supplements, managing stress, and so on). But despite your best efforts, sometimes medications are needed to help regulate your menstrual cycles, control your symptoms, manage your health risk factors, or just to help you see your way clear to what needs to happen to get better. Medications can be used as an ally on the road to better health. Some problems, like hypothyroidism, don't respond to diet or exercise. Or perhaps what's happening with your health has been going on for a while and has progressed to the point where you need to start medications to get better. Maybe you're showing signs of prediabetes, and medications may help reduce the risk of progressing to full-blown diabetes.

There is also the possibility of starting out on medications you may be able to wean off of down the road, as the effects of diet and lifestyle change take hold. Or you may only need medications temporarily (to increase your odds of getting pregnant, for example). But medications can never compensate for a lousy diet and sedentary lifestyle—that is, you can't take meds instead of making diet and lifestyle changes and expect to get the optimal results from the medications. Many people with diabetes have run through a long list of oral agents to manage the disease, only to eventually end up on insulin. Sometimes, try as you might, things turn out this way, but there's a lot we can do to keep our dependence on medication to a minimum.

Medications used to treat PCOS tend to fall into several categories (see the table below): insulin sensitizers, hormone regulators, symptom management meds, lipid (cholesterol) lowering meds, and blood pressure regulators.

### *Medications to Treat PCOS*

MEDICATION	EXAMPLE
Insulin sensitizers	metformin, pioglitazone, rosiglitazone
Hormone regulators	oral contraceptive pills, progesterone, clomiphene citrate, letrozol
Symptom management	spironolactone, finasteride, minoxidil, retonoin, tetracycline
Lipid (cholesterol)-lowering agents	gemfibrozil, niacin, statins
Blood pressure regulators	diuretics, angiotensin-enzyme inhibitors, angiotensin-receptor blockers, beta-blockers, calcium channel blockers

### **Preparing for the Doctor's Visit**

In today's health-care environment, many physicians are crunched for time. Be sure to bring anything to the appointment that outlines your past medical history and specific concerns. Make a list of all the potentially important pieces of the puzzle for the PCOS expert to analyze. This greatly facilitates the gathering of information and helps the clinician develop a clear picture of what's been happening and what your goals are. Gather the following information ahead of time:

- **Menstrual history.** How old were you when you got your first period? What has your menstrual pattern been like? Are there any previous pregnancies, and if so, how many?
- **Weight history.** If you are currently overweight, did your weight change significantly in a short period of time? Has your weight been a challenge all your life, or has managing become more of a problem recently?
- **Family history.** Are there diabetes, heart disease, cancer, history of fertility problems, or weight issues in your family?
- **Medications and/or dietary supplements.** Include everything you are taking as well as the doses.
- **Previous tests.** If available, bring along the results of previous blood tests, ultrasounds, and so on.

The first thing that will generally happen in the diagnosis process is that the doctor will look to rule out other explanations for your health complaints. These might include such

disorders as hyperprolactinemia, nonclassic congenital adrenal hyperplasia, or Cushing syndrome, a hormonal disorder caused by prolonged exposure of the body's tissues to high levels of the hormone cortisol. The doctor will weed through three different types of information: the symptoms and a physical examination, a variety of blood tests, and other test results. What exactly is he or she looking for?

## Menstrual Disturbances

Women with PCOS typically get their periods around the usual age of twelve to thirteen, but it's not uncommon for a young woman to make her first trip to the gynecologist because she hasn't gotten her period at all. Menstruation may start out regular, but by the mid-teen years cycles may start to lengthen or be skipped altogether. Frequently, birth control pills are prescribed to regulate this, but this doesn't mean the PCOS is gone. The symptoms are just being overridden by the hormones in the oral contraceptives. During the teen years skin problems seen in women with PCOS may also start to kick in (although acne in general isn't unusual during the teen years).

Because oral contraceptives regulate hormones, and therefore many of the signs and symptoms of PCOS, it's not unusual for a woman to think all is well—until she goes off her birth control pills for one reason or another and then she doesn't get her period. Although some women with PCOS have fairly regular twenty-eight-day cycles, PCOS should be suspected in anyone with cycles that last longer than thirty-five days. Those women without periods will often be given medications (like progestin) to trigger the onset of a period. Age at menopause is believed to be the same for women with and without PCOS.

## Skin and Hair Problems

Skin problems in women with PCOS are extremely common, brought on by increased levels of male hormones (androgens). Androgens increase production of sebum (an oily substance secreted by the sebaceous glands in the skin), which increases inflammation and bacterial growth in the skin, causing acne. Seborrhea (flaky skin) and hidradenitis suppurativa (inflammation of the sweat glands in the armpit and groin) are also common in PCOS, as is a particularly telling skin sign called acanthosis nigricans (AN). AN is a skin condition characterized by velvety, raised, pigmented skin changes most commonly seen on the back of the neck, armpits, groin, and beneath the breasts. AN is often described as the skin "looking dirty," but the discoloration can't be scrubbed off. Skin tags are also often present. AN is frequently a skin symptom of insulin resistance and is more common in dark-skinned people.



### ***What to Expect from Your Doctor***

*By Dr. Alison Zimon, reproductive endocrinologist at Boston IVF*

A complete workup for PCOS will involve ruling out a number of conditions that can masquerade as PCOS in their presentation and will confirm the PCOS diagnosis. It will also address the severity of your PCOS and its associated health problems, including



impaired glucose tolerance, diabetes, obesity, high cholesterol, infertility, hypertension, and cardiac disease. Most commonly, particularly in the United States, the diagnosis is made when a woman has less frequent or absent menstrual cycles with evidence for excess male hormones and other conditions are excluded. A comprehensive evaluation will likely include a detailed focused history of your symptoms, your health, and your family's health. Your clinician may ask about your pubertal milestones, menstrual patterns, weight fluctuations, signs of excess male hormones (such as acne and excess hair growth), and other medical conditions and symptoms. A physical exam will be performed and, in addition to a routine exam, will include screening for signs of male hormone excess, abnormal endocrine function, insulin resistance, reproductive development, and anatomic abnormalities.

Your clinician may conclude that you have PCOS based on your history and exam alone. However, often he or she will order tests to complete the evaluation or send you to a specialist for this. Most likely, these will include serum measurements of luteinizing hormone (LH) and follicle stimulating hormone (FSH), which are hormones secreted from the pituitary gland in the brain that regulate ovarian function. Levels of the ovarian hormone (estrogen) and the male hormones (testosterone, androstenedione, and dehydroepiandrosterone sulfate [DHEAS]) may be measured. Some testing to evaluate your glucose and insulin metabolism may be performed, such as fasting serum glucose and insulin, glucose-load challenge, and glycosylated hemoglobin level. Most other tests will be done if alternative diagnoses are considered or need to be ruled out, including thyroid disease, excess prolactin, Cushing's disease, enzyme defects, hormone-secreting tumors, or hyperlipidemia. Your clinician may also order tests to make sure your liver and kidneys are functioning properly. Finally, if it has been six months to a year since your last period, your clinician may want to be sure you have not developed an overgrowth of your uterine lining, resulting in endometrial hyperplasia or early endometrial cancer. He or she may recommend an ultrasound to measure the lining or perform a simple office biopsy to sample the lining tissue.

Another major PCOS sign that can be particularly annoying is hirsutism. All manner of expensive or uncomfortable therapies exist to deal with this hair growth (laser, electrolysis, waxing, shaving)—most women will do whatever it takes—as do some medications (that either treat the underlying hormonal problems or the hair growth itself). As if growing facial hair wasn't upsetting enough, some women also experience hair thinning on the crown of the head similar to male-pattern balding. For many women a full head of hair is vital to the self-esteem, and losing it, particularly during the reproductive years, can result in nothing short of panic! The mechanism isn't completely understood, but hormones are the likely culprit. Hair loss may improve with treatment of the underlying insulin resistance. I remember one patient who started taking metformin, a medication to manage insulin resistance, and a multivitamin at the same time; she commented that the vitamin seemed to be making her hair grow thicker. The more likely explanation, however, was that her insulin

levels were improving on the metformin, causing a drop in her androgen levels. Other medications exist to help mediate hair loss for women with PCOS.

## Weight Problems

Being overweight or obese is commonly associated with PCOS, but which comes first, the chicken or the egg? Likely, it's a little bit of both—depending on individual circumstance. Research cites some widely fluctuating numbers on this, but it appears that between 50 to 80 percent of women with PCOS are overweight or obese. And they tend to carry much of the excess weight as abdominal fat (the apple versus the pear body). This is particularly damaging to overall health because of its association with a greater risk of diabetes, hypertension, and cardiovascular disease. Certainly, there are both lean and obese women with PCOS, but obese women are more likely to be harmed by the syndrome's health implications. Likely because of a slew of metabolic derangements, many women with PCOS gain weight very easily and struggle more to lose it. Understandably, they feel frustrated, particularly when a physician stares at them cynically when they've reported having "realized" to lose weight without results!

### *Helpful Medications to Treat PCOS*

*By Dr. Alison Zimon, reproductive endocrinologist at Boston IVF*

**Insulin sensitizers.** Insulin resistance is believed to be a central cause of PCOS. Insulin sensitizers (medications that make you less resistant to insulin) are sometimes used as a component of the treatment plan. The most commonly prescribed insulin sensitizer for PCOS is metformin (Glucophage); others include pioglitazone (Actos) and rosiglitazone (Avandia). They work by multiple complex mechanisms, but put simply, these medications partially reverse the insulin resistance so that the same level of insulin is better able to do its job, including driving glucose into cells. Ultimately, this lowers the body's need for insulin, the circulating levels of insulin decrease, and the demands on the pancreas are lessened. Although insulin sensitizers help the body deal with excess sugar, they rely on a healthy pancreas to secrete insulin and a healthy diet to minimize the stress of an oversupply of carbohydrates.

**Hormone regulators.** Depending on your menstrual patterns and your reproductive plans, medications that help normalize reproductive hormones may be prescribed. Most women with PCOS have irregular cycles and experience menses at random intervals, from thirty days to fifty days to several months or even years. This irregularity is often associated with hard-to-manage heavy and dysfunctional bleeding. Furthermore, a woman who has rare to absent menses is at risk of an overgrowth of the uterine lining (the endometrium) as a result of unopposed estrogen (in the absence of the protective postovulatory hormone progesterone). If long-standing, unopposed estrogen can lead to endometrial hyperplasia, precancer, or cancer.

Although improved diet, exercise, and concomitant weight loss can promote cycle regulation in women with PCOS, often hormone therapy is required to do this. One method is oral contraceptive pills (OCPs), because they provide a balance of estrogen and progesterone while causing a regular shedding of the lining, both of which are protective. Birth control pills, in addition to contraception, have additional benefits for women with PCOS—most notably a reduction in serum male hormones, which may help decrease acne and excess sexual hair growth (hair on the face, abdomen, inner thighs, and back). Intermittent progesterone therapy is an alternative option for women with medical contraindications to OCPs, who poorly tolerate them, or who prefer not to be on a daily hormone treatment. The progesterone Medroxyprogesterone acetate (Provera) is given for ten to fourteen days every two to four months. This therapy does not provide contraception, and a pregnancy test must be done after every interval before starting a dose. It is important to keep track of the treatment schedule because to protect oneself from unopposed estrogen, a menstrual bleed must occur at least four times a year.

Sometimes improved insulin sensitivity—through weight loss, exercise, and possible insulin-sensitizing agents—will promote ovulation in a woman with PCOS. However, conception rates can be dramatically increased by using medications that induce ovulation. These work by temporarily blocking estrogen, resulting in an exaggerated stimulation of the ovary via the brain hormone follicle stimulating hormone (FSH). Two classes of these medications are selective estrogen reuptake modulators (SERMS), such as clomiphene citrate (Clomid), and aromatase inhibitors, such as letrozole (Femara). Pregnancy rates with these medications are 5 to 12 percent on average, with a 5 to 10 percent chance of a twin pregnancy.

**Symptom management.** Because of irregular menstrual cycles and anovulation in women with PCOS, another consequence is a hormone imbalance in the ovaries and adrenal glands marked by an excess of androgens (male hormones), including testosterone, dehydroepiandrosterone (DHEA), and androstenedione. In women a relatively modest increase in androgens overstimulates the sebaceous glands and the hair follicles on the face, neck, chest, abdomen, inner thighs, and back. As a result, many women with PCOS suffer from acne and hirsutism (excess male-pattern hair). OCPs help to lower the androgen levels and serve as the first-line therapy for hyperandrogenism. If OCPs do not achieve acceptable improvement, second-line medications may be used. Severe acne may be treated with antiproliferation medications like isotretinoin (Accutane) or antimicrobials (for example, tetracycline). Medications for treatment of hirsutism act by decreasing the hair-follicle response to androgens; Spironolactone (also a diuretic) is the most common of these. Less frequently, androgen excess in PCOS women is marked by male-pattern balding. Medical therapy is limited but acts to disrupt testosterone effect at the hair follicle and includes finasteride (Propecia) or to stimulate follicle growth as with minoxidil (Rogaine).

**Lipid (cholesterol)-lowering medications.** Hyperlipidemias (that is,



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