

A Whole Health Guide to Polycystic Ovarian Syndrome (PCOS)



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Empowerment & Knowledge

What You Need to Know About PCOS

Polycystic Ovarian Syndrome, or PCOS, is considered one of women's most common endocrine and metabolic issues. It is estimated that up to 22% of women from all ethnicities and backgrounds in their reproductive years contend with this disruptor of hormones and metabolism, depending on the diagnostic criteria used (1–3). An even more significant issue is the finding that many women are left undiagnosed for an average of two years and see multiple health professionals before a diagnosis is made (3–5).

What makes this condition so difficult to diagnose by medical providers?

The diagnosis of PCOS is misleading and continues to create confusion in the medical community (3). While increases in the number of follicles (cysts) on the ovaries, often referred to as the “string of pearls,” can be seen in PCOS, this symptom alone is not sufficient for a diagnosis of the condition (2,6).

Further, some patients with PCOS do not have to have any cysts on ultrasound but may still be diagnosed with the condition. How is this possible? After years of varying viewpoints in the medical community, the criteria for diagnosing PCOS have evolved as a deeper understanding of the condition is realized—though this remains an area of conversation for clinicians and researchers.

According to the most recent diagnostic criteria, known as the modified Rotterdam criteria for diagnosing PCOS, two of the following are present*: (7)

1. High androgens or hyperandrogenism symptoms
2. Menstrual cycle irregularity
3. Changes in ovary

*This information is for educational purposes only. Diagnoses are provided by your healthcare provider. Descriptions are provided in Table 1.

With that said, you may also see the four types of PCOS (Table 1) mentioned, which were criteria established at the 2012 NIH Evidence-Based Methodology Workshop on PCOS, and it continues to serve as a convenient way to approach research and clinical care (8–10).

Table 1. The Four Phenotypes of PCOS

PCOS Type*	Hormone Profile	Most Common Symptoms	Menstrual Cycles	Ovarian Changes**
Phenotype A "Classic PCOS"	Elevated testosterone and/or DHEA	Acne, male pattern hair loss, excessive hair growth	> 35 days apart or < 8 menses per year	Present
Phenotype B "Classic PCOS"	Elevated testosterone and/or DHEA	Acne, male pattern hair loss, excessive hair growth	> 35 days apart or < 8 menses per year	Not present
Phenotype C "Non-ovulatory PCOS"	Elevated testosterone and/or DHEA	Acne, male pattern hair loss, excessive hair growth	Normal	Present
Phenotype D "Non-hyperandrogenic PCOS"	Normal testosterone and DHEA levels	None	> 35 days apart or < 8 menses per year	Present

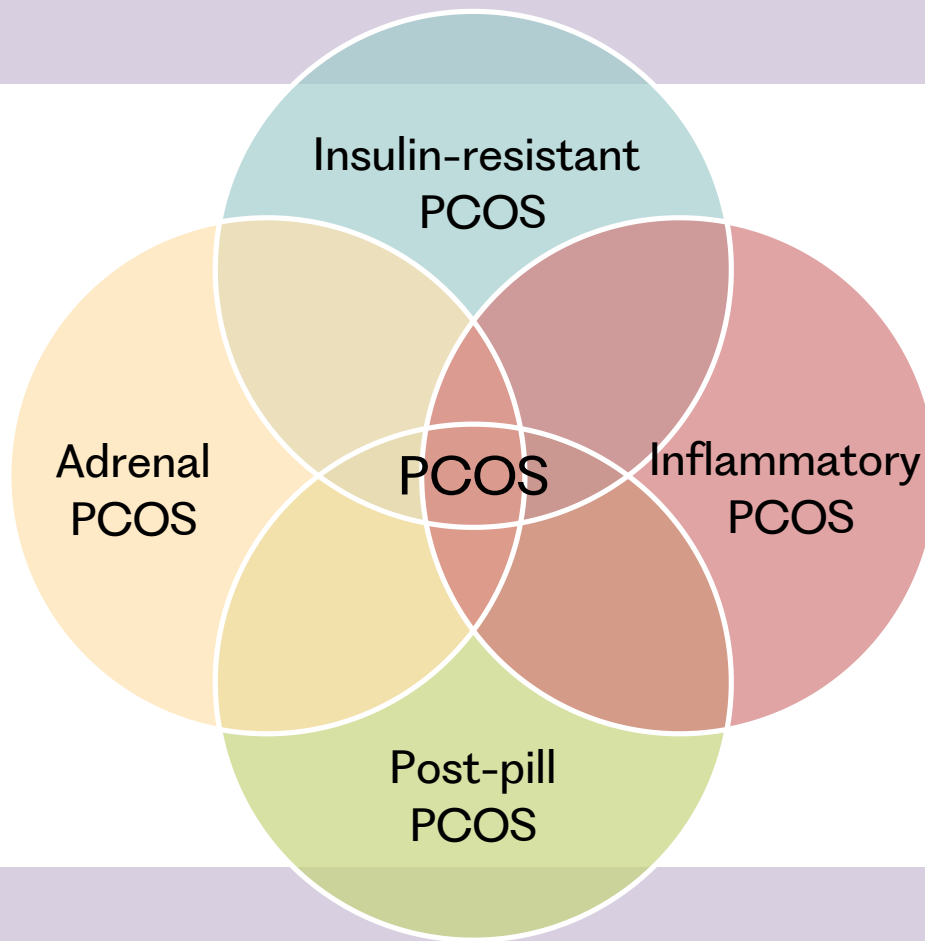
Abbreviations: DHEA:dehydroepiandrosterone; >: greater than; <: less than

*Phenotypes have been reported as Types A-D and Types 1-4 but contain the same criteria (8,9)

** Ovarian changes include Polycystic appearance on ultrasound (20 or more follicles per ovary or 10 cm³ or greater ovarian volume)

It is worth noting that some websites classify the four types of PCOS as “functional PCOS types” described in Figure 1.

Figure 1. The Four Functional PCOS Types



It is important to note that functional PCOS types do not meet the medical definition or criteria a qualified healthcare provider uses for a medical diagnosis.

For example, while insulin resistance is present in two-thirds of women with PCOS, insulin levels are not a marker used to diagnose PCOS. Likewise, in inflammatory PCOS, inflammation biomarkers are also not a diagnostic criterion. Post-pill PCOS most likely refers to a concept called “post-birth control syndrome.” This syndrome is said to occur when birth control is stopped and symptoms of PCOS are experienced until the body restores hormonal balance.

Alternatively, birth control pills can mask symptoms and underlying hormonal imbalances of PCOS, causing women to be undiagnosed until after they stop the pill. Finally, adrenal PCOS refers to the elevation of DHEA levels, which can be one of the required criteria but is not the only marker needed.

Additionally, scientific evidence does not support these particular classifications. Yet, some clinicians may find this an easy, convenient way to address the root cause of a woman’s concerns related to PCOS.

Unsure of your type? No worries!

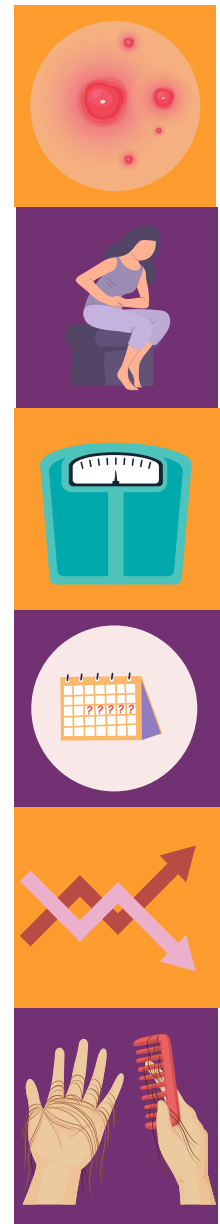
Regardless of the “type” of PCOS, the foundational diet, supplements, exercise, and lifestyle factors that regulate insulin and glucose levels, lower inflammation, balance hormones, and reduce stress are the same.



Common Signs and Symptoms

Beyond the diagnostics, women with PCOS can experience a range of signs and symptoms, including, but not limited to: (10)

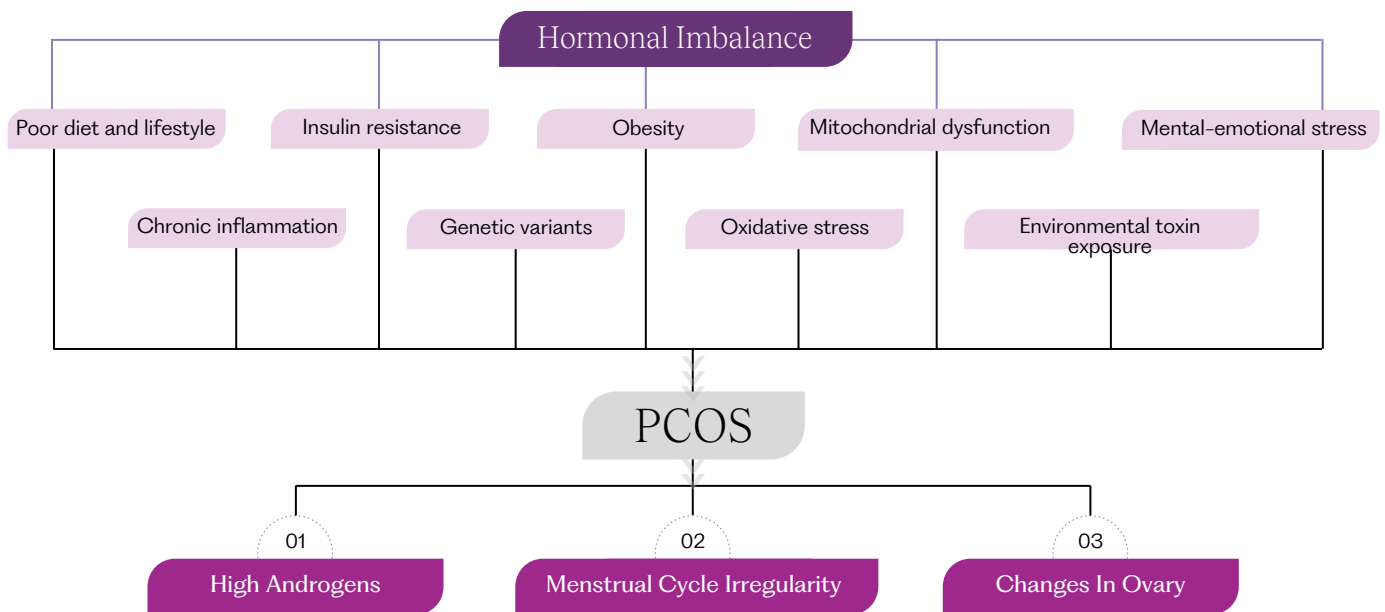
- Acanthosis nigricans (dark, thick, velvety skin in body folds/creases such as the neck or armpits)
- Acne
- Androgenic alopecia (thinning and diffuse hair loss, sometimes called “male pattern baldness”)
- Bowel symptoms that mimic irritable bowel syndrome (IBS)
- Decrease in follicle-stimulating hormone (FSH) levels
- Hirsutism (excessive body hair)
- Increase in androgenic hormones (testosterone, DHEA)
- Increase in luteinizing hormone (LH) levels
- Infertility
- Insulin resistance
- Irregular menstrual cycles
- Obesity
- Pelvic pain
- Unexplained weight gain/inability to lose weight
- Virilism (development of masculine characteristics)



What causes PCOS?

The exact cause of PCOS is unclear, as many factors play a role in developing this condition. Root causes can include one or more of the following: (10–13) (Figure 2).

Figure 2. Root Causes of PCOS



What can you do?

If you have any of the abovementioned concerns, you should visit your medical practitioner for an evaluation. They can assess the severity of your symptoms and condition and discuss with you the wide array of options you have. Every woman has beliefs about life, health, and medicine, so finding a practitioner aligned with those values is imperative.

It is important to note that other conditions and medications can mimic or have an association with PCOS. For example:

- Long-term exposure to high levels of cortisol (14)
- Hypothyroidism/autoimmune thyroid disease, with symptoms such as hair loss, irregular cycles, obesity, and infertility being shared across both conditions (15,16)
- Antiepileptic drugs such as valproic acid or valproate may stimulate excess androgens (17,18)

With these factors in mind, speaking to your healthcare provider would be helpful.

Hormones

Key Communicators In The Body

How does the body communicate within?

All information in the body is received through two types of messengers — neurotransmitters and hormones. Neurotransmitters tend to come from proteins and help cells communicate through the nervous system. Hormones are usually fat-soluble and communicate cell to cell or from one cell through the bloodstream to another cell. These two messengers control nearly every aspect of the body's function. They can be the root cause of many health issues like PCOS.

What does “hormone balance” really mean?

You might have heard the phrase, “hormone balance” since it is so commonly used. However, it is not typically defined. Sometimes different practitioners will address it in different ways, and not always as the whole system. When there is hormone balance, there is streamlined communication through the endocrine system, or the glands in the body that produce hormones. The endocrine system is a feedback system, which means that there is communication within each of the glands that can turn on and turn off the signal.

For example, if there is something stressful in the environment, the brain registers this threat (usually through the emotional part of the brain called the amygdala). The hypothalamus and pituitary gland receive this signal and send out a series of hormones to communicate with other parts of the endocrine system, like the thyroid gland (in the neck) and the adrenal glands (two triangular glands that each “sit” on top of the kidneys). The thyroid and adrenal glands get the signal to produce different hormones, like thyroid hormone (from the thyroid gland) and cortisol (from the adrenal glands). These hormones are needed by the body to help to better metabolize fuel to deal with the stressor.

After these hormones are released and then used by the body to help with metabolism, they eventually signal back to the hypothalamus and pituitary gland to “turn off” their signals. Healthy hormone balance would mean that the hypothalamus and pituitary turn off the signal, and then the body finds its way back to its baseline, non-stressed state. This is called a feedback loop. The body is in good communication with these different glands are all giving and receiving the proper signals.

There can be cases where this communication through the hypothalamus, pituitary gland, thyroid gland, adrenal gland, and, in the case of the female body, the ovaries (these are the reproductive glands) is not in harmony.

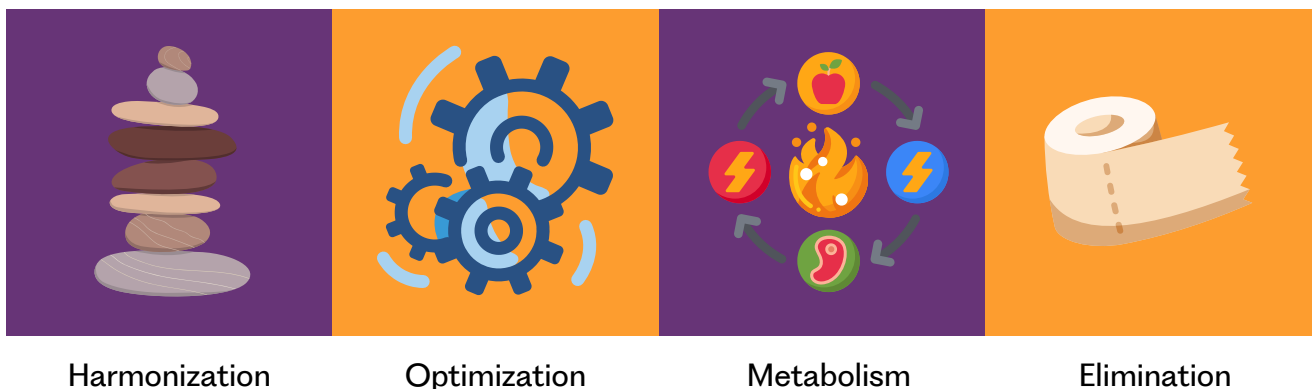
Here are some instances where there could be an endocrine system out of balance:

- The glands are not functioning properly, perhaps due to genetics, stress, toxins from the environment, lack of nutrients, or inflammation. As a result, the glands are not able to send a signal. They may also not be able to receive the signal.
- The glands are overproducing a signal because there is no feedback from the gland that it has been received. In these cases, the communication or feedback loop has been broken. It's like a phone that just keeps ringing and ringing, but no one is answering it. It just makes a lot of noise and is disruptive.
- The glands are not picking up the signal from the body to respond. In this case, the initial signal to respond has gone quiet, so the body may become inflamed, or disease may settle in because there was no response to what was threatening to the body

Therefore, “hormone balance” is when there is a signal to turn on the body’s response and then turns off the body’s response. When there is a lack of being able to turn on or turn off the body’s response, there is “hormone imbalance.” Hormone imbalance is part of the root cause of PCOS.

THE WAY TO FEEL AT “HOME” IN YOUR BODY: FOUR STEPS TO HORMONE BALANCE

To get your body’s communication on track and have seamless signals and ready responses from the endocrine system, we need to look to four different processes, which are all happening simultaneously in your body. When these four aspects are taken care of, you feel more calm, even, able to perform, fully functional in your body — in other words, you feel more “at home” in your body.



If you can remember the H.O.M.E. acronym, you’ll easily recall how to get back into hormone balance.

Harmonization

Think of your endocrine system, which is made of several glands, like the pituitary gland, thyroid gland, adrenal glands, pancreas, and ovaries, all as part of an inner orchestra. They are all making the “music” within, communicating signals back and forth, turning on and turning off during the perfect beat and rhythm. Before an orchestra gets started with their performance, the conductor ensures that each instrument is properly tuned. If just one instrument is out of tune, it can make the entire symphony sound like noise rather than beautiful music. You can usually pick out which instrument(s) is(are) out of sync.

Similarly, we need to “tune” our inner endocrine glands. If they are worn out because of stress, low in functioning because they don’t have nutrients, or perhaps burdened with toxins that you’ve taken in (particularly the case with the thyroid gland!), then they won’t be harmonized or tuned in to the overall whole of the endocrine system. They may be squeaky or off in notes.

Harmonization occurs in several ways. We need to take care of our bodies, our endocrine “instruments” through a healthy diet, the right amount and type of physical activity for our bodies, reduce stress inputs or deal with stress through mind-body practices, and lower our exposure to toxins in the environment. When we get rid of the interference and get our endocrine system in good working condition, we are ready for better communication to take place.

In this guide, we will help you to get ideas to make this shift. Sometimes you may need to work with a healthcare professional to guide you in making these changes “stick”. It takes time, attention, and focus to tune your endocrine system to keep it in quality condition. However, it’s well worth it, because if you don’t address the overall health of the endocrine system on a regular basis, the symphony inside will be cacophony or noise.

Optimization

With a well-oiled instrument, or a well-functioning endocrine gland, you are ready to optimize its communication. Since hormones are made from fats and neurotransmitters are made from proteins, you need to ensure that you have a constant supply of healthy fats and quality protein from the diet to fuel your endocrine system. Think of a car. You can have a beautiful, brand-new car, which has well-functioning parts, like the engine, but it may not have gasoline in the tank. It may not have oil in the engine to run optimally.

Through nutrients in the proper balance and ratios for your body, you can optimize your endocrine “engine”. When it comes to macronutrients, fats and proteins are key. Non-starchy carbohydrates that are high in fiber, like cruciferous vegetables (e.g., broccoli, kale, cauliflower) and leafy greens can give you the staying power and energy you need. Often, people need energy, so they select foods that are high in starch and sugar, like potato chips or other snacks, breads, and pastas. These foods may give energy initially, but they ultimately take energy away, robbing you of your vital currency to fuel your hormones (and neurotransmitters).

Let’s say that you are eating healthy amounts of fats, proteins, and even non-starchy carbohydrates, but you are still feeling low in energy and your hormones are not balanced. You might need to look deeper into micronutrients, or vitamins and minerals. These nutrients are often required as helpers in making hormones. You can have the raw material of the fat, but you need vitamins like vitamin C, the team of B vitamins, and minerals like magnesium, zinc, and iron, to make the hormones. It’s like an assembly line. If you miss one part of the production of hormones, it doesn’t get made or it isn’t functional. Therefore, micronutrients complement macronutrients in the process of optimizing your body’s production of hormones.

In this guide, we provide you with an outline of foods that will optimize your endocrine system, including the macronutrients (protein, fat, carbohydrates) and micronutrients (foods that contain the spectrum of vitamins, minerals, and phytonutrients, or plant compounds that can act as antioxidants).

Metabolism

You've got your harmonized orchestra, all the players are adequately nourished and fed, and now they need to make their music! Metabolism is the music that carries through the endocrine system. It is the body processing hormones, which means making them, moving them from one place to another through the blood and lymph, and then arriving at the cell so it can function in the cell. Usually, this means that the hormone keys into a receptor and then there is like a relay race inside the cell, with more communication through proteins. Often, those messages will make their way to the genes, causing the genes to make some protein. Those proteins can work inside the cell or get carried outside of the cell to some other place.

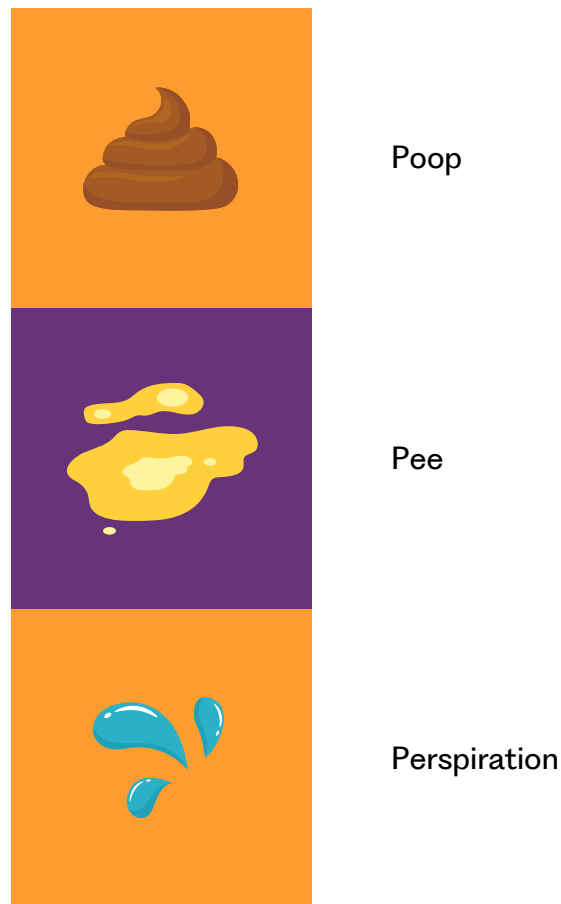
Therefore, the "music" of hormones is heard throughout our bodies. That communication is "heard" even by the DNA, causing more communication and signals. You might think of this process as an overall dance of one hormone affecting another and ultimately the entire body is moving to this rhythm of hormones.

Once that hormone has done its job of singing its tune at the cell, it can then travel to the liver. The liver can package it up in a way to get it ready to be eliminated from the body. This process of "metabolic transformation" of hormones is sometimes referred to as detoxification. Detoxification requires essential nutrients to work well. Without the necessary nutrients, you can get used-up hormones that are now different in structure that can be damaging to the body. That's why it's equally important to not just make the hormones, but to properly metabolize them, eventually packaging them up to be eliminated as waste.

In this guide, we provide you with some foods and lifestyle strategies to help with making this multi-part "dance" of metabolism even more streamlined, with receiving, amplifying, and eventually quieting the dance.

Elimination

If metabolism happens properly, now we are ready for the hormone “finish line”. We eliminate hormones in many ways: through poop, pee, and perspiration (the 3Ps!) . That’s why it’s so important to be having regular bowel movements (1-2 per day on average), urinating throughout the day, checking the color of the urine to be sure it’s not too light or dark, and even engaging in enough physical activity so you can sweat out those metabolized hormones, as well as toxins!



In this guide, all the food and lifestyle strategies are designed to get you to the end with healthy elimination.

Hormones & PCOS

All information in the body is transferred by two types of messengers — neurotransmitters and hormones. Neurotransmitters help cells communicate through the nervous system and hormones enable cells to communicate through the bloodstream. These two messengers control nearly every aspect of the body's function. They are influential and can be the root cause of many health issues, like PCOS.

Hormone levels naturally fluctuate throughout the menstrual cycle; therefore, knowing the day of your menstrual cycle is imperative if a qualified healthcare provider completes laboratory testing.

While two main androgenic hormones are included in the diagnostic criteria for PCOS (testosterone and DHEA), all hormones are essential to women's health.

These are the top hormones when it comes to PCOS.

Testosterone: A sex hormone that plays a role in regulating libido, bone mass, muscle mass, and fat mass. This is often referred to as the “male sex hormone,” but this is misleading as women also produce testosterone in much lower amounts. Testosterone is needed in women as it is converted to estrogen.

In PCOS, testosterone levels can be elevated beyond what is normal for women, especially compared to estrogen levels.

DHEA: A steroid hormone made primarily in the adrenal glands and secondarily in the ovaries and brain. This hormone converts to both testosterone and estrogen.

In PCOS, DHEA levels can be elevated beyond what is normal for women.

The following hormones are not part of the diagnostic criteria for PCOS, though an imbalance in one or more may contribute to symptoms:

Follicle Stimulating Hormone (FSH): A hormone produced in the pituitary gland responsible for stimulating eggs' growth during the menstrual cycle.

In PCOS, FSH levels may be decreased.

Luteinizing hormone (LH): A hormone produced in the pituitary gland responsible for stimulating ovulation (releasing a mature egg) in women. FSH and LH work together; therefore, an LH/FSH ratio may be assessed by your provider. If this ratio is high, ovulation does not occur.

In PCOS, LH levels may be increased.

Estrogen: A sex hormone that plays a role in female reproduction. It is also critical for bone, cardiovascular, and mental health and influences hair, skin, and nail health. Estrogen is a broad term describing the estrogens made: estrone, estradiol, and estriol. The estrogen levels fluctuate in a cyclical pattern, with higher levels at the start of the menstrual cycle, peaking at ovulation, and declining afterward until menstruation begins.

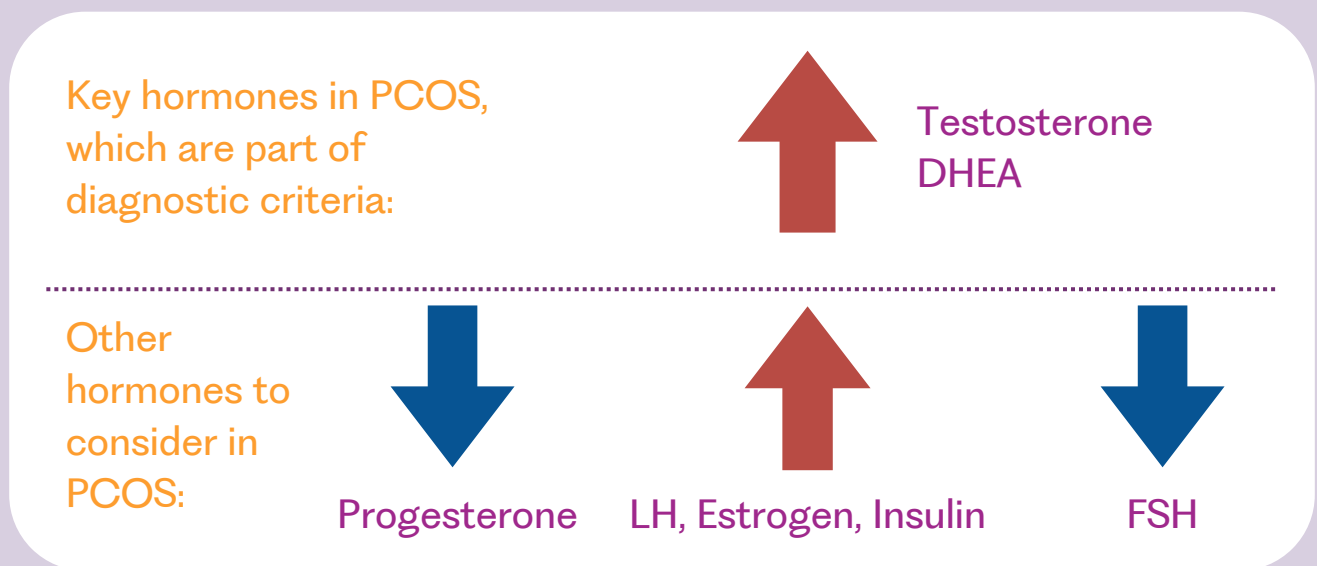
In PCOS, estrogen levels may be normal, decreased, or elevated.

Progesterone: A sex hormone that plays a role in the menstrual cycle and pregnancy. It is also vital for adrenal health. Like estrogen, progesterone is also cyclical. It will be lower at the start of the menstrual cycle, higher after ovulation, and remain higher until the menstrual cycle begins.

In PCOS, progesterone may be normal or decreased.

Insulin: A hormone created by the pancreas to control the amount of glucose in the bloodstream at any given time. It shuttles blood glucose (blood sugar) into cells, which is then used for energy. Sometimes, insulin is referred to as the key that opens the door for glucose to come into the cells.

In PCOS, up to two-thirds of women have insulin resistance, meaning the body is not responding well to insulin. This lack of response can contribute to elevated insulin and/or blood glucose levels.



Drugs and Hormone Balance

The conventional treatment for PCOS is oral contraceptives (OC) to reduce hyperandrogenism and glucophage (Metformin) to improve insulin sensitivity, and clomiphene is often used for ovulation stimulation (2).

Contraceptive medication (i.e., “the pill”) may shift hormone levels; however, women wishing to conceive cannot rely on contraceptives to balance their hormone levels. Additionally, these medications can create drug-induced nutrient depletions such as zinc insufficiency or various B-vitamin insufficiencies, including folate, B-6, and B-12. These insufficiencies can lead to new or exacerbations of other symptoms not thought to be directly related to PCOS, such as depression, anxiety, digestive distress, or fatigue due to poor red blood cell formation.

These therapies should be discussed with your healthcare provider.



Supplements and Hormone Balance

In addition, supplements can provide support for hormonal balance while you are working on modifying diet, exercise, stress, and other lifestyle factors.

For example, licorice root and saw palmetto have also been shown to support better breakdown of testosterone in the system, which may help with excess hair growth and acne (19,20). Red clover and chaste tree berry may help increase progesterone levels (13).

Choosing a supplement that supports the balanced production of hormones rather than introducing hormones to the body can be considered. Hormone balancing begins at the brain in the hypothalamus, cascading down through the pituitary, thyroid, adrenal glands, and eventually the ovaries.

This signaling then circles back to the hypothalamus, creating a continuous feedback loop for ongoing communication between those organs. This process is referred to as the hypothalamus-pituitary-thyroid-adrenal-ovarian (HPTAO) axis (Image 2).

Depending on your needs, this may result in an increase or decrease in hormone production. However, many factors can cause this communication system not to work as efficiently as it should and therefore, additional support for the HPTAO axis can provide health benefits.

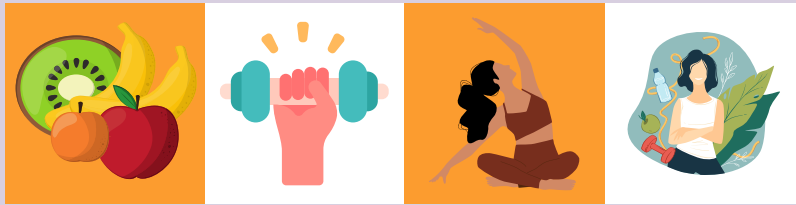
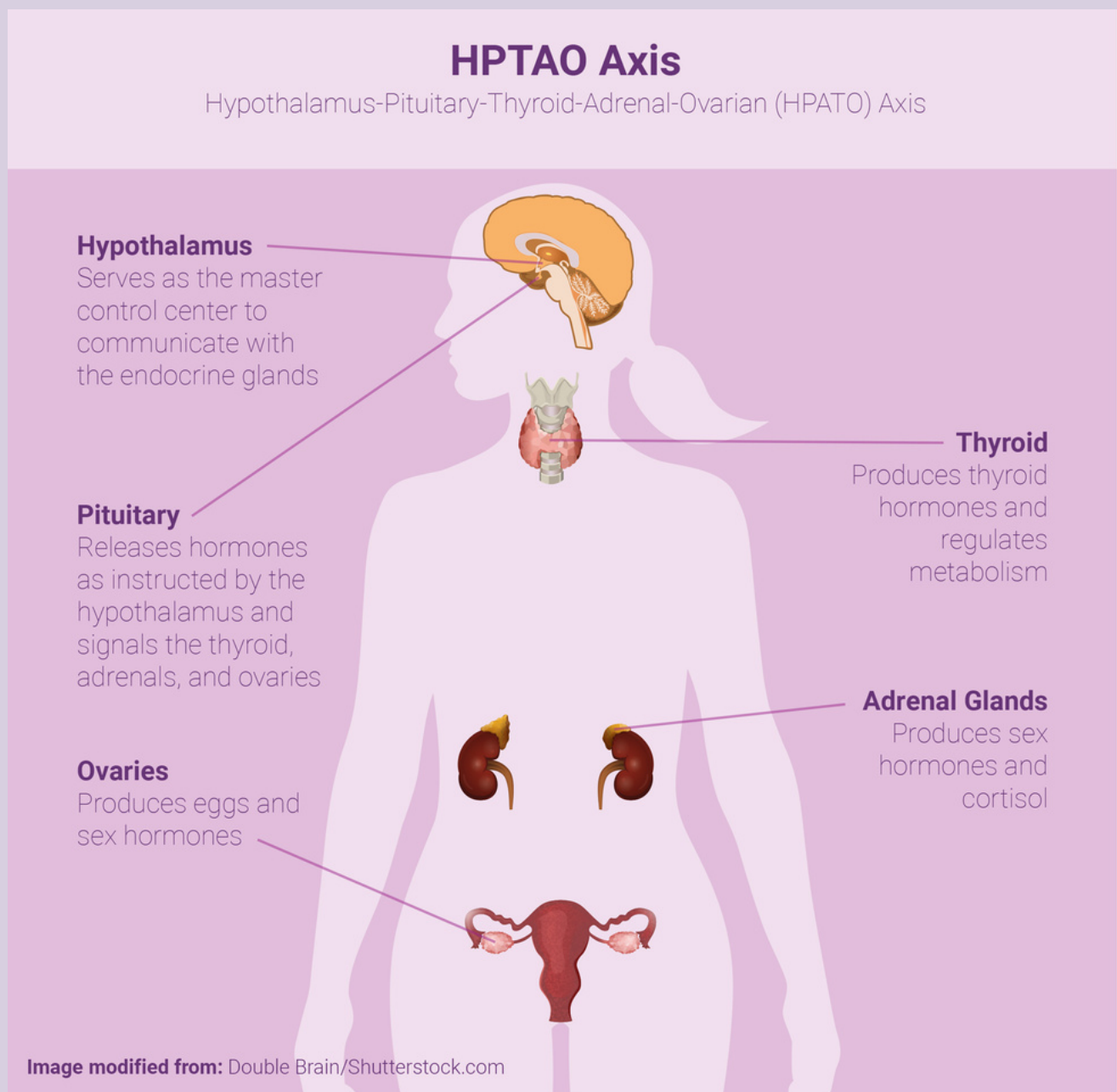


Figure 3. HPTAO Axis

The Hypothalamus–Pituitary–Thyroid–Adrenal–Ovarian (HPTAO) axis is how your body communicates hormonal messages inside through the endocrine system. The hypothalamus works with the pituitary gland to serve as a master control center to the other endocrine organs such as the thyroid, adrenal glands, and ovaries. In PCOS, this communication is imbalanced. Diet, nutrients, herbs, exercise, and lifestyle can all help with the balance of this interconnected system.



Overall, support of the HPTAO axis is essential. Clinical research on specific phenotype combinations (or colors) of *Lepidium peruvianum*, commonly known as maca, supports the body's HPTAO axis.

Rather than introducing exogenous hormones into the body to manipulate hormone levels, specific maca phenotypes nourish the endocrine system, supporting the body's hormone production.

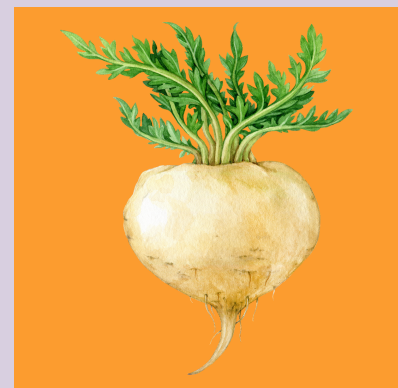
However, not just any maca will do.

First, research has shown that there are up to 17 colors of maca that have varying DNA and ingredient profiles and, most importantly, can have different physiological effects on the body, meaning some are more beneficial for men than women and vice versa (21–24). For example, some maca colors can increase androgen activity, potentially making PCOS and its symptoms worse. One case report showed increased testosterone levels in a woman after taking generic maca supplements (25).

Second, in addition to needing to use specific phenotypes (colors) of maca, the concentration and bioavailability of the ingredient were critical in order to elicit a statistically significant improvement in multiple hormones (26–29).

Third, even the location where the maca grows, as well as farming, drying, and manufacturing methods impacts the benefits it can provide (30). Therefore, choosing the right maca is especially important for women with PCOS.

However, supporting the HPTAO axis is not the only aspect of supporting the body's hormone balance. Metabolism, detoxification, and elimination are also vital, so specific maca phenotypes can be combined with other specific herbal and nutritional support, personalized dietary recommendations, and an exercise program to provide the ideal support for PCOS.



There are many options to consider when selecting the best supplements for your needs. We encourage you to speak to your healthcare providers to determine what will provide you with the best support.

How you manage your diet, exercise, stress, and other lifestyle factors may impact your hormone health and outcomes of PCOS.

This guide is designed to provide you with general recommendations to assist in each of these areas.

Diet & Nutrition

The primary focus of most PCOS diets should be to manage insulin resistance since over two-thirds of women with PCOS present with insulin and blood sugar imbalances. Additionally, while not all women with PCOS have weight concerns, if they exhibit excess body weight, this should also be a focus of any diet since excess body weight causes inflammation, an underlying contributor to PCOS and some of its symptoms (10,34).

There isn't one dietary pattern that all women should follow. Research demonstrates benefits to many food plans, such as the Mediterranean, Paleo, DASH, and ketogenic diets (35–38).

The best food plan is one you can comply with and should be personalized to your likes and lifestyle!

Even though one's diet needs to be personalized, here are some general nutrition guidelines that can benefit PCOS, regardless of the food plan you may follow.

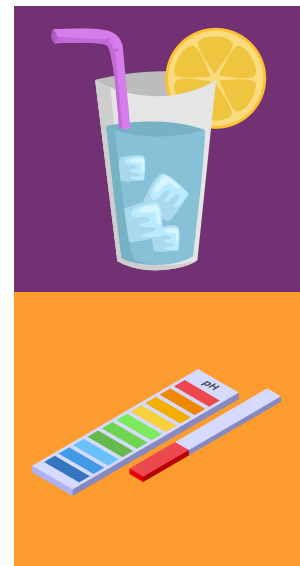
Drink Water

Proper hydration aids in delivering nutrients, regulates body temperature, improves mood and concentration, increases/maintains energy, lubricates joints, and supports healthy detoxification. It is also critical to support regular bowel movements, urination, and sweating — our three routes of eliminating waste from our bodies. Water intake may need to be adjusted based on physical activity and sauna use, to name a few.

Do you find water boring?

Add fruits like oranges, lemons, limes, and grapefruit, herbs like mint, cilantro, and rosemary, or vegetables like cucumbers. Get creative and combine some of these fruits, herbs, and vegetables, such as cucumber & mint or grapefruit & rosemary.

Additionally, if you drink water but still don't feel hydrated, you may consider mineralizing your water using Sole (a super-saturated Himalayan crystal salt solution). One study demonstrated that mineralized water increased hydration indicators by 10% and was effective in stabilizing pH (39).



Eat colorful, anti-inflammatory foods that are low glycemic in impact.

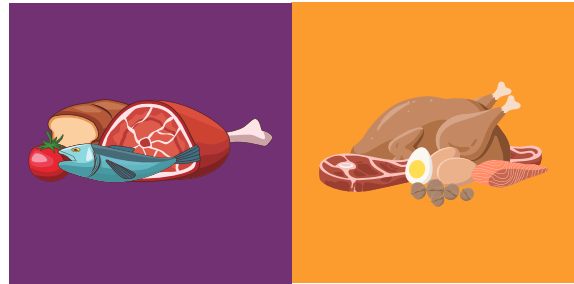
Choose organically-grown foods when possible. The Environmental Working Group's "Dirty Dozen/Clean Fifteen" guides, which are updated annually, can help prioritize your options.

Dietary Protein

Daily protein requirements vary depending on age and activity. Working with your healthcare provider to determine your optimal intake is recommended. Eating adequate daily protein is essential for hormone production, healing & repair, and increases satiety (feeling full).

Include lean proteins:

- Wild-caught fish (sardines, salmon, tuna)
- Grass-fed poultry (chicken, turkey)
- Grass-fed meat (beef, bison, buffalo, lamb)
- Organic beans and legumes
- Pasture-raised eggs
- Plant-based proteins (tofu, tempeh)



Vegetables

"Eat the Rainbow" - eat 1 serving of each color of the rainbow daily



Non-starchy

Choose 1-2 servings of the cruciferous family of vegetables- broccoli, kale, cabbage, cauliflower, radishes, Brussels sprouts

Choose green leafy vegetables daily (lettuces, spinach, bok choy)

Pick from a variety of other vegetables to make up the rainbow! (carrots, peppers, tomatoes, cucumbers, celery, jicama, mushrooms, etc.)

- Starchy (limit to 1 serving per day)
- Potatoes (all colors)
- Root vegetables (parsnips, rutabaga)
- Squash (butternut, acorn)



Low-glycemic fruits - 1-2 servings per day:

- Apples
- Berries (all)
- Cherries
- Lemons
- Limes
- Oranges
- Peaches
- Pears
- Plums



Healthy fats and oils - daily requirements vary

- Oils: extra virgin olive oil (EVOO), flaxseed, pumpkin seed, sesame, avocado
- Avocados
- Clarified butter/ghee
- Olives



Nuts and seeds — daily requirements vary

- All nuts and seeds, including nut butters (almond, cashew)
- Pumpkin seeds, sesame seeds, and flaxseeds can help balance blood sugar and bind up excess androgens (testosterone), making them beneficial for both major issues in PCOS (13,40—42).
- For flaxseed, ensure it is stored in a dark container to protect it from oxygen and light, as both reduce healthy nutrients.



Whole grains* - 1-2 servings per day

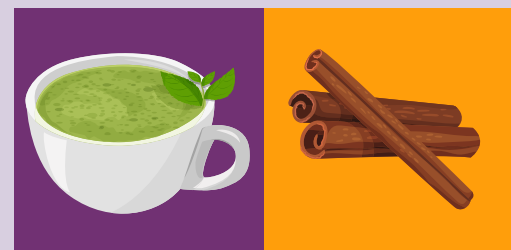
- Rice (brown, basmati, jasmine)
- Oats
- Millet
- Buckwheat
- Barley

*Choose gluten-free options when applicable



Therapeutic foods

Green tea & cinnamon are therapeutic foods that can help regulate insulin (14,20—22).

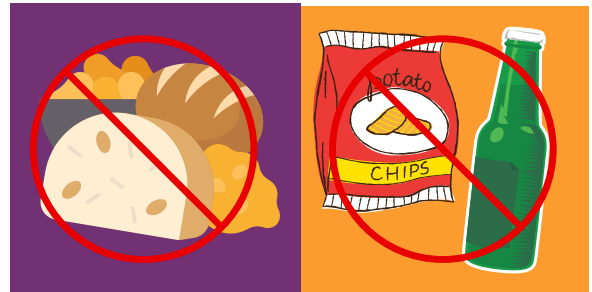


REDUCE OR AVOID:

- Possible or known food triggers such as:
 - Animal dairy (milk, cheese, yogurt)
 - Corn
 - Gluten (e.g., barley, rye, wheat, spelt)
 - Peanuts

Note: Work with your healthcare provider to determine whether you have any food allergies, intolerances, or sensitivities through laboratory testing or elimination from the diet.

- Processed/refined carbohydrates
 - Chips
 - Crackers
 - Breads (especially white bread)
 - Fruit juice
 - Pancakes and waffles
 - Pastas
 - Ready-to-eat cereals
 - Soft drinks
 - White sugar and other refined sweeteners
 - White flour



- Artificial sweeteners (Equal, Sweet-N-Low, Splenda)
- Grilled foods
 - Advanced glycated end products (AGEs) are toxic compounds from high-heat cooking, such as grilled or fried foods. Research suggests AGEs directly impact PCOS and contribute to inflammation (34).
- Alcohol
 - Alcohol is a source of excess sugar in a system that may already struggle with insulin resistance.

A note about glycemic impact

Foods that rapidly increase blood sugar are known to have a high glycemic index. This spike can vary person to person, and newer research suggests it may also depend on the gut microbiome. Including protein, fiber, or fat can help to reduce the glycemic impact of a meal containing starches and sugars.

Also, eating foods in a particular order, starting with vegetables first, proteins and fats second, and starches and sugars last can reduce the glycemic response.

1

Vegetables

2

Proteins & Fats

3

Sugars & Starches

INCREASE YOUR INTAKE OF KEY NUTRIENTS

Working toward the dietary changes outlined above, you will inherently improve your nutrient intake of key minerals and vitamins to support your hormones. Yet, further assistance is needed at times to facilitate optimal health. Here is a short list of vital nutrients to support blood sugar, insulin sensitivity, lower inflammation, and hormone balance. Consult with your healthcare provider before starting any supplements.



Chromium

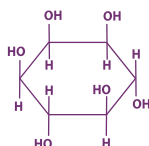
This essential mineral helps the body metabolize carbohydrates, fats, and protein. Food sources: Meat, apples, bananas, lettuce, green beans



Magnesium

Magnesium is a cofactor in hundreds of enzymatic reactions in our body. Serum magnesium levels have been associated with higher testosterone levels and insulin resistance in women with PCOS (43).

Food sources: Green leafy vegetables, nuts, legumes, and beans



Inositol

This nutrient is consumed in the diet, though it is not considered essential; therefore, a daily requirement has not been established. Inositol is produced naturally in the kidneys, liver, and brain and regulates thyroid hormones, follicle-stimulating hormone (FSH), and insulin (44).

Food sources: Fruits, beans, grains, and nuts



Omega-3 fatty acids

These polyunsaturated fatty acids (PUFAs) must be eaten in the diet and is known to play a role in many functions, including the structure of every cell in our body.

Food sources: Fish (cold water fish), leafy greens, nuts/seeds (flax, walnuts, chia seeds), and flaxseed oil

S
M
A
S
H

An easy way to remember the most beneficial fish to eat is the acronym SMASH:

- Sardines
- Mackerel
- Anchovies
- Salmon
- Herring



Vitamin D

Vitamin D is a well-known, fat-soluble vitamin found in foods and produced through exposure of the skin to ultraviolet light (from the sun).

Food sources: Fatty fish is the best source. Low levels can be found in other food sources, such as beef liver and egg yolks or foods fortified with vitamin D.

Support gut health

Tending to the gut is essential when balancing the female reproductive system, since they are close in the same area of the body. The general dietary suggestions made will naturally assist in optimizing gut health.

However, there may be some additional steps to consider with the help of your healthcare provider such as the following:

- Remove food triggers that can contribute to inflammation and gut microbiome imbalance (known as dysbiosis). Typical food triggers include gluten, animal dairy, peanuts, and eggs, though this list should be personalized to each individual.
- Consider adding probiotic and prebiotic-rich foods into your daily diet. Probiotics are the beneficial bacteria in the digestive tract, and prebiotics are fiber-rich foods that feed probiotics. Higher fiber foods also support bowel movements by eliminating excess hormones and toxins, providing many needed nutrients.

Select probiotic-rich foods

- Aged cheese
- Cottage cheese
- Fermented vegetables
- Kefir
- Kimchi
- Kombucha
- Miso
- Pickled vegetables
- Plain yogurt
- Sauerkraut

Select prebiotic-rich foods

- Asparagus
- Garlic
- Green bananas
- Jerusalem artichokes
- Legumes
- Onions
- Whole grains (aim for gluten-free)

A high-quality probiotic supplement can also be considered if extra support is needed. Research demonstrates that specific strains of probiotics provide specific health benefits. For example, various strains of *Lactobacillus* and *Bifidobacterium* are beneficial for various parameters of PCOS, including body weight, body mass index (BMI), glucose regulation, reducing inflammation, and impacting testosterone levels (45,46).

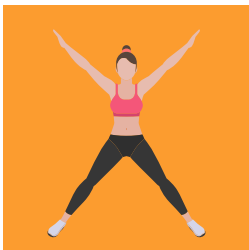
Seek assistance from a trained professional for assistance with creating a nutrition plan and probiotic support that will work for your health concerns and lifestyle.

With their support, you can also address your relationship with food, which is often stressful and must be redefined for long-lasting change.

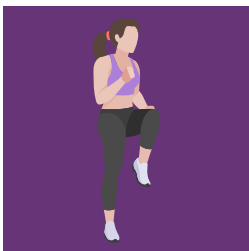
Exercise & Movement

Exercise and movement aim to gain muscle mass that improves metabolism and cardiovascular stamina for heart health. It is best to use a combination of aerobic and resistance exercises to improve PCOS. What is important is getting the heart rate up and making your muscles work.

It is estimated that 50% of women with PCOS are obese or at risk for gradual weight gain tending to obesity. It has been shown that even a 10% weight reduction can lead to more regular ovulation and decreased insulin resistance (47). Exercise can help with weight loss.



Aerobic activity – Provides many benefits to the body, including improving cardiovascular health, supporting the immune system, boosting mood, helping with sleep, and the list goes on. Studies have found that 30 minutes of aerobic activity three times weekly can improve insulin levels (48).



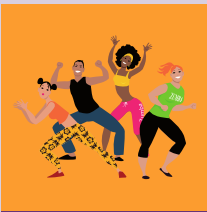
High-intensity interval training (HIIT) – Studies have indicated that 30 minutes of HIIT three days per week benefits women with PCOS and insulin resistance (49,50). It may also decrease DHEA levels (48).



Resistance training (RT) – Benefits women with PCOS by improving blood glucose regulation, decreasing fat mass, and increasing muscle mass (51). Limited studies also suggest RT can decrease testosterone levels in women with PCOS (48). Resistance training includes light weights, resistance bands, machine equipment, and plyometric activities.

Remember: any movement is good movement! Movement of any kind reduces stress, improves metabolism, namely blood sugar management, and improves hormone balance, including a reduction in androgenic hormones (52). It doesn't take much -- a simple walk after eating can reduce blood sugar.

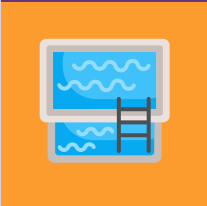
SOME TIPS TO HELP YOU MOVE MORE:



Do what you enjoy! For some, it may mean the gym and hitting the elliptical and weights. For others, it can be the pool, and still others, the dance floor. Find a combination of activities that you enjoy.



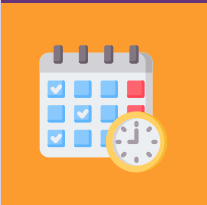
Add some resistance activities — consider squats, lunges, push-ups, resistance bands and/or light weights to give your large muscle groups some additional attention.



The pool is a great place to combine aerobics with the natural resistance the water provides.



Find a buddy or group to work out with or to participate in classes or activities. Think about things like a hiking group, dance class, yoga, pilates class, soccer team, golf, tennis, or others.



Schedule a time with yourself for exercise...and then keep your appointment! Hire a personal trainer to keep you accountable. Is there a gym on the way to/from work to make it easier to stick with?

Seek assistance from a trained professional for assistance with creating the ideal exercise routine. With their support, you can ensure exercise meets your likes, time schedule, and addresses any health or joint concerns (i.e., weak back or knees).

Stress Management

Chronic stress, whether emotional or physical, is known to affect hormone balance.

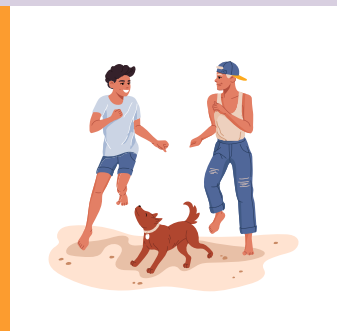
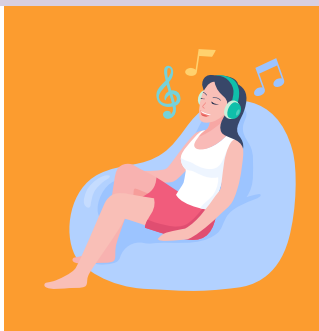
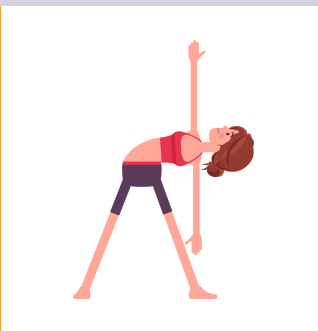
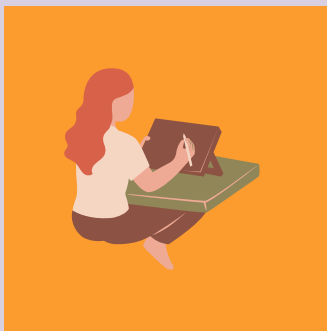
The increased release of cortisol from the adrenal glands when under stress worsens insulin response in the body and interferes with the normal function of thyroid hormone, testosterone, estrogen, and progesterone (19).

A large study found that yoga and mindfulness-based practices reduce cortisol, blood pressure, and blood sugar, among other markers (53).

You can work to reduce stress and its effects by:

- Coloring, journaling, or completing puzzles
- Doodling or drawing
- Engaging in meditation, guided imagery, prayer, or breathwork
- Getting a massage
- Listening to soothing music
- Playing with pets
- Practicing yoga
- Reading a fiction book
- Sipping on some tea and relaxing. Chamomile and spearmint tea have been shown to help reduce testosterone levels (13).
- Soaking in a bath with bath salts and calming essential oils, like lavender.
- Taking intentional “pauses”. This can be a time for doing something creative or just simply ‘being.’
- Walking in nature (“forest bathing”)
- Watching a comedy

Like exercise, find something you enjoy doing and make time for it.



Lifestyle & Environment

Modifying lifestyle factors may also be helpful for hormonal balance.

Support quality sleep

It is twice as common for women with PCOS to have sleep difficulties (54). Ensure you practice good sleep hygiene and get evaluated for sleep apnea if appropriate.

Aim for 7–9 hours of sleep nightly by establishing a regular bedtime, turning off electronics/screens at least 1 hour before bed, and calming yourself with some stress management techniques listed above.

When indicated, you may benefit from calming herbs such as chamomile, lavender, valerian, or lemon balm (55,56). Further, L-theanine, found in green tea, can help promote relaxation and sleep (57).

One of the most known supplements to support sleep is melatonin (58). The pineal gland, found in the brain, produces melatonin to induce sleep. Adults produce between 0.1 and 0.9 mg of melatonin daily, which declines as we age and is higher in children and adolescents (58).

Aside from sleep, studies have found melatonin to provide several benefits for women with PCOS, including positive changes in hormone levels and improvements in the regularity of the menstrual cycle (58). Further, one paper showed that a phytomelatonin supplement (melatonin from plants) was superior to synthetic melatonin, which is the most common supplementation form on the market (59).

Check with your healthcare provider before starting any sleep support supplements, as there may be some contraindications. Additionally, “more is not always better” when using some supplement options mentioned above; therefore, guidance should be provided on choosing the correct dose.

Reduce exposure to endocrine-disrupting plastics and chemicals

Increasing research shows that constant exposure to chemicals interferes with normal hormone function and PCOS (60). Plastics, in particular, act like estrogens in the body, further throwing hormones out of balance in a PCOS patient.

HERE ARE SOME TIPS FOR REDUCING YOUR TOXIN LOAD AND SUPPORT HORMONE BALANCE.

- Buy bisphenol A (BPA)-free water bottles and containers (good choice). An even better choice would be to use glass whenever possible.
- Minimize the use of food in cans when possible to reduce intake of aluminum and bisphenol liners.
- Toss Teflon and other non-stick cookware and replace them with cast iron, stainless steel, and glassware.
- Drink tea or coffee from a reusable mug, especially when on the go.
- Avoid microwaving food in plastic containers or coverings.
- Avoid fragrances whenever possible (e.g., perfumes, scented products like candles, etc.).
- Following an anti-inflammatory, high-antioxidant food plan with adequate protein, as described in this guide, will provide foods that support the elimination of toxins from the body.
 - However, some specific foods and supplements may provide additional support, such as milk thistle, dandelion greens, spirulina, and alfalfa (61,62). Check with your healthcare provider which ones would be best for you.
- Quit smoking
 - Smoking interferes with proper estrogen production and clearance. It has been associated with worsening metabolic profiles and insulin resistance in women with PCOS (63).

Review the Environmental Working Group's Dirty Dozen Endocrine Disruptors for more information.

WWW.EWG.ORG

Conclusion

Many dietary and lifestyle factors may help manage PCOS. Our goal is to help you improve hormonal health through diet and lifestyle choices and using supplementation as needed. Working with a health professional who can customize a plan to meet your individualized needs is best.



Summary



Empowerment & Knowledge

- When embarking on dietary and lifestyle changes, implement them steadily, allowing you to establish them as habits.
- Speak to your healthcare provider about the symptoms you are experiencing.
- Schedule an appointment with your healthcare provider for a complete evaluation.
- Remember, only a doctor can provide you with a medical diagnosis.



Hormones

- Speak to your healthcare provider about the option of hormone testing to know your levels and routinely have them monitored.
- Consider supplements to support the HPTAO axis and hormone balance.



Diet & Nutrition

- Choose a dietary pattern that fits your likes/dislikes, lifestyle, and beliefs.
- Drink 64 ounces or more (based on individual needs) of water daily to stay hydrated.
- Eat whole, anti-inflammatory, low-glycemic foods like berries, legumes, and non-starchy vegetables.
- Avoid processed carbohydrates, refined sugars, and artificial sweeteners.
- “Eat the Rainbow” with one color from every food color daily.
- Aim to eat cruciferous vegetables daily for detoxification support.
- Support gut health with probiotic and prebiotic foods like fermented foods.
- Limit or avoid alcohol intake.
- Reduce or eliminate possible food triggers to reduce inflammation.
- Focus on key nutrients like chromium, magnesium, inositol, omega-3 fatty acids, and vitamin D to help with insulin sensitivity, healthy ovulation, and healthy inflammatory response.



Exercise & Movement

- Select activities you enjoy doing.
- Schedule regular activities on your calendar for consistency.
- Work with a personal trainer to develop a personalized, ideal workout program.
- Start light and work up gradually.
- Engage in aerobic and resistance training, and bring in high-intensity interval training (HIIT).



Stress Management

- Make time to relax and decompress.
- Take a bath at night to unwind
- Restore through sleep, gentle activity, and creative “pauses.”
- Read an interesting book and/or see a comedy.
- Be patient and kind with yourself as your body works to restore balance.



Lifestyle & Environment

- Sleep for 7-9 hours nightly.
- Enhance sleep hygiene and consider supplements if support is needed.
- Reduce exposures to endocrine disruptors, such as plastic food containers and water bottles. See www.ewg.org for more information.
- Quit smoking and avoid any exposure to passive smoke.

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