

Clinical Roundup

Selected Treatment Options for Polycystic Ovary Syndrome

Integrative Strategies

Polycystic ovary syndrome (PCOS) is a complex heterogeneous condition with a number of related risk factors, and its exact origins are not completely understood. However, research shows direct links between PCOS and several conditions, including hyperandrogenism, obesity, insulin resistance, metabolic syndrome, and type 2 diabetes.

Managing PCOS with integrative and complementary medicine involves three key areas of focus: hormone balance; metabolic balance; and anti-inflammatory approaches. Multifaceted treatment protocols that address these areas simultaneously may be successful in reversing PCOS and restoring normal ovulation and fertility. Such approaches include a low-glycemic diet, exercise, herbal/nutritional medicine, and acupuncture.

Diet and exercise—A primary feature of PCOS is obesity, which can exacerbate insulin resistance and promote excess androgen production in women—and vice versa as these issues are closely related. Even a 5% weight reduction with diet and exercise interventions can improve insulin sensitivity and help restore ovulation in patients who have PCOS.¹

Insulin resistance is present in 50%–80% of women with PCOS.² A low-glycemic diet that minimizes refined foods and emphasizes lean protein, complex carbohydrates, anti-inflammatory foods, and healthy fats is essential. This type of diet improves insulin sensitivity, reduces inflammation and obesity, and lowers serum testosterone in women with PCOS.³

Herbs and nutrients—D-Chiro-inositol is a natural carbohydrate compound available as a dietary supplement. Research shows that it increases insulin sensitivity, reduces serum testosterone, lowers blood pressure and serum triglycerides, and improves ovulatory function in patients who have PCOS.⁴

A traditional Chinese herbal formula, Tian Gui, made with 11 botanical ingredients, has been shown to ameliorate PCOS by regulating ovarian function and insulin levels.⁵ Another traditional Asian formula, containing *Glycyrrhiza glabra* (licorice) and *Paeonia* spp. (peony) root, reduces plasma testosterone levels and induces ovulation in patients with PCOS.⁶ In another

study, licorice root reduced serum testosterone, and was recommended by the researchers as a potential adjuvant therapy for treating PCOS and hyperandrogenism.⁷

In my practice, I also recommend a comprehensive formula for metabolic health when I treat patients who have PCOS. This formula contains traditional Asian botanicals; medicinal mushrooms; sodium alginates; and the nutrients chromium polynicotinate, lipoic acid, and taurine. Such a formula helps improve glucose and insulin profiles, balance hormones, support fat and sugar metabolism, and reduce inflammation.

Acupuncture—Acupuncture can balance glucose and insulin sensitivity, assist in weight loss, reduce inflammation, balance hormones, and induce ovulation in patients who have PCOS.⁸ One study suggested that Chinese herbs, together with acupuncture, were more effective for treating PCOS than herbal treatments alone.⁹

PCOS cases are expected to rise over the next decades, concurrent with our worldwide obesity epidemic. A comprehensive protocol addressing serious PCOS risks, such as cardiovascular disease is an important strategy for managing and reversing PCOS and related health concerns.

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Nutrition

I believe that there are different subsets of polycystic ovary syndrome (PCOS) and, as such, they are treated differently. There are the typical overweight, hirsute, and amenorrheic females; there are the thin females with normal glucose levels and irregular menses; and there are many variations between these two presentations.

This contribution discusses treatment of a typical patient with PCOS and mentions what I do for more difficult cases. I must emphasize that I believe that PCOS is, first and foremost, a disorder of nutrition and should be treated as such. When blood sugar and insulin imbalances are corrected, an improved hormone imbalance follows suit, most often on its own.

A good low-glycemic diet is key and has been shown to improve fasting blood sugar, insulin, and hemoglobin A1c levels in patients with metabolic syndrome.¹ I recommend low-glycemic foods with small meals eaten more frequently throughout the day to prevent blood sugar spikes. In addition, while my general rule as a holistic physician is to keep patients off conventional medications, I often prescribe a short-term course of metformin. I usually start at 500 mg p.o., q.h.s., in an extended-release formula. I would also include supplements for addressing insulin resistance, such as chromium, *Cinnamom cassia* (cinnamon), and *Gymnema sylvestre* (gymnema); in addition a recent study showed the possibility of berberine being as effective as metformin for hyperinsulinemia.²

For harder-to-treat patients, I may add an androgen blocker, such as spironolactone for patients who are severely hirsute. In addition—and especially in the beginning of treatment—while the blood sugar is becoming balanced, I would also try 6 months of N-acetylcysteine at 1200 mg/day, plus L-arginine at 1600 mg/day—both in divided doses to restore gonadal function.³ I also believe acupuncture is a great adjunct for treating PCOS.

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Holistic Approach

Polycystic ovary syndrome (PCOS) is the most common female endocrine disorder, affecting up to 10% of women of reproductive age.^{1,2} Women with PCOS may have oligo-ovulation, infertility, acne, and hirsutism, as well as metabolic sequelae, such as an elevated risk of diabetes and cardiovascular disease.³

A thorough clinical assessment is critical to confirm the diagnosis and identify risk factors for long-term health maintenance. This information helps me, as a clinician, to prioritize integrative approaches in a plan that takes into equal consideration: (1) existing metabolic imbalances; (2) each woman's unique concerns (e.g., weight management, acne, hair loss, or infertility); and (3) the impact of PCOS on the patient's mental state and sense of self.

Lifestyle approaches include: minimizing exposure to hormone-disrupting chemicals; physical activity; and achieving ideal body weight through a low-glycemic index diet that includes foods rich in omega-3 fatty acids and 1–2 servings of *Glycine max* (soy) daily.⁴

Supplements with potential benefit include vitamin D₃; chromium picolinate (1000 mcg per day); D-chiro-inositol/pinitol (600–1200 mg per day); *Cinnamom cassia* (cinnamon; 1/4–1 tsp per day); licorice root in conjunction with spironolactone for amelioration of side-effects; and standardized *Vitex agnus-castus* (chasteberry; 60 drops of tincture or 175 mg of extract per day).^{5–8}

Acupuncture and mind-body therapies assist by addressing both physiologic as well as emotional factors. For patients who require pharmacotherapy, first-line medications include metformin, oral contraceptive pills, and spironolactone. A holistic approach can help women with PCOS obtain short-term relief of symptoms and can prevent disease in the future.

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Naturopathic Approach

Polycystic ovary syndrome (PCOS) management requires considerable individualization, given the array of patient presentations, and many naturopathic approaches exist for both symptom management and chronic disease risk prevention. In my practice, I base my therapeutic choices on a thorough assessment to identify particular symptomology and to evaluate the risk of comorbid conditions, such as obesity, cardiovascular disease, insulin resistance, and infertility.

To manage the common symptoms of oligomenorrhea, acne, and hirsutism, a herbal approach often works best, as aggressive hormonal modulation is typically necessary. I use estrogenic and progestogenic herbs to regulate luteinizing hormone and follicle-stimulating hormone levels, and antiandrogenic herbs to curb relative excess. *Vitex agnus-castus* (chasteberry), *Cimicifuga racemosa* (black cohosh), *Angelica sinensis* (dong quai), *Humulus lupulus* (hops), *Glycyrrhiza glabra* (licorice), *Tribulus terrestris* (puncture vine), *Mentha spicata* (spearmint), and *Paeonia lactiflora* (Chinese peony) are common herbs that I use, as they tend to produce strong clinical outcomes.

Acupuncture is an excellent intervention for regulating menses and ovulation, and reducing infertility risk.¹ This modality can also be used constitutionally to address glucose and cortisol dysregulation, and can reduce acne, hirsutism, and risk of diabetes and obesity.² I conduct a comprehensive Traditional Chinese Medicine intake to determine appropriate acupuncture points, and I place most patients on a weekly acupuncture protocol for 6–12 weeks, depending on the patients' needs and responsiveness to treatment.

Nutritional approaches can also be utilized for symptomatic relief, but I tend to see greater results for chronic disease prevention. Inositol has strong evidence for treating many PCOS symptoms; I use this intervention particularly to address infertility in patients with poor ovarian function.^{3,4} Adequate vitamin D status has also been associated with improved outcomes, so I add this supplement for all patients, given that this deficiency is widespread.⁵

I routinely encourage regular exercise in patients with PCOS, as this is a crucial component for improving insulin resistance, regulating menses, and reducing cardiovascular and diabetes risks.⁶ I also individualize my dietary counseling to target weight management, sugar restriction, and heart-healthy foods, all of which help to address symptoms and reduce comorbidities. In overweight and obese patients, a specific focus

on a hypocaloric diet in addition to exercise can improve outcomes considerably.⁷

Given the disparity in PCOS presentations, a standardized approach can be futile. I have had immense success when my management was flexible and individualized to particular patient needs.

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Evidence-Based Systematic Review Results

The Natural Standard Research Collaboration (www.natuirstandard.com) systematically reviews data on complementary and alternative medicine (CAM). Natural Standard does not practice or recommend specific therapies, but uses comprehensive and reproducible methodologies to create objective and reliable information for patients and health care professionals. Based on an evaluation of the literature, CAM treatments that may be beneficial for polycystic ovary syndrome (PCOS) include (but are not limited to) acupuncture, L-arginine, and N-acetylcysteine (NAC).¹

Acupuncture—In preliminary human research, repeated electroacupuncture treatment (EA; 10–14 treatments for a total of 8–9 months) was shown to induce regular ovulation in women with PCOS with amenorrhea or oligomenorrhea. This was particularly true in patients with fewer androgenic signs or metabolic disturbances.²

In a randomized controlled trial (RCT) in patients with PCOS undergoing *in vitro* fertilization and embryo transfer

(IVF-ET) receiving ethinylestradiol and cyproterone acetate tablets, gonadotropin-releasing hormone agonist, and EA, the fertilization rate, cleavage rate, and rate of high-quality embryos were all significantly superior to patients in a control group.³ The clinical pregnancy rate was also found to be higher, compared to the control group, but this was without statistical significance.

In another RCT in women with PCOS, 16 weeks of low-frequency EA was shown to significantly decrease circulating total testosterone, androstosterone glucuronide, and androstane-3 α ,17 β -diol-3-glucuronide, and to significantly increase menstrual frequency, compared to exercise or no intervention.⁴ However, other research did not find statistically significant differences between 5 months of sham acupuncture and true acupuncture in ovulation rate, luteinizing (LH) hormone-to-follicle stimulating hormone ratio improvement, decline in LH, and number of pregnancies.⁵

L-Arginine—In a preliminary open study, combined treatment with 1600 mg of L-arginine and 1200 mg of NAC daily for 6 months improved menstrual function (based on number of uterine bleedings and a well-defined biphasic pattern in basal body temperature suggesting ovulatory cycles) and decreased homeostasis model assessment (HOMA) index, in patients with polycystic ovary syndrome and oligoamenorrhea.⁶ The effect of L-arginine alone cannot be determined from this study, and further research is required before conclusions can be drawn.

N-acetylcysteine—In an RCT of patients with PCOS, NAC (600 mg three times daily for 24 weeks) had equal efficacy to metformin (500 mg three times daily for 24 weeks), both resulting in a comparable significant decrease in body mass index, hirsutism score, fasting insulin, HOMA index, free testosterone, and menstrual irregularity, compared with baseline values.⁷

However, in another RCT of infertile women with clomiphene citrate-resistant PCOS, treatment with metformin (500 mg three times daily for 6 weeks) was shown to be superior to NAC (600 mg three times daily for 6 weeks) for increasing rate of ovulation.⁸ In yet another RCT trial of patients with clomiphene citrate-resistant PCOS, who were undergoing therapy for infertility, a combination of clomiphene and NAC (1.2 g daily) significantly increased ovulation and pregnancy rates.⁹ In other clinical research, addition of NAC to clomiphene citrate significantly improved ovulation rates in patients with PCOS.¹⁰

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Iyengar Yoga

Polycystic ovary syndrome (PCOS) is a hormonal condition affecting women that is characterized by a cluster of symptoms, including facial hair, acne, obesity, and menstrual irregularities. The cause of PCOS is unknown, but it is associated with excess androgens, insulin resistance, and inflammation. Treatments include synthetic estrogens/progesterone, metformin, and surgical removal of cysts. Adjunct complementary therapies, such as yoga, may also be helpful.

In a recent randomized clinical trial, yoga was significantly better than exercise for reducing facial hair and improving menstrual frequency, hormone concentrations, and glucose metabolism.^{1,2} Most yoga poses may be practiced safely, provided they are modified to create space and softness in the abdomen. To ensure that the abdomen remains soft, but not compressed, standing poses are done facing a trestle or wall, and only open twists, such as *bharadvajāsana* I and II and *marichyāsana* I (twist only) are performed; forward bends may be practiced with a concave back. *Paripurna navāsana* may be performed with the back and legs supported by a wall and chair.

Inversions balance the endocrine system and lift and tone the organs when practiced correctly.³ *Salamba sirsāsana* should be practiced on a three-fold blanket elevating the head, which lifts the organs upward. The legs are positioned a hip-width apart, using a block between the inner thighs, held in place with a belt (Fig. 1). The inner thighs should move the block back and

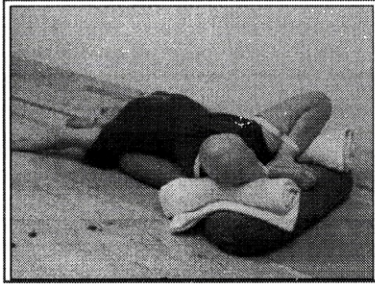
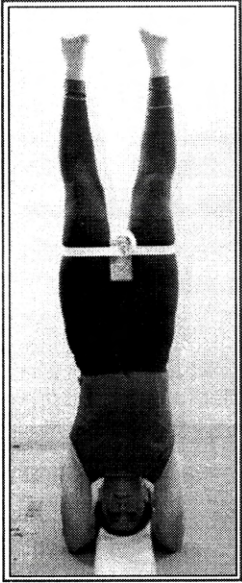


Figure 1 (left). *Salamba sirsāsana* using a block, belt, and a three-fold blanket. Courtesy of, and with the permission of, Lois Steinberg, PhD.

Figure 2 (above). *Supta baddha konāsana* with T-shaped bolsters. Courtesy of, and with the permission of, Lois Steinberg, PhD.

the backs of the inner upper thighs should move away from the block to spread the sacrum; the buttocks should lift. The result is further balance, lift, and toning of the organs.

Back bends such as *urdhva dhanurāsana* with the feet elevated on a chair/platform to lift the pelvis and elongate the organs are beneficial. Supine poses with T-shape support of bolsters (Fig. 2, depicting *supta baddha konāsana*) and *supta padangusthāsana* with the leg to the side, and the corresponding buttock supported on a small folded blanket, also are effective.³

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Yoga

Polycystic ovary syndrome (PCOS) is emerging as the most common endocrine abnormality of reproductive-age women in the United States, with an estimated prevalence of 4.8% and 8.0% in white and in black women, respectively.¹

It is believed that both genetic predisposition and lifestyle factors contribute to the etiology of PCOS.² High-calorie diets and a lack of exercise, resulting in obesity and insulin resistance, have been linked to PCOS.³ An association between stress and PCOS has also been documented.⁴ Adult women with PCOS have a five-to-ten-fold increased risk of developing glucose intolerance⁵ and a two-fold increased risk of developing metabolic syndrome.⁶ There are studies suggesting that chronic stimulation of sympathetic activity, the result of a stressful lifestyle, can induce dysregulation of the hypothalamus–pituitary–ovarian axis (HPO axis) in women with PCOS.⁷

Yogic lifestyle, a form of holistic mind–body medicine, is known to reduce stress and sympathetic tone.⁸ A recent randomized controlled trial showed that a 12-week holistic yoga

Yogic lifestyle, a form of holistic mind–body medicine, is known to reduce stress and sympathetic tone.

program was significantly better than physical exercise for reducing anti-Müllerian hormone, luteinizing hormone, and testosterone; modifying Ferriman and Gallway scores for hirsutism; and improving menstrual frequencies in patients with PCOS.⁹

Yoga not only addresses the problems of PCOS but also may help to prevent the long-term complications of the condition, such as cardiovascular disease and diabetes.¹⁰ Furthermore, yoga—being holistic in its approach—is more cost-effective and safe, and has long-term benefits. Hence, yoga may be recommended as an adjunct to standard medical care for managing PCOS.

The following yogic practices have been found to be helpful for patients with PCOS:⁹

- (1) Physical postures (*āsanas*) 1 minute each, unless noted otherwise, including:
 - (a) *Surya namaskāra* (Sun Salutation) for 10 minutes
 - (b) Prone *āsanas*, including Cobra Pose (*bhujangāsana*), Locust Pose (*śhalabāsana*), and Bow Pose (*dhanurāsana*)
 - (c) Standing *āsanas*, such as the Triangle Pose (*trikonāsana*), Twisted Angle Pose (*parśvakonāsana*), and Spread Leg Intense Stretch (*prasāritapādottānāsana*)
 - (d) Supine *āsanas*, including the Inverted Pose (*vīparitāka rāṇī*), Shoulder Stand (*sarvāṅgāsana*), and Plough Pose (*halāsana*)
 - (e) Sitting *āsanas*, including the Sitting Forward Stretch (*pāścimottānāsana*), Fixed Angle Pose (*baddha konāsana*), and Garland Pose (*mālāsana*).
- (2) Breathing techniques (*prāṇāyama*)—2 minutes each of Sectional Breathing (*vibhāgiya prāṇāyama*), Forceful Exhalation (*kapalabhāti*), Right-Nostril Breathing (*surya anuloma viloma*), and Alternate-Nostril Breathing (*nādisuddhi*).

- (3) Guided relaxation (*savāsana*) for 10 minutes
- (4) *Om* meditation (*Om dhyāna*) for 10 minutes
- (5) Group lectures, directed toward cognitive restructuring, based on the spiritual philosophy underlying yogic concepts, spiritual coping strategies, and more. ■

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