

ANP

Association for
Nutrition &
Naturopathic
Professionals

SUPPORTING PRACTITIONERS

SINCE 2001

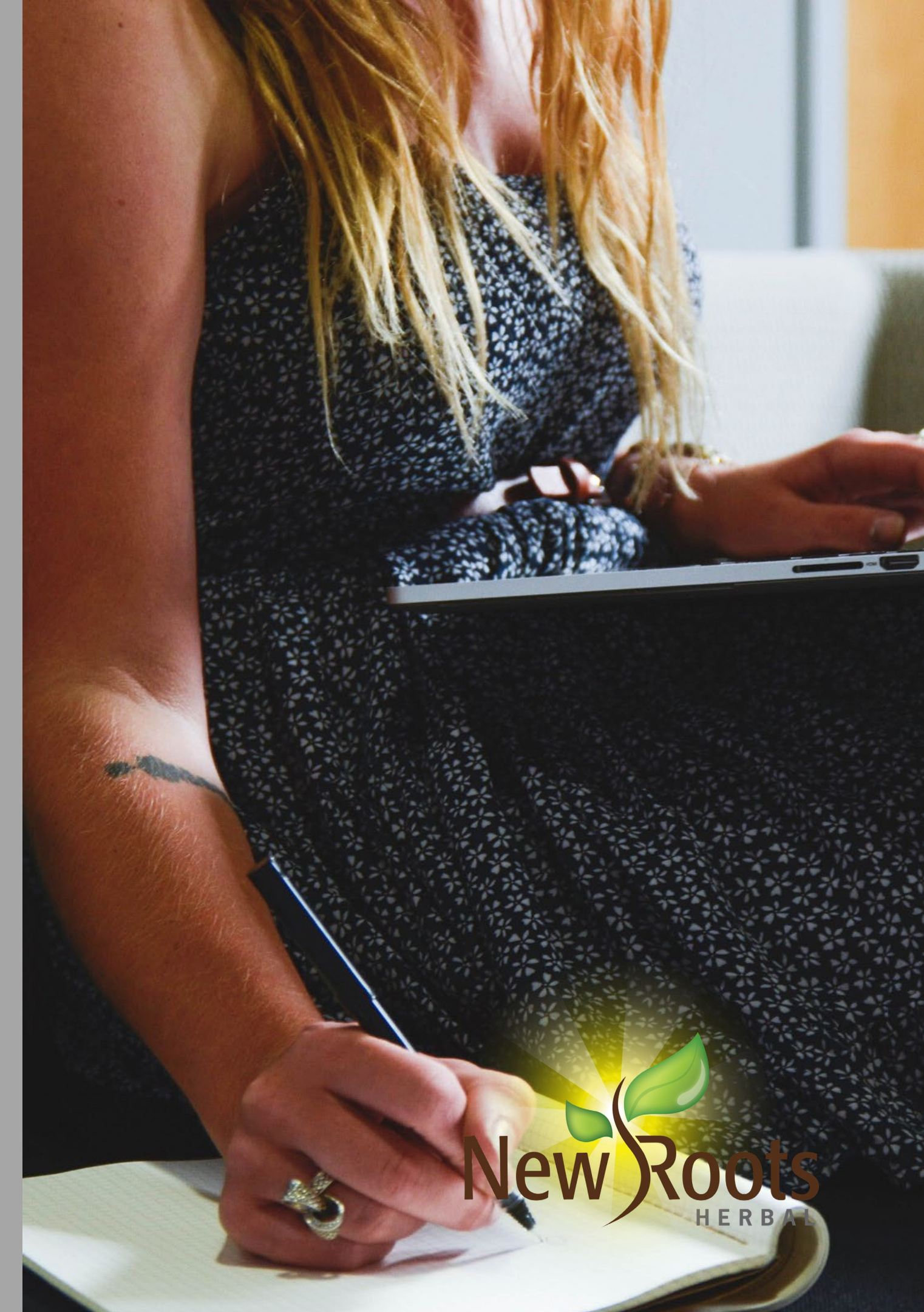
Rethinking PCOS

1

By Kim Bretz

WHAT ARE WE COVERING?

- How to interpret blood work in the PCOS patient and how to use it to guide your treatment protocols
- Understanding of treatment options for women with PCOS
- PCOS beyond fertility - learn about the risks associated with PCOS beyond issues in pregnancy



The Basics: Why It Matters



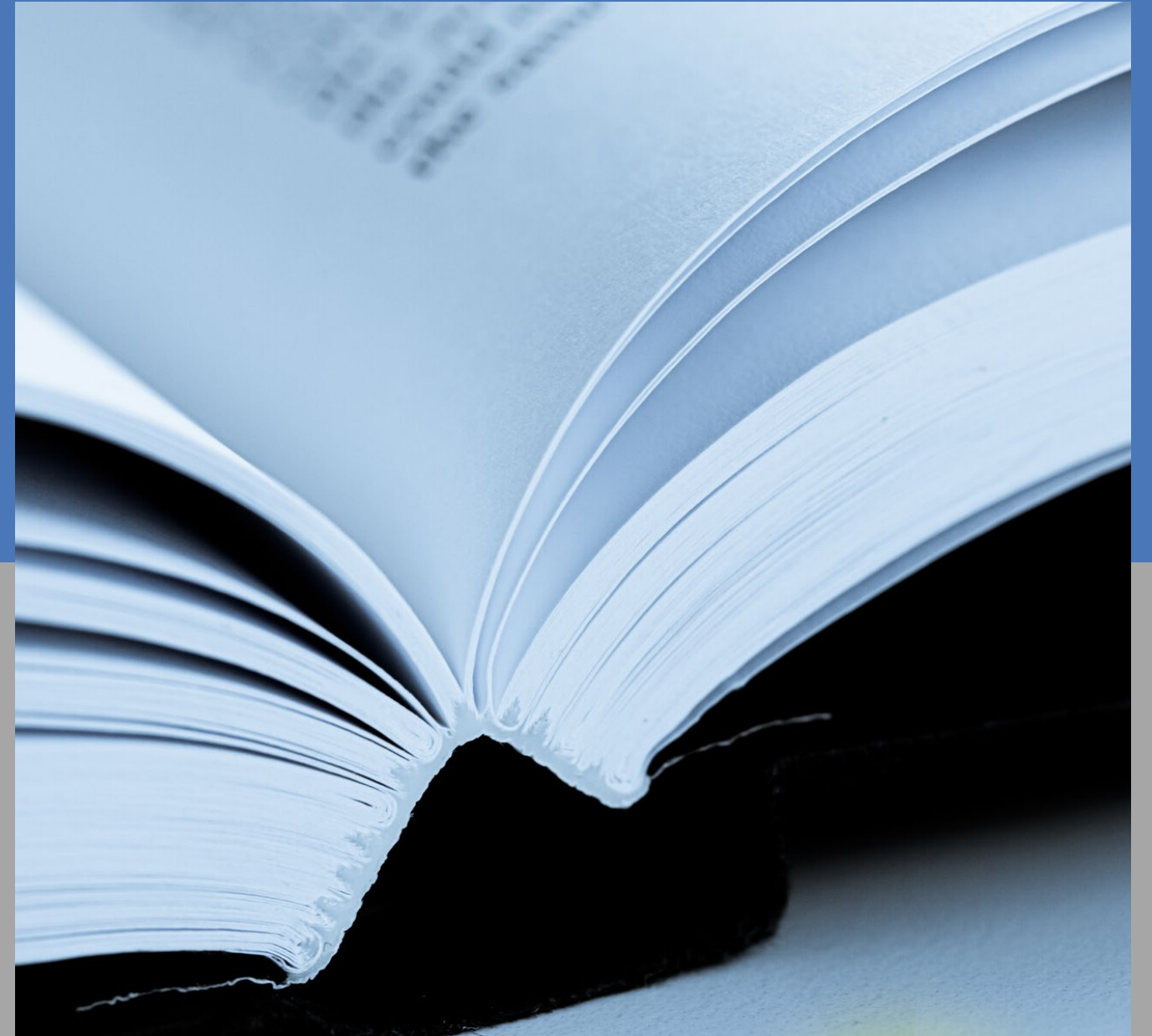
Impact

What are our patients getting wrong about hormones?

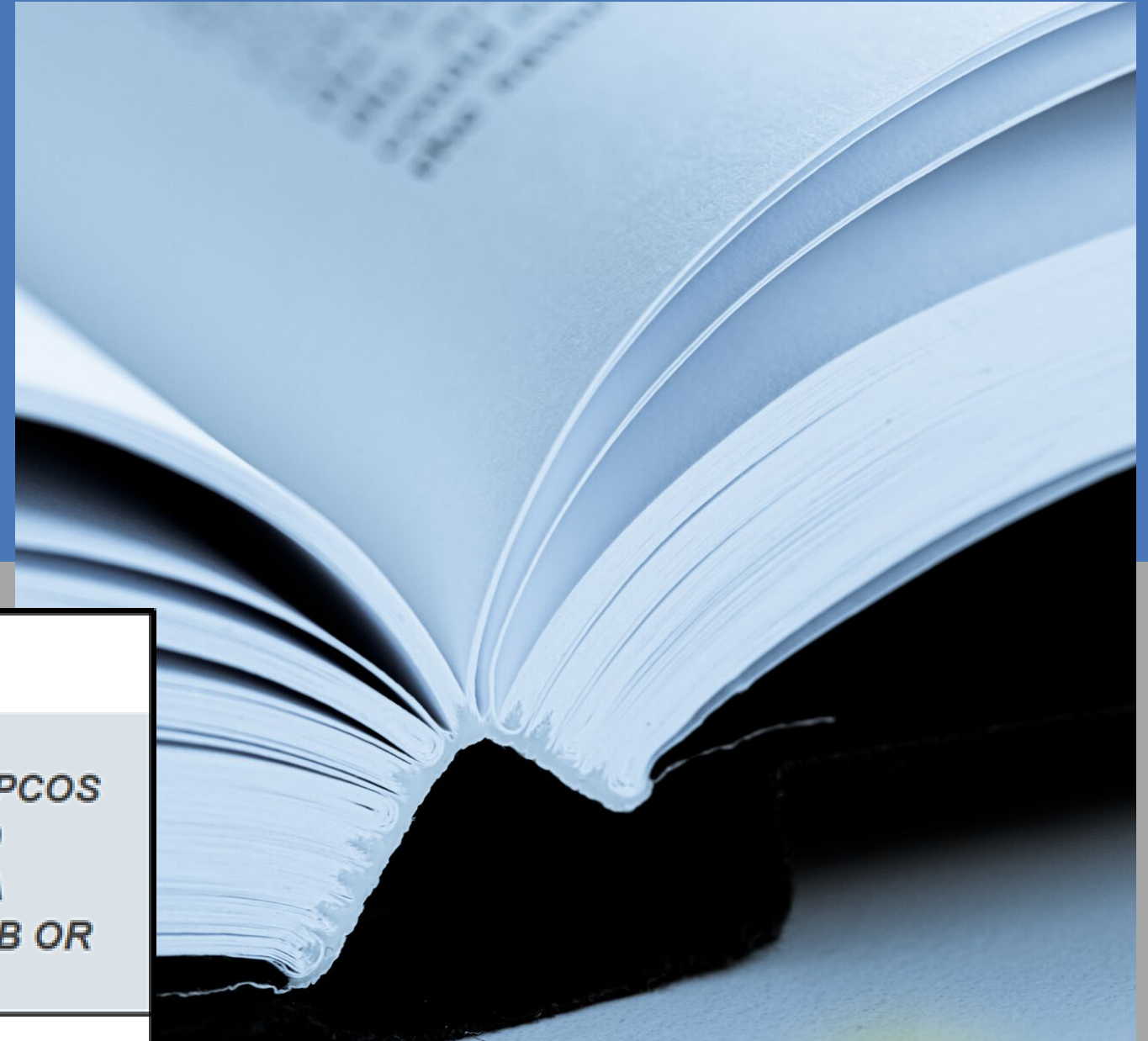


What people actually think PCOS is...

- Cysts on the ovaries
- High testosterone on blood work
- Diabetes



Diagnostic Criteria



Criteria for Diagnosis of PCOS

<i>CLINICAL FINDING</i>	<i>NATIONAL INSTITUTES OF HEALTH CRITERIA, 1990 (MUST HAVE BOTH OF THE FINDINGS MARKED BELOW)</i>	<i>ROTTERDAM CRITERIA, 2003 (MUST HAVE ANY TWO OF THE FINDINGS MARKED BELOW)</i>	<i>ANDROGEN EXCESS AND PCOS SOCIETY, 2009 (MUST HAVE A PLUS EITHER B OR C)</i>
Hyperandrogenism*	X	X	A
Oligomenorrhea	X	X	B
Polycystic ovaries		X	C

Diagnosis Confirmed.

That's it!





What commonly happens?

- **Basic lab values are normal*****
- **Wait until the patient wants to get pregnant - use bcp and potentially metformin (if diabetic) in the meantime**

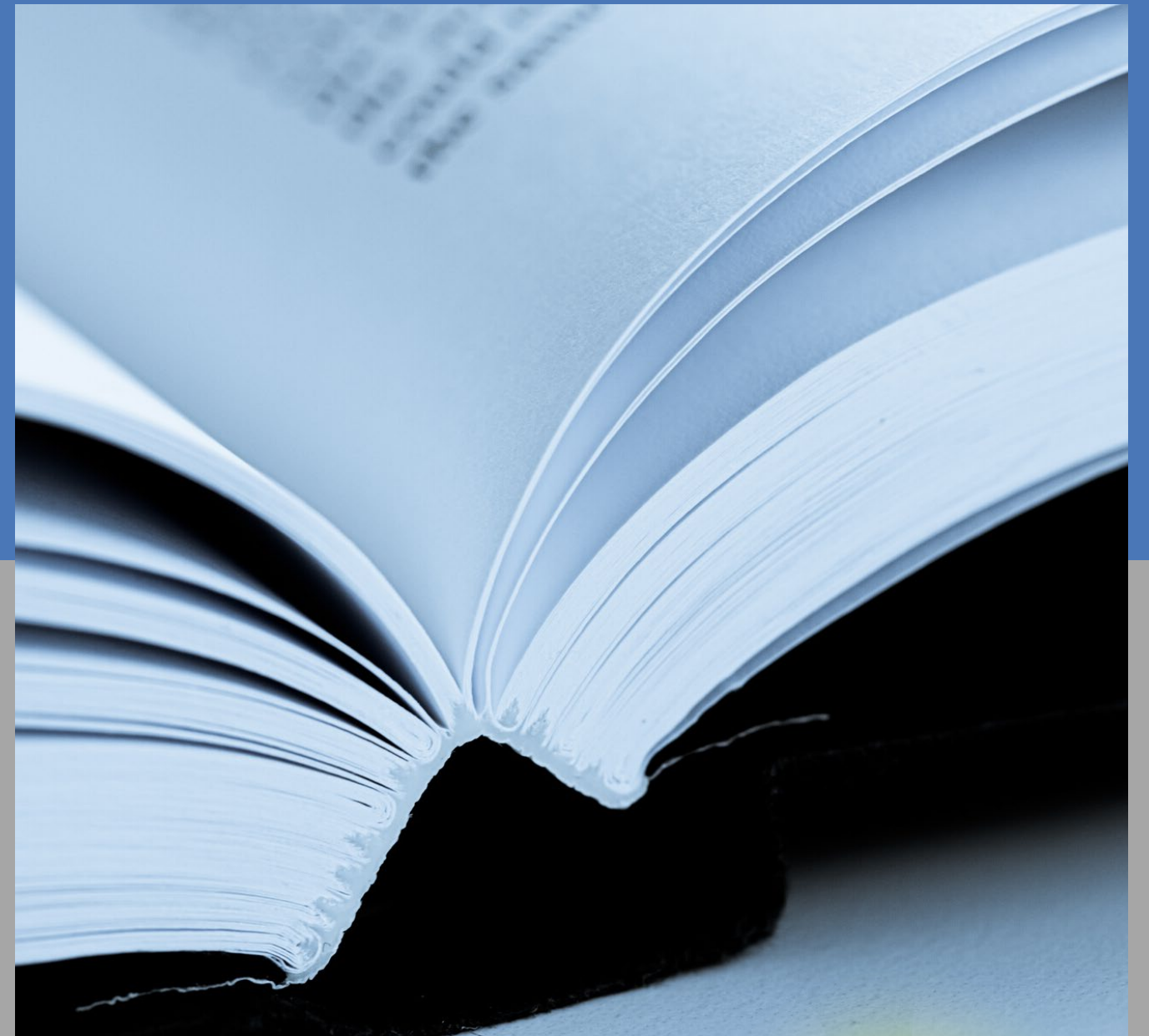
***glucose, HbA1c,
testosterone



Diagnostic Criteria

Rule out other conditions if your patient has hyperandrogenism and cycle irregularity:

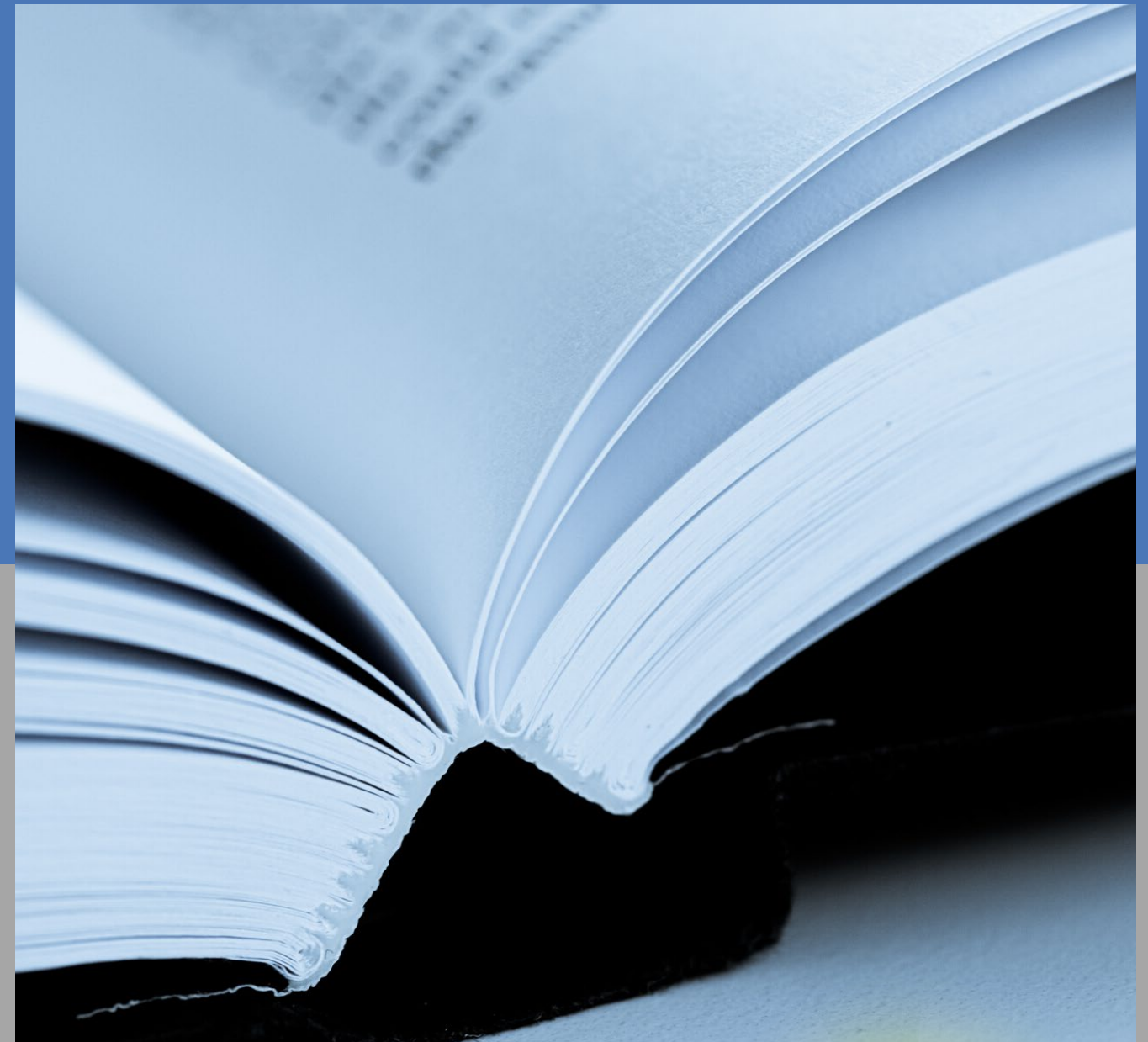
- Pregnancy test
- TSH (or thyroid panel)
- Prolactin



Diagnostic Criteria

If all are normal, consider:

- Low body weight, signs of eating disorder – rule out **hypothalamic amenorrhea** (serum LH, FSH, estradiol)
- Hot flashes and urogenital symptoms – rule out **primary ovarian insufficiency** (serum FSH and estradiol)
- Back fat pad, purple striae, hypertension – rule out **Cushings disease** (dexamethasone suppression test, urinary or salivary cortisol)



Lab Standards at my Local Lab

Test	Normal
Fasting Glucose	3.6-6.0 mmol/L
HbA1c	Under 6%
Fasting Insulin	20-180 nmol/L
Triglycerides	Under 1.7 mmol/L
<u>hs-CRP</u>	Under 1.0 = low risk 1.0 – 3.0 = moderate risk Over 3.0 = high risk
SHBG	20-180 nmol/L
Ferritin	5-272 Ug/L
Iron	11-34 <u>umol/L</u>

Is it PCOS?



Test Results

Fasting Glucose	5.0
HbA1c	5.5
Total T	2.0
Ultrasound	Normal

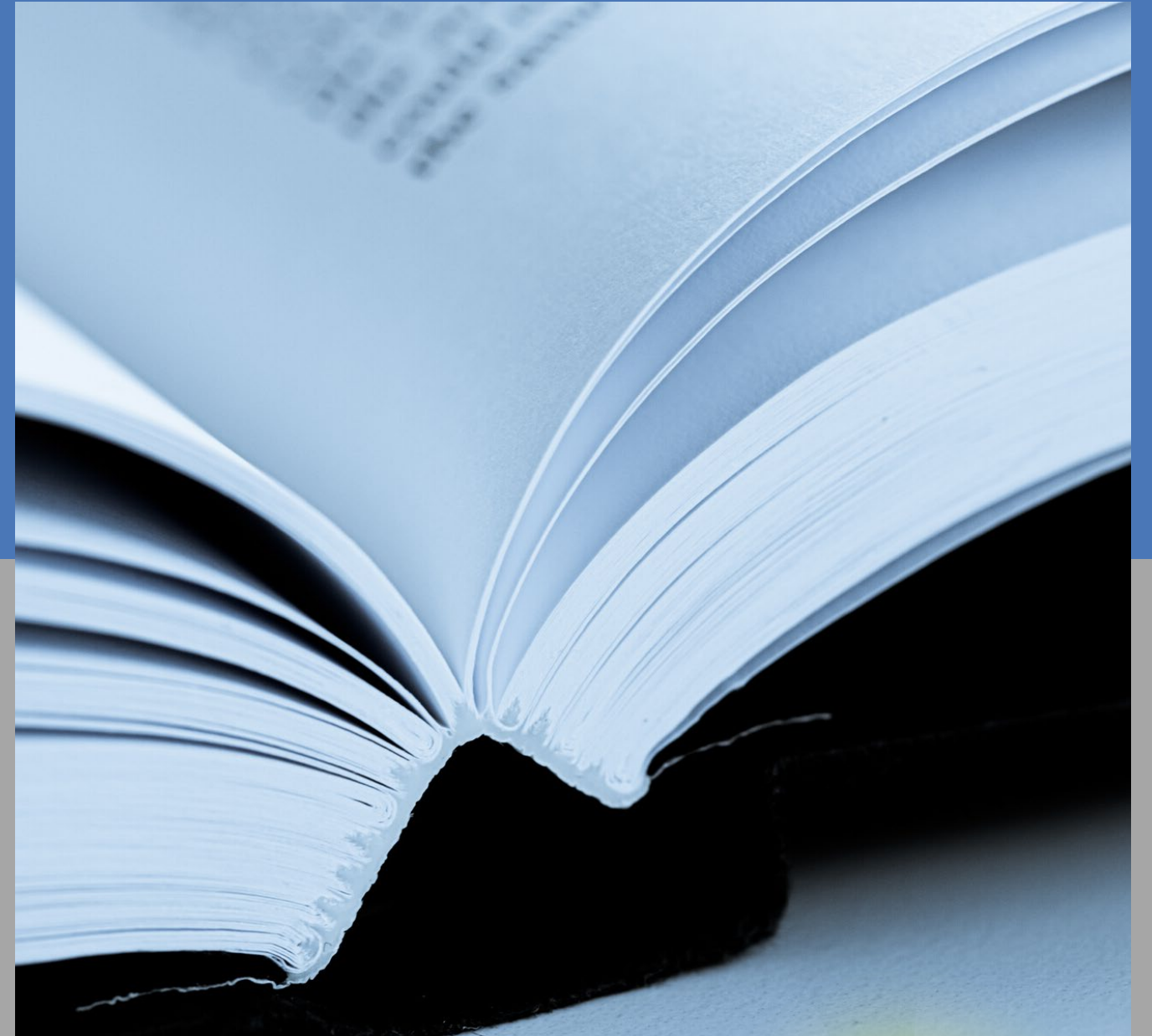
- 26 year old woman
- Acne
- Low level hirsutism
- Overweight
- Infrequent periods



Better Labs for PCOS

Screening Standard:

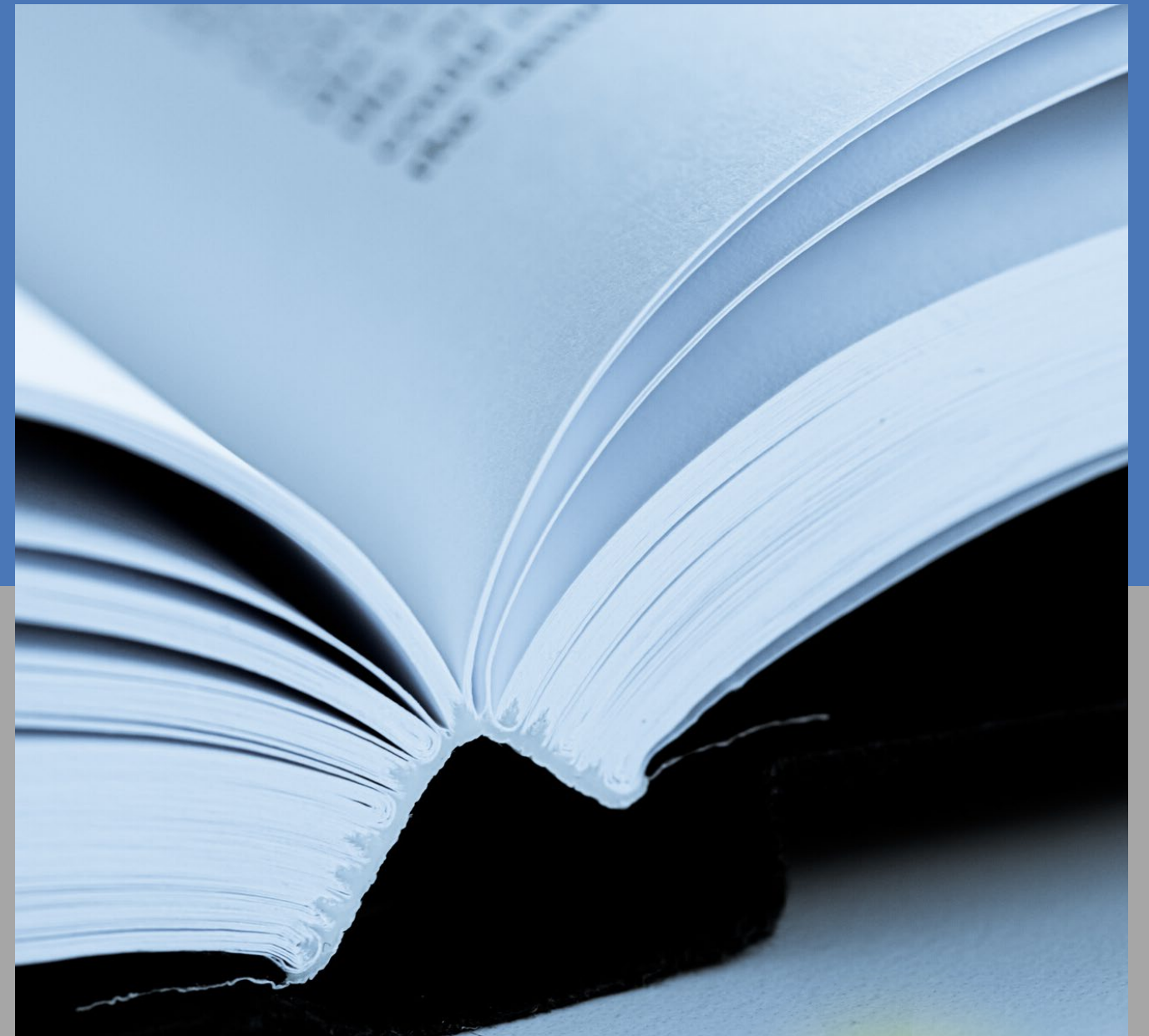
- 2 hour OGTT
- Blood pressure
- Lipid panel inc triglycerides
- Evaluate for signs and symptoms of obstructive sleep apnea in obese patients
- Evaluate for signs and symptoms of depression



And even better labs for PCOS

Next level:

- Fasting glucose and insulin
- CRP (inflammation)
- Ferritin
- Sex hormone binding globulin



Is it PCOS?



Test Results

Fasting Glucose	5.0
HbA1c	5.5
Insulin	112
Triglycerides	3.18
hs-CRP	1.37
SHBG	29.8

- 26 year old woman
- Acne
- Low level hirsutism
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- Infrequent periods

HOMA-IR Scores

Estimation on insulin resistance

Calculator: <https://www.dtu.ox.ac.uk/homacalculator/>

Healthy Range: 1.0 (0.5–1.4)

Less than 1.0 means you are insulin-sensitive which is optimal

Insulin Resistance - over 1.9

Above 1.9 indicates early insulin resistance

Above 2.9 indicates significant insulin resistance

HOMA-IR Scores














Serum testosterone can be normal...

And there can still be signs of high androgens

A modification of the Ferriman-Gallwey scoring system. A score of 8 or more indicates hirsutism

A score of 8 or more indicates hirsutism

Harrison S, Somani N, Bergfeld WF. Update on the management of hirsutism. Cleve Clin J Med. 2010 Jun;77(6):388-98. doi: 10.3949/ccjm.77a.08079. PMID: 20516250.

Foreburn Area	Chin	Lower Jaw & Neck	Upper Back	Lower Back					
									
1	Sparse terminal hairs on chin	1	Sparse terminal hairs over lower jaw	1	Sparse terminal hairs	1	Scattered terminal hairs	1	Scattered terminal hairs
2	Sparse terminal hairs with small thickened areas	2	Sparse terminal hairs with small thickened areas	2	Increased number of spread terminal hairs	2	Increased number of spread terminal hairs	2	Increased number of spread terminal hairs
3	Entire chin covered with light growth	3	Entire area covered with light growth	3	Entire area covered with light growth	3	75% of covered terminal hairs	3	75% of covered terminal hairs
4	Entire chin covered with heavy growth	4	Entire area covered with heavy growth	4	Entire area covered with heavy growth	4	Entire area covered with heavy growth	4	Entire area covered with heavy growth
	Chest	Upper Abdomen	Lower Abdomen	Pubic Area					
									
1	Circumareolar or midline terminal hairs	1	Scattered midline terminal hairs	1	Small number of scattered midline terminal hairs the length of linea alba	1	Scattered terminal hairs		
2	Circumareolar and midline terminal hairs	2	More terminal hairs, still midline	2	Midline concentration of terminal hair the length of the linea alba	2	Spread hair to the cleft		
3	75% of chest covered with terminal hairs	3	50% of upper abdomen covered	3	A midline thickened band of terminal hair less than 1/2 width of pubic hair at base	3	75% of covered terminal hairs		
4	Entire area covered with terminal hair growth	4	Entire area covered with terminal hair growth	4	An inverted V-Shaped coverage 1/2 width of pubic hair at base	4	Entire area covered with terminal hair growth		

Is it PCOS?

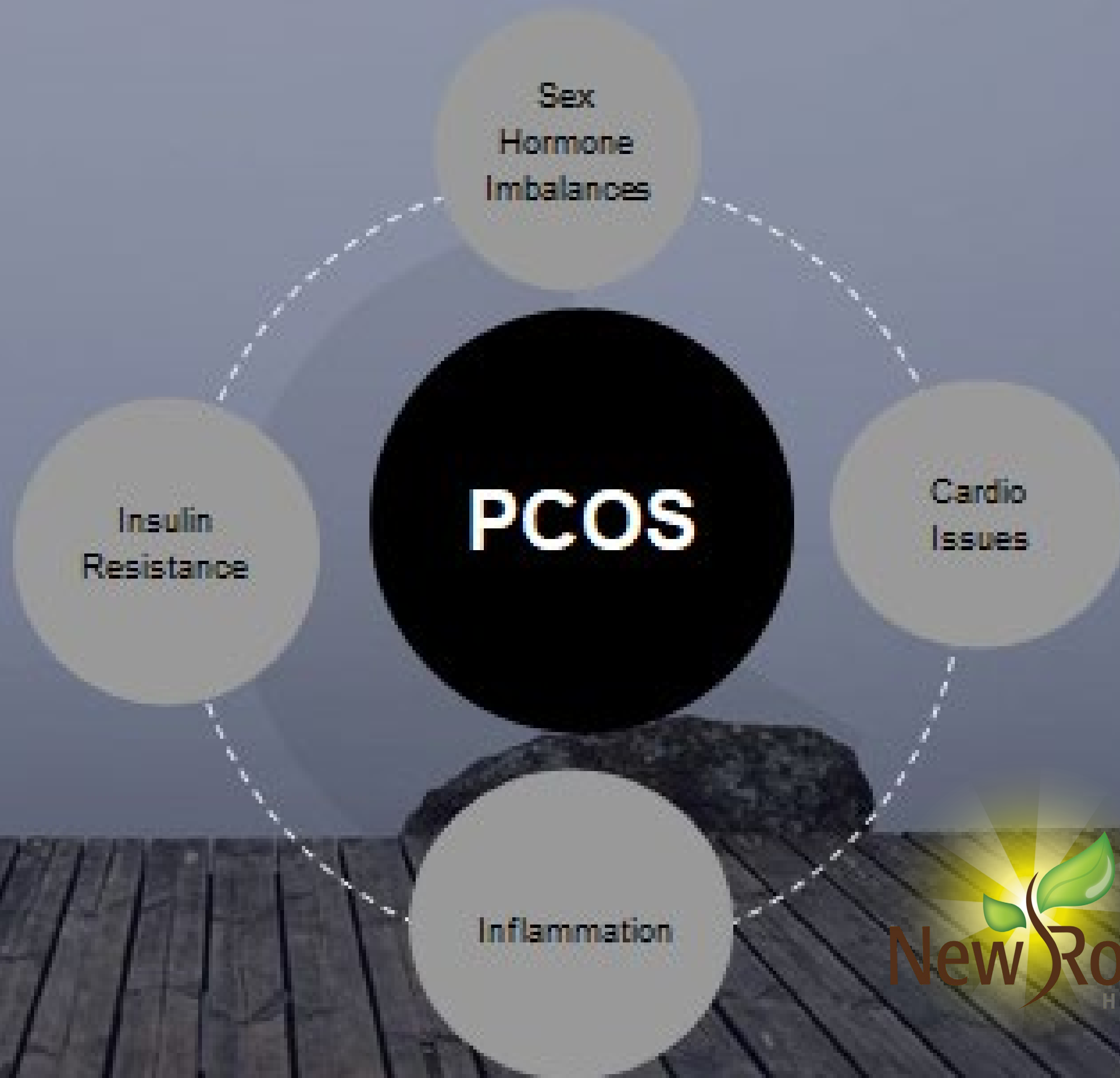


Test Results

Fasting Glucose	5.0
Insulin	112
HOMA IR	2.06
Elevated triglycerides	
Moderate cardiac inflammatory risk	
Low normal SHBG	

- 26 year old woman
- Acne
- Low level hirsutism
- Overweight
- Infrequent periods

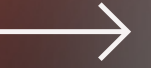
Went from a patient who was told it's not PCOS...



Insulin Resistance



Insulin Resistance



Insulin

Insulin is a hormone, and when insulin goes up, it allows glucose to move from the blood into the cells

Insulin Resistance

In insulin resistance, we can't get glucose into the cells

A Background

Insulin Resistance

What Is Insulin Doing?

- If the body has sufficient energy, insulin signals the liver to take up glucose and store it as glycogen
- And once glycogen stores are full? De novo lipogenesis
- Turn the glucose into triglycerides, or fat
- Working as a growth hormone = anabolic
- Tell the ovaries to make more testosterone
- Decrease the production of SHBG in the liver

So...is the insulin really not working?



Inositol



PCOS: Inositol

Review > [Int J Endocrinol.](#) 2016;2016:1849162. doi: 10.1155/2016/1849162. Epub 2016 Oct 23.

Effects of Inositol(s) in Women with PCOS: A Systematic Review of Randomized Controlled Trials

Vittorio Unfer¹, John E Nestler², Zdravko A Kamenov³, Nikos Prapas⁴, Fabio Facchinetti⁵

Affiliations + expand

PMID: 27843451 PMCID: PMC5097808 DOI: [10.1155/2016/1849162](#)

[Free PMC article](#)

Abstract

Polycystic ovary syndrome (PCOS) is a common endocrine disorder, with complex etiology and pathophysiology, which remains poorly understood. It affects about 5-10% of women of reproductive age who typically suffer from obesity, hyperandrogenism, ovarian dysfunction, and menstrual irregularity. Indeed, PCOS is the most common cause of anovulatory infertility in industrialized nations, and it is associated with insulin resistance, type 2 diabetes mellitus, and increased



Myo-Inositol in powder, 100% natural from non-GMO rice.

- There is also accumulating evidence on the beneficial effects of myo-Ins administration on reproductive function and ...for amelioration of the metabolic aberrations of PCOS and for restoring spontaneous ovulation



PCOS: Inositol

Gynecol Endocrinol, 2019 Jan 7;1-4. doi: 10.1080/09513590.2018.1549656. [Epub ahead of print]

Comparison of metformin plus myoinositol vs metformin alone in PCOS women undergoing ovulation induction cycles: randomized controlled trial.

Agrawal A¹, Mahey B¹, Kachhawa G¹, Khadgawat R², Varanasi P¹, Kishani A¹.

⊕ Author information

Abstract

The present study was planned to evaluate the benefit of synergetic effect of Metformin plus Myo-inositol versus Metformin alone in infertile polycystic ovarian syndrome (PCOS) women undergoing ovulation induction. One hundred and twenty infertile PCOS women were randomized: Group I (n = 60) received Metformin (500 mg) plus Myoinositol(600 mg) three times a day; Group II received Metformin 500 mg three times a day. Subjects were advised to try for spontaneous conception. Those who did not conceive after 3 months, were given three cycles of ovulation induction + intrauterine insemination. Hormonal and biochemical profile parameters were done at baseline and after 3 months of therapy. Primary outcome measure was live birth rate. Secondary outcomes were improvement in menstrual cycle, hormonal and biochemical parameters, spontaneous conception, abortions, multiple pregnancy, and ovarian hyperstimulation syndrome. Baseline demographic, hormonal and biochemical parameters were comparable in two groups. There was a significant improvement in menstrual cycles (cycle length and bleeding days) in Group I as compared to Group II. Improvement in HOMA-IR was significantly higher in Group I (p = .03) as compared to Group II after 3 months. Live birth rate was significantly higher in the Group I as compared to Group II [55% (33/60); 26.67% (16/60); p = .002]. The study concluded significantly higher live birth rate in women receiving the combination as compared to metformin alone.

- There was a significant improvement in menstrual cycles (cycle length and bleeding days) in Group I as compared to Group II
- Improvement in HOMA-IR was significantly higher in Group I as compared to Group II after 3 months
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- The study concluded significantly higher live birth rate in women receiving the combination as compared to metformin alone

PCOS: Inositol

Horm Mol Biol Clin Investiq. 2018 Mar 2. pii: /j/hmbci/ahed-of-print/hmbci-2017-0067/hmbci-2017-0067.xml. doi: 10.1515/hmbci-2017-0067. [Epub ahead of print]

Management of women with PCOS using myo-inositol and folic acid. New clinical data and review of the literature.

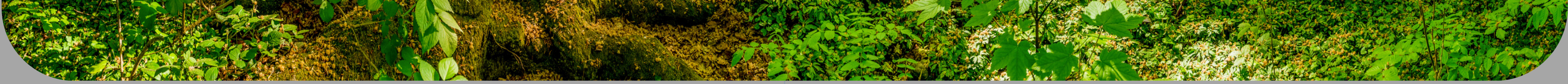
Regidor PA¹, Schindler AE², Lesoine B³, Druckman B⁴.

Author information

Abstract

Introduction The use of 2 × 2000 mg myo-inositol +2 × 200 µg folic acid per day is a safe and promising tool in the effective improvement of symptoms and infertility for patients with polycystic ovary syndrome (PCOS). In addition, PCOS is one of the pathological factors involved in the failure of in vitro fertilization (IVF). Typically, PCOS patients suffer of poor quality oocytes. **Patients and methods** In an open, prospective, non-blinded, non-comparative observational study, 3602 infertile women used myo-inositol and folic acid between 2 and 3 months in a dosage of 2 × 2000 mg myo-inositol +2 × 200 µg folic acid per day. In a subgroup of 32 patients, hormonal values for testosterone, free testosterone and progesterone were analyzed before and after 12 weeks of treatment. The mean time of use was 10.2 weeks. In the second part of this trial it was investigated if the combination of myo-inositol + folic acid was able to improve the oocyte quality, the ratio between follicles and retrieved oocytes, the fertilization rate and the embryo quality in PCOS patients undergoing IVF treatments. Twenty-nine patients with PCOS, underwent IVF protocols for infertility treatment and were randomized prospectively into two groups. Group A (placebo) with 15 patients and group B (4000 mg myo-inositol +400 µg folic acid per day) with 14 patients were evaluated. The patients of group B used 2 months' myo-inositol + folic acid before starting the IVF protocol. For statistical analyses Student's t-test was performed. **Results** Seventy percent of the women had a restored ovulation, and 545 pregnancies were observed. This means a pregnancy rate of 15.1% of all the myo-inositol and folic acid users. In 19 cases a concomitant medication with clomiphene or dexamethasone was used. One twin pregnancy was documented. Testosterone levels changed from 96.6 ng/mL to 43.3 ng/mL, and progesterone from 2.1 ng/mL to 12.3 ng/mL in the mean after 12 weeks of treatment ($p < 0.05$) Student's t-test. No relevant side effects were present among the patients. The women in the IVF treatment the group A showed a higher number of retrieved oocytes than group B. Nevertheless, the ratio follicle/retrieved oocyte was clearly better in the myo-inositol group (= group B). Out of the 233 oocytes collected in the myo-inositol group, 136 were fertilized whereas only 128 out of 300 oocytes were fertilized in the placebo group. With regards to the oocytes quality, better data were obtained in the myo-inositol group. More metaphase II and I oocytes were retrieved in relation to the total number of oocytes, when compared with the placebo group. Also, more embryos of grade I quality were observed in the myo-inositol group than in the placebo group. The duration of stimulation was 9.7 days (± 3.3) in the myo-inositol group and 11.2 (± 1.8) days in the placebo group and the number of used follicle-stimulating hormone (FSH) units was lower in the myo-inositol group in comparison to the placebo group: 1850 FSH units (mean) versus 1850 units (mean). **Discussion** Myo-inositol has proven to be a new treatment option for patients with PCOS and infertility. The achieved pregnancy rates are at least in an equivalent or even superior range than those reported using metformin as an insulin sensitizer. No moderate to severe side effects were

- In addition, our evidence suggests that a myo-inositol therapy in women with PCOS results in better fertilization rates and a clear trend to a better embryo quality.
- As by the same way the number of retrieved oocytes was smaller in the myo-inositol group, the risk of a hyperstimulation syndrome in these patients can be reduced.
- Therefore, myo-inositol also represents an improvement in IVF protocols for patients with PCOS.



Inositol



Oral inositol, often in combination with folic acid, seems to improve glycemic and lipid parameters, as well as ovulation and pregnancy rates, in some patients with PCOS



PCOS



Oral inositol seems to improve lipid parameters, blood pressure, and insulin resistance in patients with metabolic syndrome



Metabolic Syndrome





Inositol: Expectations

- Ovulation improvement: 2-3 months
- HOMA-IR, SHBG, testosterone studies: 3-6 months
- ART studies showing improvement in improvement of oocyte quality, reduce gonadotropin dose needed and improve procedure outcomes: 2 weeks-3 months PRIOR to procedure

Dose: 4 grams myo- inositol

- Fertility planning
- Obesity
- High insulin resistance
- Non-compliant to diet
- High levels of metabolic syndrome

Dose: 2 grams myo- inositol

- Non-fertility focused at this time
- Mild insulin resistance
- Strong dietary compliance
- Low level of metabolic syndrome

Other Supplements



PCOS: α -lactalbumin



Hydrolyzed *alpha*-lactalbumin (with this hydrolysis the amino acids are assimilated more easily into the body)

- Myo-inositol (MI), successfully used in polycystic ovary syndrome (PCOS), was administered with α -LA to exploit its action of favouring the passage of other molecules through biological barriers, and also considering its anti-inflammatory effect.
- The combination of MI with α -LA allowed us to obtain significant progress in the treatment of PCOS MI-resistant patients. Therefore, this new formulation was able to re-establish ovulation, greatly increasing the chances of desired pregnancy

Journal List > J Ovarian Res > v.11; 2018 > PMC5944130

Journal of Ovarian Research

BMC

J Ovarian Res. 2018; 11: 38.

PMCID: PMC5944130

Published online 2018 May 10. doi: [10.1186/s13048-018-0411-2](https://doi.org/10.1186/s13048-018-0411-2)

PMID: [29747700](https://pubmed.ncbi.nlm.nih.gov/29747700/)

Effects of myo-inositol plus alpha-lactalbumin in myo-inositol-resistant PCOS women

Mario Montanino Oliva,^{✉1} [Giovanna Buonomo](#),¹ [Marco Calcagno](#),¹ and [Vittorio Unfer](#)²



The addition of α -lactalbumin could play a beneficial role for myo-inositol bioavailability by changes in tight junctions permeability thus increasing plasma concentration in **simultaneous** administration

This mechanism cannot exclude other complementary possibilities of improving MI transport, when treatment lasts for weeks



First Arm of the Trial

- MI treatment for 3 months
- Results?
 - 23 of the 37 women (62%) ovulated
 - 14 (38%) did not ovulate

Second Arm of the Trial

- 14 MI-resistant patients given MI + α -LA for 3 months
- Results?
 - 12 of the 14 women (86%) ovulated
 - MI plasma levels at the end of the treatment significantly improved compared to the baseline

PCOS: Vitamin D



Vitamin D3 in form of cholecalciferol, 1 000 IU per drop. Approx. 525 drops per bottle

- Women with PCOS have a significantly lower serum 25(OH)D compared to fertile controls
- A compromised vitamin D status in PCOS women is associated with a higher HOMA-IR and an unfavourable lipid profile
- Large randomized controlled trials are necessary to explore the causality of this linkage

Comparative Study > [PLoS One. 2018 Dec 4;13\(12\):e0204748.](#)

doi: [10.1371/journal.pone.0204748](https://doi.org/10.1371/journal.pone.0204748). eCollection 2018.

Vitamin D and metabolic disturbances in polycystic ovary syndrome (PCOS): A cross-sectional study

Y H M Krul-Poel ¹, P P Koenders ², R P Steegers-Theunissen ^{3 4}, E Ten Boekel ⁵, M M Ter Wee ⁶, Y Louwers ⁴, P Lips ¹, J S E Laven ⁷, S Simsek ^{1 2}

Affiliations + expand

PMID: 30513089 PMCID: [PMC6279035](#) DOI: [10.1371/journal.pone.0204748](https://doi.org/10.1371/journal.pone.0204748)



PCOS: Vitamin D

Review > [Gynecol Endocrinol. 2020 Jan;36\(1\):1-5. doi: 10.1080/09513590.2019.1625881.](#)

Epub 2019 Jun 12.

Effects of vitamin D supplementation in women with polycystic ovary syndrome: a review

[Daniela Menichini](#)^{1 2}, [Fabio Facchinetti](#)¹

Affiliations + expand

PMID: 31187648 DOI: [10.1080/09513590.2019.1625881](#)

- In six studies, it [Vitamin D] significantly decreased fasting plasma glucose and brought to improvements in insulin resistance (IR) and serum fasting insulin
- In addition, four studies reported decreases of serum triglycerides, while discordant data are reported as far as LDL, HDL, and total cholesterol levels
- High-doses of vitamin D (4000 IU), compared with low-dose (1000 IU), and placebo, showed beneficial effects on total testosterone, sex hormone-binding globulin (SHBG) and free androgen index (FAI)



Vitamin D: Expectations

- Vitamin D supplementation at high doses for a period of at least 12 weeks, may lead to improvement in women with PCOS:
 - glucose level,
 - insulin sensitivity,
 - hyperlipidemia
 - hormonal functionality

PCOS: Vitamin D + Fish Oil



Wild Omega 3 providing 660 mg of EPA and 330 mg of DHA per softgel, in the optimum proportion (2:1). The oil is obtained from wild anchovies by molecular distillation, a method of purification which guarantees a pharmaceutical grade oil free of environmental contaminants.

- Overall, the co-administration of vitamin D and omega-3 fatty acid for 12 weeks had beneficial effects on:
 - mental health parameters (depression, anxiety & stress scores)
 - serum total testosterone
 - hs-CRP
 - plasma total antioxidant capacity

Randomized Controlled Trial > [J Affect Disord.](#) 2018 Oct 1;238:32-38.

doi: 10.1016/j.jad.2018.05.027. Epub 2018 May 26.

The influences of vitamin D and omega-3 co-supplementation on clinical, metabolic and genetic parameters in women with polycystic ovary syndrome

Mehri Jamilian ¹, Mansooreh Samimi ², Naghmeh Mirhosseini ³, Faraneh Afshar Ebrahimi ², Esmat Aghadavod ⁴, Rezavan Talaei ⁵, Sadegh Jafarnejad ⁴, Shahrzad Hashemi Dizaji ⁶, Zatollah Asemi ⁷



Vitamin D & Fish Oil

Dosing

- Test Vitamin D!
 - Aim to get levels over 110nmol/L
- 25000-50000 IU per week
- Add fish oil
 - 2000 mg+ fish oil
 - Don't forget the benefit to hypertriglyceridemia (20-50% reduction); reduce fatty liver disease



PCOS: Berberine

Review > Evid Based Complement Alternat Med. 2018 Nov 14;2018:2532935.

doi: 10.1155/2018/2532935. eCollection 2018.

The Effect of Berberine on Polycystic Ovary Syndrome Patients with Insulin Resistance (PCOS-IR): A Meta-Analysis and Systematic Review

Meng-Fei Li¹, Xiao-Meng Zhou^{1 2}, Xue-Lian Li^{1 2}

Affiliations + expand

PMID: 30538756 PMCID: PMC6261244 DOI: 10.1155/2018/2532935

- Overall, the co-administration of vitamin D and omega-3 fatty acid for 12 weeks had beneficial effects on:
 - mental health parameters (depression, anxiety & stress scores)
 - serum total testosterone
 - hs-CRP
 - plasma total antioxidant capacity





Berberine: Expectations

- Reduces fasting plasma glucose, markers of insulin resistance, total cholesterol, low-density lipoprotein (LDL) cholesterol, triglycerides, testosterone levels, and waist-to-hip ratio when compared with placebo
- Increase high-density lipoprotein (HDL) cholesterol and sex hormone binding globulin (SHBG) levels
- 500 mg tid

1

Inexpensive

The costs associated with PCOS are high, including medications & fertility treatment. Supplements, simple testing & diet are reasonable

2

Easily Available

We have good options that are available to the general public - it does not require complicated paths to treatment

3

Few Known Harmful Side Effects

GI upset is the most common side effect with these supplements, but risk is minimal

4

Get Going!

Treat early...be assertive. There is much more happening beyond fertility

PCOS: Diet

[Nutr Diet](#). 2018 Aug 5. doi: 10.1111/1747-0080.12480. [Epub ahead of print]

Dietary underreporting in women affected by polycystic ovary syndrome: A pilot study.

De Giuseppe R¹, Braschi L¹, Bosoni D², Bilino G³, Stanford EC⁴, Nappi RE², Cena L¹.

[Author information](#)

Abstract

AIM: The first-line therapy for polycystic ovary syndrome (PCOS) is weight loss focussing on diet and regular exercise; measurement of diet and energy intake (EI) is important to determine associations between nutrients and health in women with PCOS. The EI underreporting (UR) is a condition characterised by reports of habitual EI that is implausibly low, compared with estimated requirements. This case-control study aims to evaluate UR in women with PCOS.

METHODS: Thirty-six women with PCOS were enrolled according to the Rotterdam criteria; 37 healthy women were enrolled as controls.

INCLUSION CRITERIA: age range 18-45 and body mass index ≥ 18.5 kg/m² in subjects without eating disorders and/or diabetes mellitus. Nutritional assessment included: anthropometry, basal metabolic rate (BMR), weight history and physical activity assessment. Subjects completed a non-consecutive three-day dietary diary to identify energy and macronutrient intake. UR was calculated (Goldberg Index: EI/BMR).

RESULTS: Although women with PCOS reported a significantly higher mean BMR than controls ($P < 0.0001$), their EI was lower ($P < 0.001$), suggesting an UR in 47.2% of women with PCOS versus 2.7% of controls ($P < 0.0001$). The EI from simple sugars was lower in women with PCOS than controls ($P < 0.01$). The protein intake was increased in controls than women with PCOS ($P < 0.0001$). Weight cycling was more frequent in women with PCOS ($P < 0.001$). Logistic regression analysis identified UR associated with PCOS ($P = 0.001$).

CONCLUSIONS: Women with PCOS underreport foods rich in simple sugars rather than underreport their total dietary intake. These results may have implications for the interpretation of diet and health correlations in this patient population.

© 2018 Dietitians Association of Australia.

- Women with PCOS underreport foods rich in simple sugars rather than underreport their total dietary intake.
- These results may have implications for the interpretation of diet and health correlations in this patient population



PCOS: Diet

➤ [Food Sci Nutr](#). 2019 Feb 27;7(4):1426-1437. doi: 10.1002/fsn3.977. eCollection 2019 Apr.

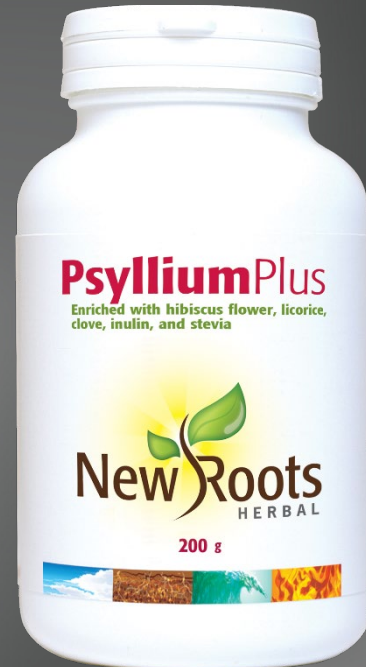
Low intakes of dietary fiber and magnesium are associated with insulin resistance and hyperandrogenism in polycystic ovary syndrome: A cohort study

Dylan A Cutler¹, Sheila M Pride¹, Anthony P Cheung^{1 2}

- In women with PCOS, those with IR consumed less fiber, less magnesium, and greater glycemic load than those without IR
- Fiber intake of women with PCOS was negatively correlated with IR, fasting insulin, glucose tolerance, testosterone, and dehydroepiandrosterone sulfate
- Magnesium intake was negatively correlated with IR, C-reactive protein, and testosterone, but positively correlated with HDL cholesterol.



Psyllium Plus & Magnesium



Fibres of *Plantago ovata* (100% husks), enriched with hibiscus flowers, licorice root, stevia, and clove, combined with inulin.

- Psyllium Plus
 - Start at 1 tsp or less (esp with sensitive patients)
 - Increase to 2-3 tsp daily
 - Watch blood pressure to ensure no increase with licorice root



The most bioavailable magnesium form of this micronutrient, and the amino acid L-taurine to improve the assimilation. The product provides 150 mg elemental magnesium per capsule.

- Magnesium Bisglycinate Plus
 - 2 capsules daily
 - 300 mg (234 mg bisglycinate + 66 mg oxide)





Perimenopause & beyond

- Long menstrual cycles
- Risk for cardiometabolic disease, metabolic syndrome, diabetes, sleep apnea, depression



Children & offspring

- ...early-life exposure to hyperandrogenemia in daughters of women with PCOS may lead to long-term alterations in gut microbiota and cardiometabolic function
-

Sherman SB, Sarsour N, Salehi M, Schroering A, Mell B, Joe B, Hill JW. Prenatal androgen exposure causes hypertension and gut microbiota dysbiosis. *Gut Microbes*. 2018;9(5):400-421. doi: 10.1080/19490976.2018.1441664. Epub 2018 May 31. PMID: 29469650; PMCID: PMC6219642.

PCOS Considerations: Our New Understandings

- PCOS underlying issues include insulin resistance, lowered SHBG levels, increased testosterone and inflammatory markers
- Testing needs to be more thorough to understand risk factors
- Treat IR first and always
- Add α -lactalbumin is myo-inositol is not helping with ovulation
- Vitamin D levels often low - test & treat

PCOS Considerations: Our New Understandings

- Add in fish oil for cardiometabolic benefit including hypertriglyceridemia
- Women with PCOS often underestimate the issues in their diet - start with positive focus
- Add psyllium fiber & magnesium
- Remember to treat women who are perimenopausal & menopausal, even when they are not worried about fertility and may not have the same level of hormonal irregularities based on symptoms

Register with the link below to receive access to:

- A practitioner guide to PCOS
- An opportunity to win 3 New Roots Herbal products of your choice

<https://www.newrootsherbal.eu/en/anpsummit-pcos>

Contact:

Helen Edwards, Certified Nutritional Therapist:

hedwards@newroots.info





Thank you

The Association of Naturopathic Practitioners

<https://theanp.co.uk/>
info@theanp.co.uk