

Understanding PCOS and Eating Disorder Risk

Lauren Absher, MPH, RDN

A dark blue diagonal graphic that starts from the bottom left corner and extends towards the top right corner, covering the lower half of the slide.

Learning Objectives

1. Understand the connection between PCOS and eating disorders
2. Nutrition recommendations for PCOS management
3. Why diets don't work long-term for PCOS management

Dysfunction of the Hypothalamic-Pituitary-Ovarian Axis

Increased pulse frequency
of the release of GnRH
from the hypothalamus

Increased ratio of LH:FSH
released from pituitary

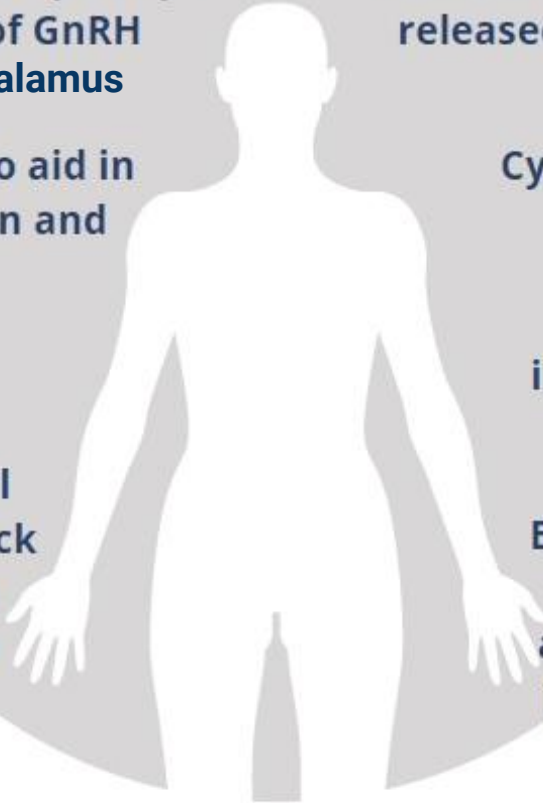
Less FSH in ovary to aid in
follicle maturation and
ovulation

Cysts = follicles that
don't ovulate

Lack of high
progesterone
without successful
ovulation cycles back
to problems with
GnRH production

Higher LH
increases androgen
production

Elevated androgens
in ovaries and
adrenals stimulate
insulin production
in pancreas



Diagnostic Criteria for PCOS (2 out of 3)

Irregular menstrual cycle (no period, missed periods, no ovulation, heavy period)

Polycystic ovaries (follicles that don't ovulate)

Elevated testosterone and other androgens (often manifest by hirsutism and acne, insulin resistance)

PCOS characteristics

Hyperinsulinemia (commonly more severe in PCOS than diabetes)

Exclusion of other diagnoses (especially hypothalamic amenorrhea in eating disorders)

Chronic condition

Hirsutism, balding patterns, acne, fertility problems are common

Metabolic symptoms worsen post-menopause

Affects an estimated 15-20% of women/AFAB

Labs to Check

- Insulin (not just blood glucose)
- Hemoglobin A1c
- Sex hormones (LH, FSH, testosterone, free testosterone, DHEA-S, progesterone, estradiol)
- C-reactive protein
- Thyroid stimulating hormone
- Cholesterol/triglycerides
- Iron
- 25 hydroxy Vitamin D
- Vitamin B12
- Sleep study

Associated risk factors for PCOS

Genetics

Environmental influences

Studies show that a higher weight DOES NOT cause PCOS

Eating Disorder Risk

40-85% of individuals with PCOS are at a higher body weight

Weight bias among practitioners and others who encourage dieting and weight loss for individuals with PCOS in larger bodies, even before diagnosis

Higher risk of poor body image - fear of weight gain, desire to control weight

Individuals with PCOS are more likely to have a subclinical/clinical eating disorder compared to those without PCOS

Eating Disorder Risk

Commonly associated with binge eating behaviors (the insulin resistance can create more intense carb and sugar cravings)

Some folks are misdiagnosed with PCOS when they have hypothalamic amenorrhea (HA)--many immature follicles can be detected with HA too!

Eating Disorder Risk

Dieting or engaging in eating disorder behaviors occur in order to attempt weight loss or prevent weight gain

Weight cycling predicts binge eating

Dieting/restricting increases preoccupation with food and risk of deprivation eating

Elevated levels of CCK, insulin, and androgens lead to intense carb cravings

Eating Disorder Risk

Disruptions of circadian rhythms throws off appetite and hormone balance

Lack of appetite early in the day

Hunger signals may mostly occur at night--intense

Lower interoceptive awareness

Eating Disorder Risk

Higher prevalence of depression, anxiety

Higher stress response and increased cortisol

Use of food, avoidance of food, or other disordered patterns to cope with emotions

Stress and PCOS

Increased cortisol due to calorie restriction, leading to deprivation eating

Lowers progesterone

Suppressed immune system, poor memory, increased depression and anxiety

Increased insulin, insulin resistance, and sensitivity to the body storing fat

Stress and PCOS

Raises cholesterol and triglycerides

Increases food cravings and worsens sleep

Increases likelihood of IBS symptoms

Nutrition Recommendations

Protein

Add protein to night snack within 2 hours of going to bed, and within 1 hour of waking up, to lower insulin and regulate circadian rhythms

Include protein with all meals to lower insulin, decrease intensity of carb cravings, increase energy level, improve quality of sleep, enable the body to have energy and desire to add movement

Promote egg quality and improves ovulation

Nutrition Recommendations

Omega-3 Fatty Acids

Include more food sources of omega-3 fatty acids and/or take an omega-3 supplement

Better quality ovulation, lowers testosterone, lowers LH, lowers insulin and blood glucose and improves insulin sensitivity

Lowers cholesterol, triglycerides, LDL cholesterol

Regulates menstrual cycle, improves fertility

Nutrition Recommendations

Omega-3 Fatty Acids

Lowers cortisol, c-reactive protein and inflammation (antioxidant properties)

Improves energy and mood

People with PCOS have a higher likelihood of an omega-3 deficiency

Wait at least 3-6 months in order to see the benefit

Nutrition Recommendations

Carbs and Fiber

Include fiber from whole grains, fruit, vegetables, beans, etc

Include other grains based on food preference

Aids in reducing oxidative stress and lowering the pro-inflammatory response

Reduces likelihood of binge eating

Nutrition Recommendations

Carbs and Fiber

Helps to regulate insulin/blood sugar levels

Helps the body utilize protein for things other than conversion to blood glucose then to ATP

Nutrition Counseling Recommendations

Focus on what foods to include based on food preferences rather than what foods to exclude

Encourage variety and adequate calorie intake--emphasis on food preference

Focus on relationship with food and address getting out of restricting, binge eating, or any other eating disorder behavior

Nutrition Counseling Recommendations

Pair higher carb foods with fiber-rich, protein-rich foods when brainstorming meal ideas

Once consistently eating in recovery, listen to the body's signals to help identify the balance that works for your body

Guide clients to introduce supplements one or a few at a time. It's common to start with inositol, omega 3s, vitamin D.

Nutrition Counseling Recommendations

Address barriers to change

- Life schedule and circumstances
- Lack of appetite
- Access to food
- Energy for grocery shopping, food prep, cooking
- Mental Permission vs physical permission
- Diet mentality and deprivation
- All-or-nothing thinking
- Emotional relationship with food
- Demonizing sugar, fruit, dairy, grains, and other carbohydrates

Nutrition Counseling Recommendations

Increase self-compassion for carb cravings by understanding what is physiologically going on

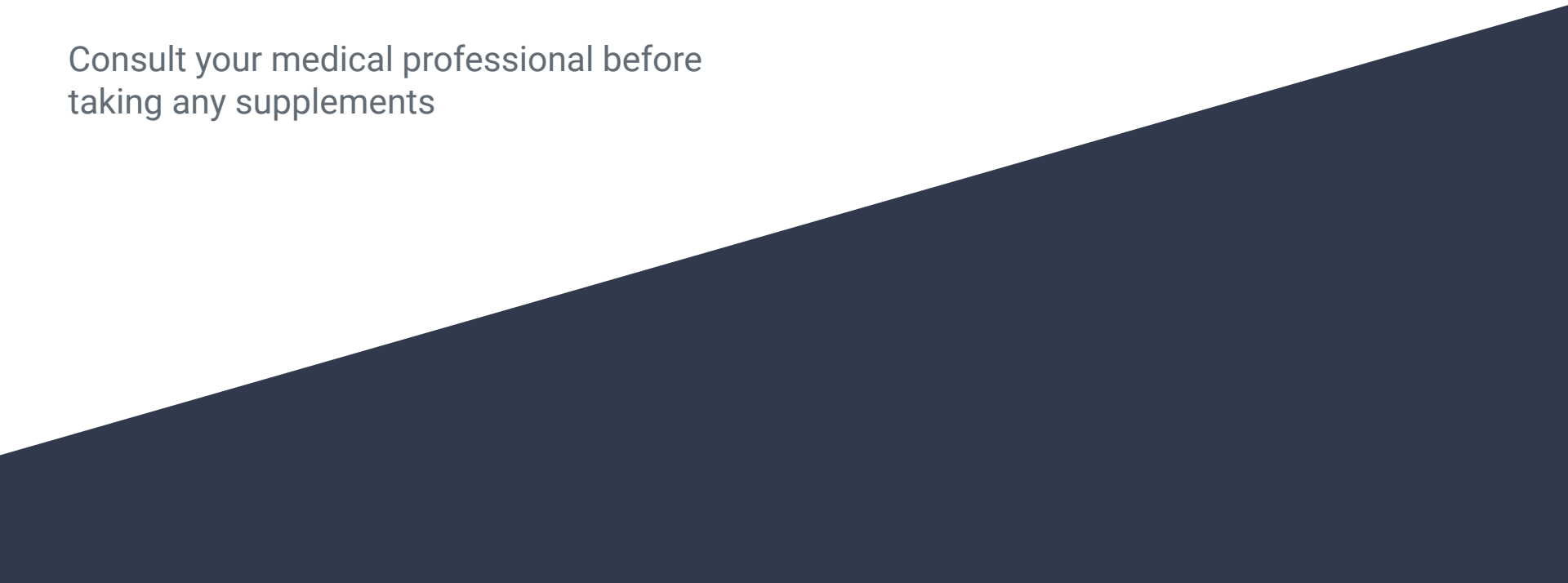
Shift observations from judgment to curiosity

Improvements in health take time. Wait at least 3-6 months after implementing changes consistently.

Re-check labs.

Supplements

Consult your medical professional before
taking any supplements

A dark blue diagonal graphic that starts from the bottom left corner and extends towards the top right corner, covering the lower right portion of the slide.

Supplements

FISH OIL

Similar benefits as consuming more foods with omega-3s

500-1000 mg per day of DHA, 3rd party tested

Take with higher fat meal to help with absorption.

Beneficial to ensure adequate intake (food may not be sufficient)

<http://www.pcosnutrition.com/4-best-supplements-fertility/>

Supplements

Vitamin D

Lowers androgens

Lowers inflammation

Improves fertility (aids in follicle egg maturation)

Lowers blood glucose and insulin

Raises HDL cholesterol

Lowers insulin resistance

<https://juliedillonrd.com/vitamind/>

Supplements

Ovasitol 40:1 ratio of MYO inositol and D-chiro inositol

Improves insulin sensitivity, blood glucose and A1c

Improves reproduction (restores ovulation, cycle length and improves oocyte and embryo quality),

Hormonal balance of insulin, androgens, etc

Reduces metabolic issues (inflammation, dyslipidemia, hypertension)

Supplements

Ovasitol 40:1 ratio of MYO inositol and D-chiro inositol

Improves energy by improving circadian rhythms

Those with PCOS may have a deficiency in inositol

Aids in carbohydrate metabolism by aiding insulin, allowing glucose into cells

Supplements

N-acetylcysteine (supplement or prescription drug)

Improves hirsutism

Lowers fasting insulin and free testosterone

Regulates menstrual cycle

Improves ovulation

Antioxidant

Supplements

Zinc

reduces PMS symptoms

improves fertility

minimizes hair loss

reduces excess body hair and acne

reduces inflammation (antioxidant)

<http://www.pcosnutrition.com/zinc-for-pcos/>

*Zn from a multivitamin may be adequate and prevent causing a deficiency in copper

Supplements

Melatonin

Improves hormone levels and menstrual regularity

Improves egg quality by improving levels of melatonin in the follicular fluid

Lowers LDL cholesterol

Antioxidant

<http://www.pcosnutrition.com/melatonin/>

Supplements

Berberines

Improves insulin sensitivity

Improves ovulation rate per cycle

Aids in gut health (short-term benefit, not to be taken longer than 3 months)

Reduces fatty liver

Can cause issues with low blood sugar.

Don't take with pregnancy

Supplements

Magnesium

Helps insulin to function properly
(blood work won't always show a deficit)

Organics acid test measures urine
and metabolites.

Medications

Oral contraceptive benefit

- Reduces androgen levels and improves dermatological symptoms of acne and hair growth (masks the condition)
- Reduces risk of endometrial hyperplasia/endometrial cancer
- Regulates cycle

Medications

Oral contraceptive benefit

Cons long-term

- Creates nutrition deficiencies.
- Associated with increased risk of insulin resistance, elevated LDL, triglycerides, and C-reactive protein (a marker of inflammation and heart disease)
- Associated with hypertension, blood clots, metabolic syndrome and inflammation
- May lower bone density

Medications

Metformin benefit

- Reduces the amount of glucose made and sent out by the liver
- Lowers insulin
- Lowers testosterone
- Improves menstrual irregularities
- Improves fertility and ovulation rates
- May improve blood pressure and cholesterol

Medications

Metformin benefit

Cons

- Long-term, it may affect the liver
- May cause nausea/diarrhea
- May create nutrition deficiencies in Vitamin B12 and folate

Medications

Spirolactone benefit

- Anti-androgen
- Reduces hirsutism, acne, thinning hair
- Raises HDL cholesterol, lowers triglycerides
- Improves insulin sensitivity

Medications

Spirolactone benefit

Cons

- Flushing, dizziness, rash, nausea, vomiting
- Not safe for pregnancy

Diets Don't Improve PCOS Long-term

Body is often resistant to weight loss

Restricting to maintain a certain weight exacerbates health issues

Dieting increases cortisol, increases risk of insulin resistance over time

A calorie deficit, skipping meals, and binge behaviors increase the oxidative stress and inflammatory response that contributes to PCOS and depletes needed omega 3s

Diets Don't Improve PCOS Long-term

Weight cycling raises insulin, androgens, blood glucose, cholesterol

Increased neuropeptide Y and blood sugar crashes from restricting may make carb cravings even more intense

Affects thyroid and adrenals hormone balance, and more systems in the body and may create more metabolic disturbances

Diets Don't Improve PCOS Long-term

Increases the all-or-nothing thinking that triggers disordered eating patterns

Worsens stress response, guilt, shame

Hinders ability to make peace with their body

Increases risk of developing hypothalamic amenorrhea

Diets Don't Improve PCOS Long-term

Increases risk of developing hypothalamic amenorrhea

Praise for any weight loss increases hyperfocus on appearance, belief that being thin is better than taking care of health

Diets Don't Improve PCOS Long-term

Worsens digestive issues

Less diverse gut microbiome can decrease absorption and utilization of nutrients

Problems with low stomach acid and enzyme response, which aids in breakdown of food

Acid reflux, constipation, diarrhea, bloating, gas

Diets Don't Improve PCOS Long-term

Eucaloric Diet and Ad Libitum Studies

Any studies claiming the benefit of lower carbohydrate diets don't control for added fiber or unsaturated fats that may be included when replacing refined carbohydrate calories with other macronutrients.

They don't assess for eating disorders if on the diet long-term

Diets Don't Improve PCOS Long-term

Intermittent fasting

Hinders recognition of hunger and fullness cues

Exacerbates the pro-inflammatory response and oxidative stress, which can raise insulin

Being stuck in belief that they have to deprive themselves, ignore hunger as long as possible

Addressing Health Professional Bias

“What recommendations would you give me if my body weight was at a normal BMI?”

Higher weight has not been proven to cause PCOS, so why would weight loss treat it?

Weight doesn't reveal someone's food choices or exercise habits or lifestyle choices. Giving unsolicited advice is shaming and can lead to patients in larger bodies avoiding doctor visits.

Addressing Health Professional Bias

It's possible to improve labs, improve symptoms, and increase fertility WITHOUT weight loss

When doctors say to someone in a thin body that it's "normal" to have an irregular period: Is it normal, or is it common and prevalent in a diet-focused society?

Has the doctor checked labs even if the person is at a normal weight range, or are they prescribing hormones that mask a condition that is undiagnosed?

References

- Bacon, L. and Aphramor, L. (2011). Weight Science: Evaluating the evidence for a paradigm shift. *Nutrition Journal*. 10:9.
- Bentley-Lewis R, Seely E, Dunaif A. Ovarian hypertension: polycystic ovary syndrome. *Endocrinol Metab Clin North Am*. 2011;40(2):433-x. doi:10.1016/j.ecl.2011.01.009
- Bernadett M, Szemán-N A. Evészavarok prevalenciája policisztás ováriumszindrómások körében [Prevalence of eating disorders among women with polycystic ovary syndrome]. *Psychiatr Hung*. 2016;31(2):136-145.
- Carmina E, Azziz R, Bergfeld W, et al. Female Pattern Hair Loss and Androgen Excess: A Report From the Multidisciplinary Androgen Excess and PCOS Committee. *J Clin Endocrinol Metab*. 2019;104(7):2875-2891. doi:10.1210/jc.2018-02548
- Cleave, C. and Jeanes, Y. (2017). Binge eating behaviours in obese women with polycystic ovary syndrome. *Proceedings of the Nutrition Society*, 76. (OCE1), E24

References

Diagnosis: Polycystic Ovarian Syndrome (PCOS). HAES Health Sheets website. Updated 2021. Accessed May 26, 2021. <https://haeshealthsheets.com/pcos/>

Escobar-Morreale HF, Luque-Ramirez, M, and Gonzalez, F. (2011). Circulating inflammatory markers in polycystic ovarian syndrome: A systematic review and metaanalysis. *Fertil Steril*.

Fang F, Ni K, Cai Y, Shang J, Zhang X, Xiong C. Effect of vitamin D supplementation on polycystic ovary syndrome: A systematic review and meta-analysis of randomized controlled trials. *Complement Ther Clin Pract*. 2017;26:53-60. doi:10.1016/j.ctcp.2016.11.008

Grassi A. Women's Health: New Data on Polycystic Ovary Syndrome. *Today's Dietitian*. 2017;19(5):12.

Hafsi W, Badri T. Hirsutism. [Updated 2020 Aug 26]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK470417/>

References

Hamilton KP, Zelig R, Parker AR, Haggag A. Insulin Resistance and Serum Magnesium Concentrations among Women with Polycystic Ovary Syndrome. *Curr Dev Nutr*. 2019;3(11):nzz108. Published 2019 Oct 3. doi:10.1093/cdn/nzz108

Krug I, Giles S, Paganini C. Binge eating in patients with polycystic ovary syndrome: prevalence, causes, and management strategies. *Neuropsychiatr Dis Treat*. 2019;15:1273-1285. Published 2019 May 16. doi:10.2147/NDT.S168944

Legro RS. Obesity and PCOS: implications for diagnosis and treatment. *Semin Reprod Med*. 2012;30(6):496-506. doi:10.1055/s-0032-1328878

Legro RS, Arslanian SA, Ehrmann DA, et al. Diagnosis and treatment of polycystic ovary syndrome: an Endocrine Society clinical practice guideline [published correction appears in *J Clin Endocrinol Metab*. 2021 May 13;106(6):e2462]. *J Clin Endocrinol Metab*. 2013;98(12):4565-4592. doi:10.1210/jc.2013-2350

Luque-Ramírez M, Alpañés M, Sanchón R, Fernández-Durán E, Ortiz-Flores AE, Escobar-Morreale HF. Referral bias in female functional hyperandrogenism and polycystic ovary syndrome. *Eur J Endocrinol*. 2015;173(5):603-610. doi:10.1530/EJE-15-0646

References

Mann, T. (2015). *Secrets from the eating lab*. New York: HarperCollins.

Morosi, A. and Jeanes, Y. (2017). Food cravings, binge eating and emotional eating behaviours in overweight and obese women with polycystic ovary syndrome. *Proceedings of the Nutrition Society*, 76.(OCE1), E15.

Nehir Aytan, A, Bastu, E., Bemiral, I., Bulut, H., Dogan, M., and Buyru, F. (2016). Relationship between hyperandrogenism, obesity, inflammation, and polycystic ovarian syndrome. *Gynecol Endocrinol*.

Olson MB, Kelsey SF, Bittner V, Reis SE, Reichek N, Handberg EM, Merz CN. (2000). Weight cycling and high-density lipoprotein cholesterol in women: evidence of an adverse effect. *J Am Coll Cardiol*. 36: 1565-1571.

Pirotta S, Barillaro M, Brennan L, et al. Disordered Eating Behaviours and Eating Disorders in Women in Australia with and without Polycystic Ovary Syndrome: A Cross-Sectional Study. *J Clin Med*. 2019;8(10):1682. Published 2019 Oct 14. doi:10.3390/jcm8101682

References

Rathnayake D, Sinclair R. Innovative use of spironolactone as an antiandrogen in the treatment of female pattern hair loss. *Dermatol Clin*. 2010;28(3):611-618. doi:10.1016/j.det.2010.03.011

Rondanelli M, Infantino V, Riva A, et al. Polycystic ovary syndrome management: a review of the possible amazing role of berberine. *Arch Gynecol Obstet*. 2020;301(1):53-60. doi:10.1007/s00404-020-05450-4

Roseff S, Montenegro M. Inositol Treatment for PCOS Should Be Science-Based and Not Arbitrary. *Int J Endocrinol*. 2020;2020:6461254. Published 2020 Mar 27. doi:10.1155/2020/6461254

Saadia Z. Follicle Stimulating Hormone (LH: FSH) Ratio in Polycystic Ovary Syndrome (PCOS) - Obese vs. Non-Obese Women. *Med Arch*. 2020;74(4):289-293. doi:10.5455/medarh.2020.74.289-293

Shah P. Polycystic Ovarian Syndrome and Its Association with Vitamin D. *Ann Med Medical Res*. 2018; 1: 1008.

References

Strohacker K, McFarlin B. (2010). Influence of obesity, physical inactivity, and weight cycling on chronic inflammation. *Front Biosci.* E2: 98-104. 10.2741/e70.

Zulian E, Sartorato P, Benedini S, et al. Spironolactone in the treatment of polycystic ovary syndrome: effects on clinical features, insulin sensitivity and lipid profile. *J Endocrinol Invest.* 2005;28(1):49-53.
doi:10.1007/BF03345529