

PCOS

Updates

Presented by Dr. K. Jones MD

Objectives

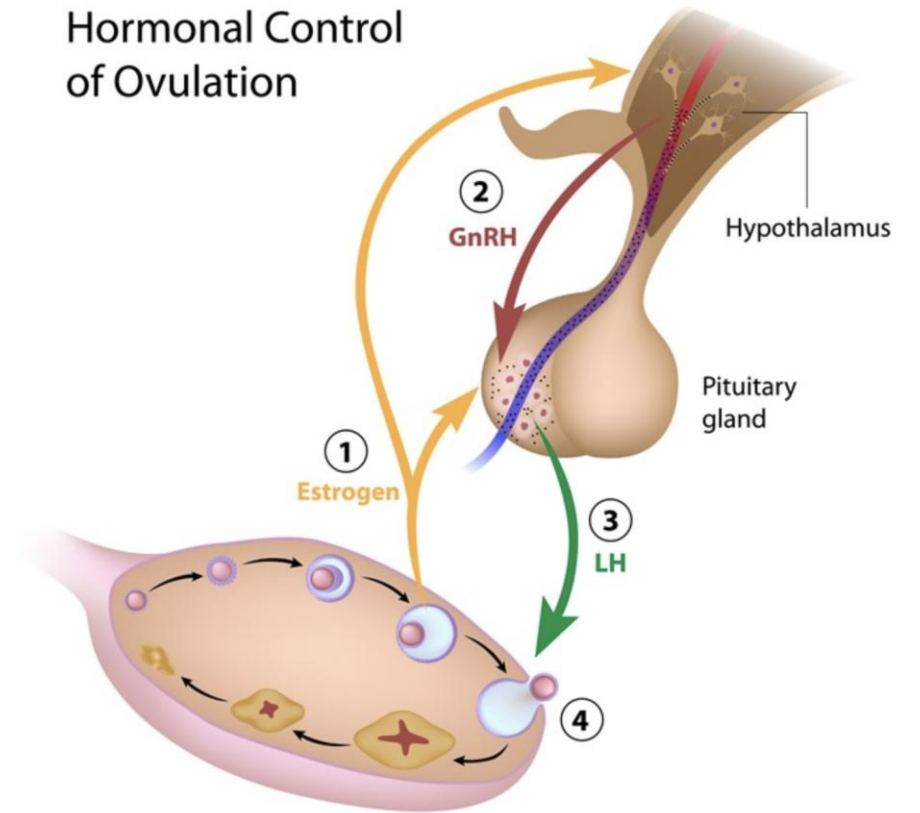
- 1. Integrate novel biomarkers in the diagnosis of PCOS
- 2. Recognize PCOS as a significant risk factor for CVD, sleep apnea and other illnesses and describe new screening requirements.
- 3. Describe novel treatment goals and upcoming therapies.

Background & Epidemiology

- **Definition:** A complex multisystem endocrinopathy characterized by androgen excess and ovulatory dysfunction.
- **Prevalence:** Affects **10–13%** of reproductive-aged women globally.
- **Pathophysiology:** Rooted in **insulin resistance** (present in up to 75% of lean and 95% of overweight patients) and neuroendocrine dysfunction (elevated LH pulse frequency).

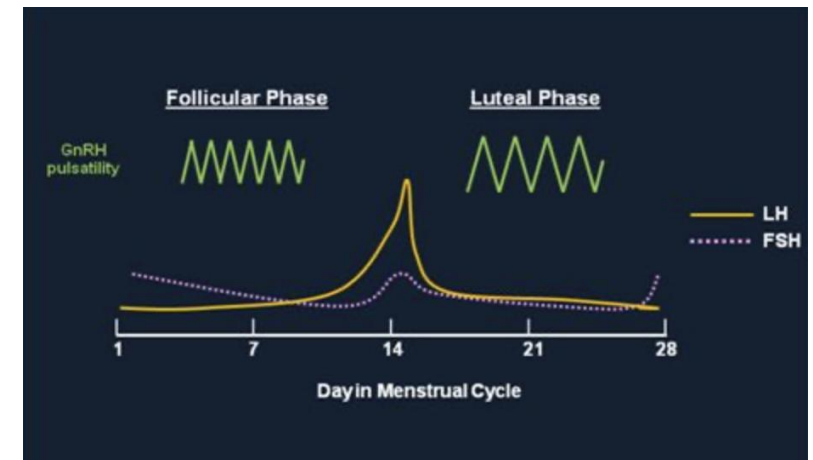
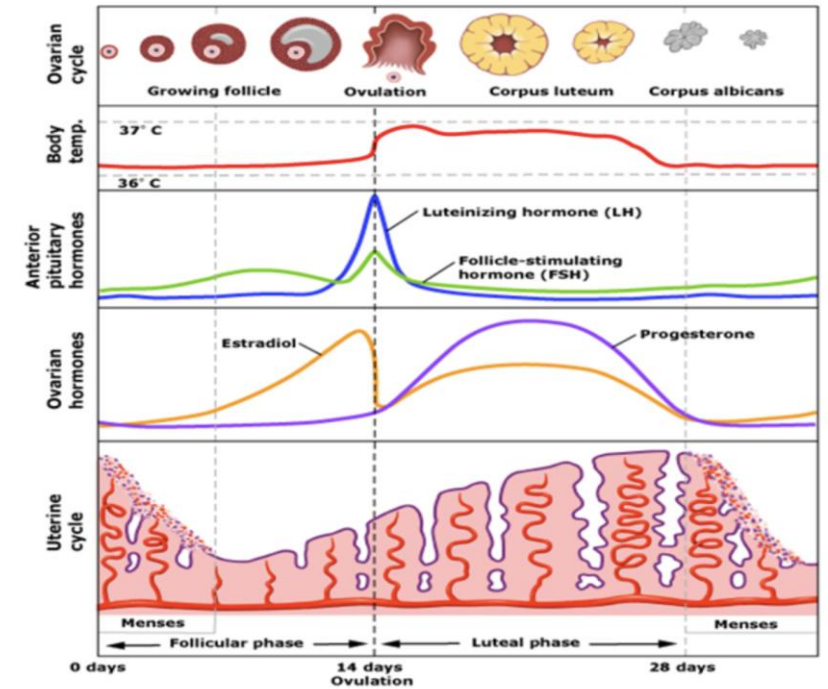
Normal ovarian cycle

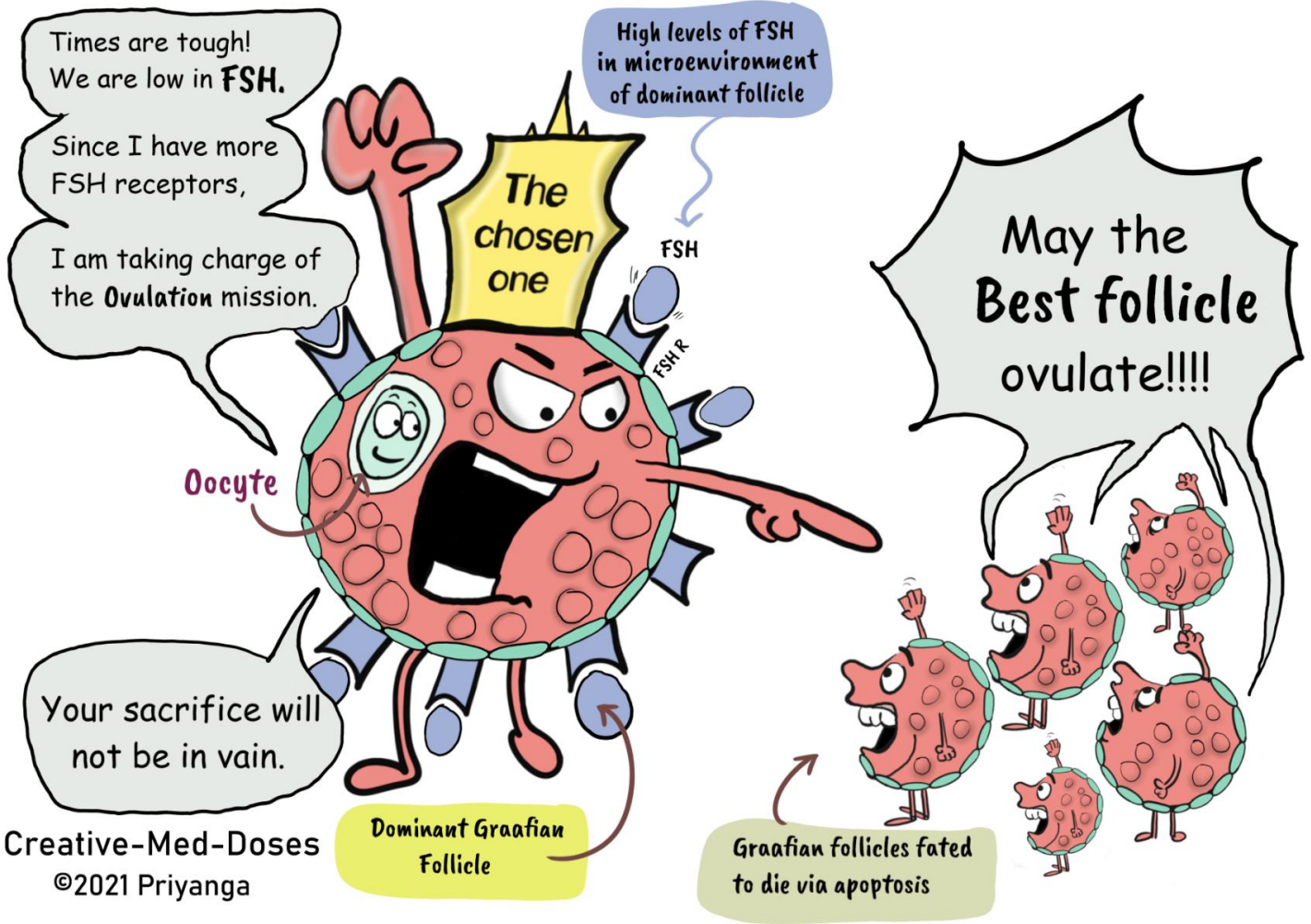
- In ovulatory women, under normal HPA axis
- A single follicle (usually) which is extracted from that month's cohort of follicles in response of GnRH stimulation
- Anterior Pituitary releases FSH and LH



Normal ovarian cycle

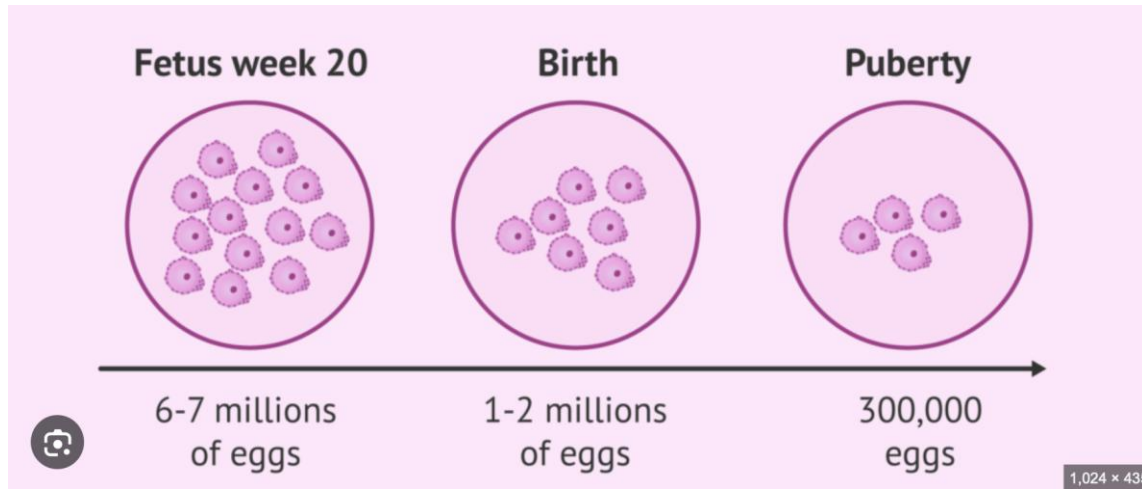
- Anterior Pituitary releases FSH and LH
- Dominant follicle has the most FSH receptors, it continues to grow at the expense of the other follicles
- Remaining follicles are reabsorbed, but removed from the pool of total egg supply
- Dominant follicle produces estrogen, which signals FSH release to cease
- Estrogen causes a one time surge of LH which triggers ovulation





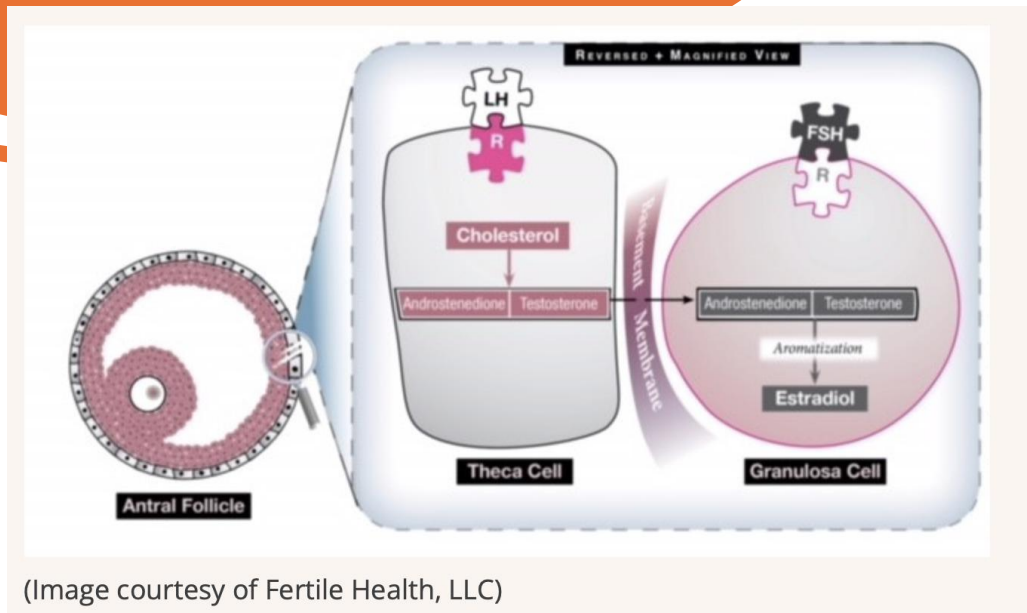
<https://creativemeddoses.com/topics-list/selection-of-the-dominant-follicle-and-microenvironment/>

dominant graafian Follicle



PCOS ovulatory cycle

- Pulsatile GnRH is altered resulting in increased LH activity by pituitary
- LH increases theca cell production of androstenedione and testosterone
- Increased androgenic state impairs normal follicular growth, maturation
- Ovary becomes filled with many small follicles that will never become dominant
- **In PCOS- affected women, an elevated AMH level is reflective of a higher number of follicles arrested in the pre-antral, antral stages that fail to ovulate**



<https://www.obgproject.com/2019/06/12/pcos-part-1-sensitive-care-of-the-pcos-patient/>

Pathophysiology

- 1. Brain-Ovary Miscommunication (High LH/Low FSH):** The pituitary gland produces excess Luteinizing Hormone (LH) and insufficient Follicle-Stimulating Hormone (FSH). This reverses the normal LH/FSH ratio.
- 2. Ovarian Theca Cell Overstimulation (Hyperandrogenism):** Elevated LH stimulates the **theca cells** (outer layer of the follicle) to produce excessive androgens (testosterone, androstenedione).
- 3. Granulosa Cell Dysfunction (Follicle Arrest):** Due to low FSH, the **granulosa cells** (inner layer) cannot convert the excess androgens into estrogen (aromatization failure). The immature eggs (follicles) cannot mature, leading to multiple "cysts" (arrested follicles) and failed ovulation (anovulation).
- 4. Insulin Resistance (Metabolic Amplifier):** Insulin resistance causes high levels of insulin in the blood (hyperinsulinemia). This insulin binds to receptors on the ovarian theca cells, acting as a "co-gonadotropin" to directly increase androgen production further.
- 5. Vicious Cycle:** The excess androgens and insulin stimulate further LH release, continuing the cycle.

Clinical Presentation

- **Reproductive:** Irregular menses (amenorrhea or oligomenorrhea) and infertility.
- **Dermatologic:** Hirsutism (terminal hair on face/body), treatment-resistant acne, and female-pattern hair loss.
- **Metabolic:** Weight gain, difficult-to-lose weight, and **acanthosis nigricans** (indicator of insulin resistance).
- **Psychological:** Significantly higher rates of anxiety, depression, and eating disorders compared to the general population.

PCOS SYMPTOMS



HAIR LOSS



HIRSUTISM



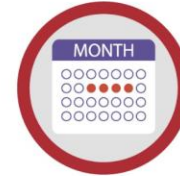
PELVIC PAIN



INFERTILITY



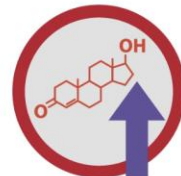
OVERWEIGHT



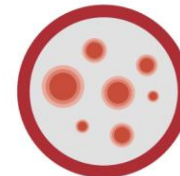
IRREGULAR PERIODS



FATIGUE



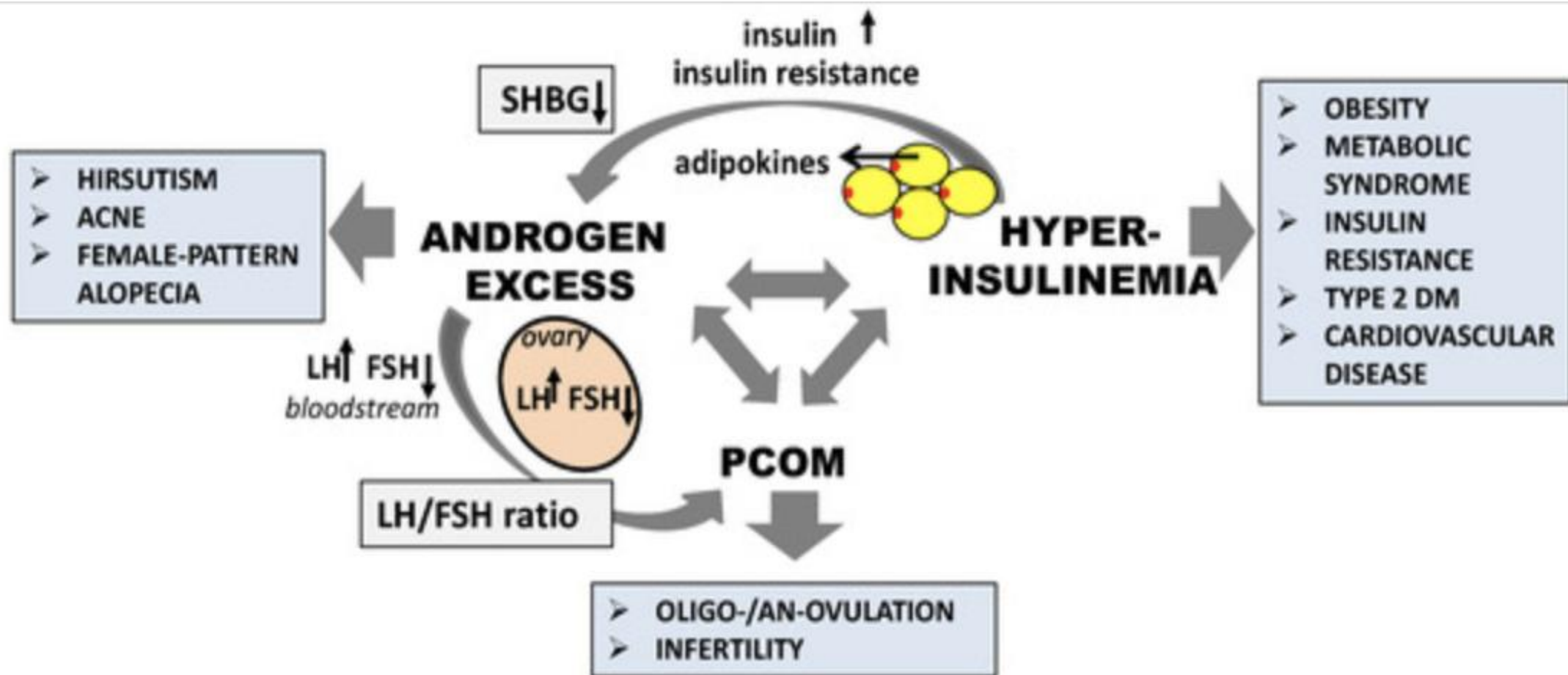
HIGH TESTOSTERONE LEVELS



ACNE



POLYCYSTIC OVARY SYNDROMS (PCOS)



Case 1

- Ms. Pac Man is 29 y o F who is having trouble conceiving.
- She had menarche at age 13, has had oligomenorrhea for years (3-4 periods per year), but was on OCP from age 19-27.
- Menses have returned to being irregular after discontinuation of OCP



- Ht: 5'4"
- Wt: 145
- BMI: 25
- She notices some extra hair between umb and pubis
- Normal amount of acne
- Most of the extra weight in abdomen area

Referred to fertility clinic, but while awaiting appointment, decides to try the new ketogenic fad diet and loses 15 lbs.

2 months later, feeling nauseated and realizes she is pregnant.

There was no menses for 3 months which is usual for her.

- While pregnant, she is found to IGT and is on a controlled carb diet
- No medications needed.
- She develops PIH in pregnancy and is induced at 38 weeks



- 3 years later, is still trying to conceive second child.
- Sees fertility clinic and is put on clomid (clomiphene citrate) for 5 cycles, finally becoming pregnant.
- Develops PIH, and also pre-eclampsia with second pregnancy, taking labetalol and induced at 38 .5 weeks.



- 10 years later- age 43, Ms Pac Man becomes pre-diabetic and hypertensive.
- Ms Pacman also has menorrhagia with thickened endometrial lining, bx hyperplasia, no malignancy
- Ms Pacman gets Mirena IUS.
- Did Ms.Pac Man have PCOS?

Risk Factors & Comorbidities

- **Genetics:** Strong heritable component; first-degree relatives have a 30–50% increased risk
 - Thus far, there are 30+ known genes involved in heritability of PCOS
- **Diabetes:** Independent risk factor for **Type 2 Diabetes** (T2D) regardless of BMI. All patients should be screened for DM.
- **Cardiovascular:** Increased risk of hypertension, dyslipidemia, and myocardial infarction.
- **Pregnancy:** High risk for gestational diabetes and pregnancy-induced hypertension.
- **Endometrial Cancer:** 2–6x higher risk due to chronic unopposed estrogen from anovulation.

Diagnostic Criteria

- **1935 (Stein-Leventhal):** Defined by hirsutism, obesity, amenorrhea, and enlarged ovaries.
- **1990 (NIH Criteria):** Required Hyperandrogenism + Chronic Anovulation; ultrasound was considered optional.
- **2003 (Rotterdam Criteria):** Expanded to include 2-of-3 criteria, officially including ultrasound (PCOM) as a key pillar.

Diagnostic Criteria: The "2023 Rotterdam Update"

Diagnosis requires the **exclusion of other disorders** (thyroid, prolactin, CAH) and meeting **2 of 3** criteria:

1. Ovulatory Dysfunction: Irregular cycles (adults: <21 or >35 days; adolescents: >45 days or <9 periods/year).

2. Hyperandrogenism:

- **Clinical:** Hirsutism (Ferriman-Gallwey score ≥ 4 –6 depending on ethnicity) or adult-onset acne.
- **Biochemical:** Elevated Total/Free Testosterone or FAI.

3. Polycystic Ovaries (PCOM) or Elevated AMH:

- **Innovation: Serum AMH** can now be used as an alternative to ultrasound in adults to define PCOM.
- **Note:** If criteria 1 and 2 are met, **no imaging or AMH is required** for diagnosis.

• **Adolescent Special Case:** Diagnosis requires **both** irregular menses AND hyperandrogenism. Ultrasound and AMH are **not recommended** for adolescents under 8 years post-menarche due to lack of specificity.

Revised Rotterdam 2023

Rotterdam Criteria for Diagnosis of PCOS

Diagnosis confirmed by 2 of 3 criteria after exclusion of other etiologies:

1. Oligo and/or anovulation
2. Biochemical and/or clinical signs of hyperandrogenism
 - Biochemical: Total T > 70 ng/dL, Androstenedione > 245ng/dL, DHEA-S >248 ug/dL)
 - Clinical: Acne, Hirsutism, acanthosis nigrans
3. Polycystic Ovaries:
 - ≥ 12 follicles (2-9mm diameter) in each ovary or ovarian volume > 10cc

Rotterdam Criteria for Diagnosis of PCOS (2).

Table 1.

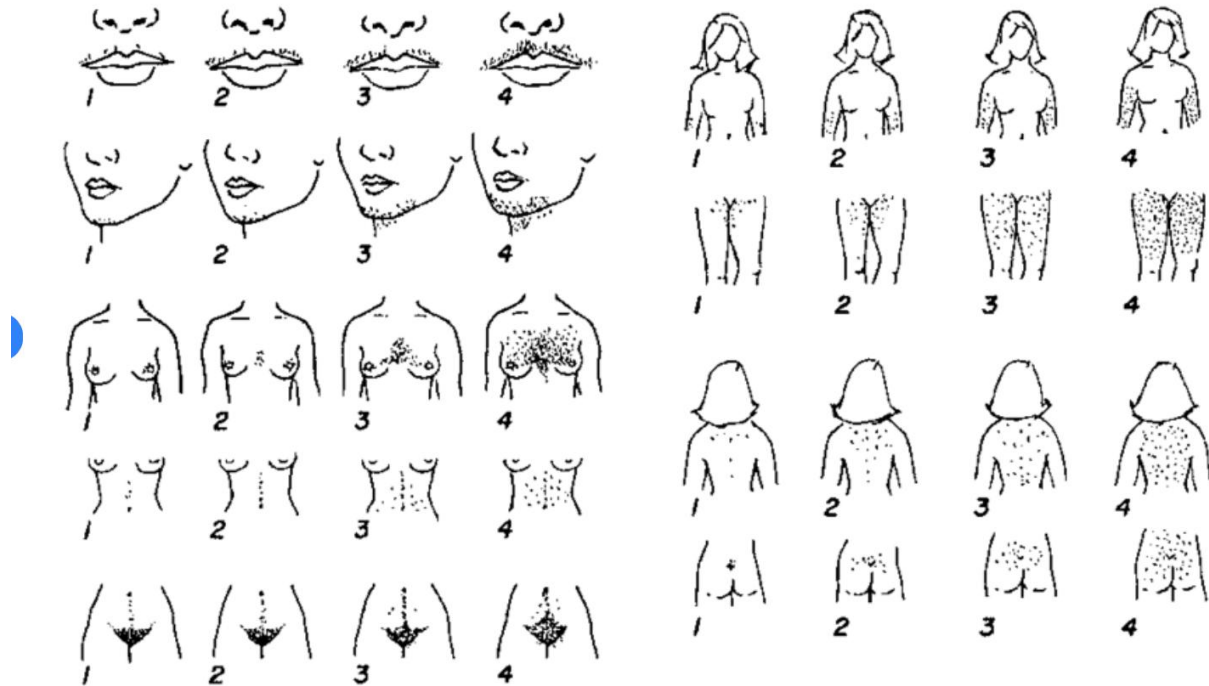
Features of the diagnosis of PCOS.

Feature	Recommended Diagnosis	Considerations
Biochemical Hyperandrogenism	<ul style="list-style-type: none">• Elevated total or free testosterone, or calculated indices of free testosterone (FAI, BioT).• DHEAS and ANSD can be considered	<ul style="list-style-type: none">• High-quality assays should be used for the evaluation of analytes
Clinical Hyperandrogenism	<ul style="list-style-type: none">• A modified Ferriman–Gallwey score of ≥ 4 to ≥ 8	<ul style="list-style-type: none">• Threshold level should be considered in the context of patient ethnicity
Oligo-anovulation	<ul style="list-style-type: none">• Oligo-amenorrhea (cycles >35 days apart or <8 menses a year)	<ul style="list-style-type: none">• If highly suspicious for PCOS, but does not have oligo-amenorrhea, consider serum progesterone or luteinizing hormone assessment
Polycystic ovarian morphology	<ul style="list-style-type: none">• ≥ 20 follicles per ovary in either ovary• ≥ 10 cm³ ovarian volume	<ul style="list-style-type: none">• Based on transvaginal ultrasonography with a transducer frequency ≥ 8 MHz

Criteria based on the modified 2003 Rotterdam criteria. FAI—free androgen index, BioT—bioavailable testosterone, DHEAS—dehydroepiandrosterone sulfate, ANSD—androstenedione.

Christ JP, Cedars MI. Current Guidelines for Diagnosing PCOS. *Diagnostics* (Basel). 2023 Mar 15;13(6):1113. doi: 10.3390/diagnostics13061113. PMID: 36980421; PMCID: PMC10047373.

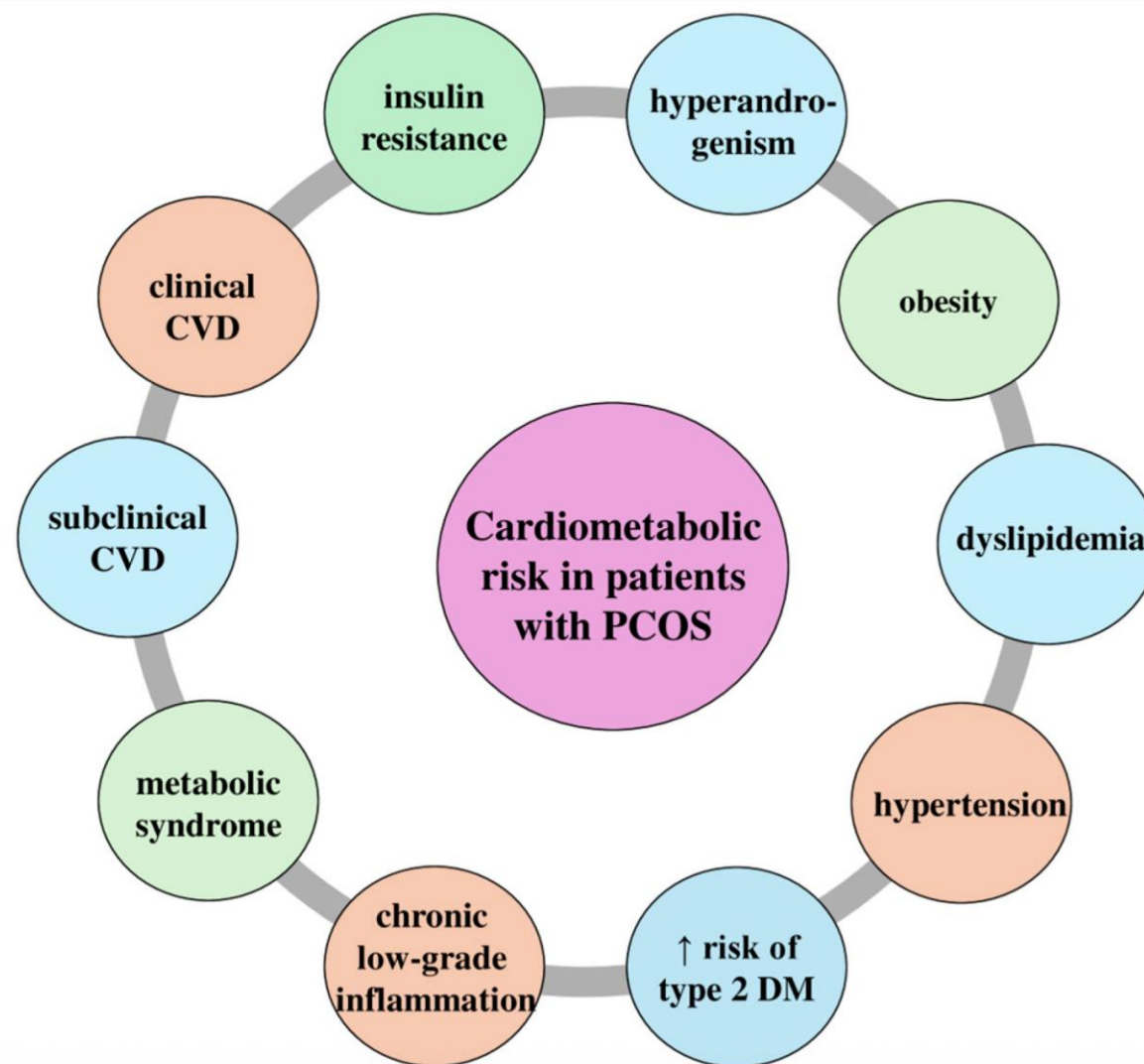
Hirsutism: Ferriman-Gallwey Scale



Hirsutism scoring system of Ferriman and Gallwey. The nine body areas possessing androgen-sensitive pilosebaceous units are graded from 0 (no terminal hair) to 4 (frankly virile). [Reprinted with permission from R. L. Rosenfield: Clin Endocrinol Metab 15: 341-362, 1986 (1) © W. B. Saunders Co.]

Key Diagnostic Updates 2023-2025

- **Anti-Müllerian Hormone (AMH) Inclusion:** Serum AMH is now accepted as an alternative marker to transvaginal ultrasound for identifying polycystic ovary morphology (PCOM) in adults. However, AMH should *not* be used for diagnosis in adolescents.
- **Streamlined Diagnosis:** If both irregular menstrual cycles and hyperandrogenism (clinical or biochemical) are present, ultrasound and AMH tests are not required for diagnosis.
- **Adolescent Criteria:** Diagnosis in adolescents is still recommended only 3+ years after menarche and relies on the presence of *both* hyperandrogenism and ovulatory dysfunction.
- **Focus on Comorbidities:** Stronger recognition of broader health risks, including **sleep apnea**, **mental health disorders** (anxiety, depression), and **fatty liver disease**.
- **Cardiovascular Risk:** PCOS is now officially recognized as a **cardiovascular disease (CVD) risk-enhancing condition**, necessitating earlier screening for metabolic dysfunction (blood pressure, lipid profiles, diabetes).



- Pililis, S.; Lampsas, S.; Kountouri, A.; Pliouta, L.; Korakas, E.; Livadas, S.; Thymis, J.; Peppas, M.; Kalantaridou, S.; Oikonomou, E.; et al. The Cardiometabolic Risk in Women with Polycystic Ovarian Syndrome (PCOS): From Pathophysiology to Diagnosis and Treatment. *Medicina* **2024**, *60*, 1656. <https://doi.org/10.3390/medicina60101656>

Phenotypes

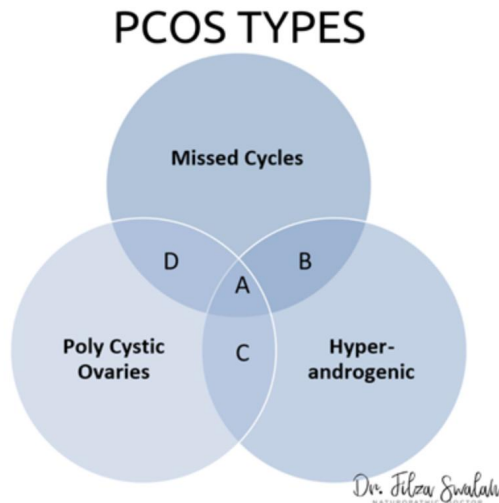
prevalence of phenotypes

A- 67.7%

B- 11%

C-17.7%

D-3.6%



Type A

- High androgens / symptoms
- Irregular periods / ovulation
- Polycystic ovaries

Type B

- High androgens / symptoms
- Irregular periods / ovulation
- Normal ovaries

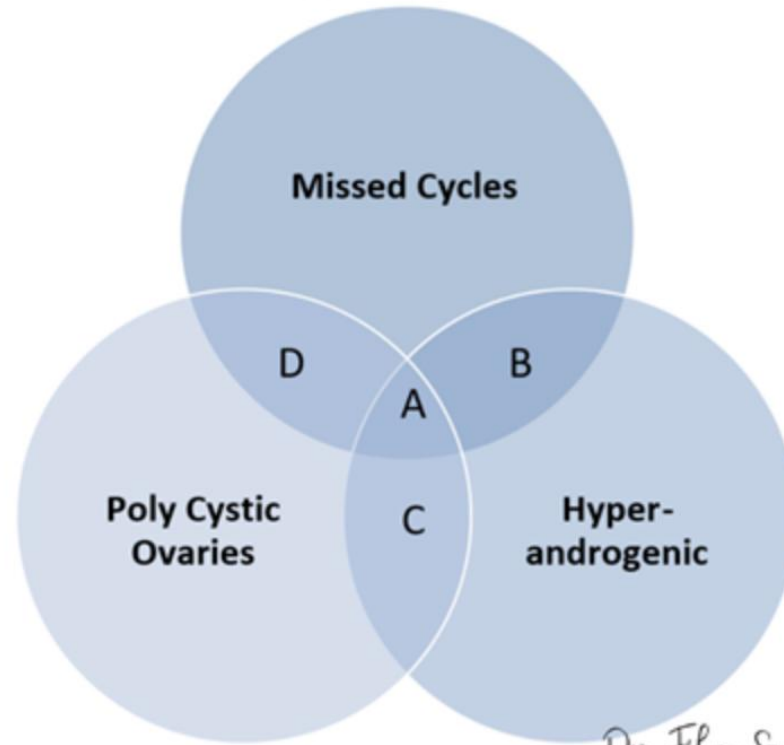
Type C

- High androgens / symptoms
- Regular periods (<35 days)
- Polycystic ovaries

Type D

- Normal androgens
- Irregular periods / ovulation
- Polycystic ovaries

PCOS TYPES



Dr. Filza Swalah
NATUROPATHIC DOCTOR

What tests to do I order?

Key Blood Tests for PCOS

Blood tests aim to measure hormone levels associated with androgen excess (hyperandrogenism) and ovulatory dysfunction. These are often best taken in the morning during the follicular phase (days 2–4 of the menstrual cycle). [+ Alberta Health Services +2](#)

- **Total and Free Testosterone:** Measures for elevated androgen levels, the hallmark of PCOS.
- **Sex Hormone-Binding Globulin (SHBG):** Often low in PCOS, which increases free testosterone.
- **Dehydroepiandrosterone Sulfate (DHEA-S):** A marker of adrenal androgen production.
- **Androstenedione:** A further androgen marker.
- **Follicle-Stimulating Hormone (FSH) and Luteinizing Hormone (LH):** Assesses ovulatory function (often checking the ratio, though the LH/FSH ratio is not a standalone diagnostic tool).
- **Estradiol (E2):** To assess estrogen levels.
- **Progesterone:** Taken around day 21 to confirm if ovulation has occurred. [+ Alberta Health Services +5](#)

What tests to do I order?

Essential Rule-Out Tests (Differential Diagnosis)


PCOS is a diagnosis of exclusion, meaning other disorders with similar symptoms must be ruled out. [National Institutes of Health \(NIH\) | \(.gov\)](#)


- **Thyroid-Stimulating Hormone (TSH):** Rules out thyroid dysfunction.
- **Prolactin:** Rules out hyperprolactinemia.
- ✘ **17-Hydroxyprogesterone (17-OHP):** Rules out late-onset congenital adrenal hyperplasia (CAH).
- **β -hCG (Pregnancy Test):** Ensures symptoms are not due to pregnancy. [National Institutes of Health \(NIH\) | \(.g... +3\)](#)

Note: CAH is routinely checked in infants in Ontario

What tests to do I order?

Metabolic and General Health Tests

Because PCOS is closely linked to metabolic issues, doctors usually order tests to assess insulin resistance and cardiovascular risk. 

- **Oral Glucose Tolerance Test (OGTT):** The preferred, most accurate test to assess insulin resistance/glycemic status (75g sugar drink).
- **Fasting Insulin and Fasting Glucose:** Evaluates blood sugar metabolism.
- **Lipid Profile/Panel:** Measures cholesterol, HDL, LDL, and triglycerides, as PCOS can increase cardiovascular risk.
- **HbA1c:** Used to check average blood sugar levels over 2–3 months. 

LH:FSH ratio normal 1:1
PCOS 2:1 to 3:1

What tests to do I order?

Other Potential Investigations

- **Anti-Müllerian Hormone (AMH):** Often high in PCOS (reflecting higher follicle numbers). While not part of the standard Rotterdam criteria, it is increasingly used in Canada, though it may not be covered by all provincial plans.
- **Pelvic Ultrasound:** A transvaginal ultrasound is the standard imaging test to detect polycystic ovarian morphology (volume ≥ 10 ml or ≥ 20 follicles in at least one ovary). [+ Alberta Health Services +4](#)

Note: If you are taking combined hormonal contraceptives (birth control pills), these can alter results, and you may be advised to stop them for 3 months prior to testing. [National Institutes of Health \(NIH\) | \(.gov\)](#)

Management & Treatment

- Treatment must be tailored to the patient's current priorities (fertility vs. symptoms).

Management & Treatment

- **First-Line: Lifestyle (Crucial)**

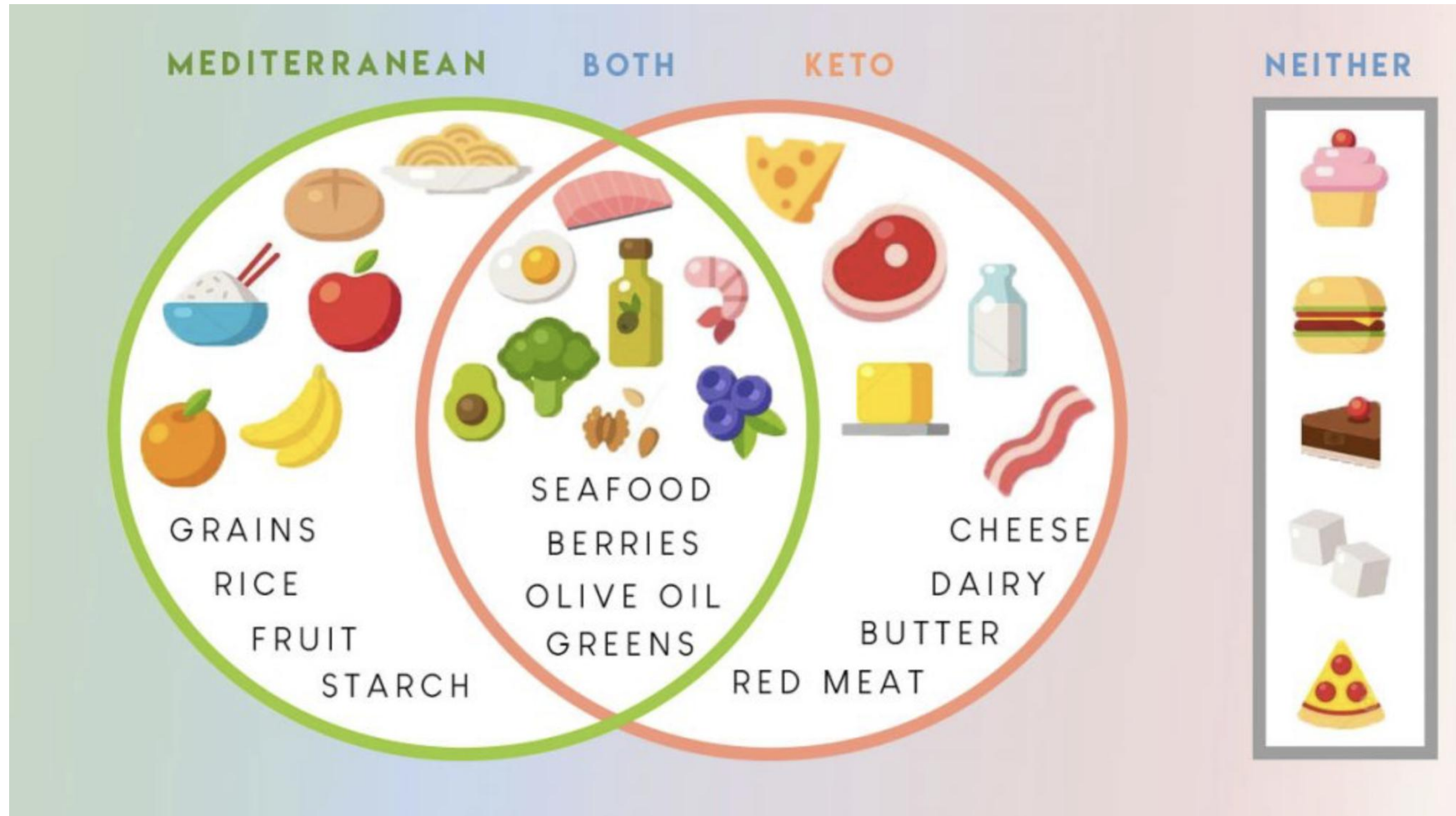
- Aim for 5–10% weight loss if BMI is elevated; however, healthy lifestyle should be encouraged for all, regardless of weight, to prevent future gain.

- No "best" diet—sustainability and insulin control are key.

- No single "PCOS diet" is mandated, but the [Mediterranean Diet](#) and **Ketogenic Diet** have shown significant promise in reducing inflammation and improving insulin sensitivity.

- New focus on **weight stigma** encourages providers to prioritize healthy behaviors over just the number on the scale.

Comparison of Mediterranean vs Ketogenic Diets



Management & Treatment

- **First-Line: Lifestyle (Crucial)**

- Aim for 5–10% weight loss if BMI is elevated; however, healthy lifestyle should be encouraged for all, regardless of weight, to prevent future gain.
- No "best" diet—sustainability and insulin control are key.

- **Hormonal Management (Cycle & Acne)**

- **Combined Oral Contraceptives (COCP):** First-line for menstrual regulation and hirsutism. Prefer low-dose ethinyl estradiol ($\leq 30\text{mcg}$).
- **Anti-androgens (e.g., Spironolactone):** Second-line for hirsutism/acne if COCP is insufficient after 6 months.

Management & Treatment

Metabolic Management

- **Metformin:** Recommended for metabolic features (T2D, pre-diabetes) or as second-line for cycle regulation.
- **GLP-1 RAs:** Now widely used off-label for PCOS with obesity, showing superior results in weight and insulin sensitivity.

Management & Treatment

- **Fertility**

- **Letrozole** (aromatase inhibitor) is now the first-line pharmacotherapy for ovulation induction (superior to Clomiphene).

- **Mental Health**

- Screening for depression and anxiety is now a **mandated part of every PCOS consult.**

About Letrozole (Femara)

- Aromatase inhibitor
 - Primarily used to inhibit production of estrogen in ER+ breast cancer
 - blocks the conversion of androgens to estrogen, preventing negative feedback on the brain and boosting FSH levels to stimulate the ovaries
 - Can be used with IUI and IVF

Key Treatment Updates 2024-2025

- **Stem Cell Therapy:** Preclinical studies (2023-2024) are exploring MSC-based therapies to restore ovarian function, with some case reports showing significant reversal of symptoms in mice and early studies in humans.
- **Lifestyle & Psychological Support:** Strong emphasis on personalized, sustainable lifestyle modifications rather than generic, restrictive dieting to avoid reinforcing weight stigma.
- **Cosmetic Treatments:** Increased use of, and research into, laser photoepilation and topical eflornithine for treating hirsutism and improving quality of life.

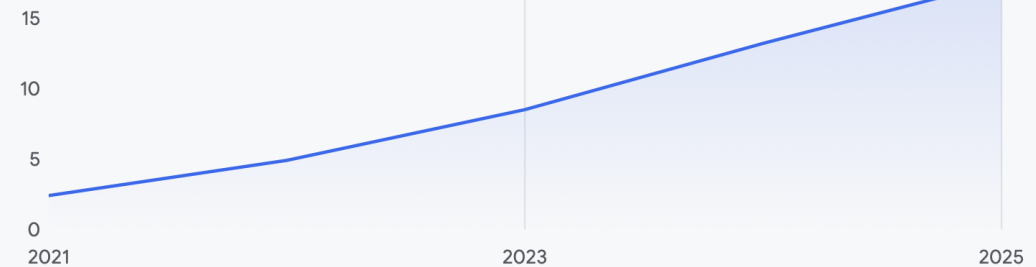
Key Treatment Updates 2024-2025

- **Letrozole as First-Line Fertility Agent:** Letrozole is now recognized as superior to clomiphene citrate for inducing ovulation in women with PCOS, offering higher live birth and pregnancy rates.
- **Emerging Metabolic Therapies:**
 - **GLP-1 Receptor Agonists (e.g., Liraglutide):** Showing promise for substantial weight loss, reducing androgen levels, and improving insulin sensitivity in obese PCOS patients.
 - **SGLT-2 Inhibitors:** Emerging as a therapeutic option for reducing visceral fat, BMI, and improving cardiometabolic markers.
 - **Inositols:** Used as insulin sensitizers (Myo-inositol/D-chiro-inositol in a 40:1 ratio), though some 2024 studies suggest lower evidence of benefit compared to Metformin for hirsutism and central obesity.

Management & Treatment

- **GLP-1 Receptor Agonists:** Prescriptions for drugs like **Semaglutide** (Wegovy, Ozempic) and **Tirzepatide** (Mounjaro) among PCOS patients have increased from 2.4% in 2021 to 17.6% in 2025. They are noted for significantly reducing BMI and improving insulin sensitivity more effectively than metformin alone.

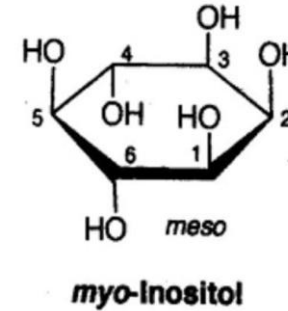
Rise in GLP-1 Prescribing Rates Among Patients with PCOS (2021-2025) [🔗](#)



Current PCOS treatment as of February 2026 has shifted from purely managing reproductive symptoms to a **multisystem, life-course approach** that prioritizes metabolic health, mental well-being, and precision diagnostics. While lifestyle modification remains the first-line "cure", medical therapy has evolved with the rapid rise of metabolic drugs like GLP-1 receptor agonists and new diagnostic alternatives for adults. [🔗](#)

Inositol

- What is it?
- Inositol is a sugar naturally produced by the body and found in food, often referred to as vitamin B8, which plays a crucial role in cell membrane formation, nerve signaling, and insulin regulation
- There are nine forms, but Myo-inositol (most common) and D-chiro-inositol are the two primary types used in supplements.
- It is found in fruits (especially citrus), beans, grains, nuts, and meat.



[Click to see full view](#)



Inositol Supplement for Women | Myo & D-Chiro Inositol 2000 mg + 50 mg, Ideal 40:1 Ratio | Hormone Balance Support | PCOS Supplement for Women | Menstrual Cycle & Ovarian Health Support

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4.6 ★★★★★ (68)

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\$26⁹⁵ (\$0.22 / count)

Brand	NutraChamps
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Item form	Capsule
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About this item

Inositol

Key Functions and Benefits of Inositol

- **Insulin Regulation:** Inositol helps the body use insulin efficiently, making it highly effective for managing insulin resistance, metabolic syndrome, and blood sugar levels.
- **PCOS Management:** It is widely used to improve symptoms of PCOS, including promoting regular menstrual cycles, reducing androgen levels (which causes acne and hirsutism), and improving egg quality and fertility.
- **Mental Health:** Inositol influences neurotransmitters like serotonin and dopamine, with potential benefits for anxiety, panic disorders, and depression.
- **Weight Management:** By improving insulin sensitivity, it may help with weight loss, reducing cravings and fat accumulation in the liver.
- **Metabolic Health:** It can help lower high triglycerides and blood pressure



SOGC Position Statement: Inositol for the Management of Polycystic Ovary Syndrome

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Scope and Purpose

This position statement aims to summarize the latest evidence addressing the role of inositol in the management of the reproductive, hormonal, and clinical features of polycystic ovary syndrome (PCOS) in adolescents and adults and to provide clinical recommendations for use.

Target Audience

Obstetrician gynaecologists are the target audience of this position statement, though health care providers from other areas of expertise may find this information helpful in their own practice.

Methods

This position statement was developed by volunteer experts who are members of The Society of Obstetricians and Gynaecologists of Canada's (SOGC) Clinical Gynaecology Committee.

The recommendations were based on a literature review of the evidence from August 5, 2022 to October 22, 2024 to include new literature since publication of an International Guideline that included a comprehensive evidence review[1] (See Appendix A and Table 1). Where appropriate, recommendations were adapted to the Canadian-context from the International Evidence-Based Guideline on the Diagnosis and Management of Polycystic Ovary Syndrome 2023[2] and from the consensus statement from the working group of the Club of the Italian Society of Endocrinology[3] focusing on the recommendations that pertained to inositol for the management of PCOS.



Key Messages:

1. A high proportion of patients seek alternative therapies, including inositol, to manage symptoms of PCOS.
2. Inositol is well-tolerated in the short term with few adverse effects reported, although further research is needed to confirm its long-term safety in clinical studies.
3. There is insufficient evidence to recommend specific dosing or preparations of inositol in the treatment of PCOS and additional well-controlled studies are warranted.
4. There is limited data on the effect of inositol on ovulation, clinical pregnancy and live birth rates. Whilst the evidence at this time on the benefit of inositol (in all forms) was inadequate to make an evidence-based recommendation on efficacy for clinical outcomes.

Recommendations

1. Health care providers should ask patients if they are taking supplements, including inositol, to manage their PCOS. (*strong, high*)
2. Health care providers should remind patients that inositol is a natural health product and thus regulated and evaluated differently than prescription drug products; clear evidence of clinical effects may not be achieved due to small sample size and different trial design and variable range of doses. (*strong, high*)
3. Inositol could be considered in those with PCOS; there is limited potential for harm and some demonstrated potential for metabolic and menstrual cycle improvement (*conditional, low*).
4. MI supplementation can be used to improve menstrual cycle and anovulation in women with PCOS as an alternative to metformin, based on individual preferences and side effects (*weak, moderate*).

Conclusion

- PCOS has a variable presentation among patients and over the duration of one woman's lifespan
- PCOS is a **lifelong condition**, not just a reproductive one.
- Always screen for CVD, DM2, sleep apnea (STOP BANG), mental health
- Use **AMH** to save patients an ultrasound if they only meet one other criterion.

References

- Arghavan Ghafari, Malihe Maftoohi, Mohammadamin Eslami Samarin, Sepideh Barani, Majid Banimohammad, Reza Samie,

The last update on polycystic ovary syndrome(PCOS), diagnosis criteria, and novel treatment, Endocrine and Metabolic Science, Volume 17, 2025, 100228, ISSN 2666-3961,

<https://doi.org/10.1016/j.endmts.2025.100228>

<https://www.obgproject.com/2019/06/12/pcos-part-1-sensitive-care-of-the-pcos-patient/>

Sachdeva, Garima; Gainer, Shalini; Suri, Vanita; Sachdeva, Naresh¹; Chopra, Seema. Comparison of the Different PCOS Phenotypes Based on Clinical Metabolic, and Hormonal Profile, and their Response to Clomiphene. Indian Journal of Endocrinology and Metabolism 23(3):p 326-331, May–Jun 2019. | DOI: 10.4103/ijem.IJEM_30_19

Christ JP, Cedars MI. Current Guidelines for Diagnosing PCOS. Diagnostics (Basel). 2023 Mar 15;13(6):1113. doi: 10.3390/diagnostics13061113. PMID: 36980421; PMCID: PMC10047373.

https://sogc.org/common/Uploaded%20files/Position%20Statements/PCOS%20Position%20Statement_FINAL_02142025.pdf

Pililis, S.; Lampsas, S.; Kountouri, A.; Pliouta, L.; Korakas, E.; Livadas, S.; Thymis, J.; Peppas, M.; Kalantaridou, S.; Oikonomou, E.; et al. The Cardiometabolic Risk in Women with Polycystic Ovarian Syndrome (PCOS): From Pathophysiology to Diagnosis and Treatment. *Medicina* **2024**, *60*, 1656. <https://doi.org/10.3390/medicina60101656>