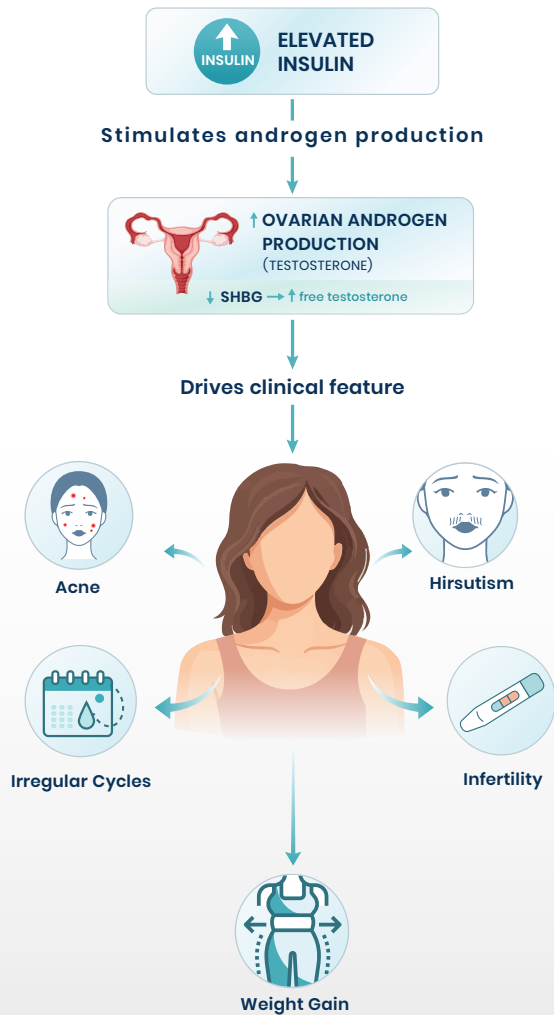


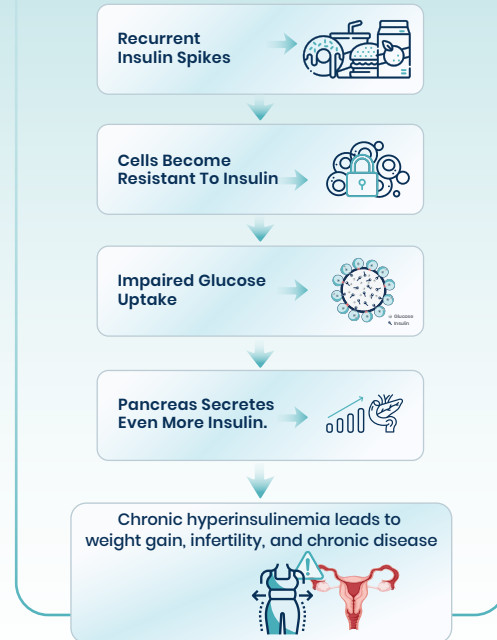
Background

- Hyperinsulinemia is a central driver of PCOS.
- Early detection and treatment of hyperinsulinemia can prevent the worsening of PCOS, infertility, and chronic disease.

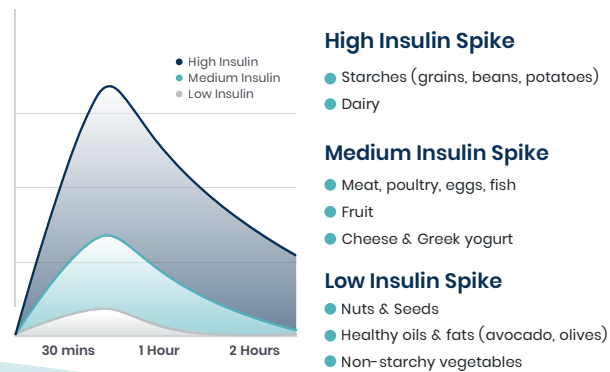


Recurrent Insulin Spikes Drive Insulin Resistance

Recurrent Insulin Spikes Drive Metabolic Dysfunction



Studies show that some foods elicit a greater insulin spike than expected based on total carbohydrate content.



A Low Insulin Lifestyle requires:

- No counting of calories, carbohydrates or fat
- No points
- No supplements or medications
- No special meals
- No special foods
- Patients can eat freely from foods that minimize insulin response



Clinical Research Overview

References:

1. Ludwig DS, Ebbeling CB. The carbohydrate-insulin model of obesity: Beyond "calories in, calories out." JAMA Intern Med. 2018;178(8):1098-1103
2. Shanik MH, Xu Y, Skrha J, Dankner R, Zick Y, Roth J. Insulin resistance and hyperinsulinemia: Is hyperinsulinemia the cart or the horse? Diabetes Care. 2008;31(suppl 2):S262-S268
3. Gannon MC, Nuttall FQ, Westphal SA, Fang S, Ercan-Fang N. Acute Metabolic Response to High-Carbohydrate, High-Starch Meals Compared With Moderate-Carbohydrate, Low-Starch Meals in Subjects With Type 2 Diabetes. Diabetes Care. 1998;21(10):1619-1626;
4. Salehi A, Gunnerud U, Muhammed SJ, et al. The Insulinogenic Effect of Whey Protein Is Partially Mediated by a Direct Effect of Amino Acids and GIP on β -Cells.; 2012

Studying a Low Insulin Lifestyle in Women with PCOS (PILOT)¹

Purpose:

To determine whether a low insulin lifestyle improves weight, insulin levels, and testosterone in women with PCOS.

Method:

24 women with PCOS followed a low insulin lifestyle for 8 weeks. Participants were not taking medications that affect hormones or insulin, including metformin, spironolactone, or hormonal contraception.

insara	Before	After	Change	P-value
Weight (lbs)	225	206	↓19	<0.0001
Waist Circumference (inches)	43.2	39.9	↓3.3	<0.0001
Fasting Glucose (mmol/L)*	95.0	86.0	↓8.9	0.01
2-Hour Glucose (mmol/L)	128.0	114.8	↓13.1	NS
Fasting Insulin (mIU/mL)	32.7	15.7	↓17	<0.0001
2-Hour Insulin (mIU/mL)	225.8	142.9	↓82.8	0.03
HOMA-IR**	3.9	1.9	↓1.9	<0.0001
HgbA1c (%)*	5.5	5.2	↓0.3	0.001
Total Testosterone (ng/dl)	53.3	43.3	↓10	0.008
Free Testosterone (pg/dl)	7.8	6	↓1.8	0.04
Triglycerides (mg/dl)	162.8	108.2	↓57	<0.0001

* Patients were not allowed to be in this study if they had confirmed diabetes, thus glucose levels were within the normal range both before and after this study.

** HOMA-IR: Homeostatic model assessment for insulin resistance is used to measure overall insulin resistance.

Conclusion:

After 8 weeks, patients had significant reductions in insulin levels, weight, and testosterone, indicating improved metabolic and hormonal health

References:

- Phy JL, Pohlmeier A, Cooper J, Harris K, Watkins P, Boylan M. Polycystic ovary syndrome patients achieve successful weight loss and decreased waist and hip circumference after 8-week low starch/low dairy diet. *Fertil Steril.* 2013;100(3);
- Pohlmeier AM, Phy JL, Watkins P, et al. Effect of a low-starch/low-dairy diet on fat oxidation in overweight and obese women with polycystic ovary syndrome. *Applied Physiology, Nutrition and Metabolism.* 2014;39(11):1237-1244;
- Jackson B, Kishan R, Mullins C, et al. NUTRITIONAL EDUCATION (FACE-TO-FACE AND VIDEO INSTRUCTION) FOR POLYCYSTIC OVARY SYNDROME RESULTS IN GREATER REDUCTION IN BMI AND HEMOGLOBIN A1C THAN CALORIC RESTRICTION, EXERCISE AND METFORMIN. *Fertil Steril.* 2022;118(4):e95
- Spontaneous Pregnancies in Polycystic Ovary Syndrome (PCOS) Patients with a Low Starch/Low Dairy Diet: A Retrospective Case Series. *J Community Med Public Health.* 2022;6(2);

A Low Insulin Lifestyle Shifts the Body Toward Burning Fat for Energy²

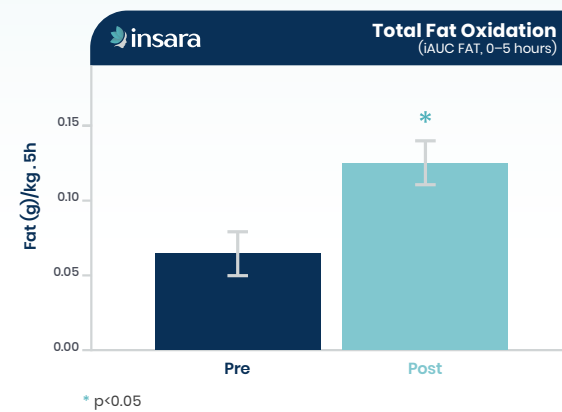
Purpose:

Elevated insulin is associated with a reduced ability to burn fat for energy. This study evaluated whether a low insulin lifestyle helps women with PCOS burn fat.

Method:

Fat burning was measured before and after 8 weeks, both at rest and after drinking a high-fat meal.

Fat oxidation was measured every 30 minutes over 5 hours following a high-fat liquid meal using indirect calorimetry, with each measurement taken during a 15-minute steady-state period



Conclusion:

After 8 weeks, patients burned significantly more fat, showing improved ability to use fat for energy.

Randomized Controlled Trial of a Low Insulin Lifestyle vs Standard Care in PCOS³

Purpose:

To compare a low insulin lifestyle to standard care, including calorie restriction, exercise, and metformin, in women with PCOS

Method:

56 women with PCOS were assigned to either standard care or a low insulin lifestyle for 8 weeks. The low insulin lifestyle was delivered digitally or face-to-face

Digital Group: Low insulin lifestyle
Face to Face Group: Low insulin lifestyle

insara	Weight Loss	BMI	Waist Circumference	Hip Circumference
Control	↑ 0.36 lbs	↑ 0.3	↓ 0.4 in	↓ 0.5 in
Digital	↓ 12.9 lbs	↓ 2.2	↓ 1.8 in	↓ 1.7 in
Face-to-Face	↓ 17.3 lbs	↓ 3.1	↓ 3.2 in	↓ 3.3 in

insara	Fasting Insulin (µIU/ml)		
	Pre-Diet	Post-Diet	Total Change
Control	21.9	23.2	↑1.3
Digital	20.2	17.6	↓2.6
Face-to-Face	32.2	20.6	↓11.6

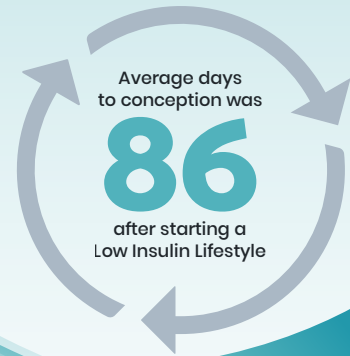
Conclusion:

The low insulin lifestyle resulted in greater improvements in weight and insulin levels than standard care

Spontaneous Pregnancies in Patients with PCOS after Following Low Insulin Lifestyle (Case Series)⁴

Conclusion:

A low insulin lifestyle resulted in spontaneous conceptions in ten obese infertile women with PCOS.

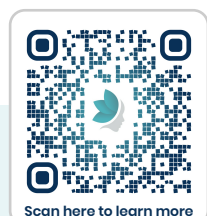


Conclusion:

A low insulin lifestyle significantly improves metabolic and hormonal markers in women with PCOS

Early intervention to lower insulin levels may help reduce the risk of worsening PCOS symptoms, infertility, and chronic disease

The Insara app helps patients apply a low insulin lifestyle to improve metabolic and reproductive health



Scan here to learn more