

DRFIONAAND.COM

LEAN PCOS

Beyond Weight loss

Fiona McCulloch BSc ND

LEAN PCOS : STATS



- 5% of all lean women have PCOS
- 20-30 % of women with PCOS are of average weight or lean.
- Women with lean PCOS often undiagnosed

WHAT IS THE DEFINITION OF “LEAN”?

- “Obese” is defined as a BMI of >30
- “Overweight” is defined as a BMI of >25

Problems with using BMI as criteria:

- No body composition info
- Many “lean” women with PCOS have measurable body composition differences
- Separates out “lean” women - less research on aspects involved in the continuum of PCOS since lean are a lower % of women with PCOS



WAIST TO HEIGHT RATIO

<42 Extremely Slim

42 to 46: Lean and Healthy

46 to 49: Healthy, Normal Weight

49 + Increased Risks for Insulin Resistance and Diabetes

2016 Study 754 Women

- Waist to Height Ratio predicts IR in 71 % of women with PCOS

BMI

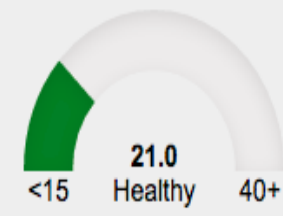
Enter information:

Weight: lbs

Height: ft

Results:

Your BMI is



<15 Healthy 40+

21.0

Waist to Height Ratio Calculator

Enter information:

Age: < 50 yrs old 50 and above

Waist: in

Height: ft

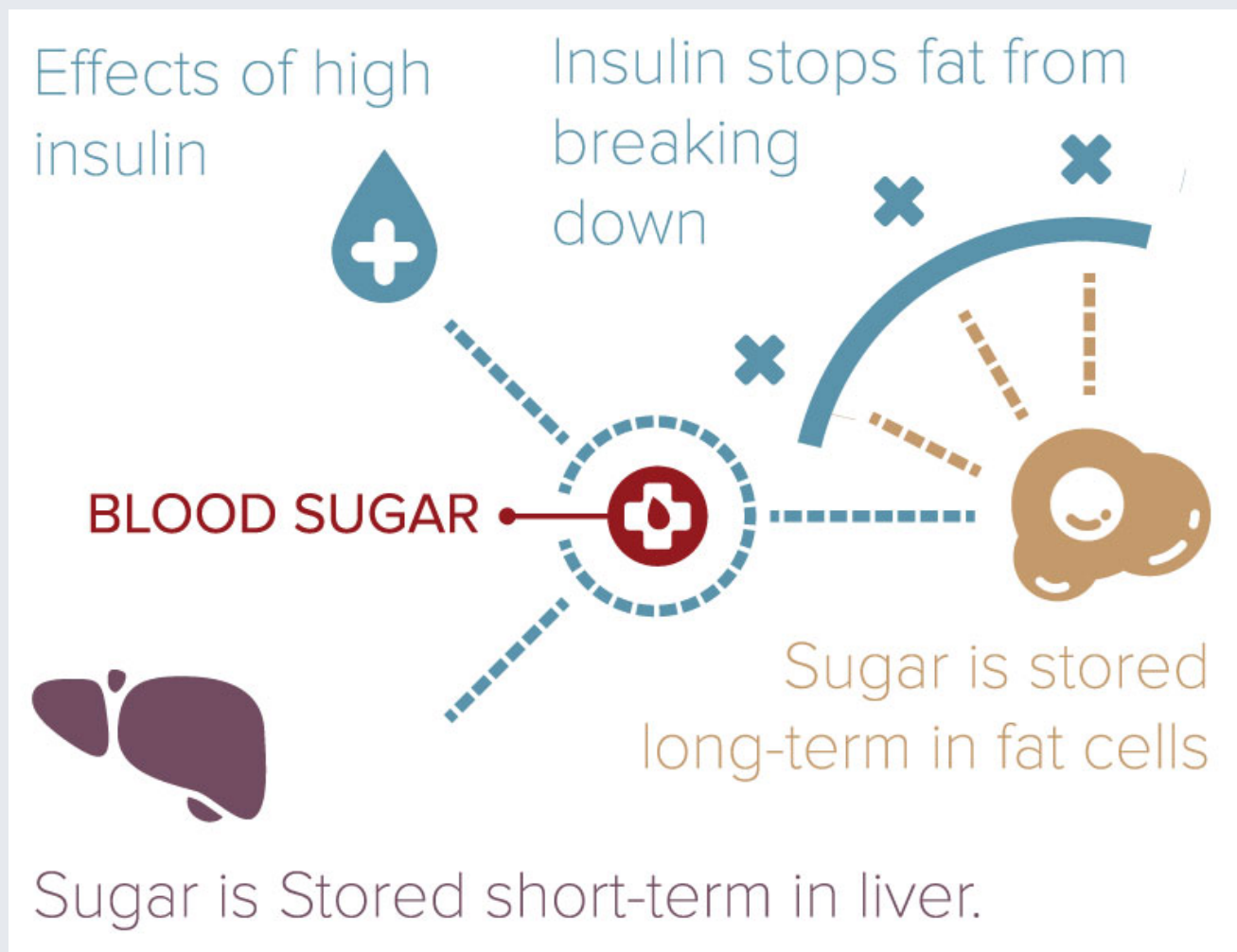
Results:

Your Height to Waist ratio is:

0.55

You are above the 0.50 limit.
Losing 3in off your waist will lower the risk of diabetes, heart disease and stroke

WHAT DOES INSULIN DO?

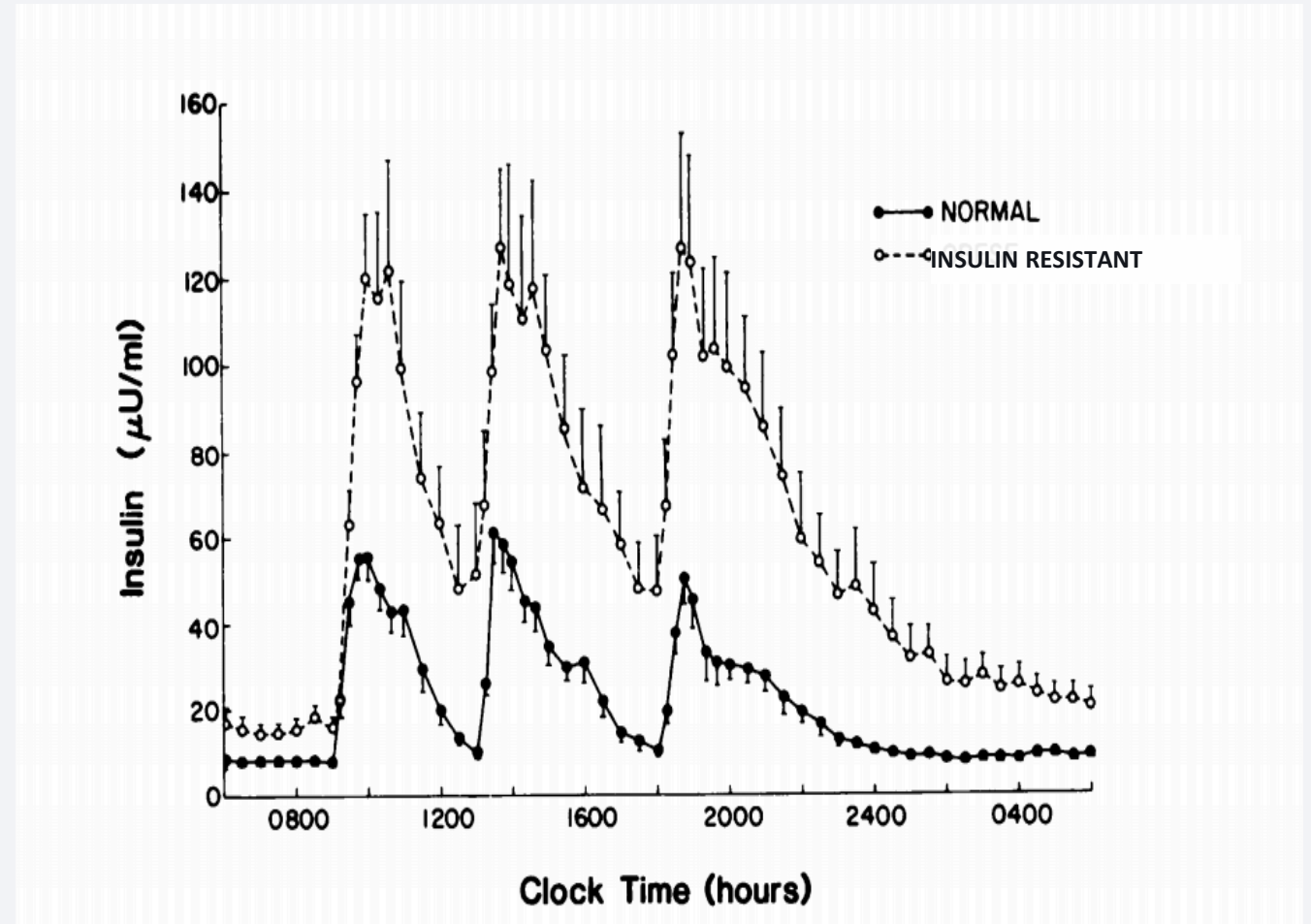


WHAT'S UP WITH INSULIN IN LEAN PCOS?

- Depending on method of measurement, around 75 % of Lean PCOS women are insulin resistant
- Measured by markers such as HOMA-IR, QUICKI, Hyperinsulinemic Glycemic Clamp.
- **NOT** by markers like HBA1C and fasting glucose.
- What about the 25% who are not insulin resistant?

WHAT'S UP WITH INSULIN IN LEAN PCOS?

- Research suggests that many lean PCOS women have normal fasting insulin, but are more likely to have hyperinsulinemia after eating.
- In the earliest stages with very lean PCOS – even post meal insulin may be normal – in these cases there is insulin hypersensitivity.



REACTIVE HYPOGLYCEMIA

- Drop in blood sugar 1.5-5 hours after eating.
- Increases hunger
- 50% of women with lean PCOS *Altuntas et al., 2005*
- Due to insulin hypersensitivity and/or elevated insulin secretion
- An early marker that often precedes the development of PCOS or insulin resistance

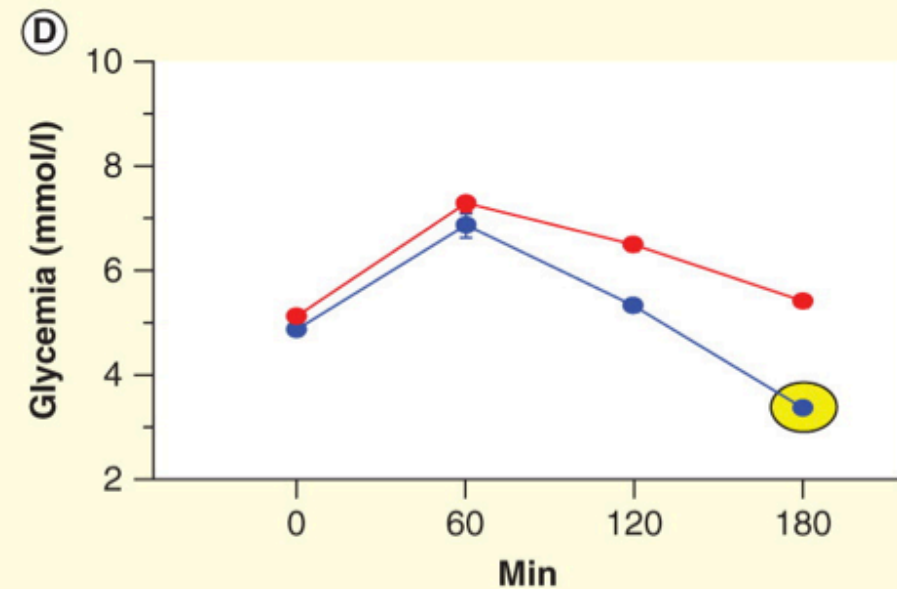
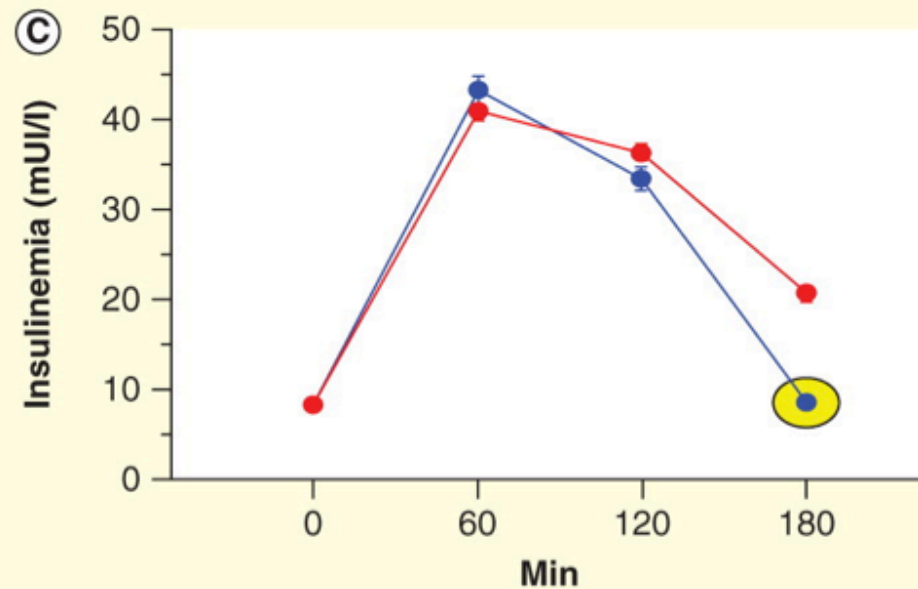


LOW BLOOD SUGAR

...throw a cookie, quick!

Some women with lean PCOS have normal fasting insulin and don't secrete high amounts of insulin when they eat.

These women tend to have drops in their blood sugar after eating. They are **HYPERSENSITIVE TO INSULIN**.

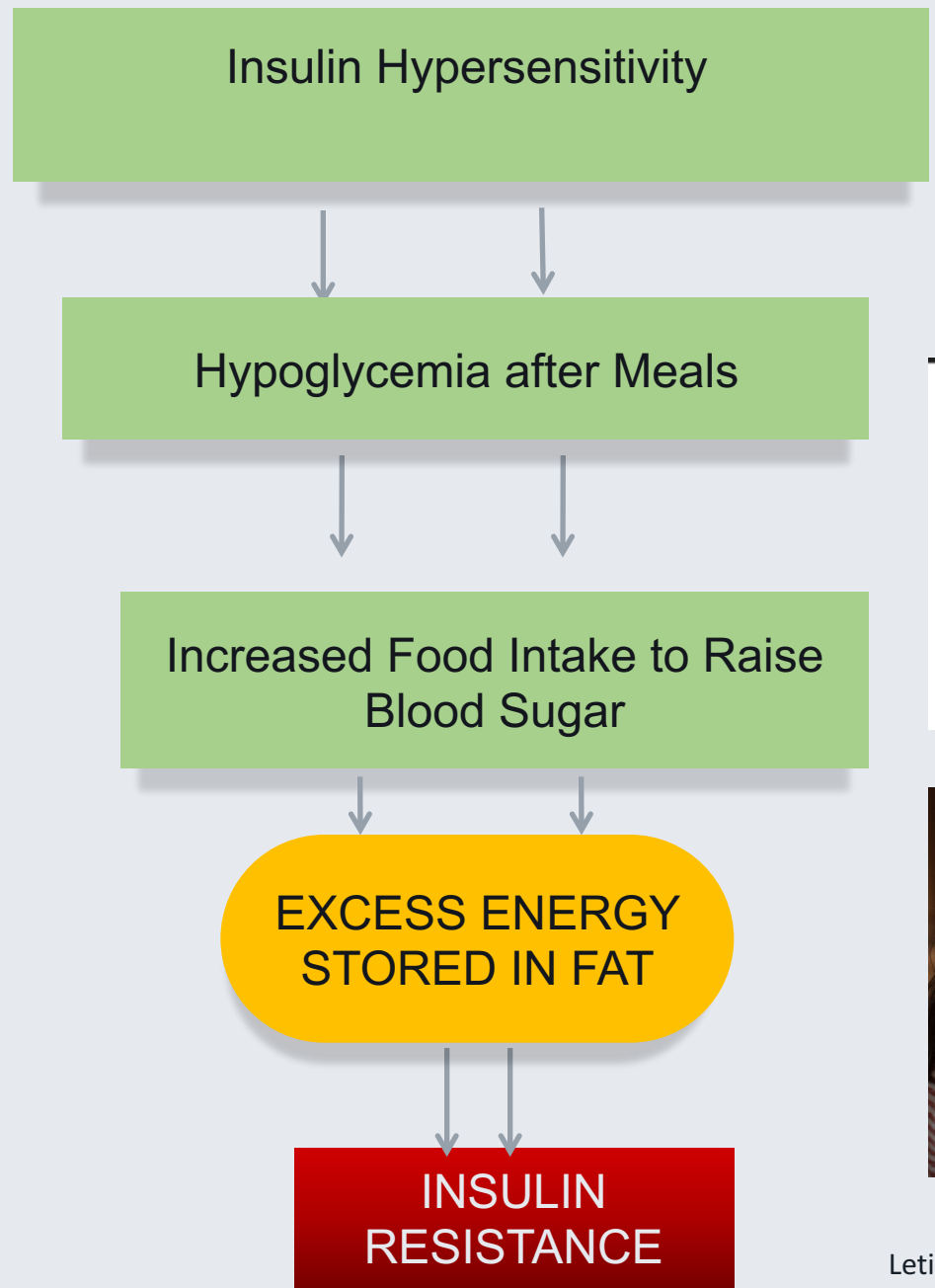


Hypoglycemic
Normal blood sugar

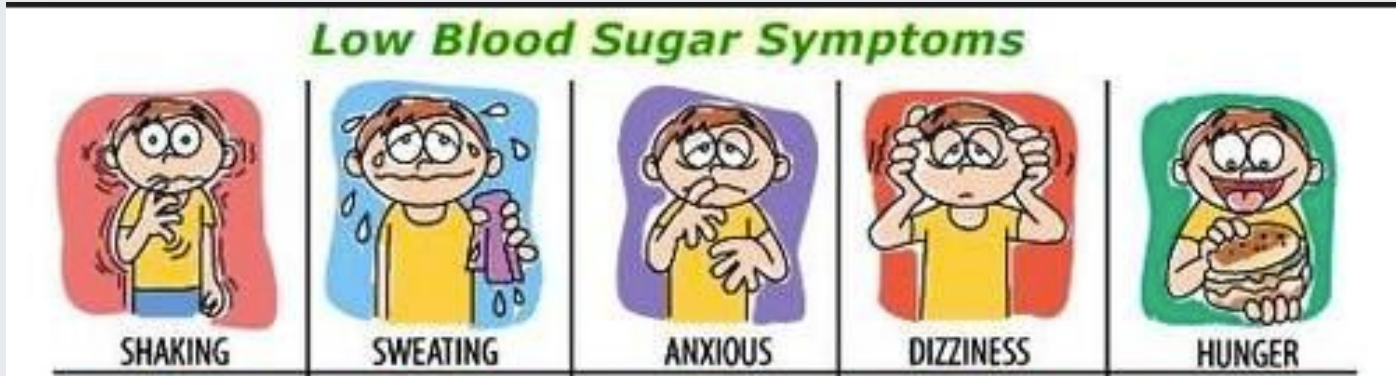
● Glycemia at t = 180 min <3.9 mmol/l
● Glycemia at t = 180 min ≥3.9 mmol/l

← MANY LEAN PCOS WOMEN

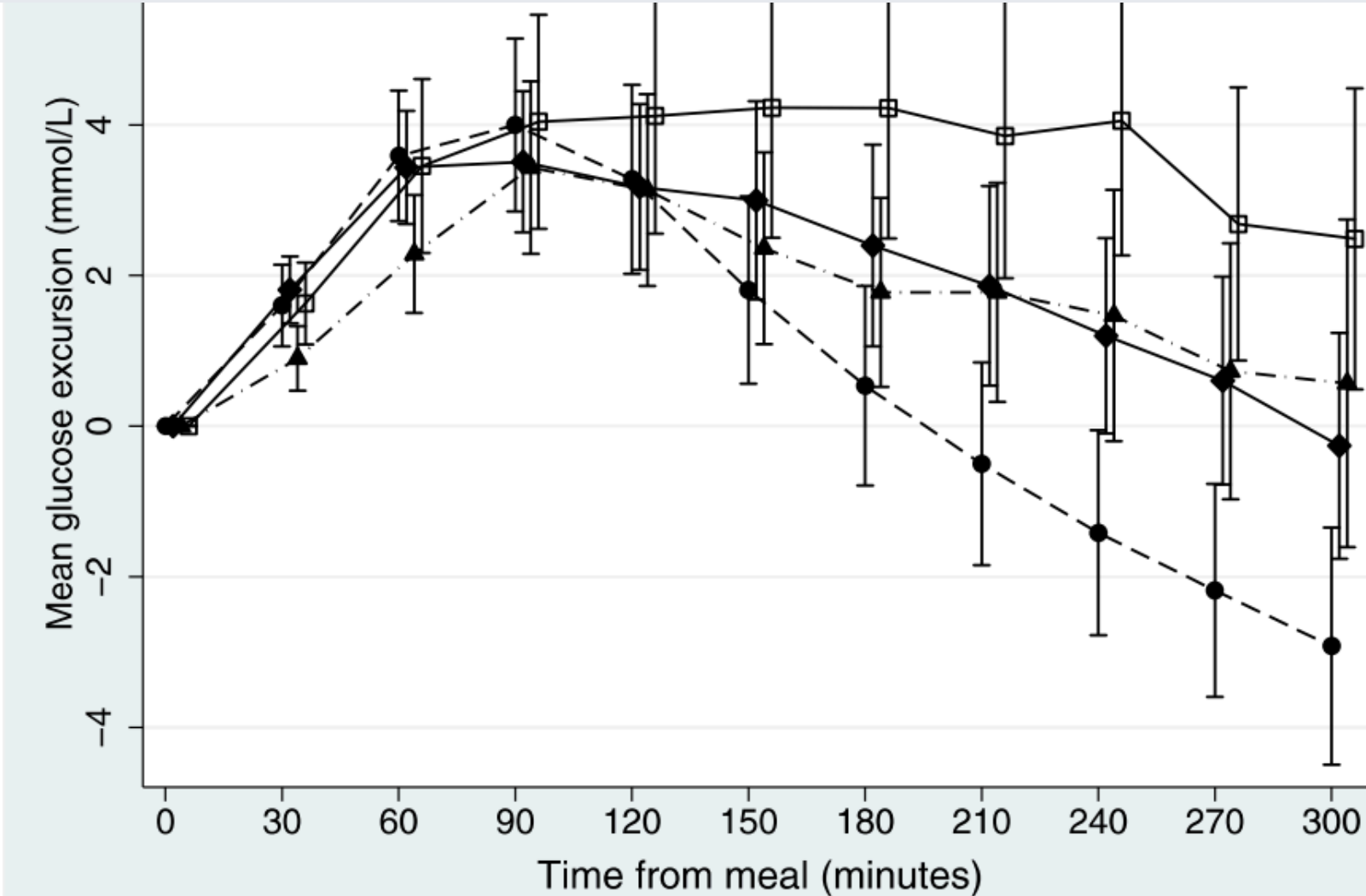
Development of Insulin Resistance in Lean PCOS



Genetics



CARBOHYDRATE CAUSES RISE AND THEN DROP IN BLOOD SUGAR.



Fat & Protein
(HF/HP)

Fat (HF/LP)

Protein (LF/HP)

Carbohydrate

IT'S HARDER TO STAY LEAN WITH PCOS

JUST AS IT'S HARDER TO LOSE WEIGHT

- Although women with PCOS had a higher BMI than control women, **an overall comparison of women with and without PCOS showed no significant difference in dietary intake.** However, stratification by BMI revealed that lean women with PCOS reported significantly lower energy intake than lean women without PCOS.
- Lean pcos have lower caloric intake than other lean women— harder to maintain weight.



Wright et al. Dietary intake, physical activity, and obesity in women with polycystic ovary syndrome. *Int J Obes Relat Metab Disord.* 2004 Aug;28(8):1026-32.

LEAN PCOS WOMEN!! HOW CAN YOU TELL IF YOU ARE INSULIN RESISTANT?

- We need to look deeper if you are lean or average weight!
The typical tests for DIABETES (hint, not the same as insulin resistance!) will show you as “normal”
- What you need to test: **Fasting Insulin, Fasting Glucose.**
– simple, cheap, easy!
- Input numbers into HOMA-IR Calculator here →
<http://www.thebloodcode.com/homa-ir-calculator/>
- **Many studies use a 2.5 HOMA-IR** as the cut off.
One study found that 47% of lean women tested with PCOS were insulin resistant.
- Another large study on 6868 healthy individuals found a cut off of 1.7
– above this indicates insulin resistance.
- **QUICKI** – similar ratio based calculation. May be more sensitive.
Cut off is typically <0.35 = insulin resistance.
- <http://www.hslls.pitt.edu/medcalc/QUICKI.htm>

Healthy Range: 1.0 (0.5–1.4)

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

Above 1.9 indicates early insulin resistance.

Above 2.9 indicates significant insulin resistance.

HOMA-IR Blood Code Calculation

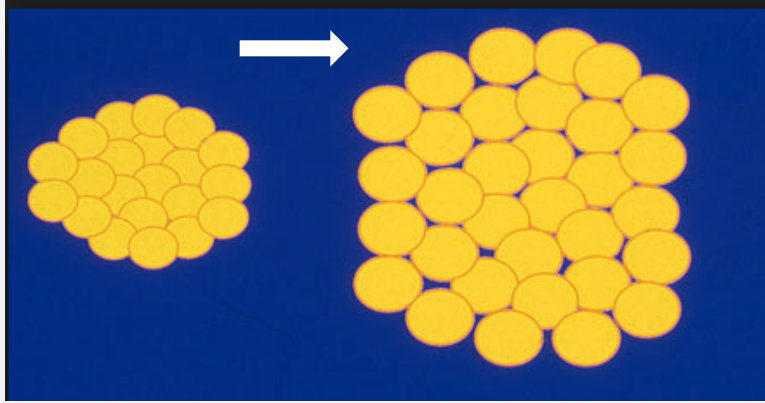
Insulin uIU/mL (mU/L)		Glucose (mg/dL)		HOMA-IR
17	X	102	=	4.3

Yildizhan et al. The impact of insulin resistance on clinical, hormonal and metabolic parameters in lean women with polycystic ovary syndrome. J Obstet Gynaecol. 2016 May 3:1-4.

LEAN PCOS WOMEN!! HOW CAN YOU TELL IF YOU ARE INSULIN RESISTANT?

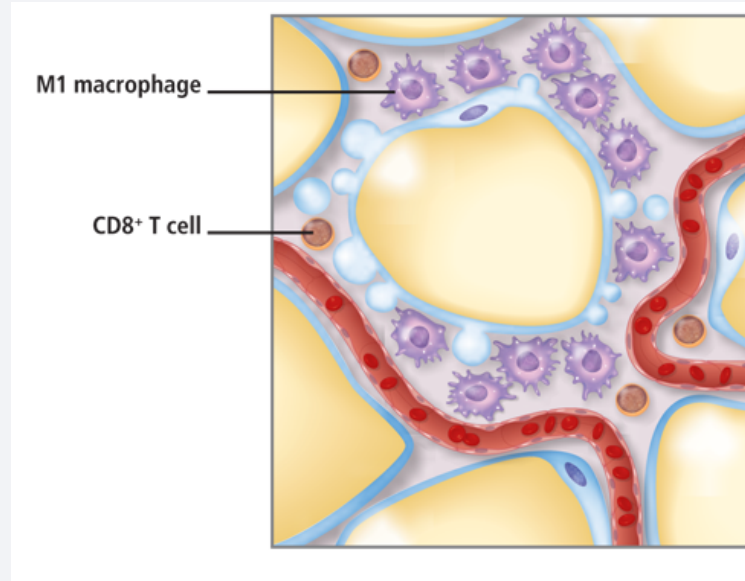
2 or 4 Hour Insulin Glucose Tolerance Test.

- Similar to Glucose Tolerance Test
- Also measures Insulin – shows if you make too much insulin after eating, or if it stays high too long.
- Can detect reactive Hypoglycemia



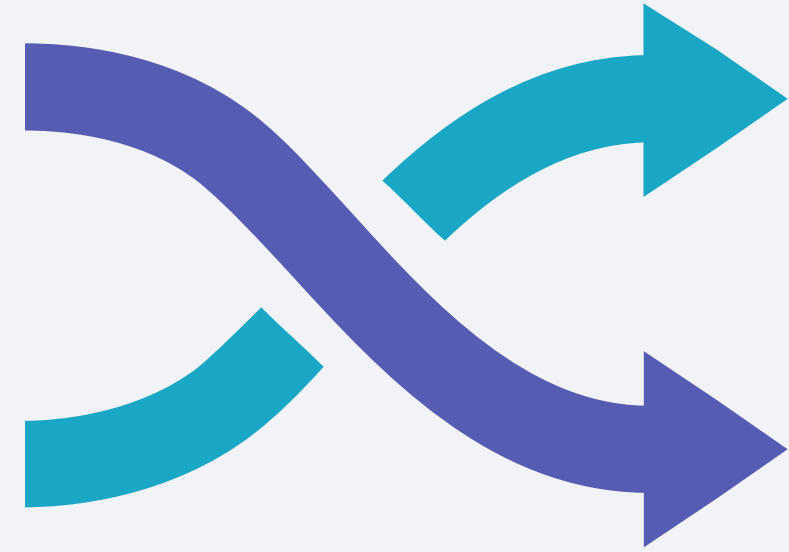
Fat Cell Dysfunction

Larger fat cells. Early marker of PCOS.



Inflammation

Early marker of PCOS - Mostly
From fat cells.



Circulatory

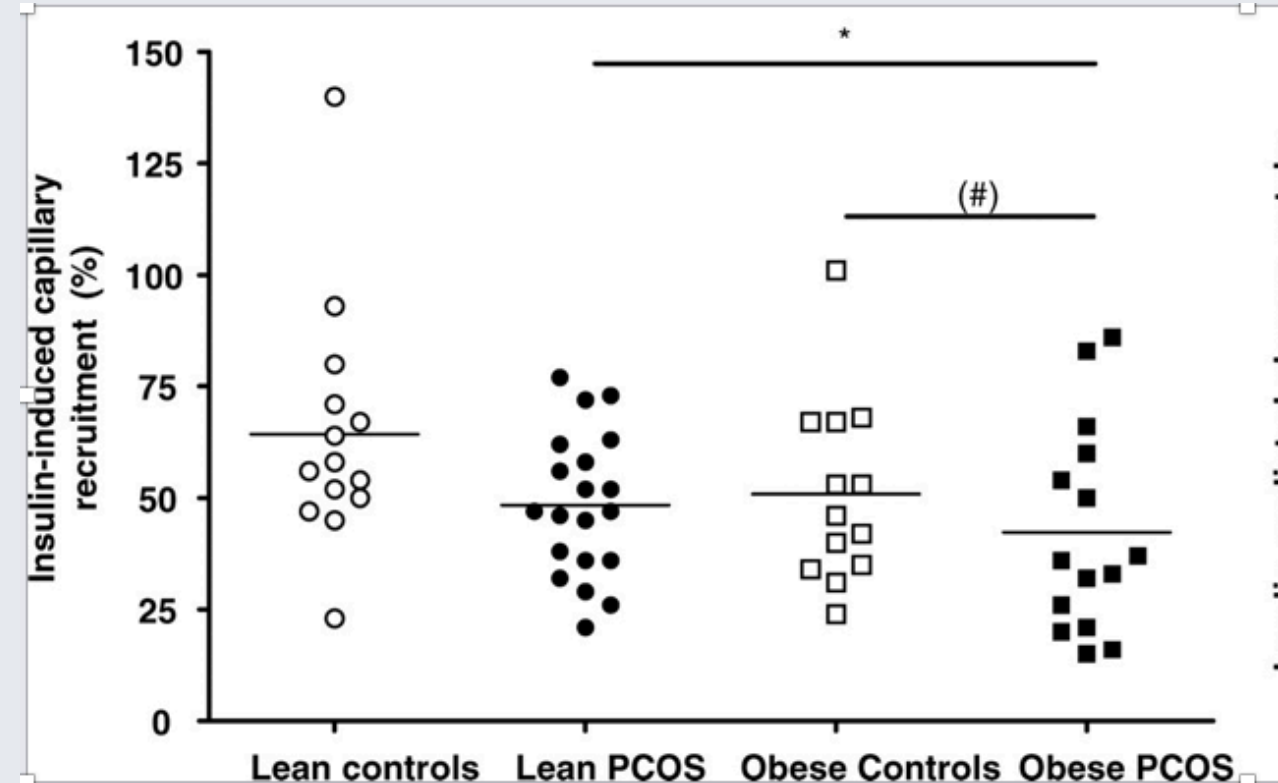
One of the Earliest Signs.
Blood vessels

In Lean PCOS There are metabolic problems that we can't see.

Insulin normally causes capillary growth, but in PCOS this is impaired.
Lower circulation to the muscles and tissues contributes to insulin resistance..

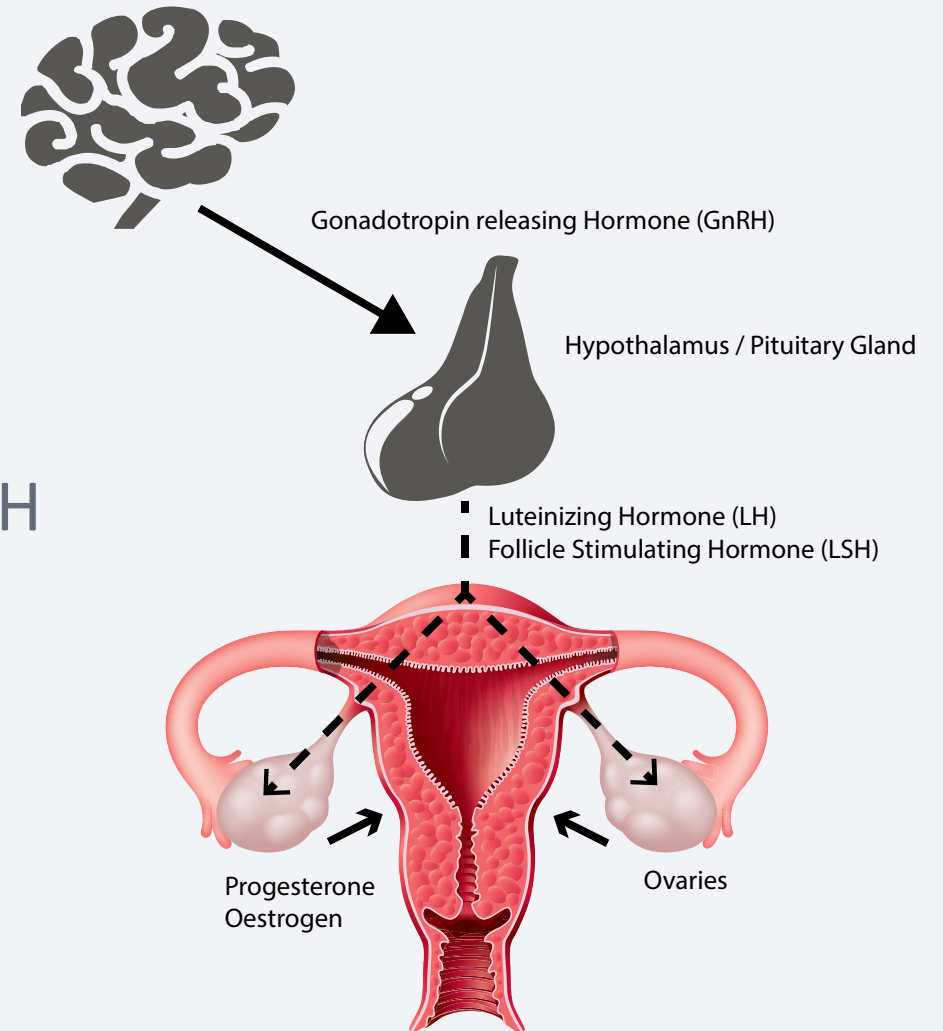
Insulin resistance develops in blood vessels a long time before it can be detected in muscle, liver, or fatty tissue.

Lean women with PCOS may have poor circulation as a result of poor capillary function.



BRAIN REGULATION OF HORMONES IN LEAN PCOS

- Higher LH to FSH ratio than in Classic PCOS.
- The more lean the woman, the higher her LH to FSH ratio will be.
- Should be checked on cycle day 3, if having menses.



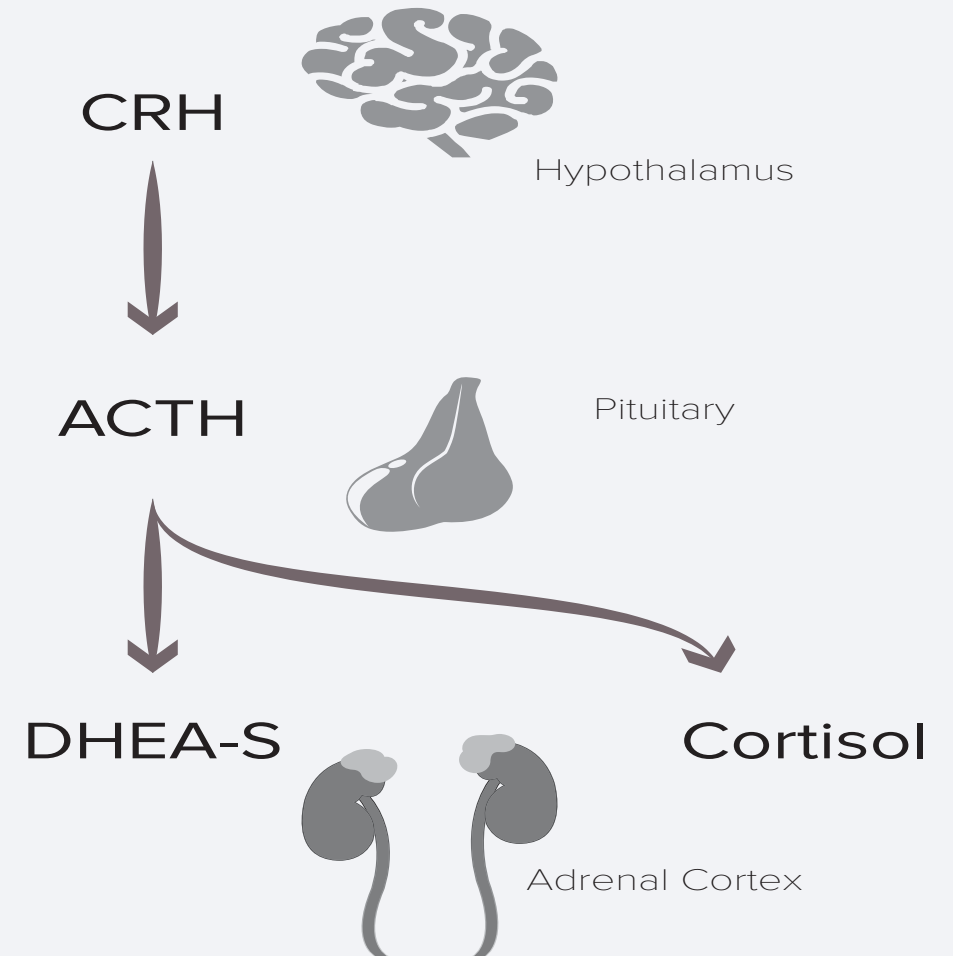
The Opioid System and Lean PCOS

- High pain threshold compared to women without PCOS.
- Higher beta endorphins. Beta endorphins stimulate LH release.
- May be related to mood disorders.



ADRENAL ANDROGEN EXCESS PCOS

- High levels of DHEA-S
- More common in lean PCOS : it helps with metabolism and makes being lean easier.
- DHEA-S reduces with age, so a higher level in an older woman is unusual even if not above the range.



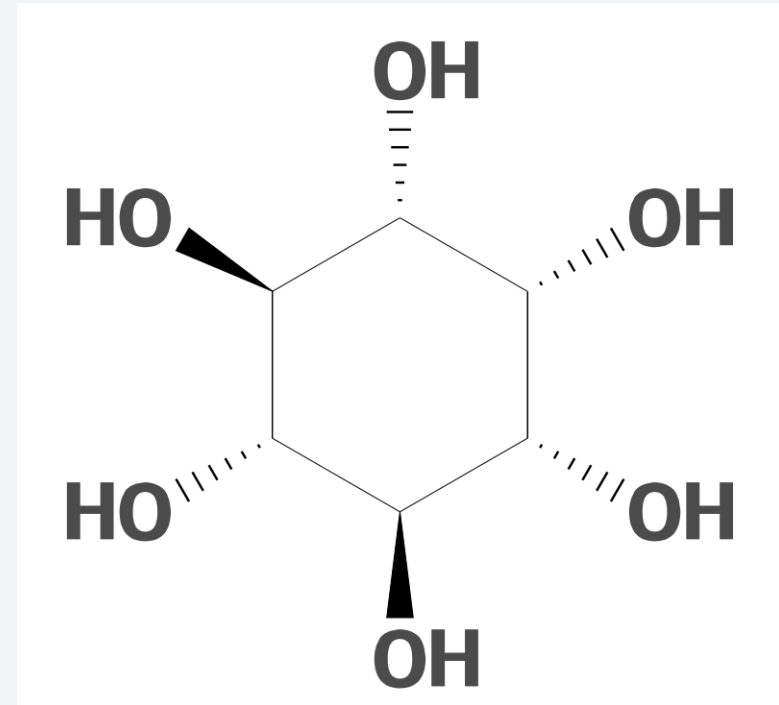
WHAT CAN YOU DO TO HELP LEAN PCOS?

- Keep blood sugar stable
- Exercise – lean muscle, resistance training. Improve insulin delivery to muscle tissues.
- Follow diet that modulates insulin secretion after meals:
 - Base meals around protein source.
 - Avoid carbohydrates alone
 - Avoid carbohydrates with fats alone.
- Stress reduction is key. Mindfulness, prayer, yoga, meditation, sleep.



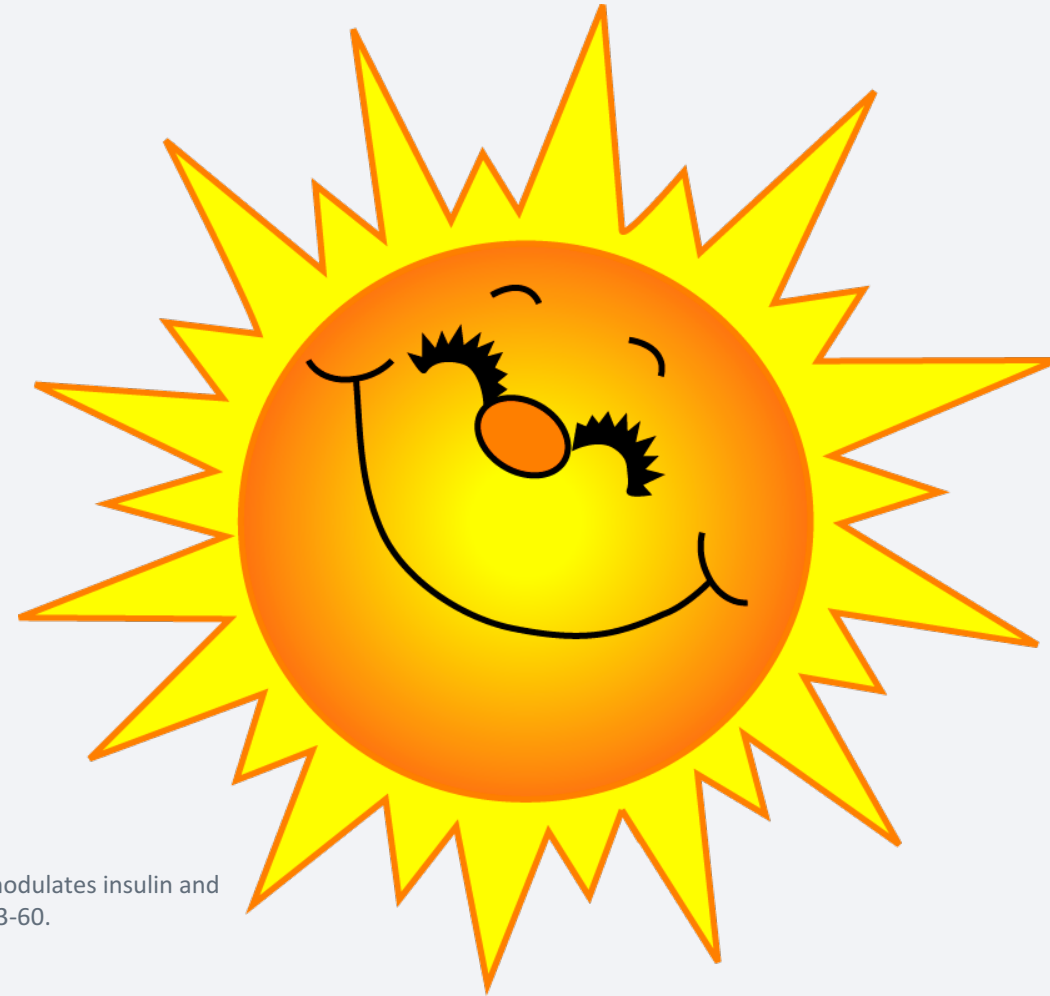
MYO-INOSITOL

- 3 grams per day reduced LH, hs-CRP (inflammation), androgens and insulin tolerance test in lean pcos



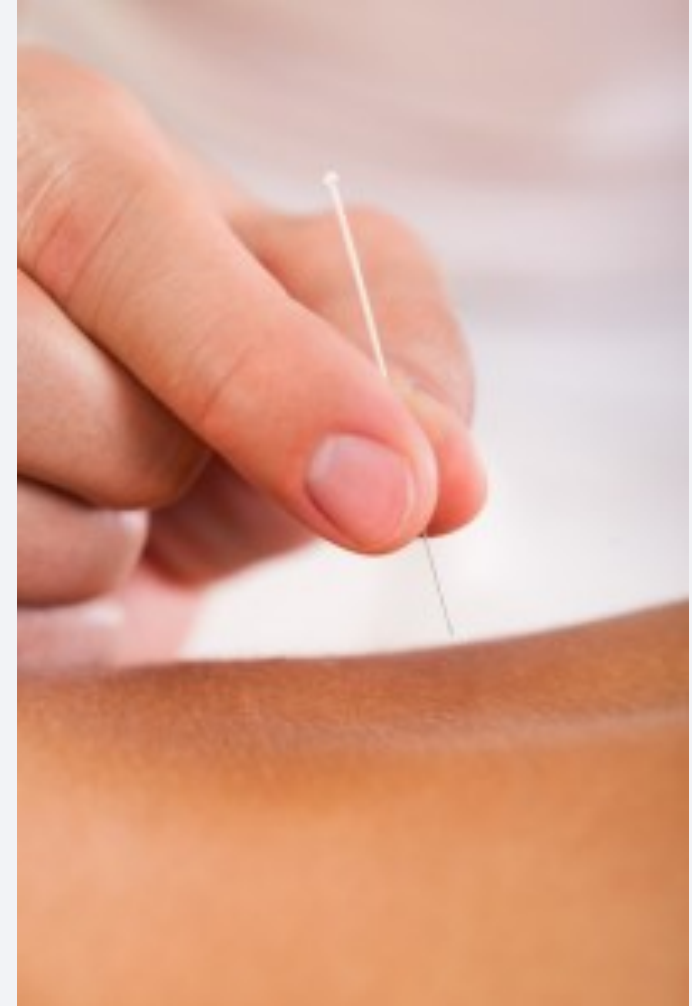
VITAMIN D STATUS

- Low vitamin D associated with Insulin resistance in PCOS



ACUPUNCTURE

- Benefits Opioid system, HPO Axis dysfunction
- Low frequency electrostimulation 2-3 times per week before ovulation can stimulate ovulation



VITEX AGNUS CASTUS

- Effects on Ovulation – Hypothalamic - Pituitary- Ovary Axis.
- Affinity for opioid receptors in ovary and brain, can lower LH through secondary effects
- Can also bind to beta-estrogen and dopamine receptors. Lowers prolactin levels.
- Infertility – over 3 months, in a group of 38 women with secondary amenorrhea (PCOS – 7 conceived)
- Infertility – in a group of 67 women with pcos – 38/67 women increased frequency of ovulation, and ovulated earlier., increased progesterone. 6 months treatment time.



BLACK COHOSH

—WOMEN WITH HIGH LH.

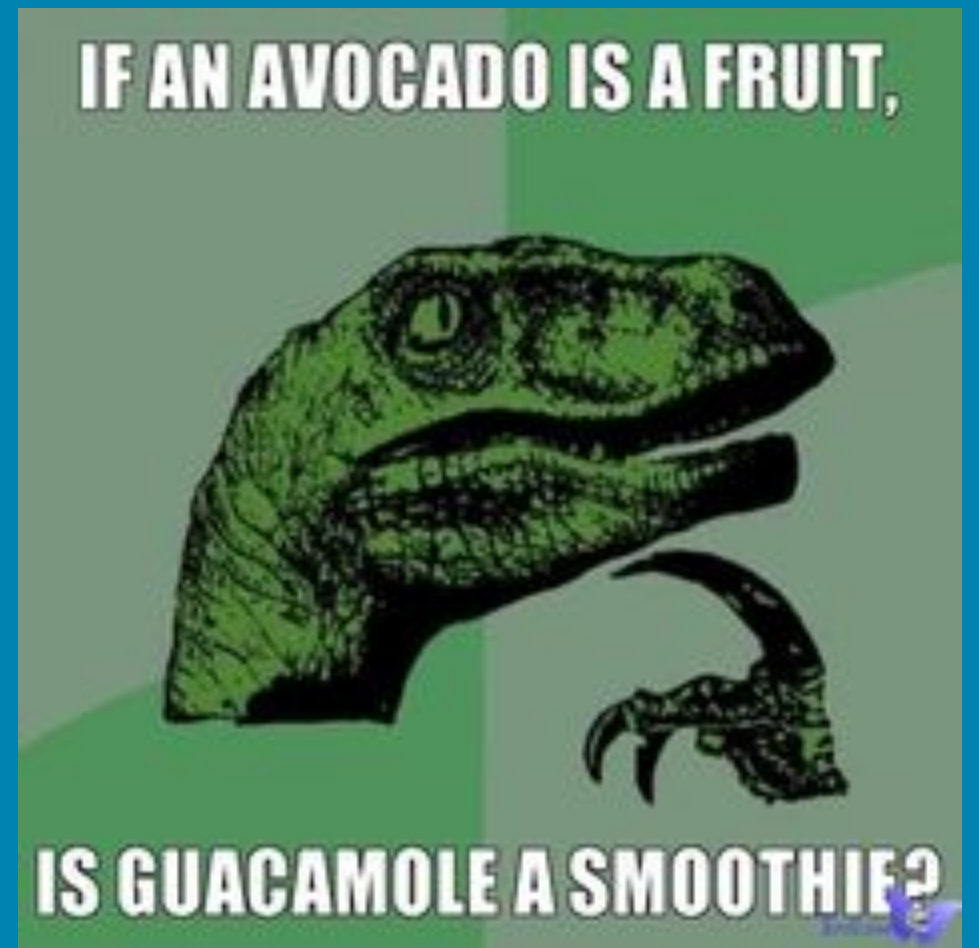
- Binds estrogen receptors in pituitary and reduces LH secretion.
- Increases luteal progesterone concentration.
- Improves LH: FSH Ratio
- Limits side effects of Clomid for those trying to conceive



As much as we have learned about PCOS in recent years, there is still much more to unravel of this complex condition.

Always stay curious as we learn how to live our best lives with PCOS!

Thank you!



DRFIONAAND.COM