

# POPULAR SUPPLEMENTS FOR PCOS

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# Disclosure

Retailer:

- Ovasitol by Theralogix
- Fish oil by Nordic Naturals
- PCOS Nutrition Center Supplements

# Why Take Supplements For PCOS?

- ▶ Help to improve labs (insulin, cholesterol, triglycerides)
- ▶ Improve ovulation and egg quality
- ▶ Replace nutrients that are missing in your diet
  - ▶ Deficiency due to malabsorption
  - ▶ Diet avoidance
- ▶ Optimize nutrient levels



# Supplements: First Things To Consider

- ▶ Supplements are not a replacement for a healthy diet & are not weight loss pills
- ▶ Not regulated by FDA like drugs
- ▶ Discuss dosage and be monitored by a healthcare professional
- ▶ What's the evidence?
- ▶ Read the label carefully!
- ▶ Look for Medical-grade quality supplements
- ▶ Independently tested:



# Tips for Taking Supplements

- ▶ Take consistently
- ▶ If possible try one at time to check for adverse effects
- ▶ Evaluate effectiveness

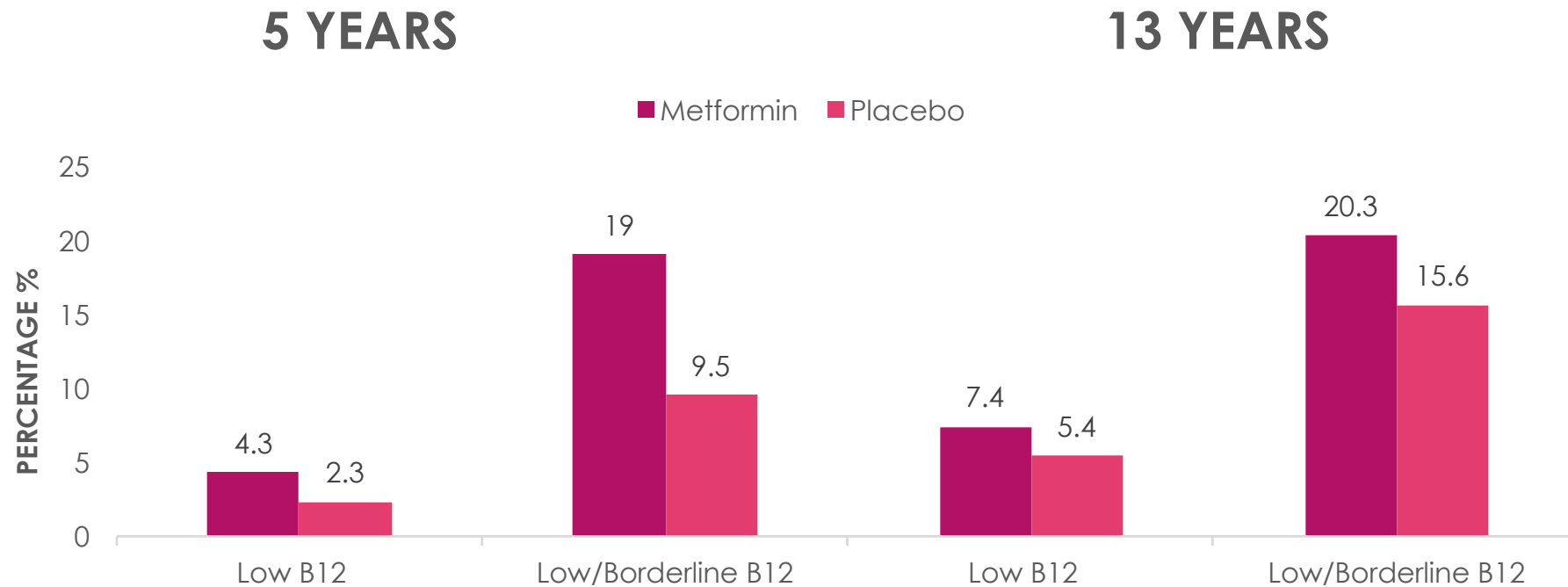




# Long-term Metformin Use and B12 Deficiency: Results from DDPOS

- ▶ Diabetes Prevention Program Outcomes Study (DDPOS)
- ▶ Impaired Glucose Tolerance, Average age 52
- ▶ Metformin 850 mg BID (n= 1073) vs. Placebo (n= 1082) for 3.2 years
- ▶ PLA and MET B12 levels assessed at 5 years [n=857, n=858] and 13 years [n=756, n=764]
- ▶ Low vitamin B12  $\leq 203$  pg/ml
- ▶ Borderline low levels 204 –298 pg/ml,
  - ▶ Aroda VR, et al. Long-term Metformin Use and Vitamin B12 Deficiency in the Diabetes Prevention Program Outcomes Study. J Clin Endocrinol Metab. 2016;doi:10.1210

# B12 Levels at 5 and 13 years in Metformin and Placebo



# Metformin, Vitamin B12 and PCOS

- ▶ **The higher the metformin dose, the more deficient people were in vitamin B12.** The effect of metformin on vitamin B12 levels was nearly the same in patients with type 2 diabetes and PCOS.
- ▶ Metformin reduced vitamin B12 concentration in **both long ( $\geq 3$  years) and short ( $< 3$  years) term.**
  - ▶ Liu Q1, Li S1, Quan H1, Li J1. Vitamin B12 status in metformin treated patients: systematic review. PLoS One. 2014 Jun 24;9(6):e100379.
- ▶ **Serum B12 levels declined and reached significant lower levels after just six months of treatment** in women with PCOS taking 1.5-2.5 grams of metformin daily.
  - ▶ Greibe E et al. Metformin lowers serum cobalamin without changing other markers of cobalamin status: a study on women with polycystic ovary syndrome. Nutrients. 2013 Jul 5;5(7):2475-82.



# Vitamin B12

## Vitamin B12 Deficiency Causes:

- ▶ Fatigue
- ▶ Anemia
- ▶ Tingling in hands and feet
- ▶ Mood and mental changes
- ▶ Permanent nerve damage

Recommend PCOS patients who take metformin have their vitamin B12 levels checked annually and supplement their diets with vitamin B12

- ▶ Recommended levels > 400      Optimal levels > 600

- ▶ **Therapeutic Dose:** 1,000 mcg      Sublingual Methylcobalimum best absorbed

# N-Acetylcysteine (NAC)

## What is it?

- ▶ Antioxidant and amino acid

## Purported uses:

- ▶ infertility/androgen-lowering
- ▶ Inflammation
- ▶ high cholesterol
- ▶ oxidative stress
- ▶ Fatty liver
- ▶ Bronchitis/immune support

**Recommended dosage:** 1.6 to 3 g/day

▶ Side effects: minimal



# NAC: Systematic Review of Randomized Trials

- ▶ 8 randomized controlled trials with 910 PCOS women
- ▶ **NAC improved BMI, total testosterone, insulin, and lipid levels**
- ▶ **“NAC had significant improvement in pregnancy and ovulation rate as compared to placebo.”**
- ▶ **NAC showed similar benefits to metformin for improving pregnancy rate, spontaneous ovulations, menstrual regularity, insulin resistance, and cholesterol**

Thakker D, Raval A, Patel I, Walia R. N-acetylcysteine for polycystic ovary syndrome: a systematic review and meta-analysis of randomized controlled clinical trials. *Obstet Gynecol Int.* 2015;2015:817849.

# Vitamin D

## What is it?

- ▶ Vitamin and hormone

## Uses:

- ▶ Great for improving fertility in PCOS!
- ▶ Increases mature follicles and regulates periods
- ▶ Vitamin D supplementation lowers elevated serum AMH levels
- ▶ Anti-inflammatory

**Therapeutic amounts:** 2,000 IU+ Vitamin D3

- ▶ Fat-soluble; take with food
- ▶ Absorbs better with Vitamin K1 & K2
- ▶ Recommended vitamin D levels >35      Optimal >50



# Fish Oil: Omega 3 fats

- ▶ **Improves:**
  - ▶ TG levels
  - ▶ Non-alcoholic fatty liver disease
  - ▶ Fertility
  - ▶ Depression
  - ▶ Skin and hair health
- ▶ Maintains cardiovascular health
- ▶ Decreases inflammation
- ▶ Supports a healthy pregnancy
- ▶ Recommended amount: 1 to 4 grams daily
- ▶ Purchase high quality, independent tested brands



# Myo-Inositol (MYO) AND D-Chiro-Inositol (DCI) Benefits

## In women with PCOS:

- ▶ Improves insulin sensitivity
- ▶ Restores hormone balance
- ▶ Improves ovulation and egg quality
- ▶ Regulates periods
- ▶ Reduces gestational diabetes
- ▶ Lowers cravings?





# Myo-Inositol (MYO) AND D-Chiro-Inositol (DCI)

## What is it?

- ▶ Pseudovitamins. Relatives of the B-complex vitamins
- ▶ Found in foods (fruits, beans, cereals, buckwheat, etc)
- ▶ Inositol-phosphoglycan (IPG) mediators “secondary messengers”
- ▶ Regulates activities of hormones including FSH, TSH and insulin
- ▶ Women with PCOS have enhanced conversion of Myo to DCI

**Recommended dosage MYO to DCI 40:1 ratio** (2 to 4 g/day Myo and 50 to 100 g DCI); take with meals

**Side effects:** Hypoglycemia?

# BERBERINE

## What is it?

- ▶ Chinese herb used for thousands of years as a treatment for diabetes & infertility

## Purported Uses:

- ▶ Insulin sensitizer; effects have been compared with that of metformin
- ▶ Lowers androgens
- ▶ Inflammation
- ▶ Cholesterol, fatty liver disease
- ▶ May assist in body fat loss

**Dosage:** 400-500 mg, two to three times daily

- ▶ What to know: Monitor liver function with long-term use



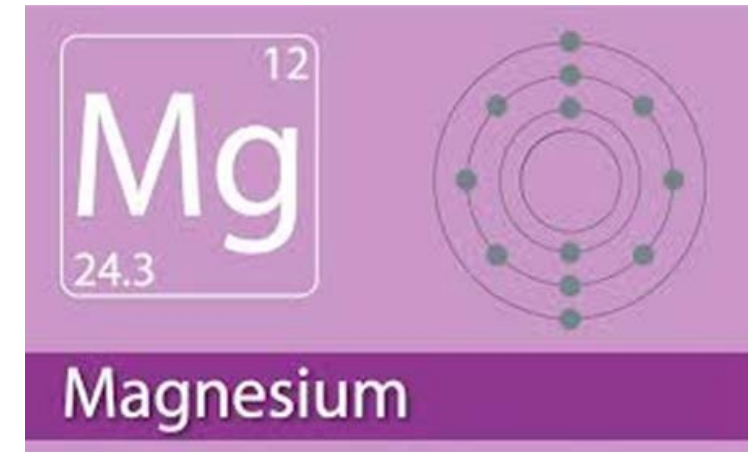
# Magnesium

## What is it?

- ▶ Fourth most abundant mineral in the body; water soluble

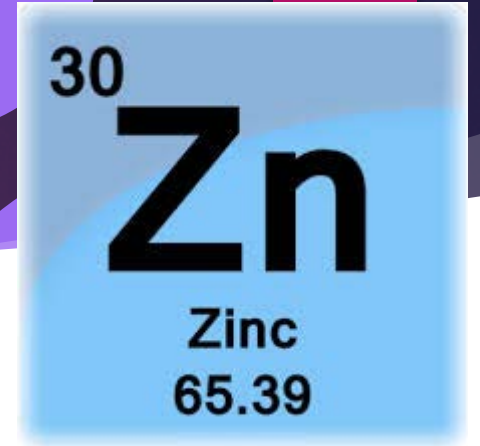
## Uses:

- ▶ Regulating glucose and insulin
- ▶ Liver detoxification
- ▶ Lowers blood pressure,
- ▶ Anxiety
- ▶ Insomnia
- ▶ Migraines
- ▶ Pain reliever



**Recommended daily amount:** is 320 mg daily    Magnesium citrate, chloride, glycinate best absorbed

# Zinc



## What is it?

- ▶ Essential trace metal that is required for over 300 enzyme functions
- ▶ Works to inhibit the enzyme that converts testosterone into its non-aromatizable form, dihydrotestosterone (DHT)

## Uses:

- ▶ Role in cholesterol and glucose metabolism, fertility
- ▶ Reduces PMS symptoms, hair loss, acne, boils
- ▶ After 8 weeks, 41.7% of women who supplemented with zinc saw a significant reduction in hair loss compared to only 12.5% of those taking the placebo.
- ▶ Women who supplemented with zinc saw significant reductions in hirsutism in just 8 weeks.

**Therapeutic Dosage:** 30 mg to 50 mg daily

# Co Enzyme Q10

## What is it?

- ▶ Antioxidant which functions as a cofactor in numerous metabolic pathways, particularly in energy production

## Uses

- ▶ Improves egg quality and ovulation
- ▶ Migraines
- ▶ Lowers cholesterol and insulin levels

**Therapeutic dose:** 200 mg to 600 mg daily

- ▶ Ubiquinol is the form of CoQ10 that is absorbed and utilized best.

# Resveratrol



## What is it?

- ▶ Antioxidant, Found in the skin of grapes, berries, red wine, and peanuts

## Uses:

- ▶ anti-aging, anticancer, and cardioprotective properties

## One Study:

- ▶ 30 patients with PCOS were randomly given either resveratrol supplement (1,500 mg) or placebo pill daily for three months.
- ▶ Resveratrol group saw a 23% reduction in their total testosterone levels and 22% reduction in DHEA sulfate levels.
- ▶ Fasting insulin levels dropped by 32%

Beata Banaszewska et al. Effects of Resveratrol on Polycystic Ovary Syndrome: A Double-blind, Randomized, Placebo-controlled Trial. J ClinEndocrinol Metab 2016;101: 3575–3581.



# Other Possible Supplements for PCOS?

- ▶ Cinnamon
- ▶ Chromium
- ▶ Alpha-lipoic acid
- ▶ Melatonin
- ▶ DIM (Diindolylmethane)
  - ▶ cruciferous vegetables including Brussels sprouts, kale, bok choy, cauliflower, broccoli
- ▶ Vitex (Chasteberry)
  - ▶ Not if high LH
- ▶ Saw Palmetto
- ▶ Peony
- ▶ Licorice



# In Conclusion

- ▶ Supplement use is common in PCOS population.
- ▶ Nutrition supplements when added to a healthy diet and lifestyle can offer health benefits and aid in improving ovulation.
- ▶ Women with PCOS may be at risk or have a deficiency in certain nutrients.
- ▶ PCOS is very heterogeneous. More RCTs are needed to determine benefits of supplement use in different women with PCOS.
- ▶ Women with PCOS should discuss the health benefits/risks of supplement use, appropriate dosage, and be monitored by a healthcare professional.





INFORMATION YOU CAN TRUST  
from the leading experts in diet and nutrition for PCOS

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