

Webinar Will Begin Momentarily

TODAY'S AGENDA:

- Welcome
- Speaker Introduction
- Presentation
- Q&A
- Closing



Professional Education Series

Support. Inform. Educate. Empower.

From Plate to Pregnancy: Nutrition and Lifestyle Strategies for Fertility



WEBINAR HOST:

Keith Hine, MS, RD

VP of Healthcare, Sports & Professional Education
Orgain, LLC



WEBINAR PRESENTER:

Judy Simon, MS, RDN, CD, CHES

Reproductive Nutrition Specialist

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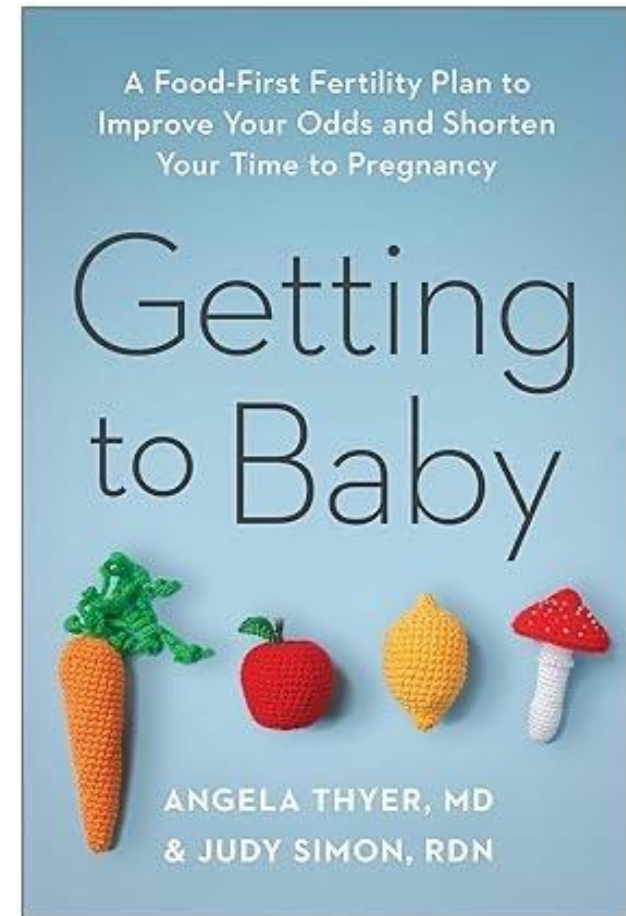
- Co-author *Getting to Baby A Food-First Fertility Plan to Improve Your Odds and Shorten Your Time to Pregnancy* (April 2024)
- Owner Mind Body Nutrition PLLC

Objectives

- Discuss the impact nutrition and lifestyle have on fertility success for men and women.
- Implement the process of nutritional assessment, diagnosis, and treatment when working with men and women who are seeking fertility assistance.
- Offer guidance in selecting high-quality supplements that complement their nutritional needs and fertility goals.
- Integrate culinary medicine and medical nutrition therapy during preconception and fertility treatment to enhance pregnancy outcomes.

My Story

- Passion for **preconception**, **maternal nutrition**, and **health behavior**
- 2001 University of Washington Roosevelt Clinic Family Med and Primary Care
- 2012 Created Food for Fertility group classes
- 2024 *Getting to Baby* co-author with Angela Thyer MD



Nutrition: Food First

- **Is there a best eating plan for fertility?**
 - *Low carbohydrate? High protein?*
 - *Ketogenic diet?*
 - *Whole 30? Ideal protein?*
 - *Avoid gluten, soy, dairy?*
- Food delivers most of our micro and macronutrients.



Nutrition and Trying to Conceive (TTC)

Why should people pay attention to nutrition when they are TTC?

- Diet is frequently overlooked in people obtaining fertility care.
- For women with specific diagnoses such as **PCOS**, **endometriosis**, **uterine fibroids**, dietary changes can improve health status.
- Management of chronic disease can positively impact fertility for men and women.
- In the **preconception window**, all individuals should aim to improve their nutritional intake for optimum fertility.
- A **team approach** is best.

Fertility

- Likelihood of conception is **highest the first few months of unprotected intercourse** and then declines.
- About 80% of couples will conceive in the first 6 months of attempting pregnancy.
- By age 40, fertility is decreased by half.
- Impact of age is much more pronounced in women.



Defining Infertility



Failure to achieve pregnancy after **12 months or more** of regular unprotected intercourse.

Earlier evaluation and treatment may be recommended after 6 months of without conception for women > 35 years old due to age related infertility.

Infertility Facts

- **15%** of couples globally are infertile.
- About **half** are due to **female fertility**, and **half** are due to **male fertility**.
- **Male factor infertility** primary cause in 20% of couples and contributory factor in 30-40%.



40

is the new

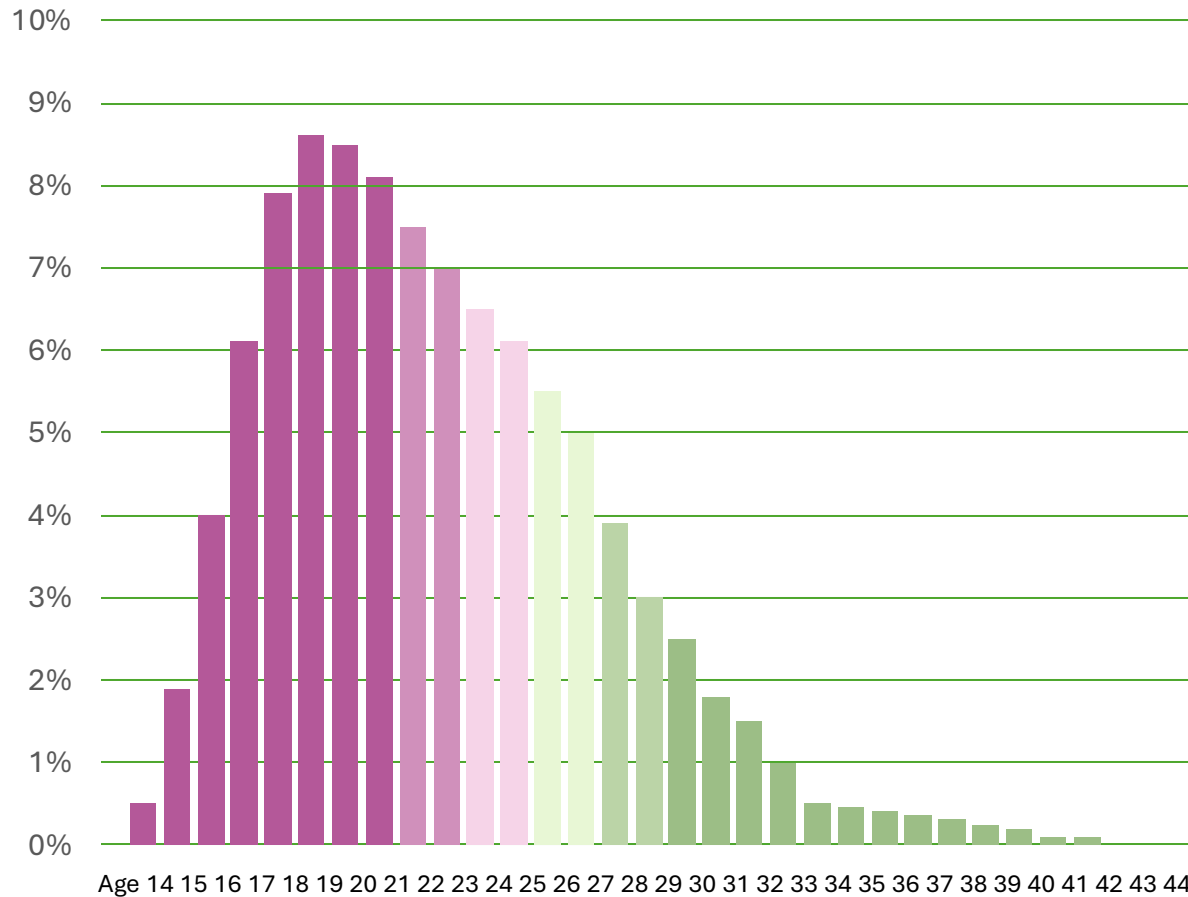
30*



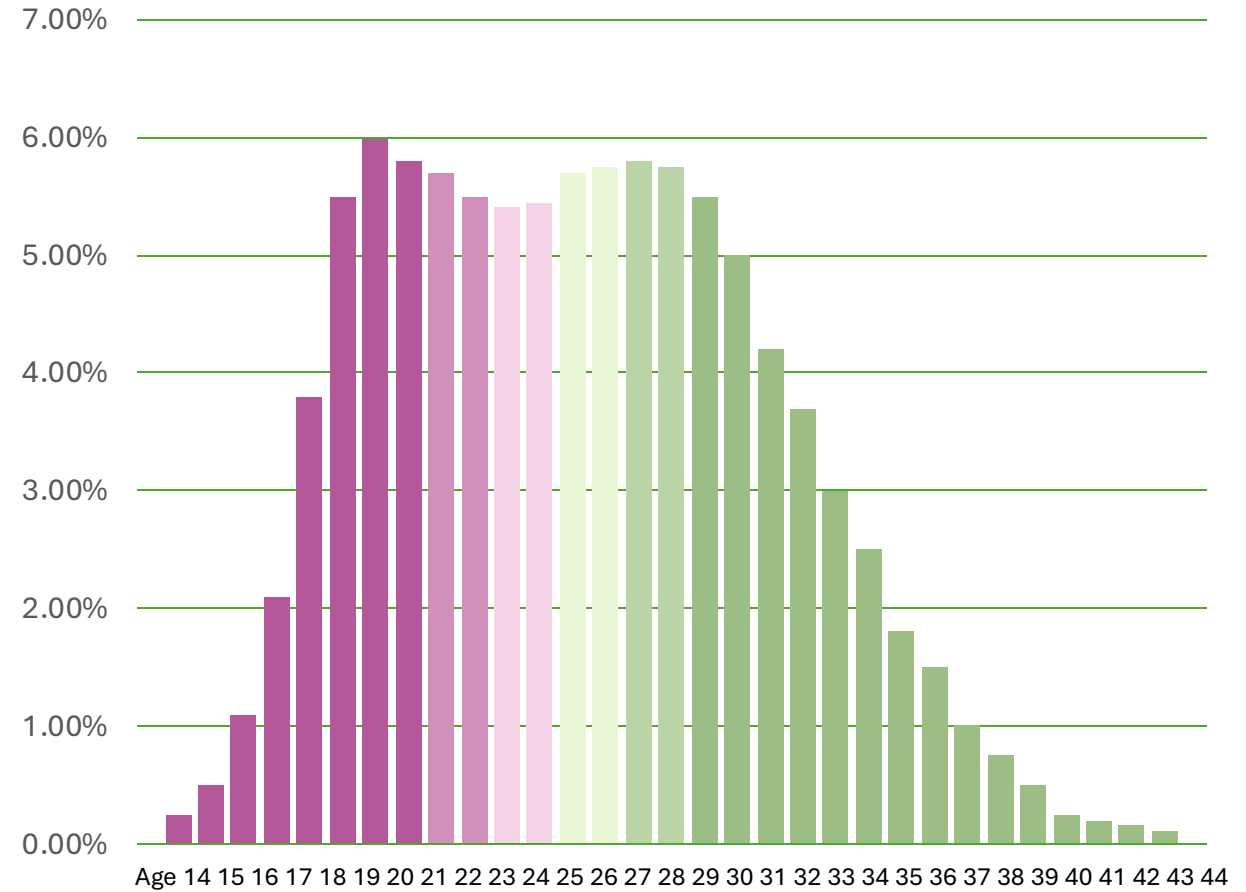
**except when it comes to fertility*

Trends in Fertility

Ages of first-time mothers in 1980



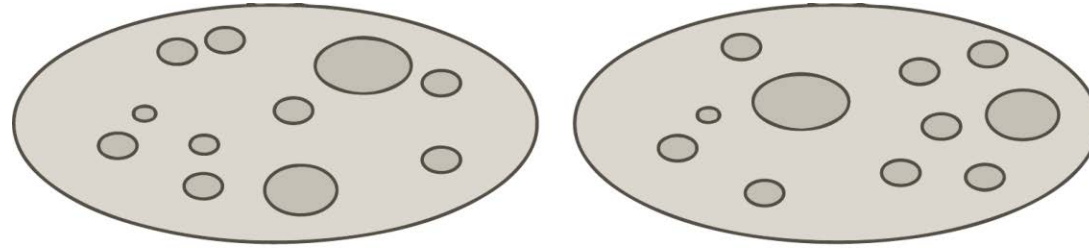
Ages of first-time mothers in 2016



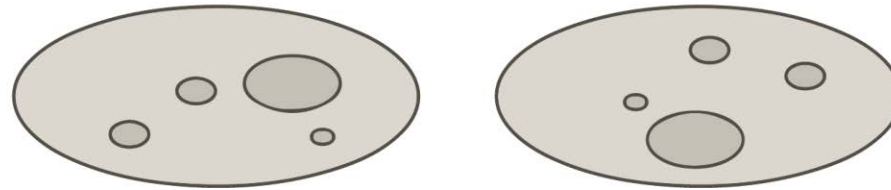
Adapted from: Bui Q, Miller CC. The Age That Women Have Babies: How a Gap Divides America. *NY Times*. August 4, 2018.

Ovarian Reserve Can Decline at Any Age

30 year old



30 year old

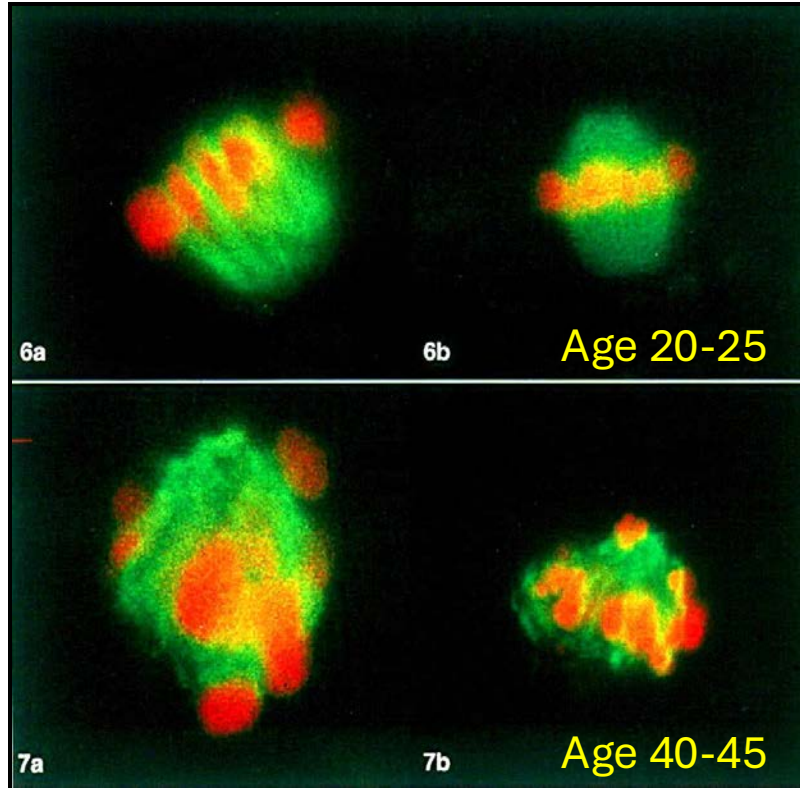


Common causes of infertility

- **Ovulation disorders** (25%)
 - PCOS: 8-13% of all women and 70% of women with anovulation
 - Premature ovarian insufficiency
 - Functional hypothalamic amenorrhea
- **Male factor** (5-40%)
- **Tubal defect** (22%)
- **Diminished ovarian reserve** (19-26%)
- **Endometriosis** (25-50%)
- **Unexplained infertility** (15%)



Embryo quality is tied to chronological age



The main reason for **female fertility decline** is the diminished ability of the fertilized egg to sort chromosomes correctly as women age.

More People are Utilizing IVF

- **Conventional**

- Infertility: Absence of pregnancy after 1 year of unprotected intercourse.

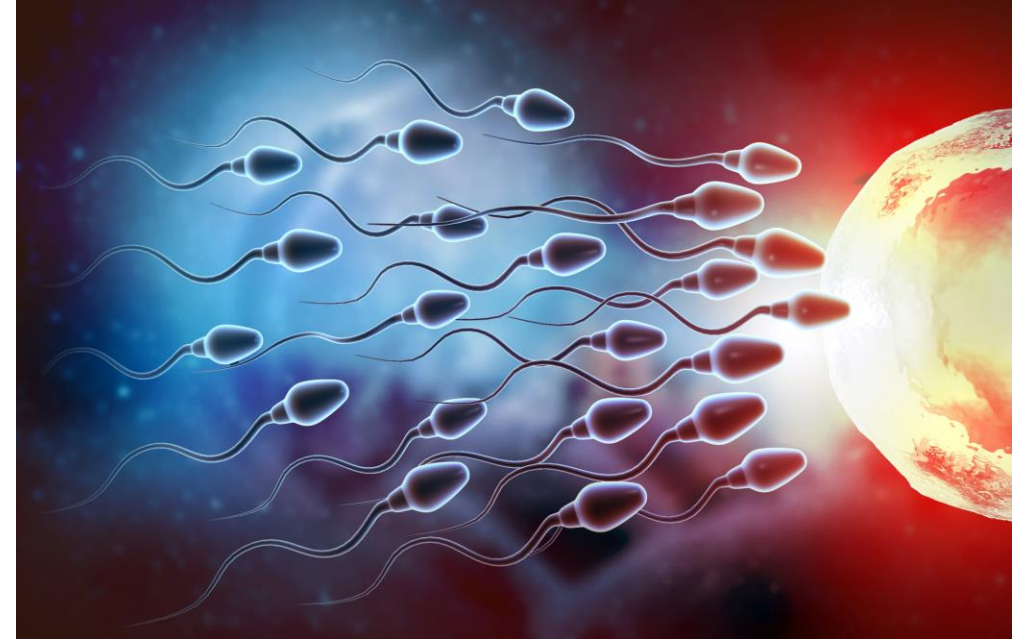
- **New**

- Proactive Family Planning: Embryo banking or egg freezing

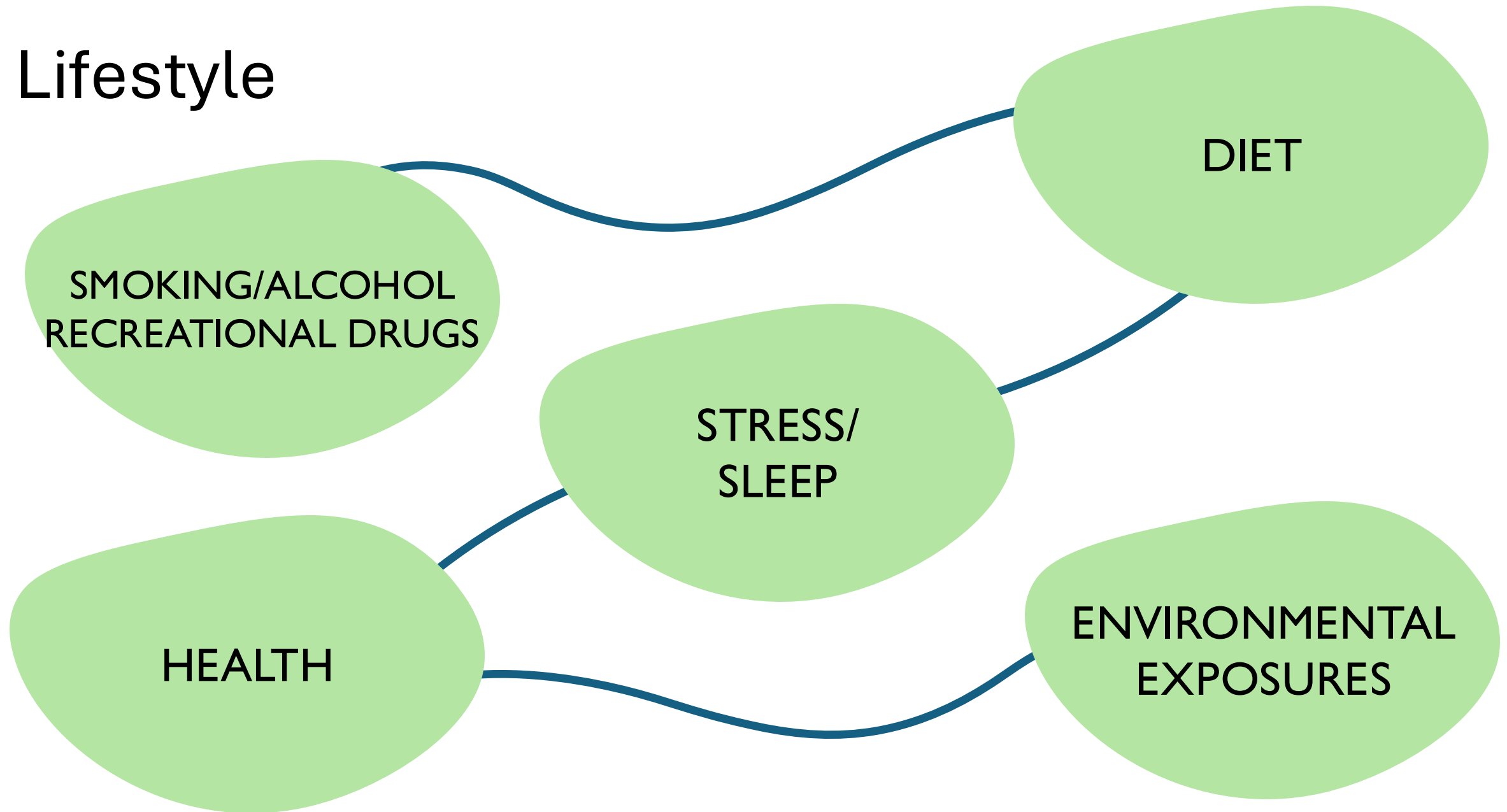


Impact of Lifestyle on Sperm and Oocytes

- Impact of diet, alcohol, sedentary behavior, tobacco, stress, cannabis, and pollutants on gametes
- Quality of oocytes is maximized or diminished in the 90 days prior to release, 70 -80 days for sperm
- **Lifestyle behaviors** can have a cumulative influence on fertility success



Lifestyle



How Can Nutrition Help



Outcomes

*“**We had our baby!!!** She was 7 lbs 11oz, 21 inches! I labored for 36 hours and pushed for 4. Baby’s blood sugars were totally fine and so were mine. Thank you again Judy for everything on this 2+ year journey! I feel like we have our baby because of all the support and education from you! **I believe all the nutrition made a huge difference.**”*



Medical Nutrition Therapy

PCOS	Diminished Ovarian Reserve (DOR)
Endometriosis	Repeat Pregnancy Loss (RPL)
Type 2 Diabetes, Metabolic Syndrome	Eating Disorders
Pre-diabetes, Insulin Resistance	Male Factor Issues
Hypothalamic Amenorrhea (HA)	Weight Concerns

PCOS Guidelines

JCEM The Journal of Clinical Endocrinology
& Metabolism

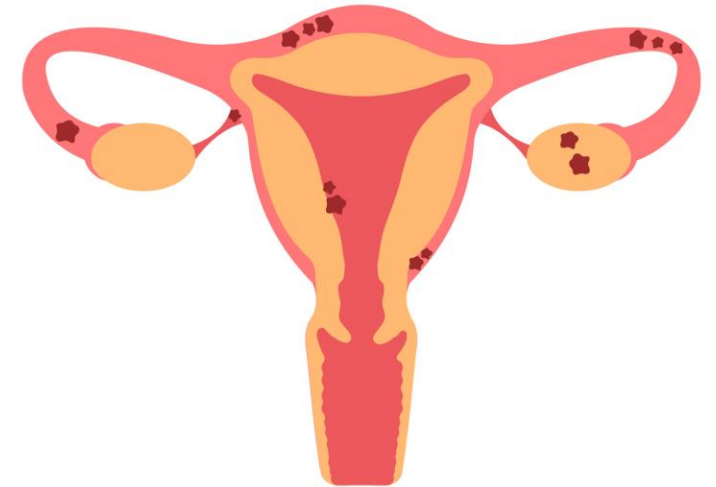
Volume 108, Issue 10, Pages 2447-2469, September 18, 2013

Recommendations From the 2023 International Evidence-based Guideline for the Assessment and Management of Polycystic Ovary Syndrome

Teede HJ, Tay CT, Laven JJE, Dokras A, Moran LJ, Piltonen TT,
Costello MF, Boivin J, Redman LM, Boyle JA, Norman RJ,
Mousa A, Joham AE.

Endometriosis

- **Implants of endometrium outside of the uterus**
- Diagnosis:
 - Surgery
 - Endometrial biopsy
 - Inflammatory
 - High estrogen state
 - 30- 50% women with dysmenorrhea
 - 30% women with infertility
- Frequent gastrointestinal symptoms:
 - Abdominal pain
 - Constipation
 - Bloating
 - Diarrhea



Weight Bias in Fertility Practice

- Patients experience **weight bias** in some fertility practices
- Unawareness of harm of weight stigma and weight cycling
- **Inequities** in access to care



FIT-PLEASE Trial

***Study Overview:** Randomized controlled trial examining preconception lifestyle intervention effects BMI ≥ 30 with unexplained infertility*

Groups:

- **Intensive Intervention:** Caloric restriction, meal replacements, Orlistat medication, increased physical activity (achieved ~7% weight loss)(n=188)
- **Standard Intervention:** Increased physical activity only (no significant weight loss)(n=191)

Primary Findings:

- Treatment: 12.2% healthy live births; Control: 15.2% healthy live births
- No improvement in pregnancy rates or time to pregnancy

FIT-PLEASE Trial, cont'd

Secondary Findings:

- Improved metabolic health from weight loss in intervention group
- Non-significant trend toward higher pregnancy loss in intensive group (33.3% vs 23.7%)

Key Takeaway:

Current evidence does not support recommending weight loss to improve fertility in women with obesity and unexplained infertility

Clinical Recommendation:

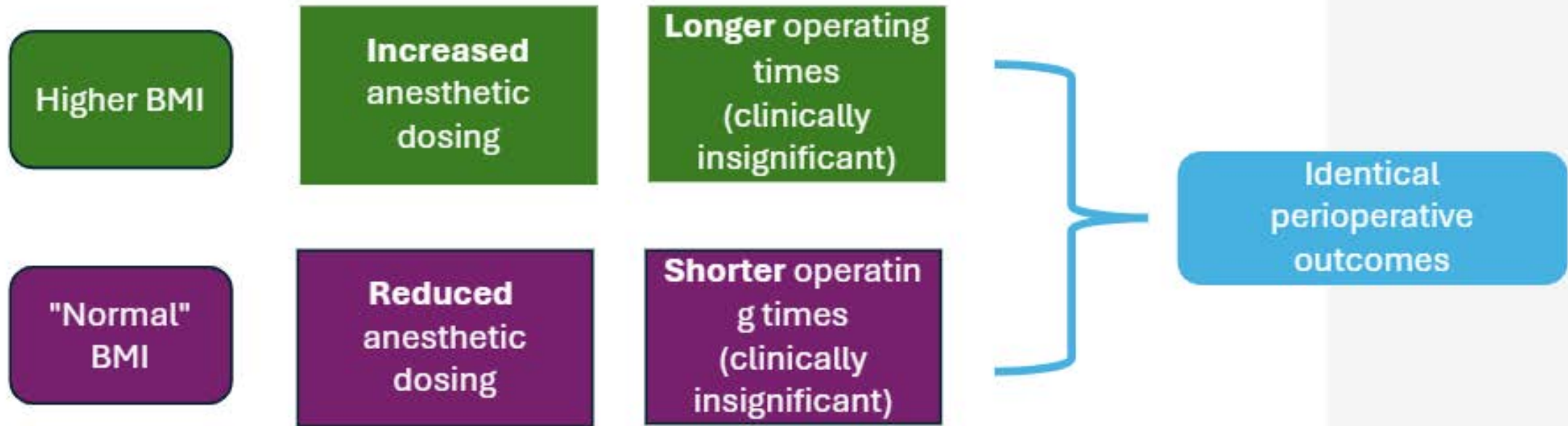
- Focus on overall health rather than weight loss as primary goal
- Consider metabolic health improvements as separate benefits from fertility outcomes

Focus on Health Outcomes

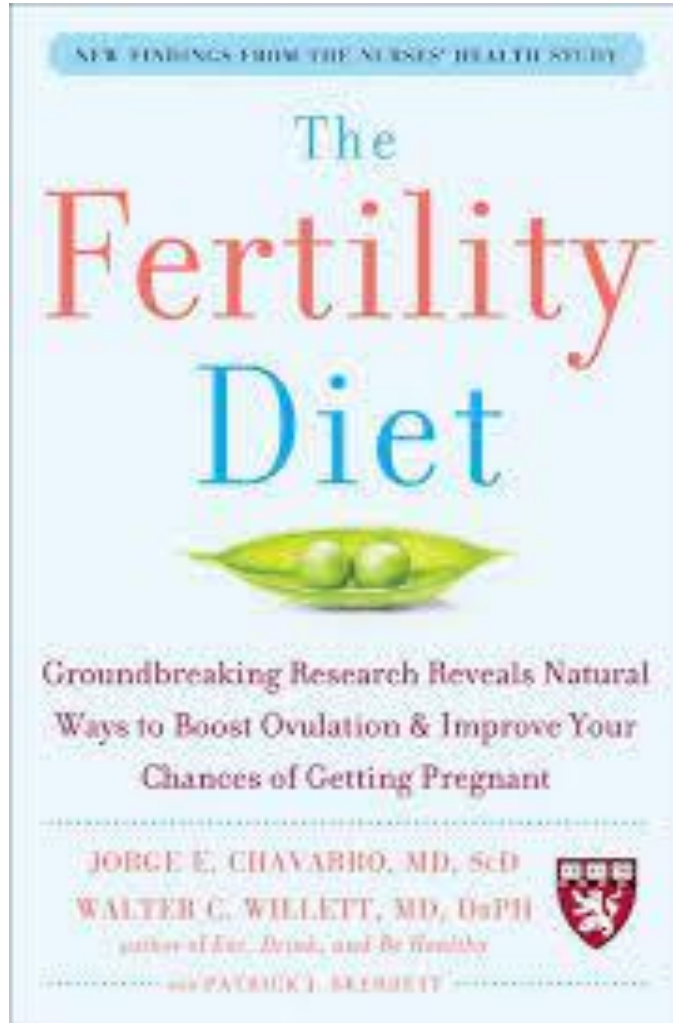
- Keto or Low Carb
- Intermittent fasting
- Restrictive or Rigid Weight Loss diets
- Relative Energy Deficiency in Sport (RED-S)
- Eating Disorders



Controlled ovarian hyperstimulation and IVF outcomes in patients with Class III/IV BMI versus normal BMI



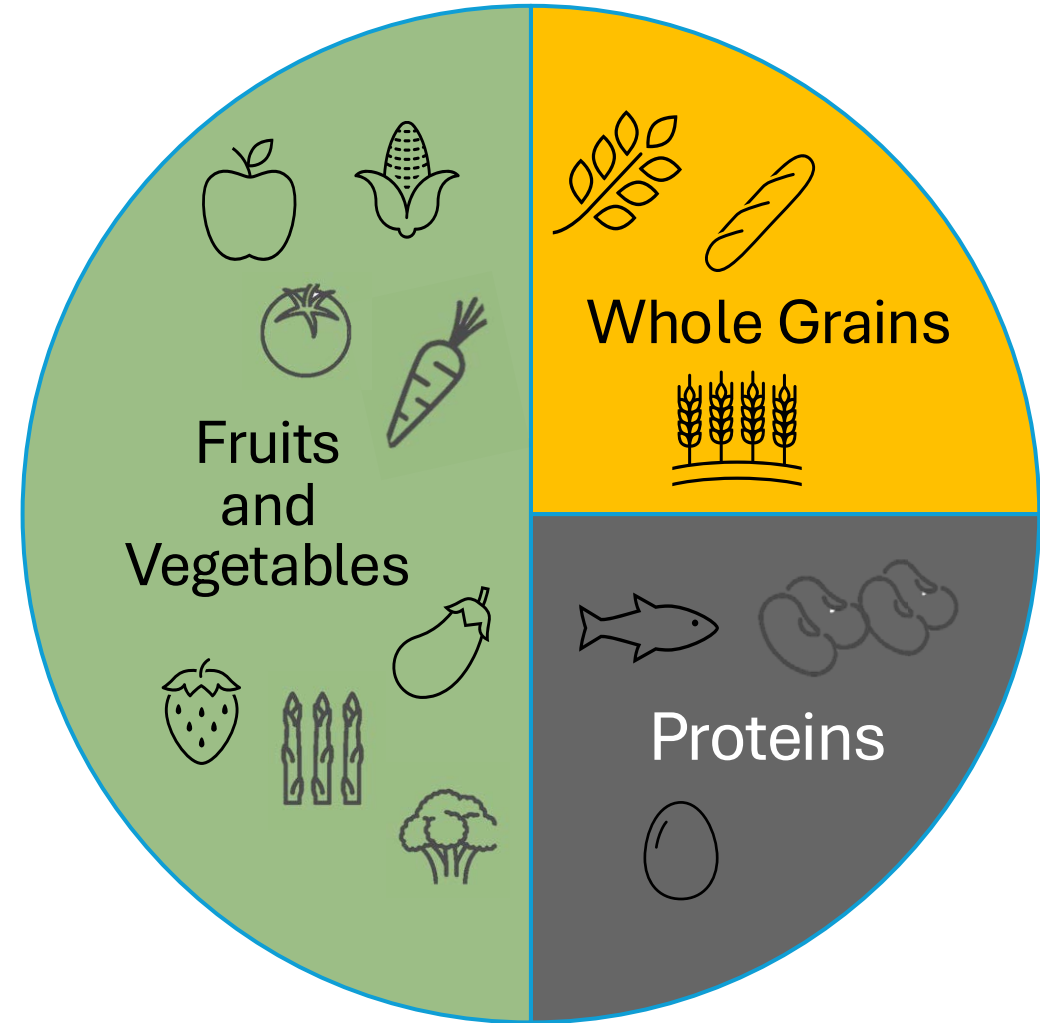
Nurses' Health Study 1989 “Fertility Diet”



The Fertility Diet Jorge E. Chavarro MD, ScD and Walter C. Willett, MD, DrPH, 2008

Fertility Nutrition Research

- Nurse's Health Study (1989): 17,5000 women were trying to conceive completed health surveys about lifestyle and pregnancy
- **“Fertility Diet”** may **improve fertility success** in otherwise healthy women



Nutrition and Lifestyle Assessment

- Reproductive history and fertility diagnosis
- Metabolic Health
- Diet history
- Supplements, herbs, medications
- Food allergies, intolerance
- Eating disorders
- Cultural preferences
- Culinary skills
- Lifestyle: Sleep, Movement, ETOH, Stress, Cannabis, Endocrine Disruptors, gut health

The Fertility Diet Recommendations

1. Avoid trans fatty acids
2. Cook with **monounsaturated fats**
3. Consume more **protein** from **plant sources** such as beans.
4. Chose more **whole grains**.
5. Consume **full fat dairy** once a day.
6. Take a **multivitamin** with folic acid and B vitamins
7. Get **iron** from vegetables sources and supplements.
8. Drink **water** in place of sugar sweetened beverages..
9. Lose as small amount of weight (5%) if menstrual cycles are irregular.
10. **Exercise** 30 minutes or more daily.

Earth Study Findings

Pro Fertility Diet

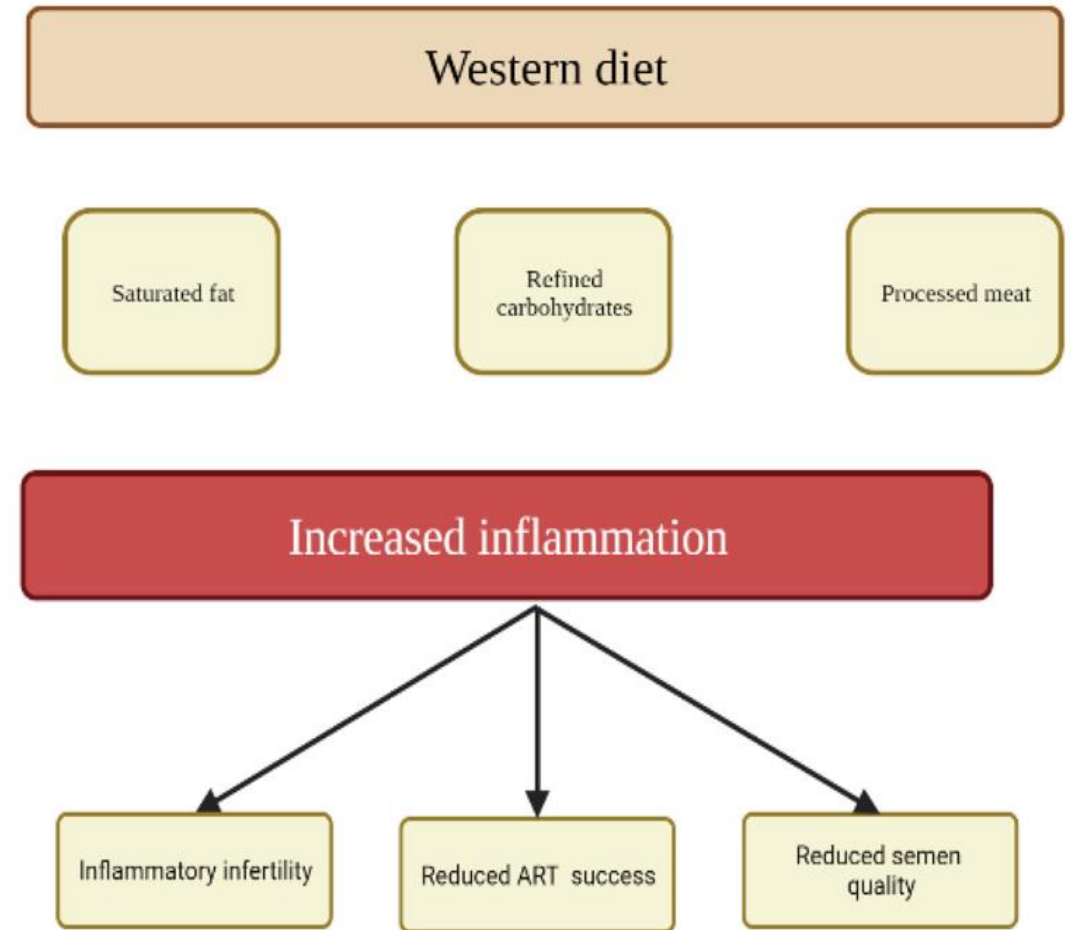
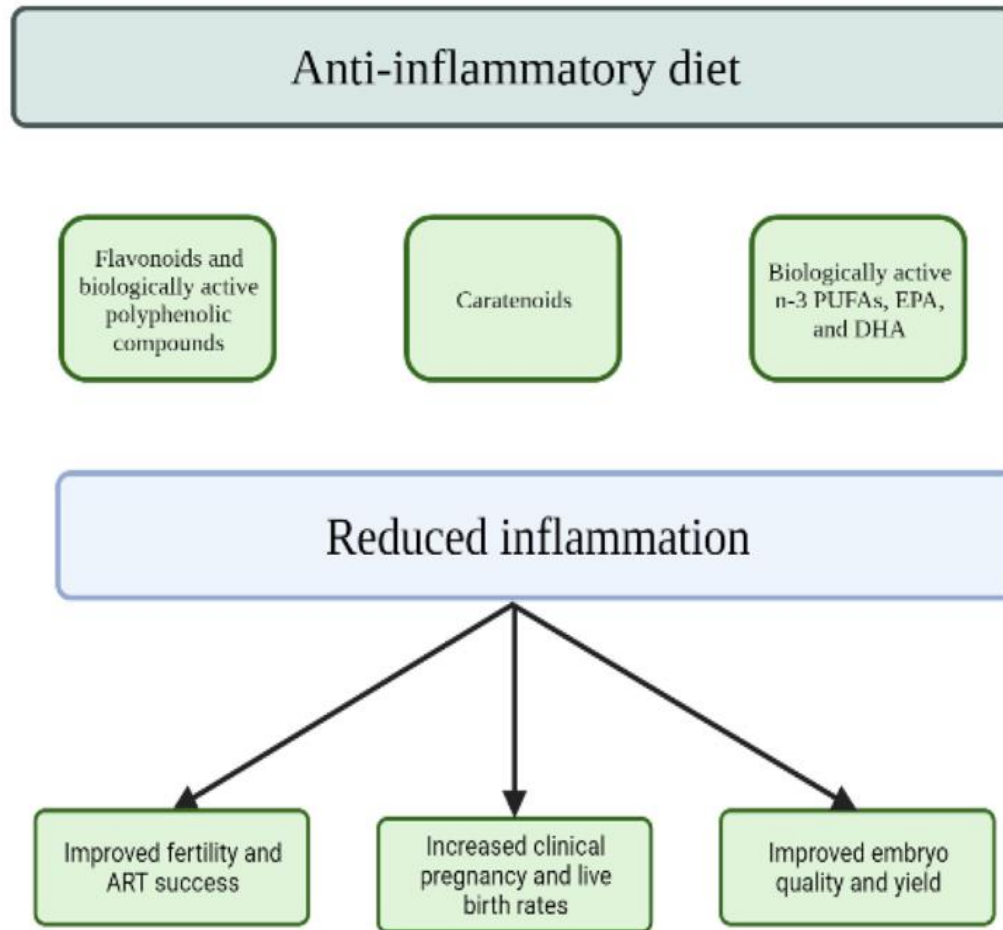
- Supplement Vitamin D and B12 if deficient
- Folic acid 800-1000 mcg daily for everyone
- Consume fish rather than other sources of animal protein
- Diets rich whole grains, seafood, dairy and soy

"...**pro-fertility diets** enhances the body's capability to **synthesize, repair, and methylate DNA**, suppress oxidative stress and support antioxidant defense, reduce systematic inflammation, and **regulate glucose and insulin metabolism**." (Gaskin, et al 2019)

Plant Forward Diet Patterns

- **Reduce inflammation**
- Promote uterine environment and implantation
- **Low glycemic** to reduce inflammation and insulin resistance
- Rich in **antioxidants** to strengthen sperm and egg function





What role does inflammation play?

Bodily process in response to injury or infection.



Prolonged sub-chronic inflammation can have adverse effects on fertility.



Disruption menstrual cycle, implantation failure, endometriosis, recurrent miscarriage.



Interfere with pathways for normal ovulatory activity



Negative impact on sperm quality

Plant Based Diet Patterns Associated with Positive Outcomes

The Effect of Dietary Patterns on Clinical Pregnancy and Live Birth Outcomes in Men and Women Receiving Assisted Reproductive Technologies: A Systematic Review and Meta-Analysis

Nicole J Kellow,¹ Jake Le Cerf,¹ Fabrizzio Horta,^{2,3} Aimee L Dordevic,¹ and Christie J Bennett¹

¹ Monash University Department of Nutrition, Dietetics, and Food, Melbourne, Victoria, Australia; ² Monash Health Department of Obstetrics and Gynecology, Melbourne, Victoria, Australia; and ³ Monash IVF, Clayton, Melbourne, Australia

Fertility Nutrition Focus

- Fish 2-3 servings per week
- Seeds, nuts daily
- Whole grains
- Fruits
- Vegetables
- Soy, lentils, beans
- Eggs
- Olive or avocado oil



Micronutrients

- **Folate** is critical in gametogenesis, fertilization and pregnancy
- 0.4-0.8 mcg folic acid recommend to prevent neural tube defects.
- ↓ Infertility
- ↓ Miscarriages
- ↑ Treatment success
- Leafy greens, legumes, citrus, avocado, fortified grains



Vitamin D and Reproductive Health

Maternal Vitamin D deficiency :

- Increases the risk of gestational diabetes
- Increases the risk of pre-eclampsia
- May improve IVF outcomes
- Associated with risk for miscarriage



Palacios, Cristina, et al. "Vitamin D supplementation during pregnancy: Updated meta-analysis on maternal outcomes." *The Journal of steroid biochemistry and molecular biology* 164 (2016): 148-155.

Macronutrients: Carbohydrates



Evidence suggests that a diet...

- *low in glycemic load*
- *with greater amounts of whole grains benefits fecundity*
- *rich in fiber and minerals*

...may reduce estrogen levels
but not affect either the risk of
infertility or ART outcomes

Macronutrients: Dietary Fats



- Oocyte maturation and quality
- Ovulation and fecundity
- Embryo implantation
- Important substrates for a wide range of functions within the reproductive system

Macronutrient: Protein (Animal- or Plant-Based)



- Research evaluating **soy intake** or supplements amongst couples undergoing IVF were found to be beneficial
- Limited evidence on **white meat** intake and fertility
- **Fish** twice a week associated with shorter time to conception.
- **Plant protein** increased benefit of fiber, vitamins and minerals
- Reducing frequency of **red meat** and processed meat may improve fertility.

Gut Health: Fiber

- Cruciferous vegetables
- Prebiotic and probiotic
- > 25 gm fiber daily
- Dietary diversity
- Reduce estrogen levels
- **Plant forward** diets have more fiber!



Nutrition Supplements

Food First

- Prenatal supplement (3 months prior to conception)
- Vitamin D if low (< 30 ng/mL)
- PCOS: Inositols may be beneficial
- Omega 3 DHA and EPA
- Vegans: additional B12 and Choline
- Additional iron if ferritin is low (< 30 ng/mL)
- Third party independent tested (content verified)
- Beware of supplements claiming to balance hormones



Estimation of Total Usual Dietary Intakes of Pregnant Women in the United States

Regan L. Bailey, PhD, MPH, RD; Susan G. Pac, MS, RD; Victor L. Fulgoni III, PhD; Kathleen C. Reidy, DrPH, RD; Patrick M. Catalano, MD

- **Dietary supplements** do help women **increase** intake of **key nutrients**.
- Significant number of women are **not meeting recommendations** for key nutrients: Vitamins A, C, D, E and K as well as iron and folic acid, calcium, magnesium and choline even with supplements.
- Some women are exceeding the UL for some nutrients because of supplements.
- Responsible formulations (standards) would benefit pregnant women.

Prenatal Supplements

- OTC or prescription
- No standards for PNV
- ACOG recommends multivitamin with at least 400 mcg folic acid
- Wide variation in cost, formulation and content

Commercially Available Prenatal Vitamins Do Not Meet American College of Obstetricians and Gynecologists Nutritional Guidelines

Fei Cai, MD¹, Benjamin K. Young, MD, MS², Jennifer A. McCoy, MD, MSCE¹

¹Division of Maternal Fetal Medicine, University of Pennsylvania, Philadelphia, Pennsylvania

²Department of Ophthalmology, Casey Eye Institute, Oregon Health and Sciences University, Philadelphia, Pennsylvania

Folic Acid vs. Methylfolate (5-MTHF) Supplements

- 5-MTHF may help reduce symptoms for some health outcomes
 - Extremely limited number of RCTs comparing 5-MTHF vs. folic acid for some health outcomes
- No RCTs have assessed 5-MTHF for NTD prevention
- **Folic acid is the only folate form recommended for NTD prevention by USPSTF, IOM, USPHS, ACOG**
 - No clinical justification to substitute 5-MTHF for a proven, safe, effective dosage of folic acid for NTD prevention



Vitamins and Supplements

	Recommended or optional	Outcomes
Folic acid	Recommended	Reduces risk of NTD, essential DNA formation and cell division
Vitamin D	Recommended	Steroid hormone supports Ovulation, bone remodeling, reduces adverse outcomes pregnancy
Antioxidants	Optional	May improve pregnancy rates.
CoQ10	Optional	Supports mitochondrial energy production
Vitamin B12	Recommended	Supports DNA production, cell metabolism, nerve function, red blood cell formation.

Vitamins and Supplements

	Recommended or optional	Outcomes
Iron	Recommended	Supports red blood cell production.
Zinc	Recommended	Support cell division, cell growth, immune system.
Choline	Recommended for women who don't consume eggs or animal products.	Reduce risk of NTD and aids in brain development.
DHA	Recommended for those who don't eat fish.	Supports brain and neurological health.
Inositol	Optional for those with PCOS	Improves insulin sensitivity, may help ovulation.

Coenzyme Q10: Treatment Considerations

- Ubiquinone vs. Ubiquinol?
- What daily dose and what duration of treatment?
- **Bioavailability** issues
 - Large, fat-soluble molecule – absorption generally poor
 - Significant variation in dissolution and absorption among different supplement
- **CoQ10 may help reduce oxidative stress and mitochondrial dysfunction, so far it hasn't shown increase in birth outcomes.**

Case Study

36 yo female

DX: RPL and possible endometriosis

List your prescribed drugs, prescribed and non-prescribed supplements and herbs		
Name the Drug, Supplement or Herb	Strength	Frequency Taken
Levothyroxine 25 mcg 1x/day	Vitamin E 400 IU 1x/day	Omeprazole 20mg 1x/day
B12 1000 mcg 1x/day	Vitamin C 500mg 1x/day	Inositol-D Chiro inositol 2000-50mg 1x/day
Prenatal vitamin	Probiotic	Rizatriptan/Metoclopramide as needed for migraine
L-arginine 1000mg 2x/day	Pycnogenol 100mg 1x/day	
Fish oil 1250mg 1x/day	Acai 500mg 2x/day	
CoQ10 400mg 2x/day	Aspirin 81mg 1x/day	

Magnesium Citrate 360 mg and Riboflavin 400 mg for migraines

Antioxidants

- **Antioxidants from food sources** have been shown to be beneficial for fertility.
- **Antioxidants from supplements** are of limited value. Cochrane review 2020
- N-acetylcysteine, melatonin, L-arginine, myo-inositol, carnitine, selenium, vitamin C, E, and omega-3



Nuts and Male Fertility



- A 14-week RCT (n=119) added 60 g of nuts/day on top of men's usual Western diet
 - Increase in total sperm count, motility, and morphology
 - Decrease in sperm DNA fragmentation
 - Increase in the orgasmic function and sexual desire

Supplements and male fertility

- Despite low-quality evidence, supplements have always been part of the management of male infertility
- Antioxidants are seen a way of counteracting the detrimental effect of oxidative stress on sperm quality
 - Methyl donors
 - Energy production /motility



Antioxidant Supplements and Male Infertility



Trusted evidence.
Informed decisions.
Better health.

Cochrane Database of Systematic Reviews

[Intervention Review]

Antioxidants for male subfertility

Conclusions:

- For **semen parameters**, findings were unreliable as heterogeneity was extremely high in each analysis
 - The use of antioxidants *may* improve a couple's chances of live birth

“Overall, the **quality of evidence was low to **very low** ...”**

and

“Subfertile couples should be advised that overall, the **current evidence is inconclusive based on serious risk of bias.”**

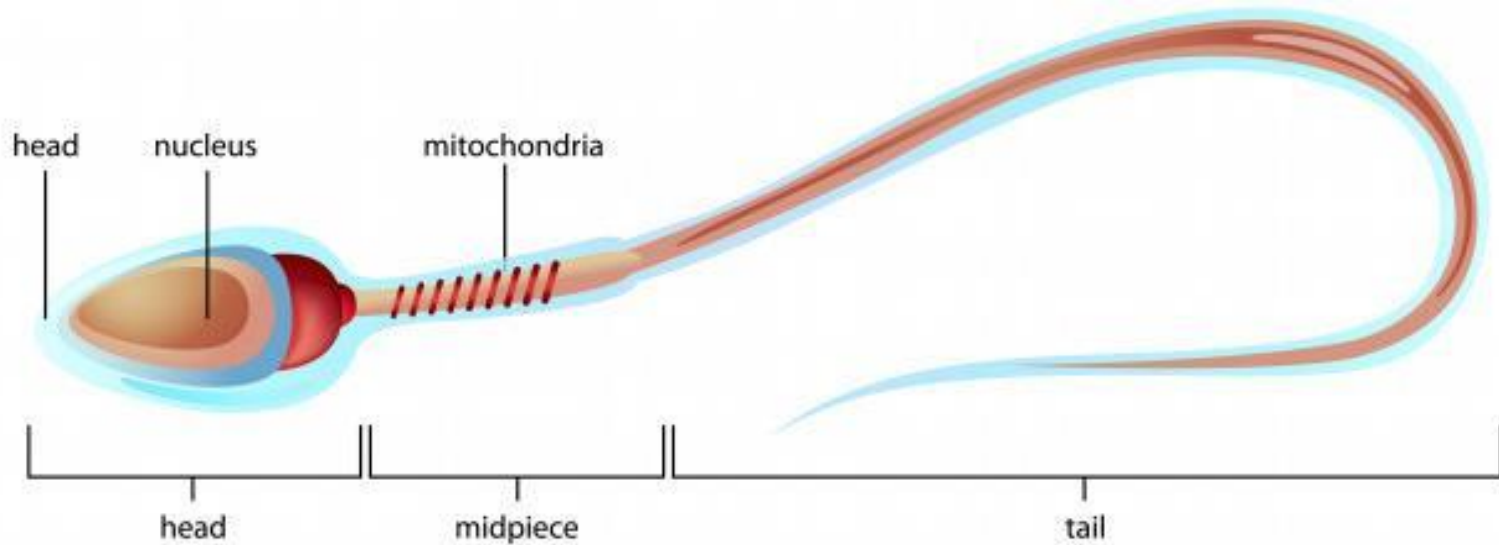
Male Factor

- **Sperm quality** can decline with
 - *Age*
 - *Weight*
 - *Chronic disease*
 - *Environmental exposures*
- Counsel male partners on a healthy diet: beware of bro culture
- Ask about alcohol, tobacco, cannabis



Sperm are particularly sensitive to oxidative stress

- Almost entire cell is filled in nucleus – rest dedicated to functional necessities
- Only essentials on board



Culinary Medicine for Fertility

- Evidence-Based
- **Food as Medicine**
- Brings together nutrition and culinary skills to improve fertility
- Preconception window all men and women should aim for to improve their **nutritional intake** for **optimum fertility** and pregnancy outcomes.

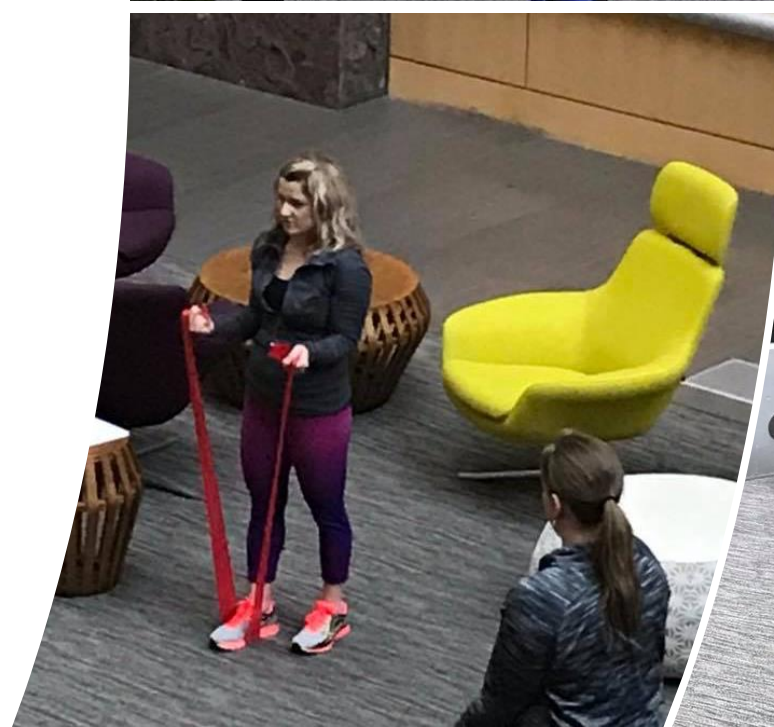


Food for Fertility Group Classes

Dietitian/Physician Collaboration



Movement
fitness,
yoga,
walking



Endocrine Disruptors & Fertility

- Chemicals that can **interfere with hormones** by mimicking, blocking, or altering hormone production, transport, or metabolism—often at **very low doses** and during **critical reproductive windows**
- EDC exposure has been associated with: lower ovarian reserve and oocyte quality
 - Altered menstrual cycle length
 - ↓ semen quality (count, motility, morphology)
 - ↑ miscarriage risk and IVF cycle disruption

Common EDCs of Concern

- **Bisphenols (BPA, BPS)** – plastics, can linings
- **Phthalates** – fragrances, personal care products, vinyl
- **PFAS (“forever chemicals”)** – non-stick cookware, food packaging, stain-resistant fabrics



Bisphenol A (BPA)

- BPA is an **endocrine disruptor** that can impact estrous cyclicity, cell proliferation in the pituitary, and affect the hypothalamic-pituitary axis.
- Infertile women have higher measurable BPA levels than fertile women.
- May impact uterine morphology for several generations.
- National Institute of Environmental Health Sciences (NIEHS) suggests that avoiding BPA exposure when pregnant or breastfeeding.

Minguez-Alcaron et al (2017) Female exposure to endocrine disrupting chemicals and fecundity: a review *Current Opinion in Obstetrics and Gynecology* 29 (4) 202-11

Ziv-Fgal et al. (2016) Evidence for bisphenol A-induced female infertility: a review *Fertility and Sterility* 106 (4) 827-856

Cooking and Food Prep

- Reduce usage of canned foods. Instead, try to buy food that comes in **glass jars** (or fresh or frozen foods.)
- **Avoid cooking your food in plastic containers**, as you might do when microwaving. Use glass or ceramic containers.
- Do not reuse water bottles that are meant to be disposable.
- Avoid cooking with non-stick pans.



- Exposure during adulthood is linked to **decreased fertility**, alterations in sperm, and decreased testosterone levels.
- Higher levels in mothers during pregnancy are linked to **anatomical changes** in infant boys that may affect their future fertility.
- **Avoid products with scents**

Endocrine Disruptors

Outdoor air quality:

- Keep windows closed high traffic areas
- Consider air purifiers
- Reduce exposure wildfire smoke

Indoor air quality:

- Use exhaust fans when cooking
- Limit use of indoor fireplaces, candles, and air fresheners
- Vacuum and dust with a damp cloth, reduce dust build up

Conclusions

- **Nutrition & lifestyle strongly influence fertility**

- **Plant-forward, whole-food patterns support preconception, fertility and pregnancy.**

- **Critical nutrients matter**
Folic acid, vitamin D, omega-3s, B12, iron & choline.

- **Food-first foundation**

- **Reduce exposure to endocrine disruptors**

- **Lifestyle optimization improves outcomes**
Sleep, stress management, movement & overall health enhance fertility and pregnancy success.

Thank you for joining us today.

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short survey after the webinar to
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Keith Hine, MS, RD

VP of Healthcare, Sports & Professional Education
Orgain, LLC

keith.hine@orgain.com



WEBINAR PRESENTER:

Judy Simon, MS, RDN, CD, CHES

Reproductive Nutrition Specialist

judy@mind-body-nutrition.com



ORGAIN INQUIRIES:

medinfo@orgain.com

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