



THE HORMONE HEALTH MASTERPLAN | HEAL London 2018
Dr. Jaclyn Chasse, ND

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PROPER HORMONE BALANCE RESTS ON 5 KEY PILLARS

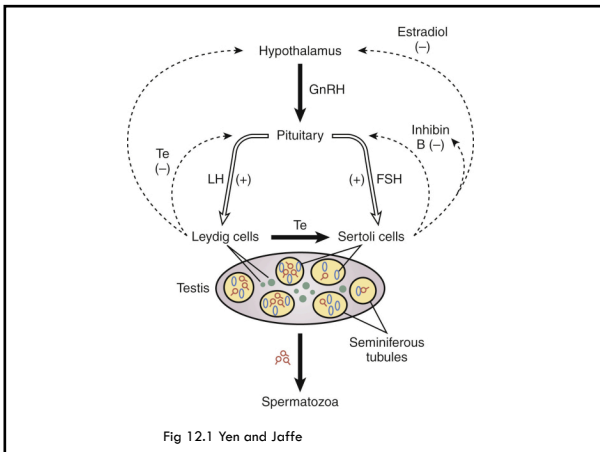
- Nutrition
- Movement
- Stress
- Environment
- Sleep

TODAY WE'LL COVER:

- The basics of men's and women's hormonal health
- The 5 key pillars including key interventions to drive hormonal balance
- The relationship of the adrenal & the thyroid with reproductive hormones
- How to ensure clients' hormone balance with the BASICS
- What to do when that's not enough!



MALE HORMONE BALANCE



- Alcohol (toxic to leydig cells, inhibit testosterone synthesis)
- Marijuana (inhibits pituitary function)
- Testosterone (inhibits pit fxn)
- Tricyclic antidepressants, antipsychotics (ejaculatory dysfunction)
- MAO inhibitors

COMMON COMPOUNDS NEGATIVELY AFFECTING MALE HORMONE BALANCE & PERFORMANCE



produced by interstitial Leydig cells

provides negative feedback to decrease secretion of GnRH and LH

secreted in pulsatile pattern at 20-30 min intervals

usually 5-6 mg secreted per day

has direct effect on skeletal growth (increases bone density), pubertal sexual development, spermatogenesis, and sex drive.

TESTOSTERONE

PRODUCTION OF TESTOSTERONE

Cholesterol → pregnenolone → DHEA → androstenediol → **testosterone** → DHT

Testosterone has direct negative feedback effect on:

- the hypothalamus, decreasing the secretion of GnRH
- the pituitary, decreasing the secretion of LH

TESTOSTERONE

Potent anabolic effects

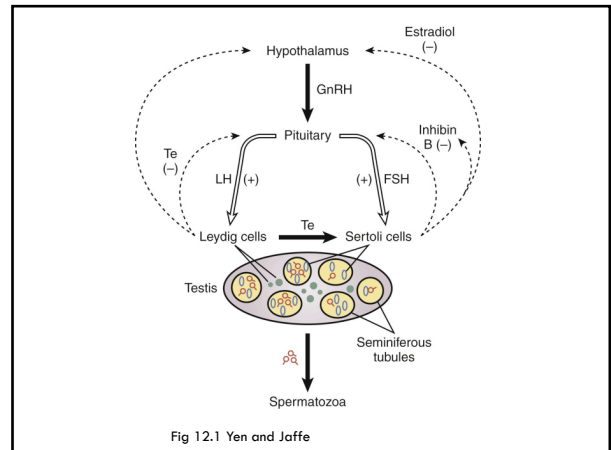
Acts as prohormone- undergoes conversions to other hormones including Estradiol and DHT

High cortisol can inhibit testosterone secretion*

Jad A., Anderson AA, Pedersen SA, et al. Effect of growth hormone replacement therapy on IGF-related parameters and on the pituitary growth axis in GH-deficient males. A double-blind, placebo-controlled crossover study. *Horm Res* 1996; 49:266.

HORMONAL EVALUATION

- Low testosterone
- Low LH/FSH indicative of hypogonadotropic hypogonadism
 - Stress is primary driver, much like in females
 - Can test pituitary fxn with cortisol (8am) and thyroxine
 - Prolactin and iron saturation are other considerations for testing
- High FSH/LH could be indicative of primary panhypogonadism



DIHYDROTESTOSTERONE (DHT)

Produced by Sertoli cells in/around seminiferous tubules

Testosterone → DHT catalyzed by 5α-reductase
 • DHT can not be converted back into testosterone

Influences development of secondary sex characteristics in adolescence

After puberty, DHT generally has undesirable effects
 • Causes male pattern baldness and BPH in adult males
 • Causes hair thinning and hirsutism in adult females

Serenoa repens is a 5α-reductase inhibitor, and can be used to selectively suppress the undesirable effects of DHT.

Required for the development of the prostate gland, urethra, scrotum, and penis from the urogenital sinus

LOW TESTOSTERONE SCREENING

Question	Points
1. I have trouble keeping my mind focused and on task	1
2. I often fall asleep after dinner	1
3. I have a decrease in libido (sex drive)	3
4. I'm more frequently sad/grumpy	1
5. I have a lack of energy that makes it difficult to get through the day.	2
6. My erections are less strong than they used to be.	4
7. I've noticed a deterioration in my work performance	2
8. I've noticed a decrease in my strength, endurance, or athletic performance	2
9. I'm not getting morning erections as frequently.	2
10. I have noticed a recent decreased "enjoyment of life"	1
11. I have recently lost height/gotten shorter	2
Total Points	

0-2 points: You are pretty healthy- lucky you! While you have some signs of a decreasing testosterone, your symptoms may also be unrelated. You should try the lifestyle recommendations we'll talk about in the program first.

3-5 points: You have signs that suggest that you might have low testosterone. It's worthwhile for you to follow up with testing to determine where your levels are at, and to treat as appropriate.

6+ points: Your symptoms are very likely related to low testosterone, and you have enough signs that warrant a proper evaluation and treatment.

LOW TESTOSTERONE SCREENING

MOOD	MUSCLE	MOJO
1. I have trouble keeping my mind focused and on task	2. I often fall asleep after dinner	3. I have a decrease in libido (sex drive)
4. I'm more frequently sad/grumpy	5. I have a lack of energy that makes it difficult to get through the day	6. My erections are less strong than they used to be.
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LOW TESTOSTERONE TESTING

Testosterone
 Optimal (if treating)
 Age 25-45 600-900 ng/dL
 Age 45-55 500-800 ng/dL
 Age 55-65 375-700 ng/dL
Most men feel best between 600-750 ng/dL

Free Testosterone
 Optimal
 90-225 pg/mL
 1.5-3% of the total T

LOW TESTOSTERONE TREATMENT

A comprehensive **Multivitamin** will ensure you have a good nutritional foundation. We recommend one with adequate vitamin D, B vitamins, Magnesium, and Zinc.

If you don't consume fish at least twice per week, we recommend taking at least 1000 mg daily of omega 3s through a high-quality **fish oil** supplement.

Zinc, magnesium, and Vitamin D are all commonly deficient in American men, and are cofactors required for testosterone synthesis.

Rhodiola is an herb that is well known to support adrenal gland function (the gland responsible for cortisol production, a key hormone used for stress management). In addition, it's known to support healthy hormonal communication patterns starting in the brain. It's a great herb to help to address any underlying miscommunication resulting in low testosterone.

Other Herbs to support Testosterone include Saw Palmetto, Nettle seed, Tribulus, Shilajit, Maca, Deer Antler Velvet, Yohimbe, and others. Choosing the best herbs depends on exactly what's going on with you. There are a couple of combo formula recommended above.

TESTOSTERONE REPLACEMENT THERAPY

Topical Forms

AndroGel: A very popular topical gel. Typically, a 1% -1.6% gel is prescribed, and 2-4 pumps applied each morning.

Injectable Forms:

Testosterone Cypionate: This form of testosterone has a half-life of 6 days (meaning 50% of the initial dose is metabolized in 6 days). Starting dose 50-100 mg dosed every 3 days.

Testosterone enanthate: 50-100 mg dosed every 3 days

Testosterone propionate: 25-50 mg every other day (dosed more frequently due to a half life of only 2 days)

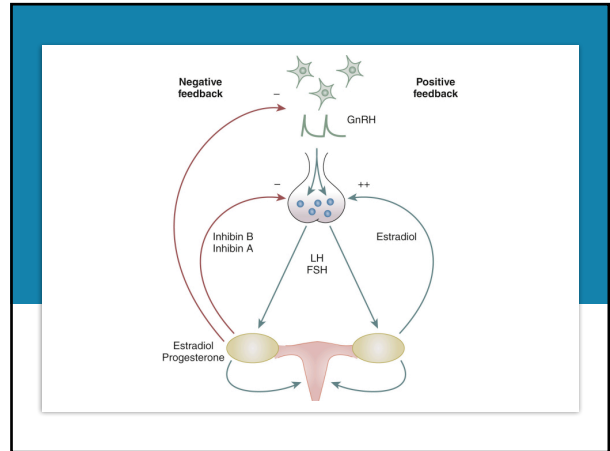
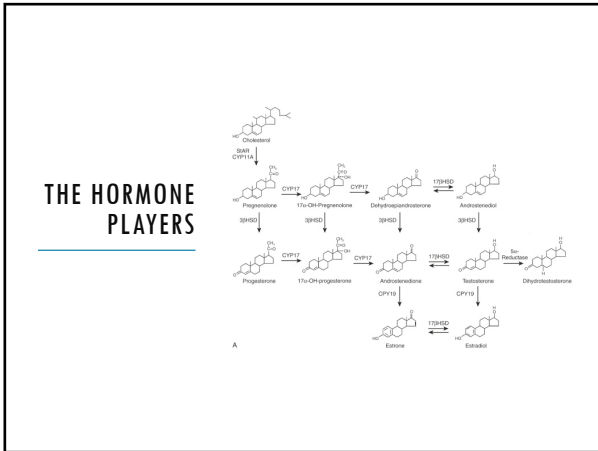
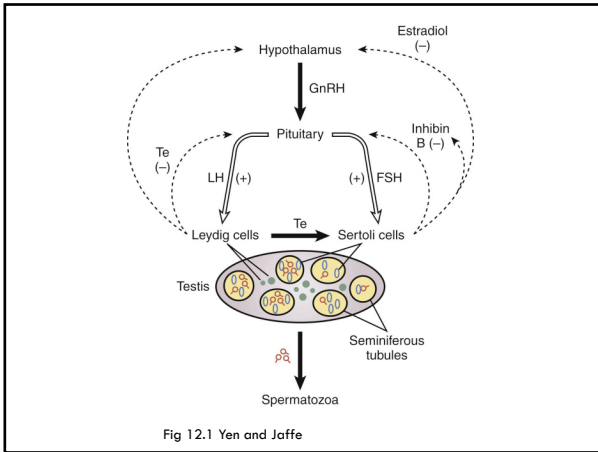
Testosterone undecanoate (ie Avedis): Weeks between injections

Patches are also available, and are used (similarly to other topicals (for patches).

If client is trying to conceive (in the next year):

You're going to want to stay away from outside testosterone dosing. A good option is:

Clemdid (Clemiphen citrate): 50-100 mg taken orally every other day

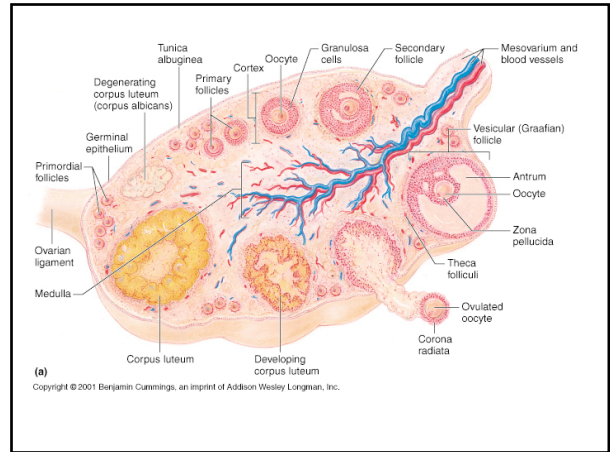
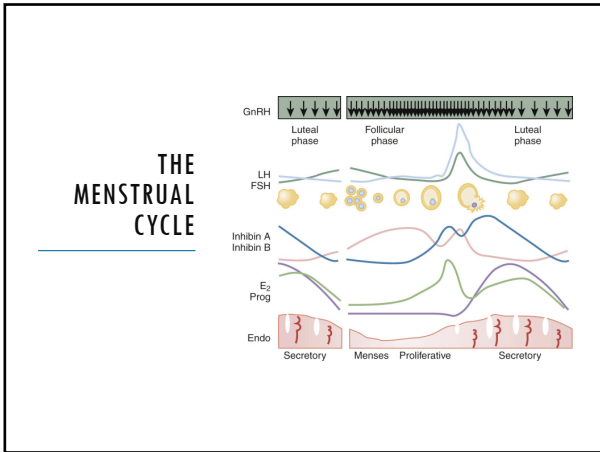


THE HORMONES

- _____
- GnRH
- _____
- LH
- _____
- FSH
- _____
- Estrogen
- _____
- Progesterone

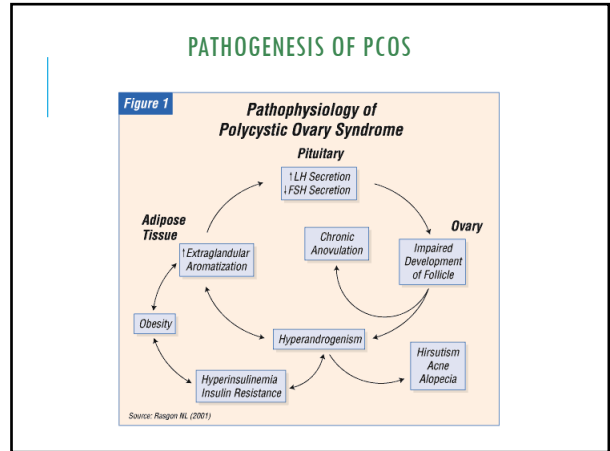
SUPPORTING HORMONES

- TSH
- Cortisol
- Prolactin
- Inhibin



HORMONAL CHALLENGES

- PCOS
- Anovulation & Oligo-ovulation
- Estrogen Dominance (Fibroids, endometriosis, etc)
- OCP withdrawal
- Hypothalamic Anovulation/lack of periods
- Menopause (not a disease!)



RISK OF DEVELOPING TYPE 2 DIABETES

- PCOS and Metabolic Syndrome:
 - 30-50% will develop Type 2 Diabetes
 - 10-30x higher risk of Type 2 Diabetes over normal population
- If obese, family history of Type 2 Diabetes, or evidence of insulin resistance:
 - Measure fasting insulin and glucose
 - Consider 2 hour modified glucose challenge

ENDOCRINE SYSTEM IS INTIMATELY CONNECTED!

That brings us to the 5 Pillars that stabilize (or derail!) hormones:

- Nutrition
- Movement
- Sleep
- Stress
- Environment



MEDITERRANEAN DIET AND FERTILITY IN WOMEN

Greatest adherence to Mediterranean diet pattern (vs. western diet) showed lowest difficulty of getting pregnant in 2154 Spanish women aged 20-45 years.

Netherlands study of 161 couples undergoing IVF/ICSI demonstrated that Mediterranean diet adherence increased the probability of pregnancy (odds ratio 1.4). It was also associated with high folate and B6 in red blood cells and follicular fluid

Toledo E et al. Fertil Steril. 2011 Nov;96(5):1149-53.
 Vujkovic M et al. Fertil Steril. 2010 Nov;94(6):2096-101.

Mediterranean Diet Pyramid

FOOD GROUPS

- Meats and sweets
- Poultry, eggs, cheese and yogurt
- Fish and seafood
- Fruits, vegetables, grains (mostly whole), olive oil, beans, nuts, legumes, seeds, herbs and spices

GUIDANCE

- Less often
- Moderate portions, daily to weekly
- Often, at least two times a week
- Base every meal on these foods

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PF MODIFICATIONS TO MEDITERRANEAN DIET

- Increase PUFAs through food or supplementation
- Eat more fats, and healthy fats only!
- Every meal focused on veggies & fruits
- Limit the grains (this depends upon the individual, but for most)
- Low intake of commonly allergenic/inflammatory foods like gluten & dairy
- Load up with Spices

ANTI-INFLAMMATORY DIET

RED WINE (optional)
No more than 1/2 glass a day

SUPPLEMENTS
Daily

HEALTHY HERBS & SPICES such as garlic, ginger, turmeric, cinnamon (dried/infused extracts)

OTHER SOURCES OF PROTEIN (high quality natural cheeses and yogurt, omega-3 enriched eggs, salmon, poultry, lean meats) 1-2 x week

COOKED ASIAN MUSHROOMS
1-2 times a week

WHOLE SOY FOODS (edamame, soy milk, soy curls, tofu, tempeh) 1-2 x day

FISH & SEAFOOD (wild-caught salmon, sardines, Atlantic haddock, cod, sea bream) 2-3 x week

HEALTHY FATS (extra virgin olive oil, wildflower pressed canola oil, rapeseed, avocado, avocado, seeds - including hemp seeds) and healthy ground flaxseed 1-2 x day

WHOLE & CHAIRED GRAINS
3-5 x day

NUTS & LEGUMES
2-3 x week

VEGETABLES (dark leafy greens and cruciferous, lots of color) 4-5 x day (at least 1 cup of each vegetable, except when possible) 4-5 x day minimum



FRUITS (fresh in season or frozen, organic when possible) 4-6 x day

REMINDE PATIENTS WHAT THEY CAN EAT!

Veggies (1-2 cups/meal)	OR	Fruits (1-2 cups/meal)
Kale		Apple
Chard		Orange
Collard		Cherries
Asparagus		Raspberries
Green beans		Blackberries
Broccoli		Blueberries
Cauliflower		Pomegranate
Sugar snap peas		Grapes
Peppers		Cantaloupe
Cucumber		Honeydew melon
Corn		Watermelon
Zucchini		Figs
Fennel		Dates
Lettuce		Cranberry
Spinach		Mango
Tomato		Peach
Onions		Pear
Bok choy		Plum
Celery		Nectarine
		Kiwi
		Grapefruit
		Pineapple
		Strawberries

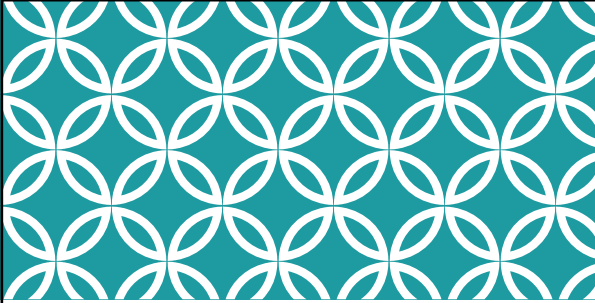
HEALTHY FATS

- Olive oil (1tbsp)
- Avocado
- Nuts (walnuts, almonds, cashews, pecans, brazil nuts)
- Seeds (pumpkin, sunflower)
- Animal fats (Organic only- lard, grass fed butter, etc)

CULINARY SPICES!

- Turmeric
- Cilantro
- Basil
- Any others!
- Rosemary
- Sage
- Chili powder
- Garlic
- Oregano
- Paprika
- Thyme
- Parsley



MOVEMENT

HIIT, ME, & RESTORATIVE EXERCISE

5 x 5 x 10


Exercises Sets Repetitions

- Squat
- Dead Lift
- Row
- Bench
- Shoulder Press

5 sets

10 reps to max

- Weight training with barbells, dumbbells, kettlebells, or machines
- Using large muscle groups with explosive movement.
- Using weights that will allow you to do 10 reps to max or failure.
- This protocol has been shown best for elevating T.
- Variation could be 3 days per week of 5 x 5 x 10 with 2 days per week HIIT.




STRESS

STRESS MANAGEMENT

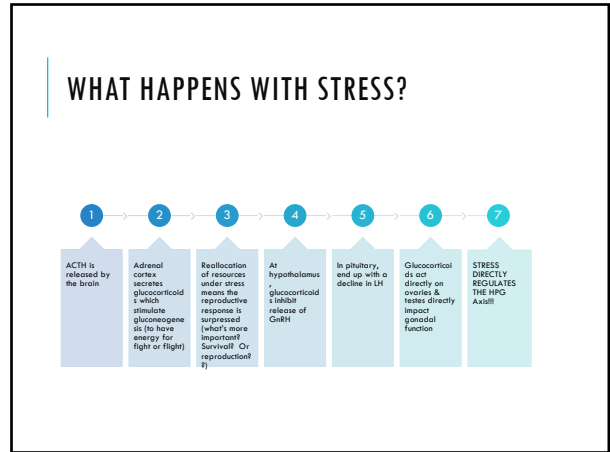
Stress mediators can be both protective and damaging. High levels of stress can lead to "allostatic overload", meaning a chance in stability of physiological systems affecting fertility.

The link between stress and female fertility exists even independent of stress hormone levels

Selye observed ovarian atrophy in response to stress in rats. Additional studies have confirmed that stress inhibits HPG axis.

STRESS IN THE BRAIN

- Stress-induced rise in glucocorticoids suppresses GnRH secretion. This can result in Hypothalamic Hypogonadism in women, and low testosterone in men
- Can lead to reproductive dysfunction
- Can include infection, malnutrition, anxiety, or depression



CHRONIC STRESS IN MEN

Glucocorticoids released in stress affect men through interaction at the hypothalamus & pituitary, but also at the testes!

- Reduced secretion of GnRH, LH, and FSH in the brain
- changes LH receptor function in the testes, so under stress, even if LH is normal, testosterone will not be produced at the same rate
- Glucocorticoids can induce Leydig cell apoptosis, reducing number of Leydig cells (which make testosterone)
- GC promote apoptosis of sperm directly within the seminiferous tubules, and can affect spermatogenesis
- GC reduce mitochondrial membrane potential, generating ROS
- Leydig cells are primary cell type expressing glucocorticoid receptor and are very sensitive to stress

CHRONIC STRESS IN WOMEN- OVARY

Glucocorticoids released in stress affect women through interaction at the hypothalamus & pituitary, but also at the ovaries & uterus!

- Reduced secretion of GnRH, LH, and FSH in the brain
- Modulates metabolic hormones & growth factors like insulin-like growth factor 1
- GR receptors on ovary in follicles, corpus luteum, and ovarian surface epithelium
 - GCs actually protect the ovary from the oxidative stress which occurs with ovulation, but out of control can cause problems!
- GCs act at ovary to inhibit LH action and steroid biosynthesis (no hormones, no ovulation, low progesterone!)
- GCs influence oogenesis at multiple stages, and are believed to inhibit oocyte maturation

CHRONIC STRESS IN WOMEN- UTERUS

GC have strong regulatory action of steroid hormones in the uterus

- GC can block estrogen-induced uterine growth & differentiation during the follicular phase in animal models.
- GC regulate the complement system, a key mediator of innate immunity. This can disrupt implantation and early viability of the pregnancy.
- GC play an important role in early pregnancy, & balance is key!
 - GC can SUPPORT pregnancy by: suppressing uterine NK cells & promoting trophoblast invasion and can HARM pregnancy by: inhibiting cytokine-PG signalling, inducing apoptosis, and inhibiting embryonic & placental growth.

STRESS MANAGEMENT

Deep-breathing exercises: may bring on a state of relaxation and calm. Studies have shown that deep breathing can lower the heart rate and blood pressure, reduce muscular tension and reduce stress hormone production

Meditation: may increase calmness and relaxation, aid in coping with illness, and improve well-being

Movement such as Yoga, qi gong and tai chi: combines physical activity, breathing techniques and meditation

STRESS MANAGEMENT

A sampling of techniques include:

- Adjust your work and medical appointment schedule to minimize the disruption of your day
- Exercise/Mindful walking
- Yoga
 - tai chi/qi gong
- Breathe work/Mindful Breathing
- Guided Imagery/Meditation/MBSR/Prayer
- Body work: Massage, Reiki, Music
- Art Therapy
- Reading/Writing/Journaling/Hobbies
- Laughter -Look for humor in difficult situations
- Friends/Family!

THE 4-7-8 (OR RELAXING BREATH) EXERCISE

This exercise is utterly simple, takes almost no time, requires no equipment and can be done anywhere. Although you can do the exercise in any position, sit with your back straight while learning the exercise. Place the tip of your tongue against the ridge of tissue just behind your upper front teeth, and keep it there through the entire exercise. You will be exhaling through your mouth around your tongue; try pursing your lips slightly if this seems awkward.

Exhale completely through your mouth, making a whoosh sound.


Close your mouth and inhale quietly through your nose to a mental count of **four**.

Hold your breath for a count of **seven**.

Exhale completely through your mouth, making a whoosh sound to a count of **eight**.

This is one breath. Now inhale again and repeat the cycle three more times for a total of four breaths.

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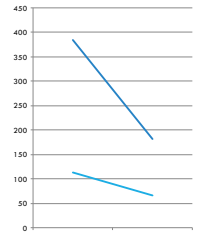
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FERTILITY IN THE US WHERE ARE WE AND WHY?

Trends in the percentage of women (ages 15-44) with impaired fecundity by age group, 1982-2012

CDC Report: "Fertility, Family Planning and Reproductive Health of US Women: Data from the 2010 National Survey of Family Growth (NSFG)"

IS FERTILITY REALLY DECLINING?



Review of 61 papers (14,947) 1940-1990

- *Ave. sperm concentration decreased from 113 million/mL to 66 million/mL
- *Ave seminal volume decreased 3.4 mL to 2.75 mL
- *Ave sperm count decreased 384.2 million to 181.5 million (52.8% decrease!!)

BISPHENOL A (BPA)

Synthetic chemical used in the manufacture of materials present in many consumer products

- Food packaging (plastic #7, can liners)
- Paper receipts
- Water pipes
- Dental composites and sealants

Over 6 billion pounds produced annually

Cc1ccc(O)cc1C(C)(C)c2ccc(O)cc2

Bisphenol A

CCc1ccc(O)cc1C(=C(C)C)c2ccc(O)cc2

Diethylstilbestrol (DES)

Oc1ccc2c(c1)ccc3c2O[C@H]4[C@@H](O)CC[C@]34

Estradiol

BISPHENOL A (BPA)

In 2003-2004 NHANES (National Health and Nutrition Examination Survey), BPA was detected in 93% of urine samples collected from 2517 residents.

Geometric mean (not SG-adjusted) BPA concentration in urine was 2.6 mcg/L

Human studies have found BPA in follicular and amniotic fluid

BISPHENOL A (BPA) METABOLISM

BPA found to be estrogenic in 1936

In experimental animal models, has been linked to

- Oocyte aneuploidy
 - Disrupts meiotic spindle formation, centrosome dynamics, and chromosomal alignment and segregation
- Reduced estradiol levels
 - Rat and porcine ovarian cells decreased estradiol production in a concentration-dependent fashion

This correlates with poor oocyte maturation and early pregnancy loss from chromosomal abnormality

BISPHENOL A (BPA) AND MALE FERTILITY

First human study on BPA and male fertility published in 2010

5 year study in Chinese men (n=514)

Men with higher exposure to BPA (as measured in urine) had lower quality sperm

- Lower sperm concentration
- Lower sperm count
- Decreased sperm vitality and motility

Men with levels of exposure equal to those common in general US population showed signs of sperm stress.

PHTHALATES AND SEMEN HEALTH

Phthalates used as plasticizers to increase flexibility of toys, vinyl flooring, electric cables, and medical devices and are also used as solvents in perfumes, lotions and cosmetics

Urinary phthalates associated with:

- Decreased sperm concentration
- Decreased sperm motility
- Decreased FSH and LH (in men)

Associations seen in subfertile men, but trends not corroborated in the general population

TOXIN TESTING FOR COUPLES

1. Screen through their story & questionnaire & basic labs
2. Targeted screening if indicated
3. Follow up with detox or referral to EM specialist

Heavy Metals: Doctor's Data Urine Heavy Metals

Unprovoked (looks at current exposure)

Provoked (with DMSA): 1g DMSA orally, followed by 24 hour collection

GPL-TOX

Tests for 172 pollutants in single urine sample including:

Phthalates
Vinyl chloride
Benzene
Organophosphates
Perchlorates
Many more!

Can add glyphosate

ENVIRONMENT

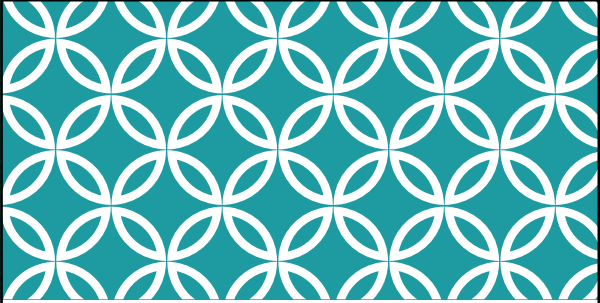
- Food; Think organic, esp. the "Dirty Dozen" and meats/dairy
- Drink filtered water. Avoid plastic containers. Use stainless steel or glass water bottles.
- Avoid using products that contain BPA or phthalates. Minimize the use of food products or storage in cans or plastic containers.
- Minimize the use of personal care products such as moisturizers, cosmetics, shower gels and fragrances.
- Avoid the use of garden, household or pet pesticides/fungicides.
- Chemicals such as lead and pesticides can be tracked indoors on shoes, so it is always recommended to remove your shoes before coming indoors.

ENVIRONMENT

- Clean air and water
- Avoid exposures to pesticides, paints and solvents
- BPA/Phthalates
- Infectious diseases – Toxoplasmosis, Flu, Blood-borne
- Fish- certain large fish (shark, swordfish, king mackerel and tilefish) contain high levels of mercury.
- Travel: Food-borne illness, Infectious diseases, Pollution
 - Heat esp. Men
 - EM energy: Wi-Fi, cell phones; computer; electric blankets

WORK ENVIRONMENT

- Look out at nature
- Natural light and colors set the mood
- Avoid prolonged sitting or repetitive movements
- Work standing up
 - Schedule a walking meeting
- Get up and move; stretch



SLEEP

MOST HORMONES ARE CYCLICAL

- Thyroid
- Testosterone
- Cortisol
- Estrogen/Progesterone
- Melatonin
- GnRH
- LH/FSH
- Nearly ALL!!

SLEEP IS ESSENTIAL FOR HORMONE RESET

- Sleep in a dark, cool room- no TV, no lights, even little flashing lights on small electronics aren't ideal.
- Quiet your evenings- it's best to avoid tv, computers, ipads, or other lit devices for at least an hour before bed. (I know, I know... this is tough! But the light prevents you from releasing the sleep hormone melatonin, and can make it hard to fall asleep).
- Consider white noise, especially if you're a light sleeper.
- No animals in your room, where their movement and sounds may disturb you

IF NEEDED

Magnolia bark to lower nighttime cortisol

Melatonin to fall asleep

• Also valerian, kava

CBD to stay asleep

Lavender oil, Honokiol, L-Theanine for racing thoughts

Watch caffeine intake during the day, even in AM!



THANK YOU!

Dr. Jaclyn Chasse, ND
www.perfectfertility.com
IG @perfect_fertility
FB/perfectfertility