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VIRTUAL CONFERENCE

October 25 - 28, 2022 | ONLINE | 2.0 CEUs

Intermittent Fasting

Differences Between Male & Female Populations

Conflict of Interest Statement

I have no actual or potential conflict of interest in relation to the research cited in this presentation.

Background

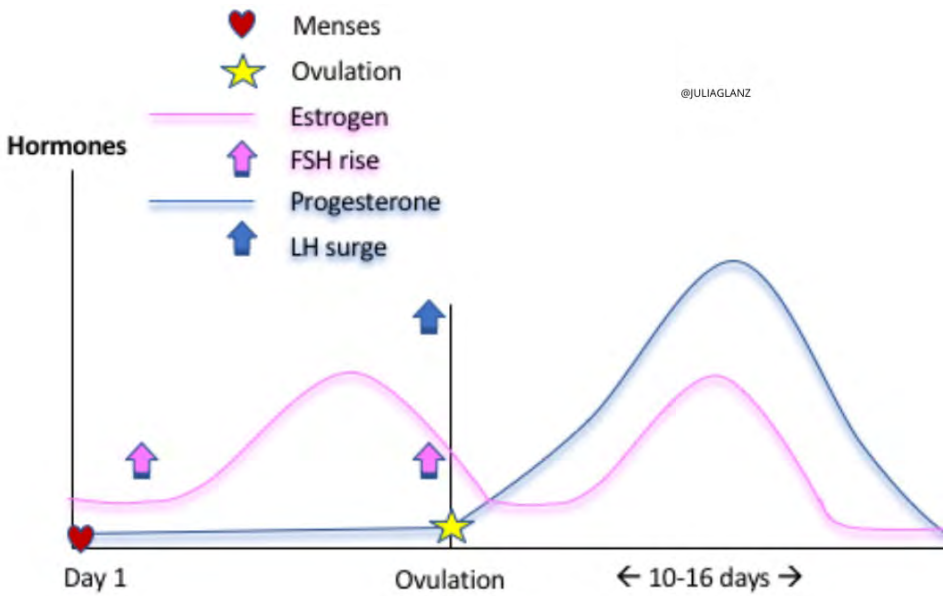
- Registered Dietitian
- Masters Degree in Nutritional Science
- Certified Strength & Conditioning Specialist
- Former College Strength & Conditioning Coach
- Former D1 soccer player
- Now have a virtual private practice

Background

- Began diving into IF in grad school
- Promising benefits on:
  - Various health markers and longevity
- **Many studies on <u>animals</u> and <u>men</u>**

Background

- Began diving into women's hormones



My mission:

To bring ***awareness*** and education to the **hormonal differences** between men and women as it relates to fasting and other nutrition and training protocols.

And how these hormones affect everything from your

- Energy
- Weight
- Metabolism
- Mood

Intermittent Fasting

Differences Between Male & Female Populations

Objectives:

- benefits of intermittent fasting specifically in alignment with your biology and physiology
- biggest mistakes to avoid

Intermittent Fasting

Differences Between Male & Female Populations

Flow of Presentation:

- **Part 1:** mistakes and benefits of intermittent fasting with your circadian rhythm *(24 hour sleep-wake cycle)*

- **Part 2:** mistakes and benefits of intermittent fasting with your infradian rhythm *(monthly menstrual cycle)*

Intermittent Fasting

Differences Between Male & Female Populations

Flow of Presentation:

- **Part 1:** mistakes and benefits of intermittent fasting with your circadian rhythm *(24 hour sleep-wake cycle)*
- **Nerdy deep dive into hormones**
- **Part 2:** mistakes and benefits of intermittent fasting with your circadian rhythm *(monthly menstrual cycle)*

What is Intermittent Fasting?

Simply put: intermittent periods of not eating or drinking anything with calories

Types of Intermittent Fasting

Time Restricted Eating (TRE)

compressing eating window

- **ie. 4-12 hour eating window; 12-20 hour fast**

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Cellular Benefits of Intermittent Fasting
From Review Article published in The New England Journal of Medicine

Systemic & Cellular Adaptations to the Bioenergetic Challenge of Fasting

Short-Term Adaptation

Increases in:
Ketones
Autophagy (cellular recycling)
Mitochondrial stress resistance
DNA repair
Antioxidant defences

Decreases in:
Insulin

Long-Term* Adaptation

Increases in:
Insulin sensitivity
HRV
Lipid metabolism
Gut microbiome health

Decreases in:
Abdominal fat
Inflammation
Blood pressure

*More human studies needed that go longer than over a period of months

N Engl J Med 2019;381:2541-51. DOI: 10.1056/NEJMra1905136

Why is Time Restricted Eating important? *Big Picture*

~51% of US population will be obese by 2030

According to linear time trend forecast published in
American Journal of Preventative Medicine, PMID 22608317

And…

~1 in 3 adults have metabolic syndrome

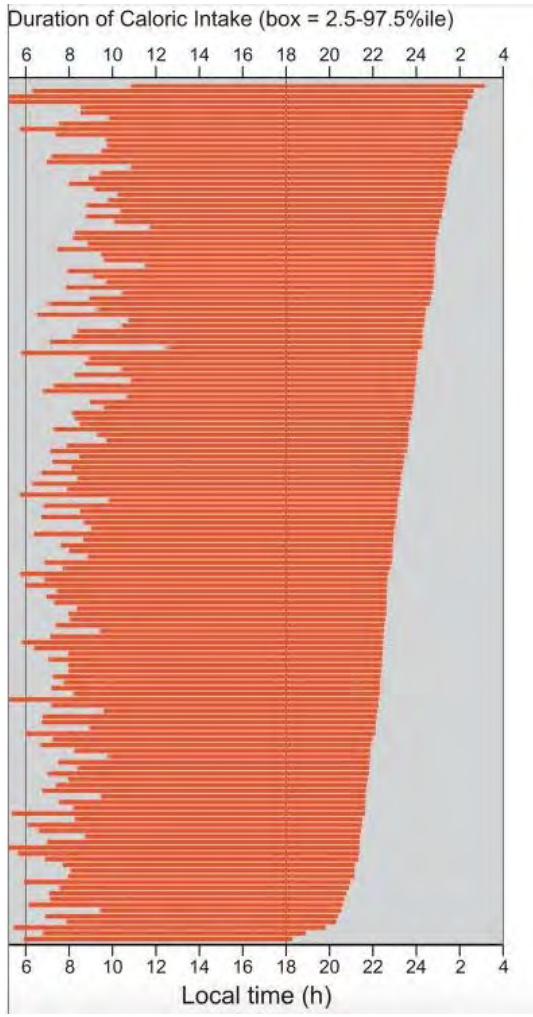
According to National Heart, Lung and Blood Institute updated May 2022
https://www.nhlbi.nih.gov/health/metabolic-syndrome

And…

Why is Time Restricted Eating important? *Big Picture*

Modern Day Eating Pattern:

Revealed by myCircadianClock app data from 156 individuals.



1. Eat all throughout the day

Median daily eating duration = 14 h 45 min

2. Eat majority of cals late in day

<25% of calories consumed before noon

37.5% of daily calories consumed after 6pm

Gill, S., & Panda, S. (2015). A Smartphone App Reveals Erratic Diurnal Eating Patterns in Humans that Can Be Modulated for Health Benefits. *Cell metabolism*, *22*(5), 789–798. https://doi.org/10.1016/j.cmet.2015.09.005

Figure 4. Modified.

Time Restricted Eating as a useful *tool* and strategy

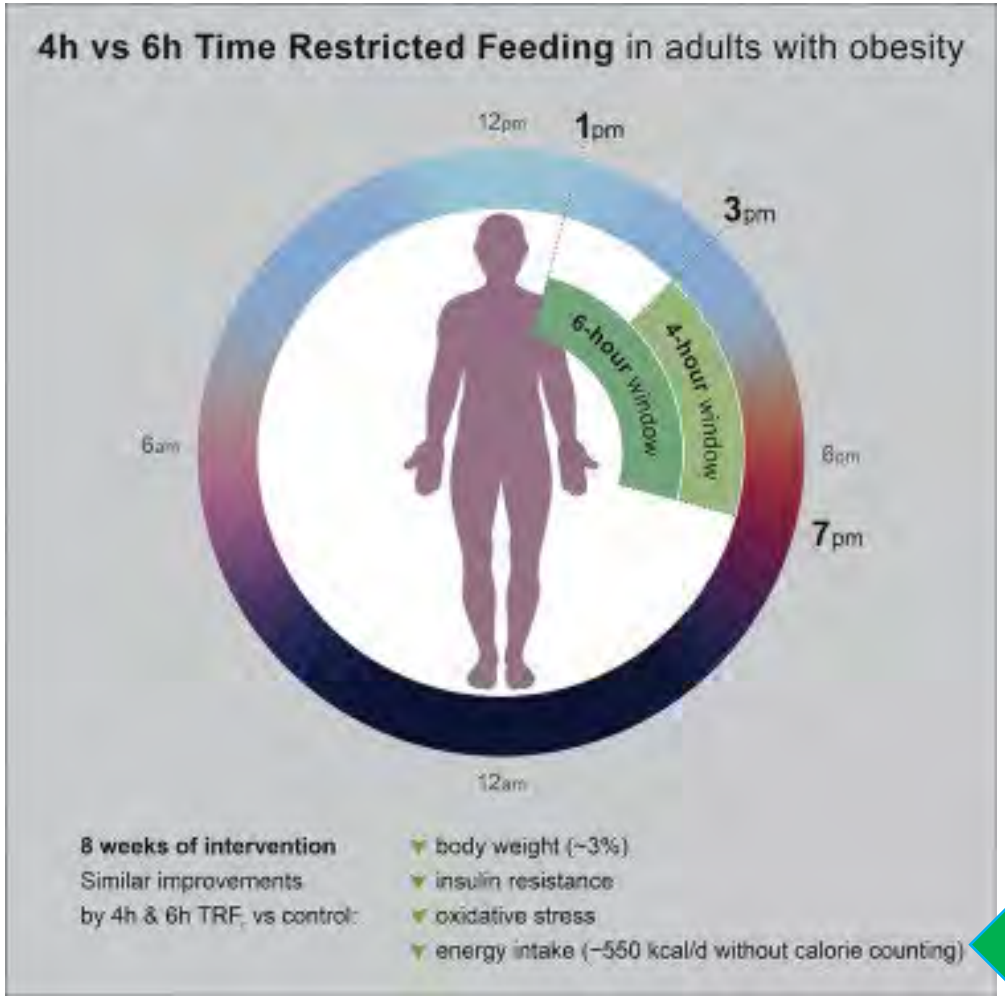


Figure 1, Sofia Cienfuegos, Kelsey Gabel, Faiza Kalam, Mark Ezpeleta, Eric Wiseman, Vasiliki Pavlou, Shuhao Lin, Manoela Lima Oliveira, Krista A. Varady, Effect s of 4- and 6-h Time-Restricted Feeding on Weight and Cardiometabolic Health: A Randomized Controlled Trial in Adults with Obesity, Cell Metabolism, Volume 32, Issue 3, 2020, Pages 366-378.e3, ISSN 1550-4131, https://doi.org/10.1016/j.cmet.2020.06.018.

Intermittent Fasting / Time Restricted Eating Benefits

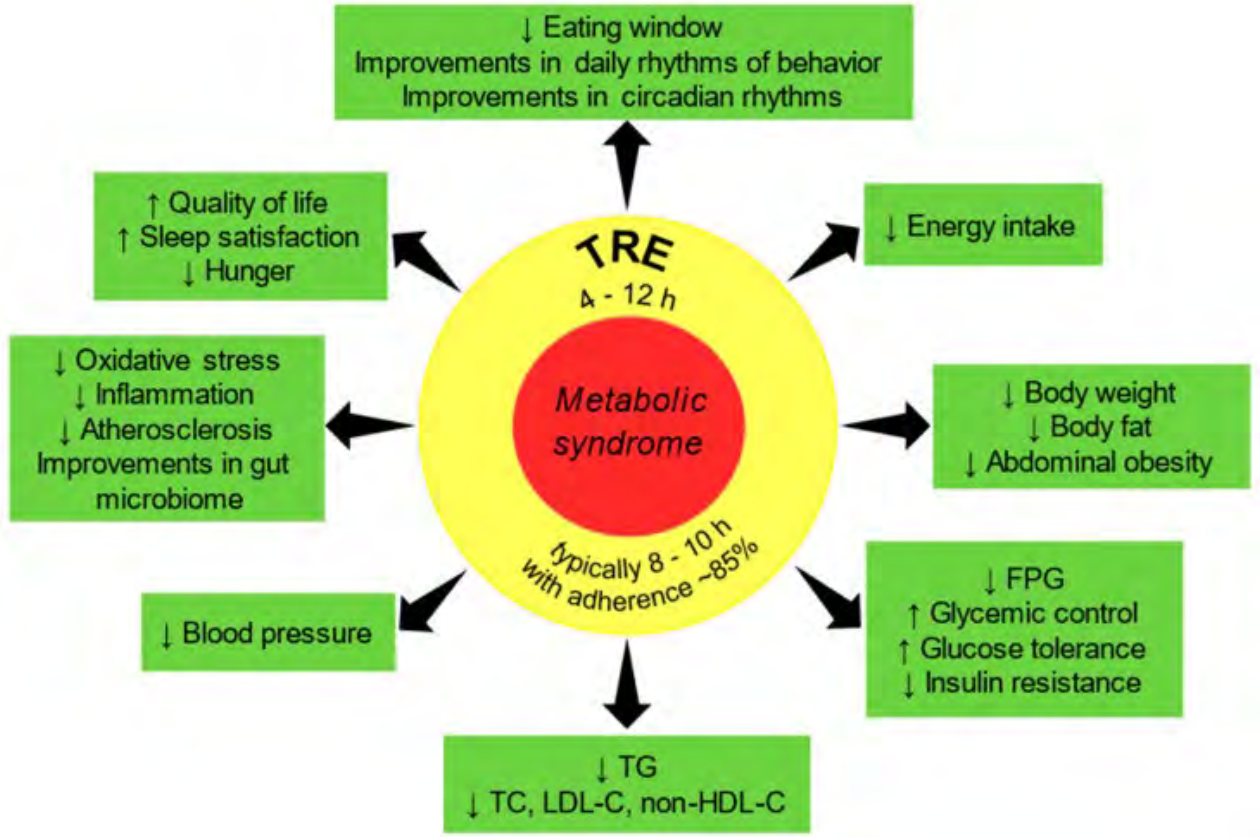
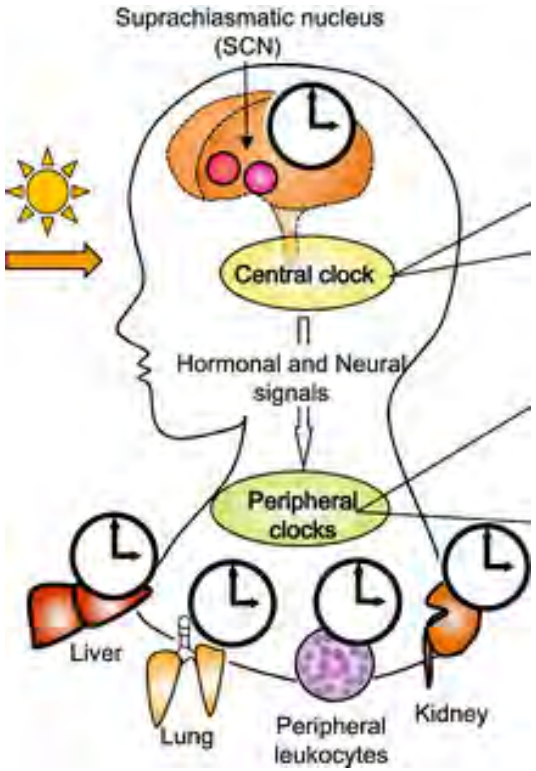


Figure 1, Świątkiewicz, I., Woźniak, A., & Taub, P. R. (2021). Time-Restricted Eating and Metabolic Syndrome: Current Status and Future Perspectives. *Nutrients*, *13*(1), 221. https://doi.org/10.3390/nu13010221

Intermittent Fasting Mistakes:

1. Fasting too long, too often
2. Not eating enough during eating window to meet your energy needs
3. Not eating/fasting in alignment with your circadian rhythm

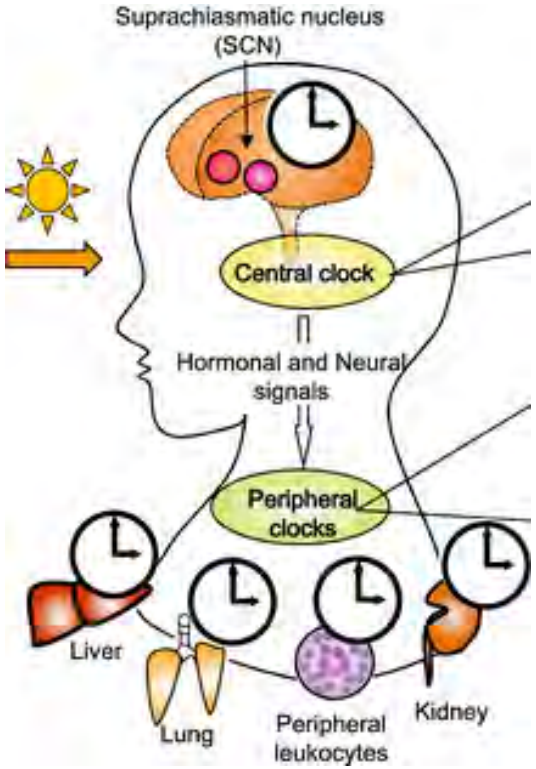
The mechanism:



Influenced by light/dark

Influenced by food intake

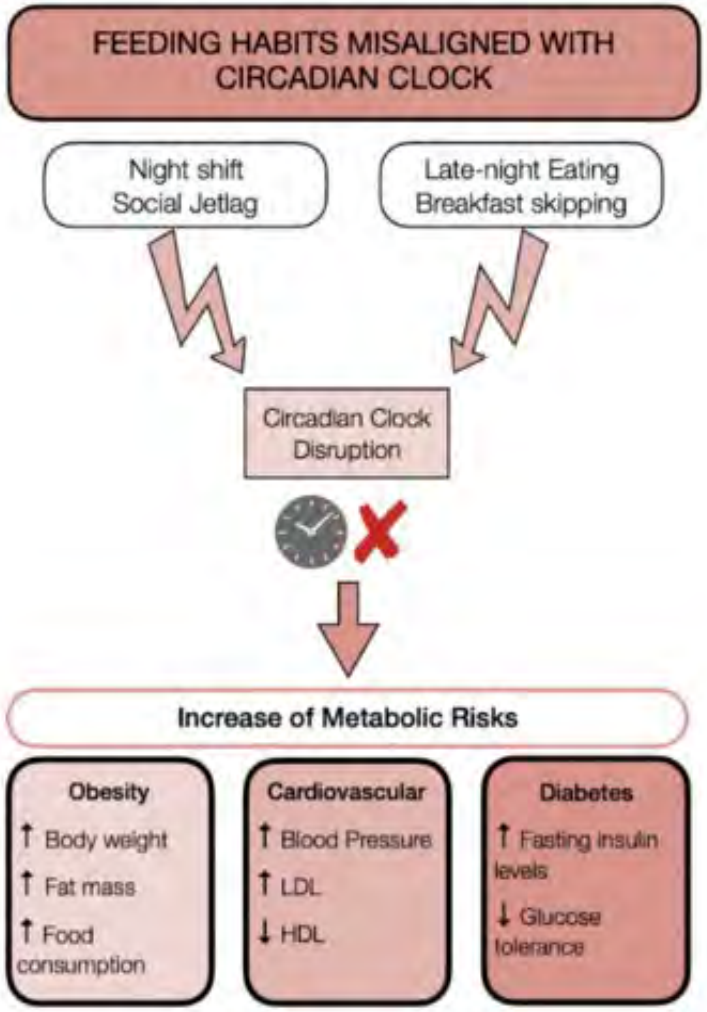
The Circadian Clock Functions As A Potent Regulator of Allergic Reaction - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/A-canonical-model-of-the-mammalian-circadian-clock-The-mammalian-circadian-clock_fig3_272520380 [accessed 23 Jul, 2022]



Clock Genes influence

- **Insulin** *(storage hormone)*
- **Glucose regulation**
- **Melatonin** *(sleep hormone)*
- **Cortisol** *(stress hormone)*
- **Digestion / absorption**
- **Appetite** *(ie. hunger hormones)*
- **Gut motility** *(mmc pathway)*

The Circadian Clock Functions As A Potent Regulator of Allergic Reaction - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/A-canonical-model-of-the-mammalian-circadian-clock-The-mammalian-circadian-clock_fig3_272520380 [accessed 23 Jul, 2022]



Charlot, A., Hutt, F., Sabatier, E., & Zoll, J. (2021). Beneficial Effects of Early Time-Restricted Feeding on Metabolic Diseases: Importance of Aligning Food Habits with the Circadian Clock. *Nutrients*, *13*(5), 1405. https://doi.org/10.3390/nu13051405, Figure 2

Part 1: Recap

Eat / fast in alignment with your circadian rhythm

Practical Tips *to start*:

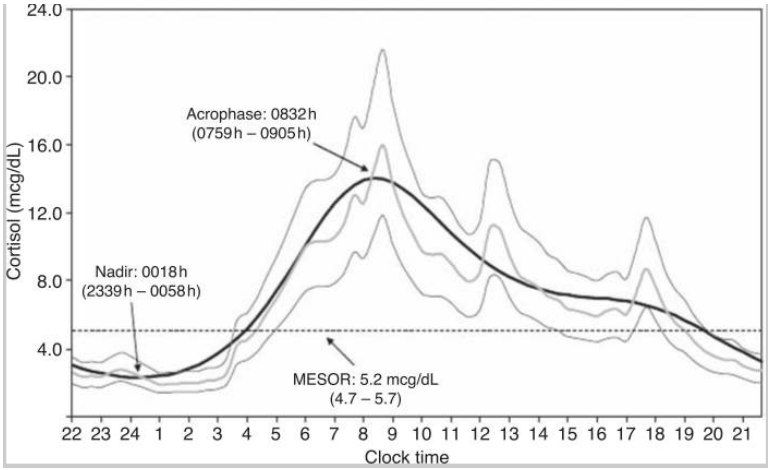
- ✓ End eating window ~3 hours before bedtime
- ✓ Eat majority of calories during earlier part of day
- ✓ Eat within a *12 hour* window

Disclaimer:
General educational purposes only. Not applicable to everyone.
Always speak with YOUR health provider before beginning any fasting protocol.

Disclaimer

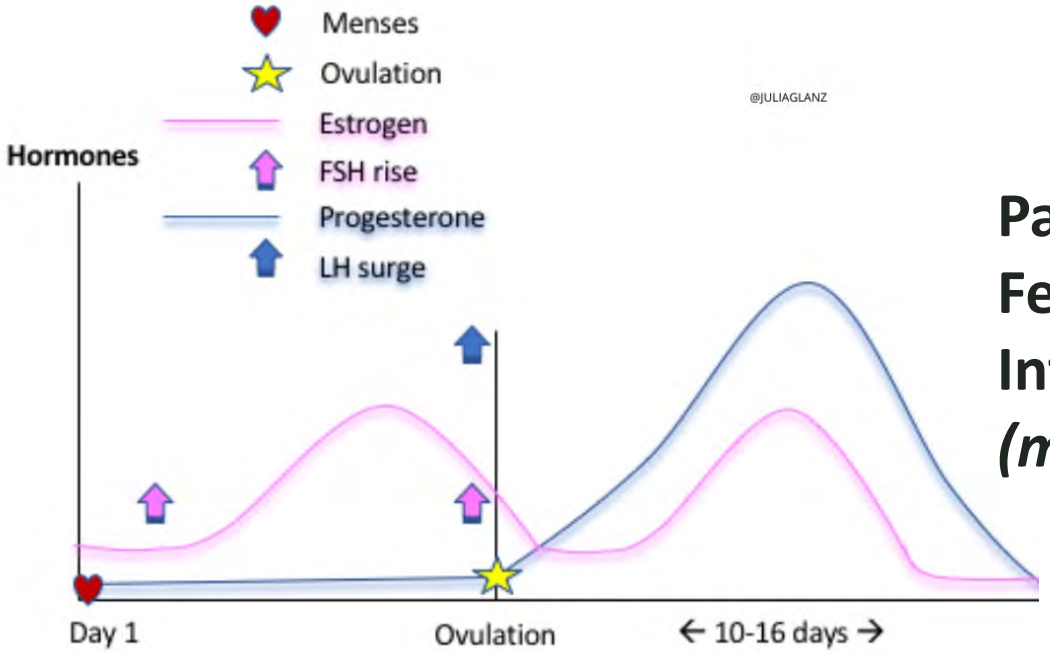
Intermittent Fasting is not for:

- Women pregnant or breastfeeding
- People with history of eating disorder / disordered eating
- People with low blood sugar or advanced diabetes
- Anyone on medication with contraindication
- People who are underweight
- Women with HA
- Anyone dealing with chronic stress



Part 1:
Male & Female Circadian Rhythm
(sleep-wake cycle)

Chan, S., & Debono, M. (2010). Replication of cortisol circadian rhythm: new advances in hydrocortisone replacement therapy. *Therapeutic advances in endocrinology and metabolism*, *1*(3), 129–138. https://doi.org/10.1177/2042018810380214, Figure 1

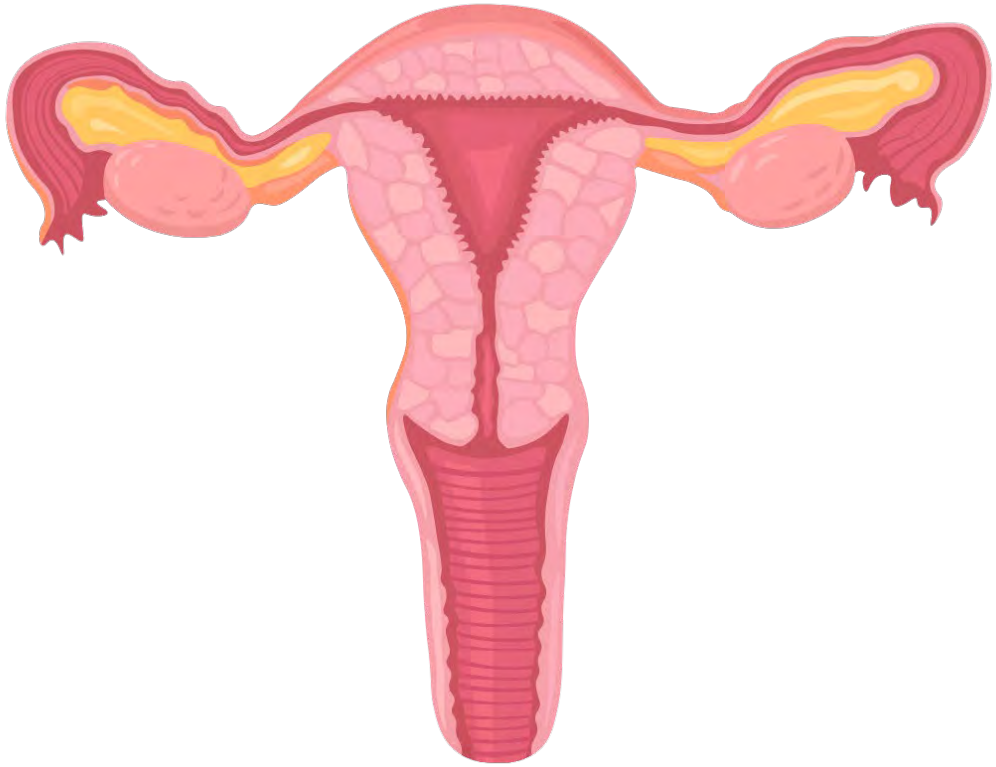


Part 2:
Female Infradian Rhythm
(menstrual cycle)

But first…

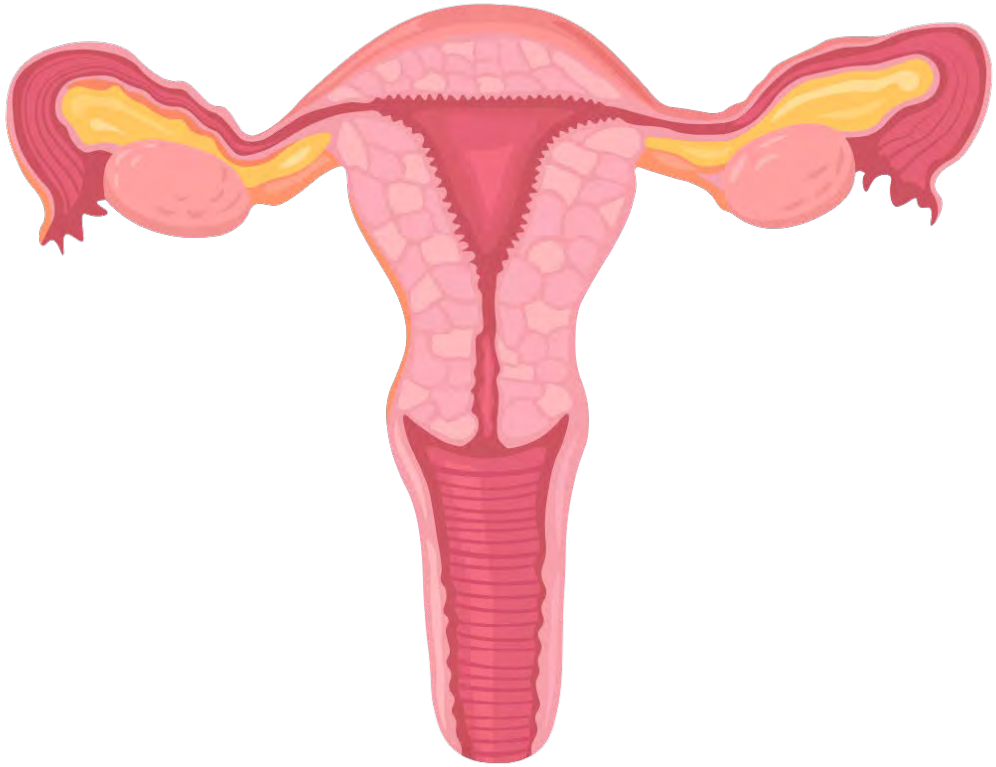
Intermittent Fasting

Biggest Difference Between Male & Female Populations



What this means…

Women in their reproductive years are biologically designed to carry a baby.



Women in their reproductive years are biologically designed to carry a baby.

Because of this…

Women are more sensitive to stress.

Stress = disruption to homeostasis

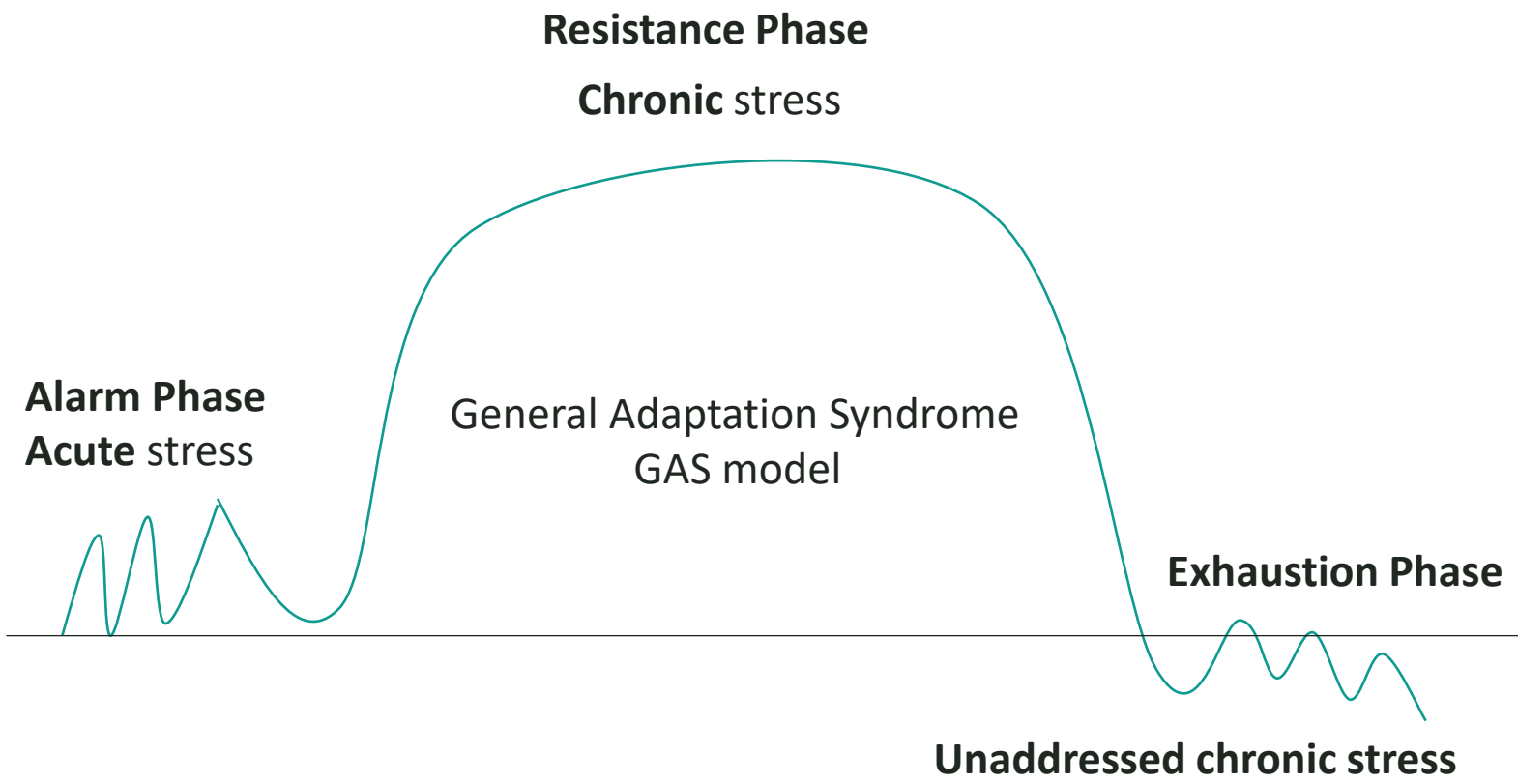
Types of Stress

Endogenous
Blood sugar spikes / falls
Inflammation
Injury
Illness
Oxidative stress
Nutrient deficiencies
Autoimmune
Dehydration
Gut pathogen / infection
Abdominal fat

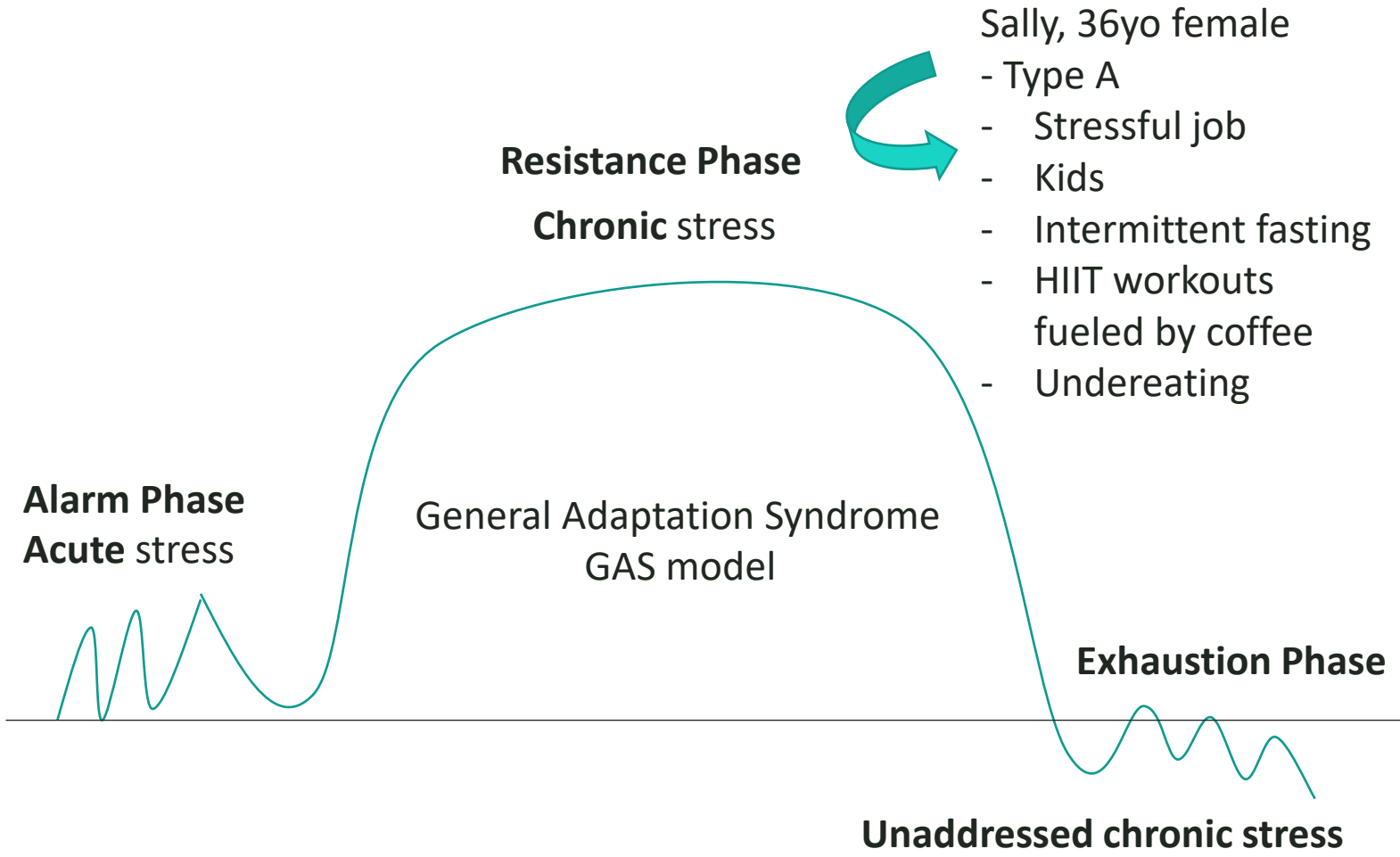
Exogenous / Environment / Mindset
Job
Being too busy
Financial worry
Relationships
Fear / perceived fear
Exercise
Fasting
Under eating
Toxin / mold exposure
Inadequate dietary / water intake
Major life change

Exercise and fasting are both good stressors *short term*

Our body has systems in place to respond and adapt

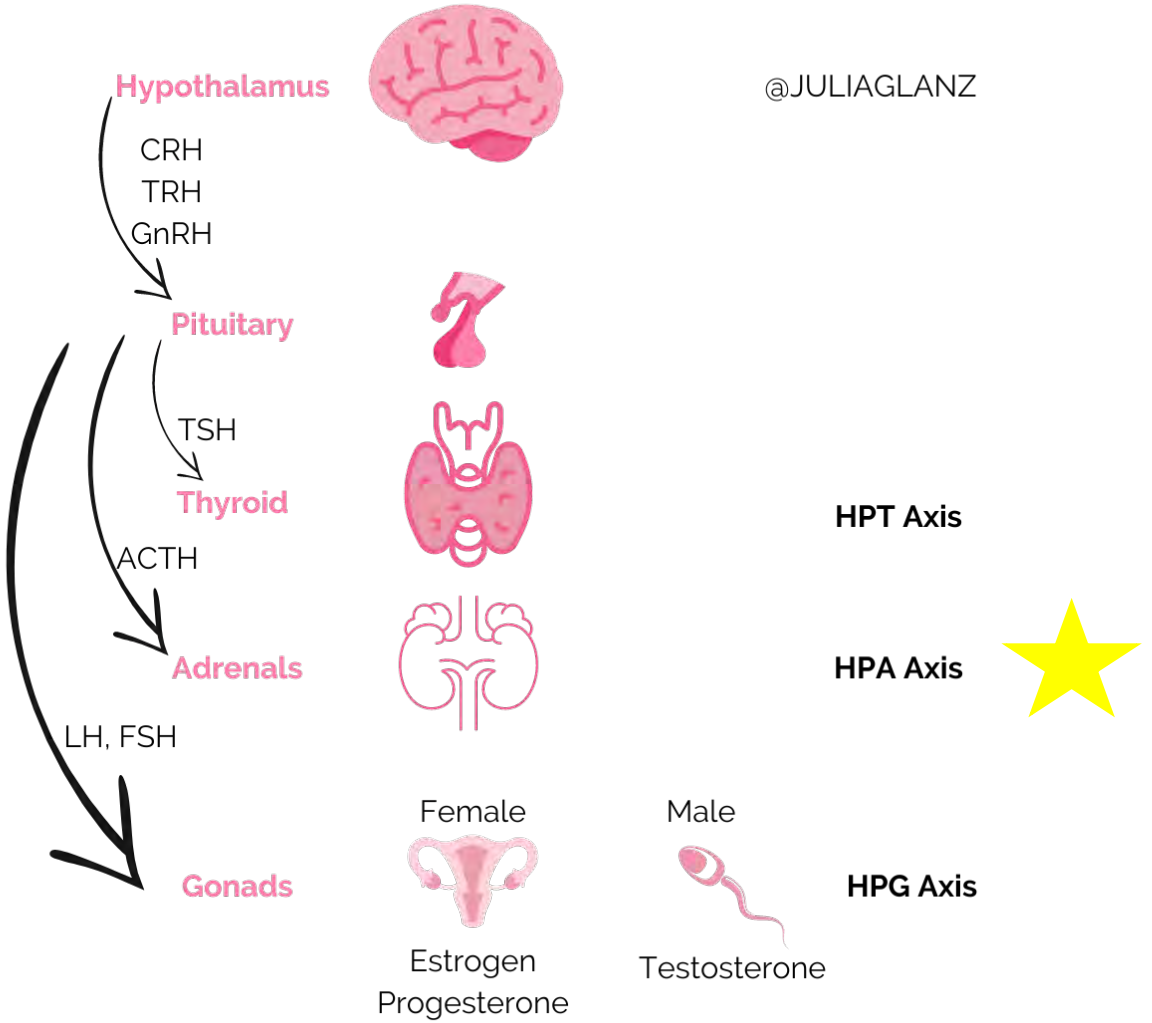

Resistance Phase
Chronic stress
Alarm Phase
Acute stress
General Adaptation Syndrome
GAS model
Exhaustion Phase
Unaddressed chronic stress

But there can always be too much of a good thing…



Time for the nerdy deep dive…

Hypothalamic - **P**ituitary – **A**drenal (HPA) Axis



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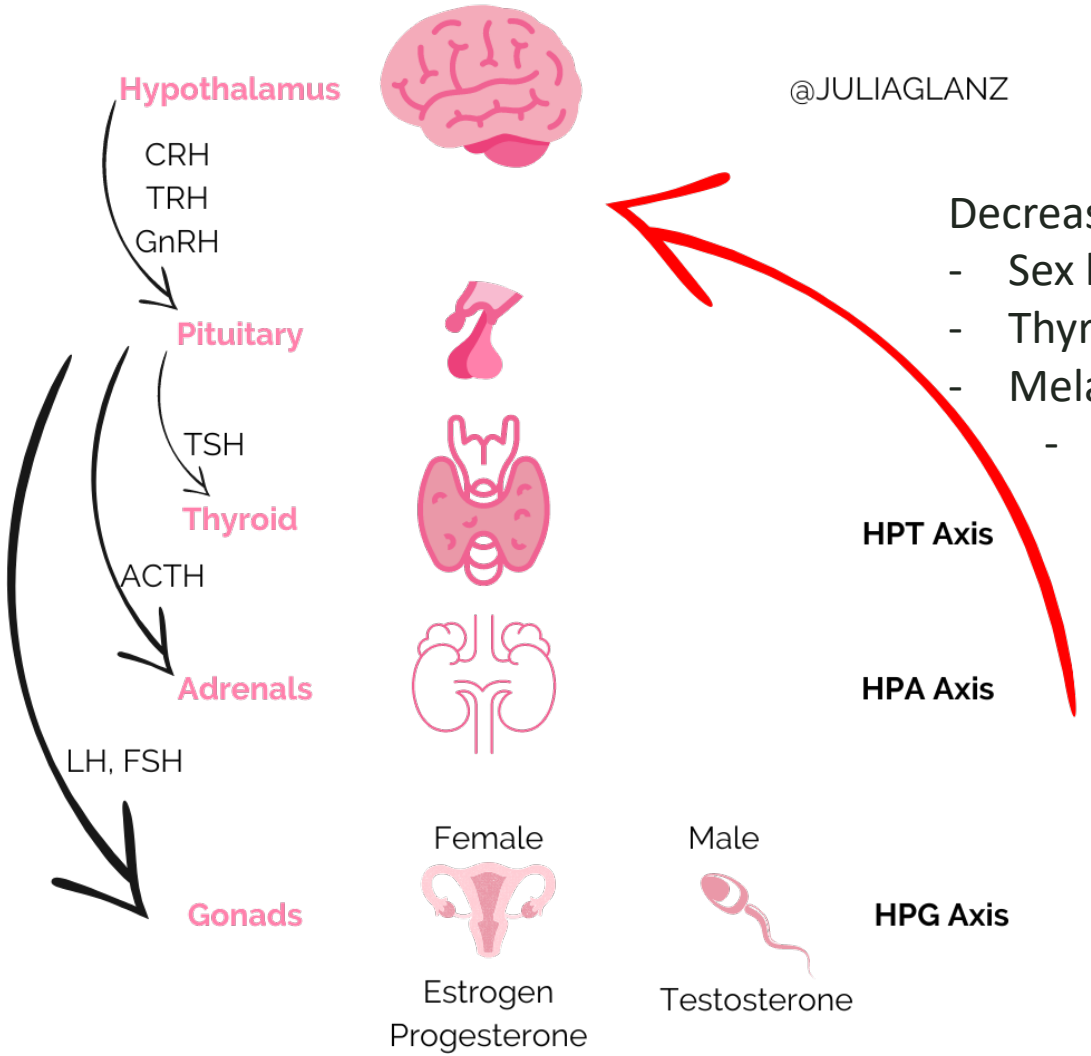
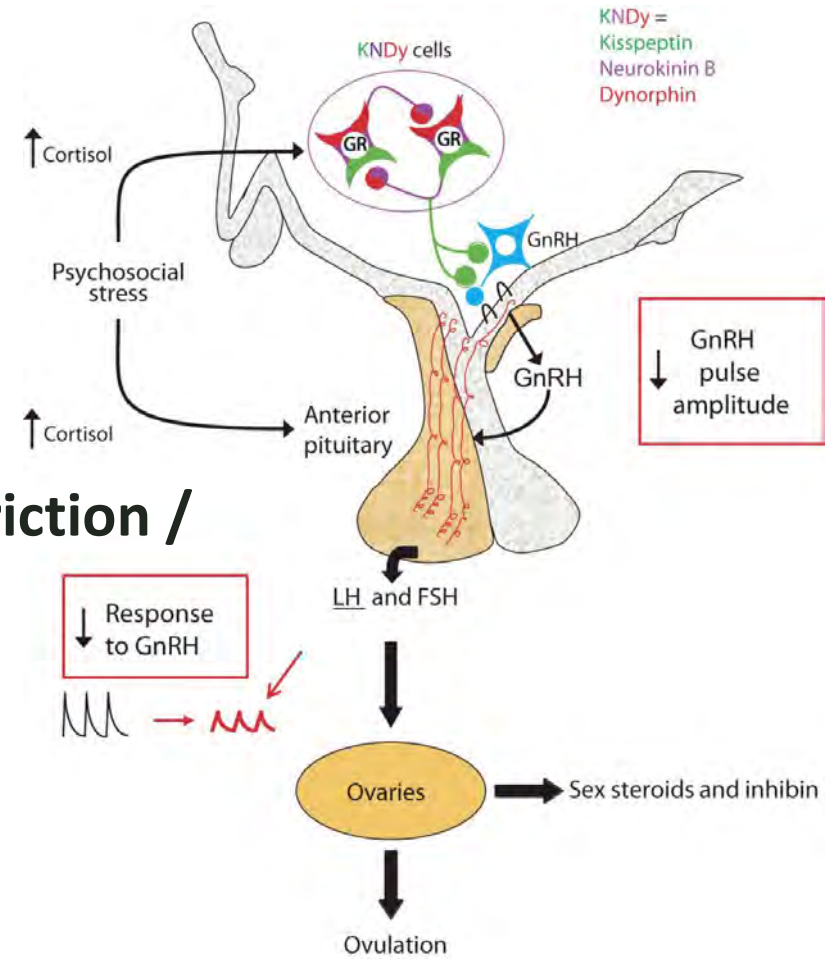


Decrease in:
- Sex hormones
- Thyroid hormones
- Melatonin
  - disrupts sleep
    - alters appetite

Kisspeptin

- Neuropeptide
- Stimulates GnRh
  - sex hormones

- **Fasting / calorie restriction / increase in cortisol = lower kisspeptin *in animals***



Reproduction 152, 1; 10.1530/REP-15-0604

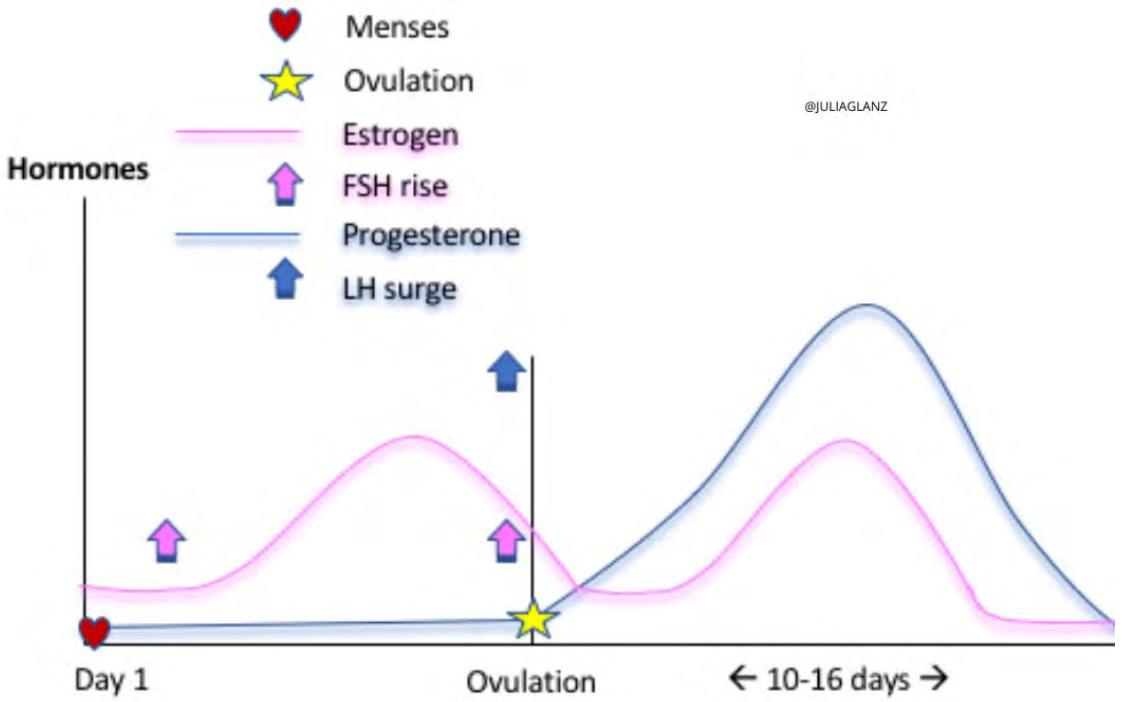
Main Takeaway For Male & Female Population:

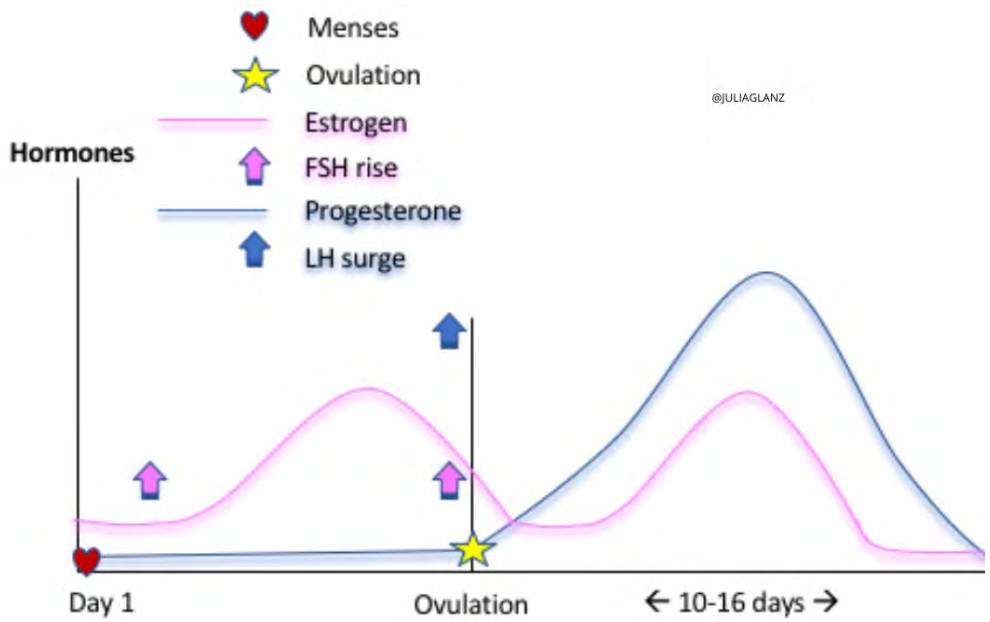
Chronic stress / high cortisol can lower melatonin, sex hormones and thyroid hormones affecting your

- Sleep
- Energy
- Body composition
- Bone health
- Heart health
- Inflammatory and immune response
- Appetite
- Digestion and absorption of nutrients

Part 2: Considerations for Women

How does the stress / impact of fasting fluctuate across the menstrual cycle?





Follicular Phase (Estrogen)

- ↑ Satiety
- ↑ Insulin sensitivity
- ↑ Stress **resilient**
- ↑ Anabolic

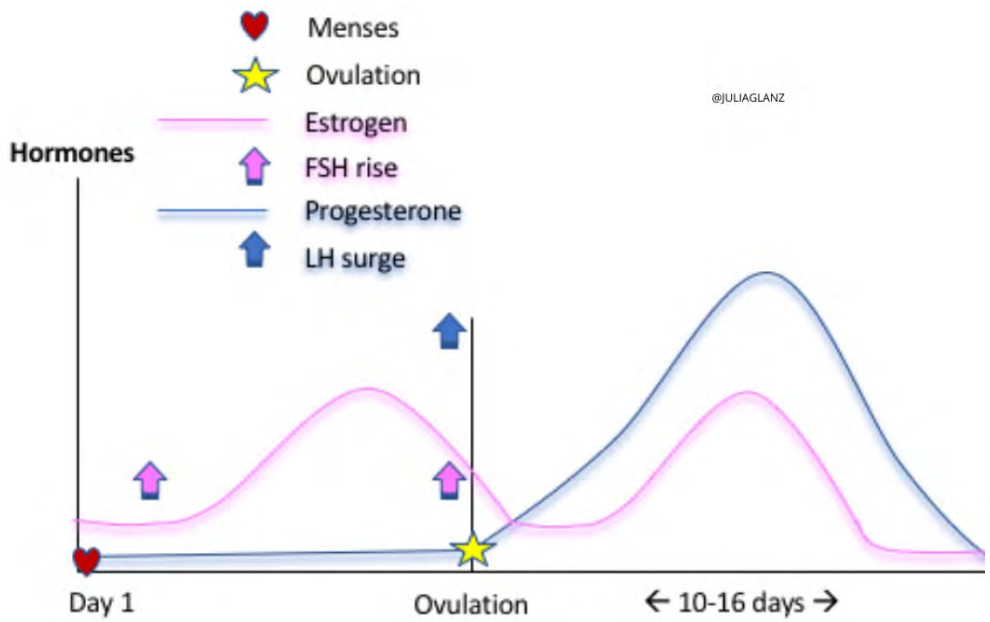
Luteal Phase (Progesterone)

- ↑ Body temp / RMR
- ↑ Energy needs / cravings
- ↑ Insulin resistance
- ↑ Stress sensitivity
- ↑ RPE

CiteHansen, Mette[1]; Kjaer, Michael[2]. Influence of Sex and Estrogen on Musculotendinous Protein Turnover at Rest and After Exercise. Exercise and Sport Sciences Reviews: October 2014 - Volume 42 - Issue 4 - p 183-192 doi: 10.1249/JES.0000000000000026

Gorczyca, A. M., Sjaarda, L. A., Mitchell, E. M., Perkins, N. J., Schliep, K. C., Wactawski-Wende, J., & Mumford, S. L. (2016). Changes in macronutrient, micronutrient, and food group intakes throughout the menstrual cycle in healthy, premenopausal women. *European journal of nutrition*, *55*(3), 1181–1188. https://doi.org/10.1007/s00394-015-0931-0

Prado Raul Cosme Ramos, Silveira Rodrigo, Kilpatrick Marcus W., Pires Flávio Oliveira, Asano Ricardo Yukio, Menstrual Cycle, Psychological Responses, and Adherence to Physical Exercise: Viewpoint of a Possible Barrier Frontiers in Psychology, VOLUME 2, 2021, DOI 10.3389/fpsyg.2021.525943, ISSN 1664-1078



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What about women who are in PERI or POST menopause?

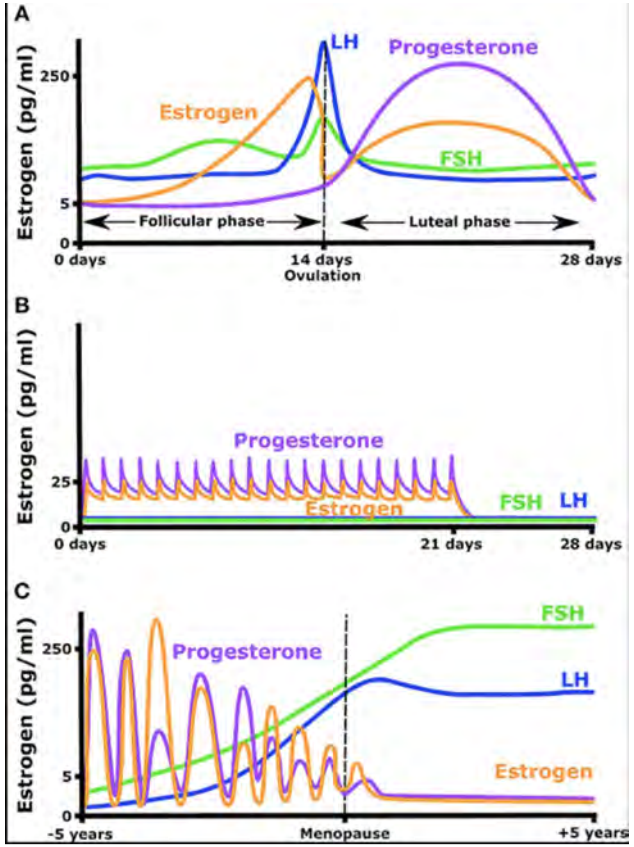

Figure 1. Hormonal fluctuation during (A) a normal menstrual cycle, (B) while taking an oral contraceptive (OC) containing both estrogen and progesterone, and (C) in the years before and after menopause.
Front. Physiol., 15 January 2019 | https://doi.org/10.3389/fphys.2018.01834

Endocrine and chronobiological effects of fasting in women

S L Berga [1], T L Loucks, J L Cameron

Result(s): Fasting increased beta-hydroxy-butyric acid and reduced free thyronine. Fasting in the midfollicular phase had no effect on LH pulsatility or on FSH, estradiol, or subsequent luteal-phase progesterone levels. However, fasting elevated cortisol and resulted in a phase advance in melatonin secretion of 81 minutes in both the midfollicular and luteal phases.

Time-restricted feeding plus resistance training in active females: a randomized trial

Grant M Tinsley ✉, M Lane Moore, Austin J Graybeal, Antonio Paoli, Youngdeok Kim, Joaquin U Gonzales, John R Harry, Trisha A VanDusseldorp, Devin N Kennedy, Megan R Cruz

The American Journal of Clinical Nutrition, Volume 110, Issue 3, September 2019, Pages 628–640, https://doi.org/10.1093/ajcn/nqz126

Published: 03 July 2019 **Article history** ▾

Conclusions

IF, in the form of TRF, did not attenuate RT adaptations in resistance-trained females. Similar FFM accretion, skeletal muscle hypertrophy, and muscular performance improvements can be achieved with dramatically different feeding programs that contain similar energy and protein content during RT. Supplemental HMB during fasting periods of TRF did not definitively improve outcomes. This study was prospectively registered at clinicaltrials.gov as NCT03404271.

Protocol: 8 wks, 8 hour eating window 12pm-8pm, similar cal & protein intake

Case Study: Female, 39, 5”4, Real Estate

WHAT ARE THE TOP ISSUES YOU HOPE THIS TEST WILL HELP YOU RESOLVE?

Why so much hair loss, why such a tender stomach (I do know I have cysts on my ovaries, I thought my appendix ruptured but possibly a cyst), why fatigue- need caffine, harder to lose weight then in the past, why period lasts 1 day + usually just spotting, why some depression + anxiety, muscle mass loss no sex drive

Typical Eating Day: <1000 calories, <40g protein

Time	Food/Beverage (List every single item on a separate line)	Amount
9:00	coffee, bulletproof MCT, 1 tbsp grass fed butter	
1:00 PM	plant base protein drink	1 serving
5:00 PM	1 string cheese, 4 slices salami	
5:15 PM	FIT Crunch bar	1 bar
7:00 AM	12 oz water and LMNT electrolte drink	1 serving
9:30 PM	oreo ice cake	

Typical Workout Routine:

4 days cardio
4 days strength

Case Study: Female, 39, 5”4 Real Estate

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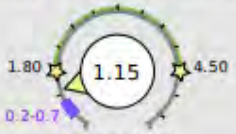
Key (how to read the results):

Sex Hormones See Pages 2 and 3 for a thorough breakdown of sex hormone metabolites



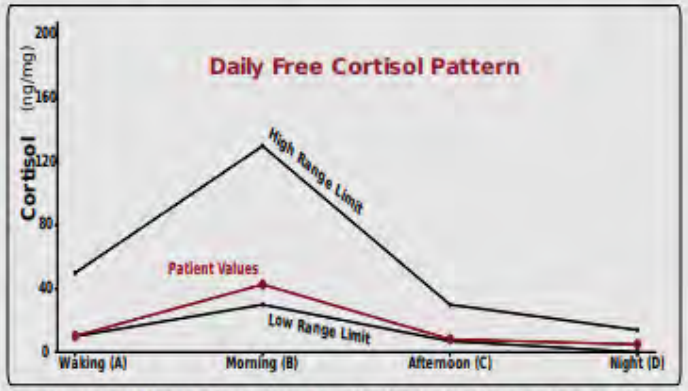
Estradiol(E2)

Progesterone
(Serum Equivalent, ng/mL)

Progesterone Serum Equivalent is a calculated value based on urine pregnanediol.

Testosterone

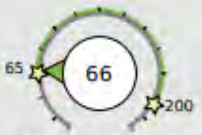
Adrenal Hormones See pages 4 and 5 for a more complete breakdown of adrenal hormones



Total DHEA Production

Age	Range
20-39	1300-3000
40-60	750-2000
>60	500-1200

Total DHEA Production
(DHEAS + Etiocholanolone + Androsterone)



24hr Free Cortisol
(A+B+C+D)

cortisol metabolism

Metabolized Cortisol (THF+THE)
(Total Cortisol Production)

Free cortisol best reflects tissue levels. Metabolized cortisol best reflects total cortisol production.

FINAL RECAP

Eat / fast in alignment with your *circadian* rhythm

Eat / fast in alignment with your *infradian* rhythm

Other tips to consider:

- ✓ Eat enough during eating window
- ✓ Don't fast too long, too often
- ✓ Always prioritize managing total stress load

This will look different for each individual

Disclaimer:
General educational purposes only. Not applicable to everyone.
Always speak with YOUR health provider before beginning any fasting protocol.

Thank You ☺

@juliaglanz