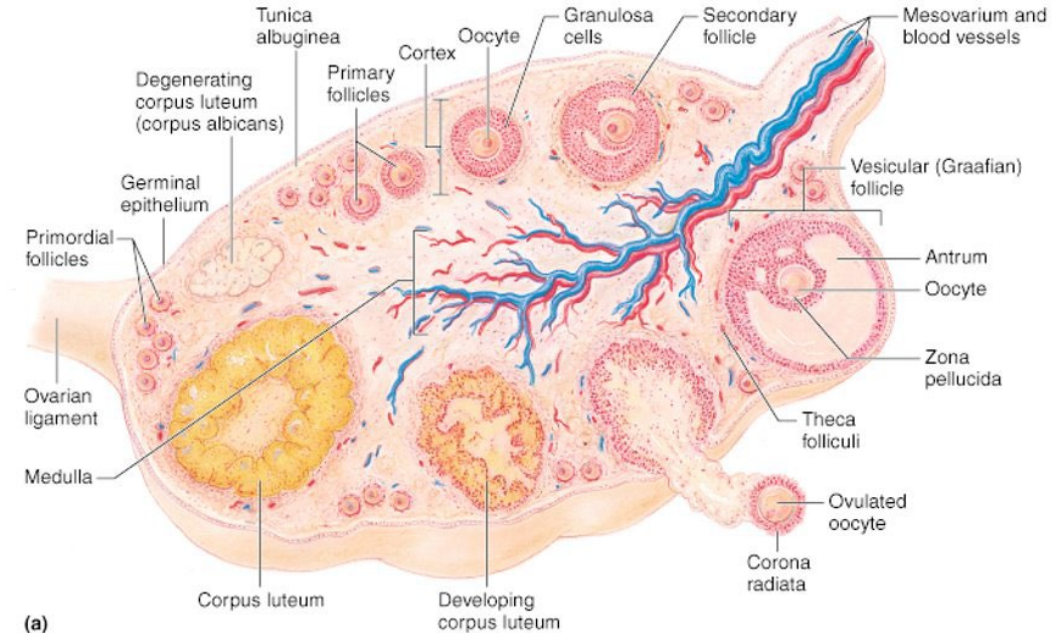


# Estrogen

# Estrogen

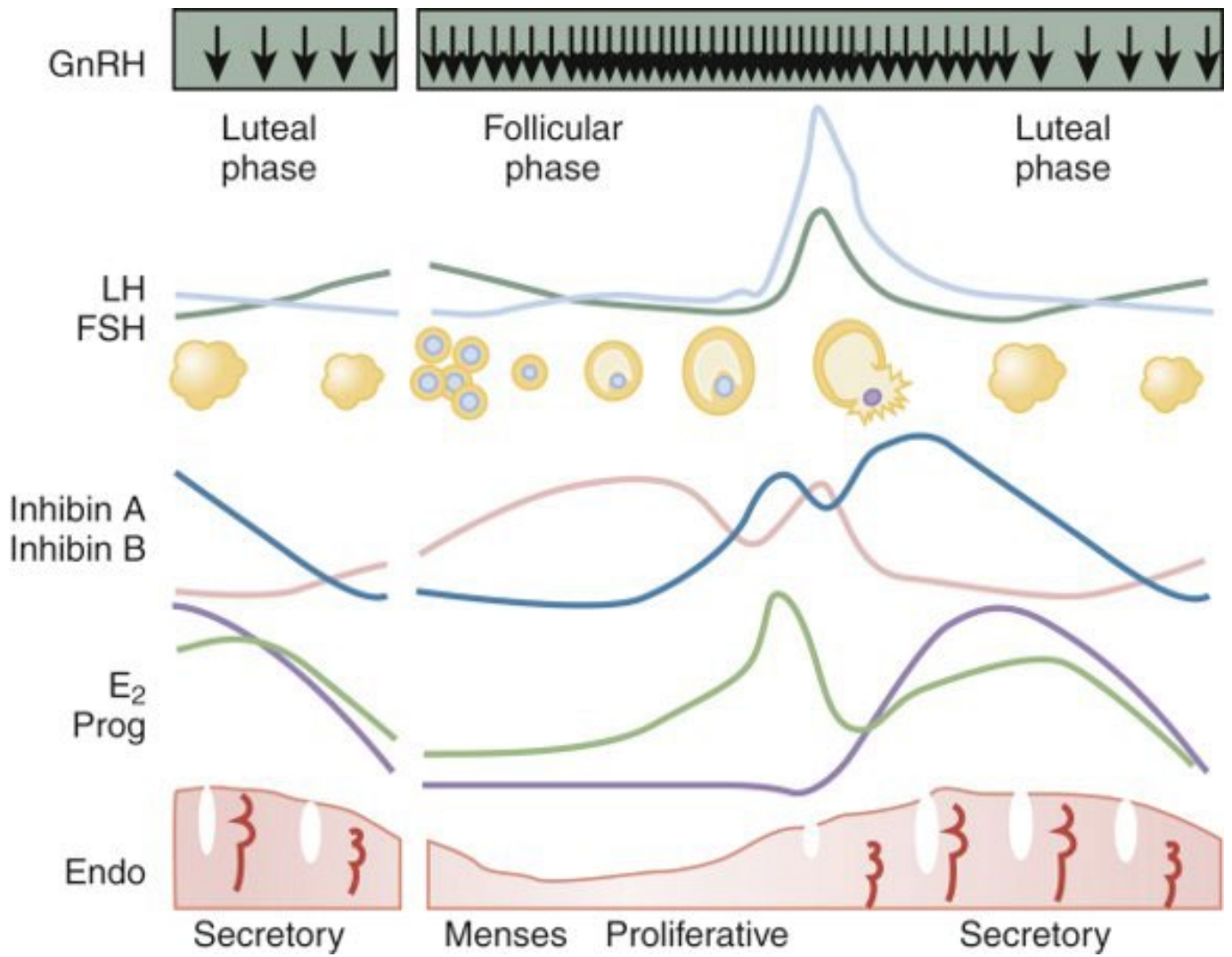
- Responsible for development and regulation of the female reproductive system
- Made by granulosa cells in the ovary when stimulated by FSH
- Feeds back to pituitary for continued release of FSH
- Promotes endometrial growth and thickening in order to prepare for implantation
- Increase cervical mucous production and changes consistency of cervical mucous



(a)

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# Estrogen



Hall, J.E. 2019. Yen and Jaffe's Reproductive Endocrinology

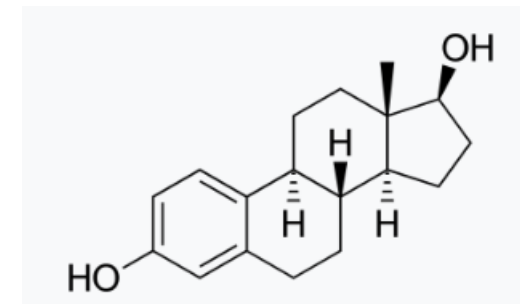
# Benefits of Estrogens

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- Growth- estrogen is critical for bone density, muscle mass, and collagen synthesis
- Libido
- Insulin sensitivity
- Support neurotransmitter balance & mood
- Weight management
- Sleep
- Memory & concentration
- Hair & skin health
- Cardiovascular health

# Estrogen Forms

- 3 major endogenously produced estrogens:
  - Estrone (E1)
  - Estradiol (E2)
  - Estriol (E3)
  - Interestingly, a 4<sup>th</sup> estrogen, estetrol (E4) is made in pregnancy!
- Estradiol is the predominant estrogen in a cycling female both in serum concentration as well as biological activity



[www.wikipedia.com](http://www.wikipedia.com)

# Estrogen Synthesis

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- Estrogens are synthesized from androgens by the enzyme aromatase
  - Testosterone
  - Androstenedione

# Low Estrogen: Signs & Symptoms

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- Hot flashes
- Insomnia
- Low sex drive
- Mood changes
- Brain fog
- Vaginal dryness & absence of fertile cervical mucous
- Joint pain
- Decreased bone mineral density

# Low Estrogen: Possible Root Causes

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- Primary ovarian insufficiency or poor ovarian cell health
- Stress and HPA axis dysfunction
- Thyroid dysfunction
- High prolactin
- Perimenopause or surgical menopause
- Anorexia, extreme exercise, or caloric deficit
- Low aromatase activity
- Hypogonadism



# Considerations to Support Estrogen

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- Assess and treat the underlying cause
- Herbal medicines (phytoestrogenic herbs)
- Dietary sources of phytoestrogens including unprocessed soy, alfalfa sprouts, and others
- HPA Axis support
- Androgen support (if also low)
- Estrogen replacement therapy (only if appropriate)

# Estrogen Excess: Signs and Risks

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- Elevated estrogen in a cycling female may be normal
- Heavy bleeding
- Cramping
- Fibroids
- Endometriosis
- Fibrocystic breasts
- Tender breasts
- Fatigue
- Mood instability
- Acne
- Headaches
- Weight gain

# Estrogen Excess: Possible Root Causes

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- Elevated estrogen in a cycling female may be normal
- Obesity
- Insulin resistance & diabetes
- Stress
- PCOS
- High aromatase activity
- Slow estrogen detoxification
- Endocrine disrupting chemical exposures
- High alcohol intake
- Gut dysbiosis
- HPA axis dysfunction

# Considerations for Estrogen Excess

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- Assess & treat the underlying cause, if known
- Support estrogen detoxification
- Support the HPA axis
- Balance inflammation
- Regulate blood sugar & weight loss (if appropriate)
- Lowering androgen levels (if elevated)
- Support liver function, generally
- Aromatase inhibitors (natural or pharmaceutical)

# Thank You!

If you are interested in learning more about hormones, each week we hold one-hour long mentorship sessions! Once you are a registered DUTCH provider, you can book these through our online scheduling link. Please call to get registered today.

**For questions, contact:**

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