

# Estrogen in Menopause

# What is Menopause?

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- Please review the first video in this series “Physiology of Menopause”
- Ovarian reserve (available ova) declines with age
- Ova maturation and release are the key contributors to estradiol (E2) and progesterone (P) levels throughout the fertile years
  - E2 and P have *numerous* actions in the body
- Ovarian fertility cycle stops at age 45-55
- Ovarian ova production stops, E2 and P drop to minimal levels
- Systems that benefitted from E2 and P experience functional decline

# 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

# Low Estrogen: Signs & Symptoms

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- Hot flashes
- Insomnia
- Low sex drive
- Mood changes
- Brain fog
- Vaginal dryness
- Joint pain
- Decreased bone mineral density

# Menopause Clinical Concerns

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- Low E symptoms:
  - Hot flashes (76.1%)
  - Insomnia, disrupted sleep (65.7%)
  - Low libido/Vaginal dryness (58.9%/55.8%)
  - Depression/Irritability/Anxiety (46.2%/45.1%/30.5%)

# Perimenopause and Menopause Symptoms

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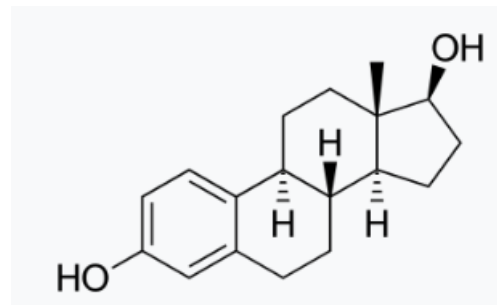
- Perimenopause: Irregular periods/fluctuating symptoms
  - Low P, high E state is common in perimenopause
  - Mood swings
  - Weight gain
  - Intermittent hot flashes/night sweats
  - Estrogen dominance interspersed with low estrogen
- During **menopause**, E & P are low all the time
- Low estrogen symptoms:
  - Hot flashes (76.1%)
  - Insomnia, disrupted sleep (65.7%)
  - Low libido/Vaginal dryness (58.9%/55.8%)
  - Depression/Irritability/Anxiety (46.2%/45.1%/30.5%)

# Estrogen Forms

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## 3 major endogenously produced estrogens:

- Estrone (E1) has modest activity, precursor to E2
- **Estradiol (E2)** is the most potent, biologically active estrogen in all stages of life
- Estriol (E3) is a phase 1 detoxification metabolite of E2, also known as 16-hydroxy-E2
  - Has weak proliferative effects on tissue, useful as a topical therapy in vaginal dryness (more on that later)



wikipedia.org

# Estrogen in Menopause

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- Estrogens in menopause come from **aromatization of androgens** produced in the ovaries and adrenal glands
- Aromatization occurs in adipose (stored fat) tissue
- Normal endogenous menopausal estrogen **may be too low to have significant biological activity**
- **Adrenal health is key in menopause**



# High or Low Estrogen?

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- Research: Menopausal estrogen is too low to have significant biological effects
- **Endogenous estrogen production in menopause is not too high**
- Weight gain in menopausal women is likely due to:
  - Insulin resistance (E2 supports insulin sensitivity)
  - Inflammation (E2 lowers inflammation)
  - Loss of muscle mass (from aging, poor diet, low E2)
  - Weight distribution favors metabolically unfavorable abdominal deposition (E2 favors thighs, hips, subcutaneous deposition = metabolically favorable)
  - FSH?
    - (Some animal research finds FSH is an independent cause of weight gain)

# Adrenal Hormones

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- Adrenal DHEA is the main T and E2 source in menopause
- In chronic stress, low adrenal output, menopause symptoms more severe
- Cortisol circadian rhythm dysfunction negatively impacts sleep, metabolic health, cardiovascular health, and inflammation at all ages
  - These things are additionally under attack in menopause due to low estrogen
- Melatonin production declines in some women with menopause

# Testing Hormone Levels in Menopause

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- Conventional medical organizations do not recommend testing
- Helpful in a comprehensive functional medicine plan
- Consider testing:
  - E2
  - Total Testosterone
  - Calculated free testosterone
  - DHEA-s
  - Adrenal assessment (cortisol, circadian rhythm)
  - Full thyroid panel
  - Cardiometabolic panel

# DUTCH Test Utility in Menopause

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- Estrogen *metabolism*
  - Determine how HRT might be metabolized
  - If additional support is needed for detox
  - Limit negative impacts of increasing estrogen levels with HRT (if using HRT)
- Androgens and *metabolites*
  - Show androgen activity in the cells
  - Circulating androgens are the sole source of estrogens
  - Also impact libido, mood, muscle mass
- Adrenal panel
  - Low adrenal output = low androgens, estrogens- even for menopause
  - Measurement of resilience with aging

# Benefits of HRT: E2

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- Most evidence shows a reduction in hot flashes
  - These impact work, sleep, mood, and beyond
- Better sleep
- Insulin and cholesterol improvement?
- Less brain fog, memory issues
- Reduced anxiety and depression
- Improved libido, vaginal dryness
- Improves long term bone health
- E2 replacement is very modest- lower than levels experienced in cycling women

# Benefits of HRT: Progesterone

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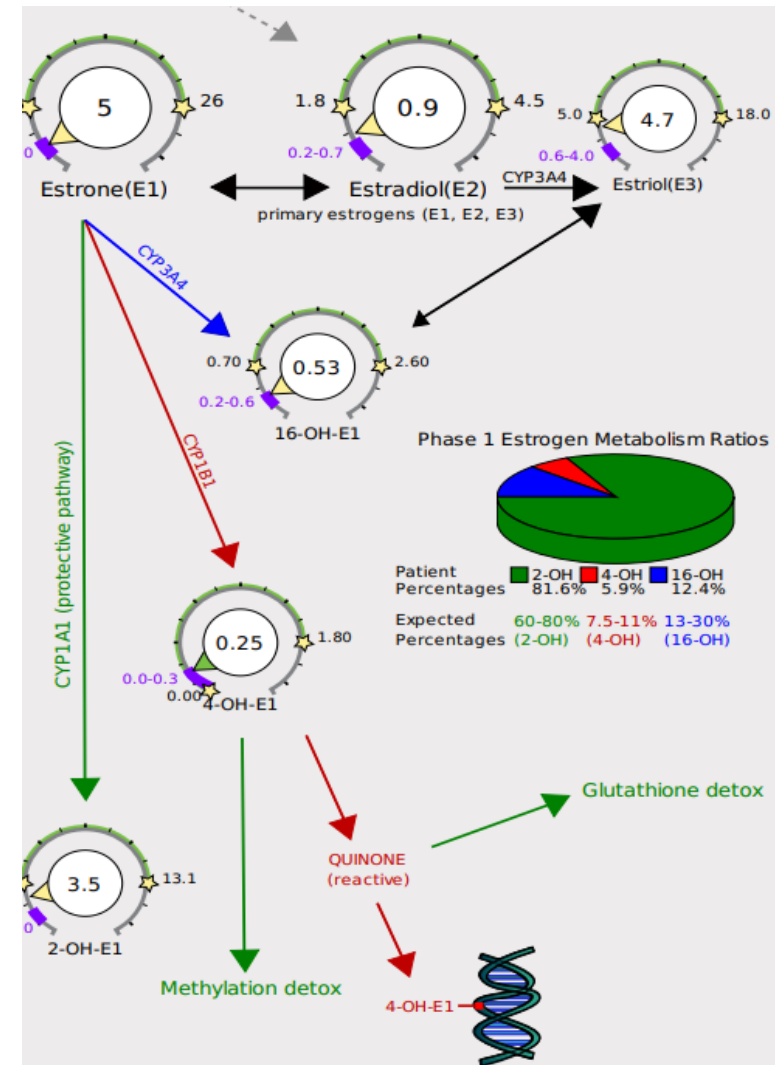
- Used to reduce endometrial cancer risk with E2 replacement
- Must be combined with E2 replacement if the patient has a uterus
- See additional progesterone lecture in this post menopause video series for more details

# Testing HRT?

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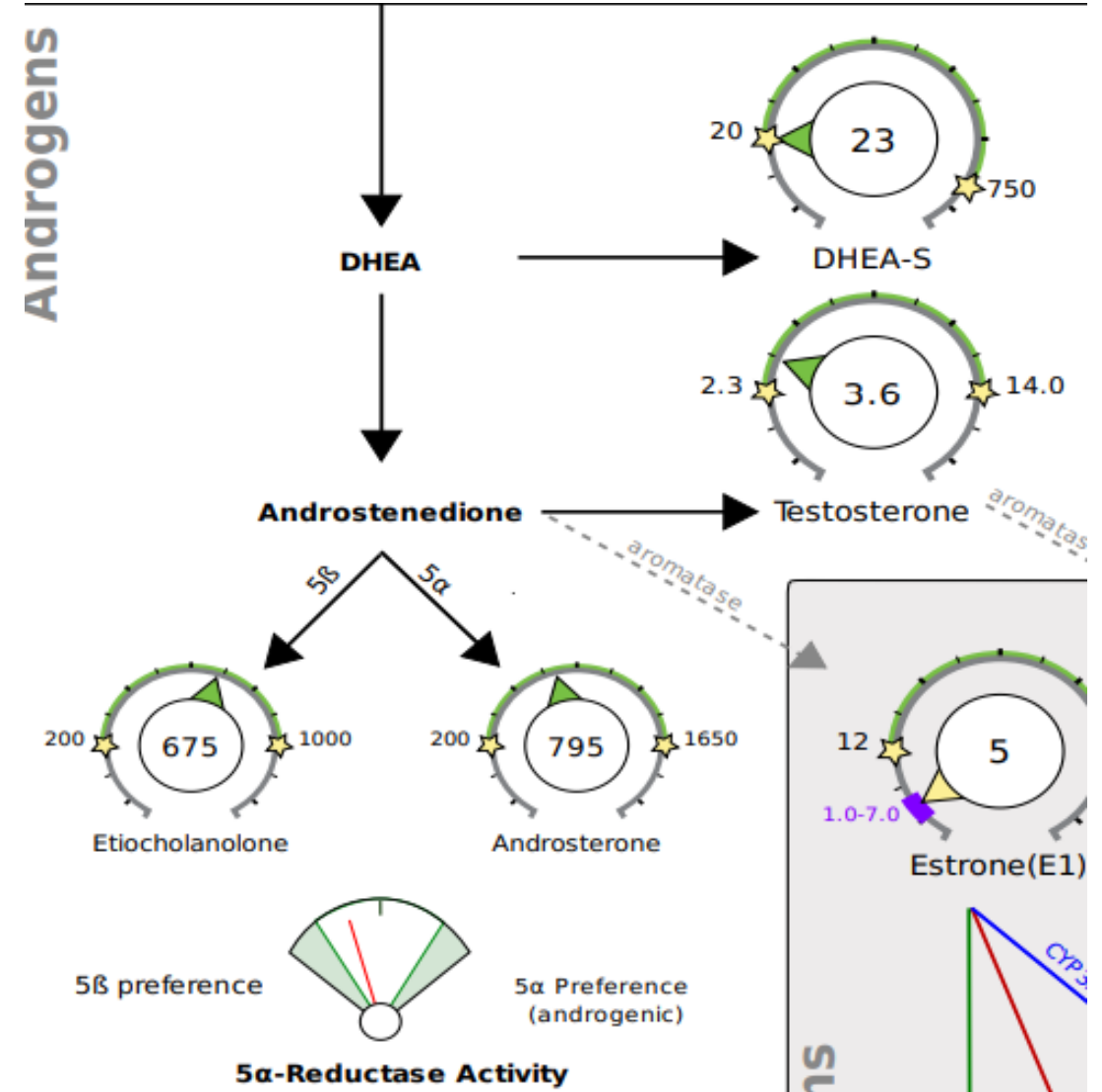
- Conventional approach is not to test hormones in menopause
- FDA says HRT = E2 only for hot flash relief
- How does the DUTCH test help?
  - See if E2 in the therapeutic range (above menopausal range)
  - Optimize E1/E2 detox
  - Other measurements may be helpful in addressing menopause concerns: circadian rhythm, androgens, melatonin, organic acids

- Estrogen levels and detox patterns

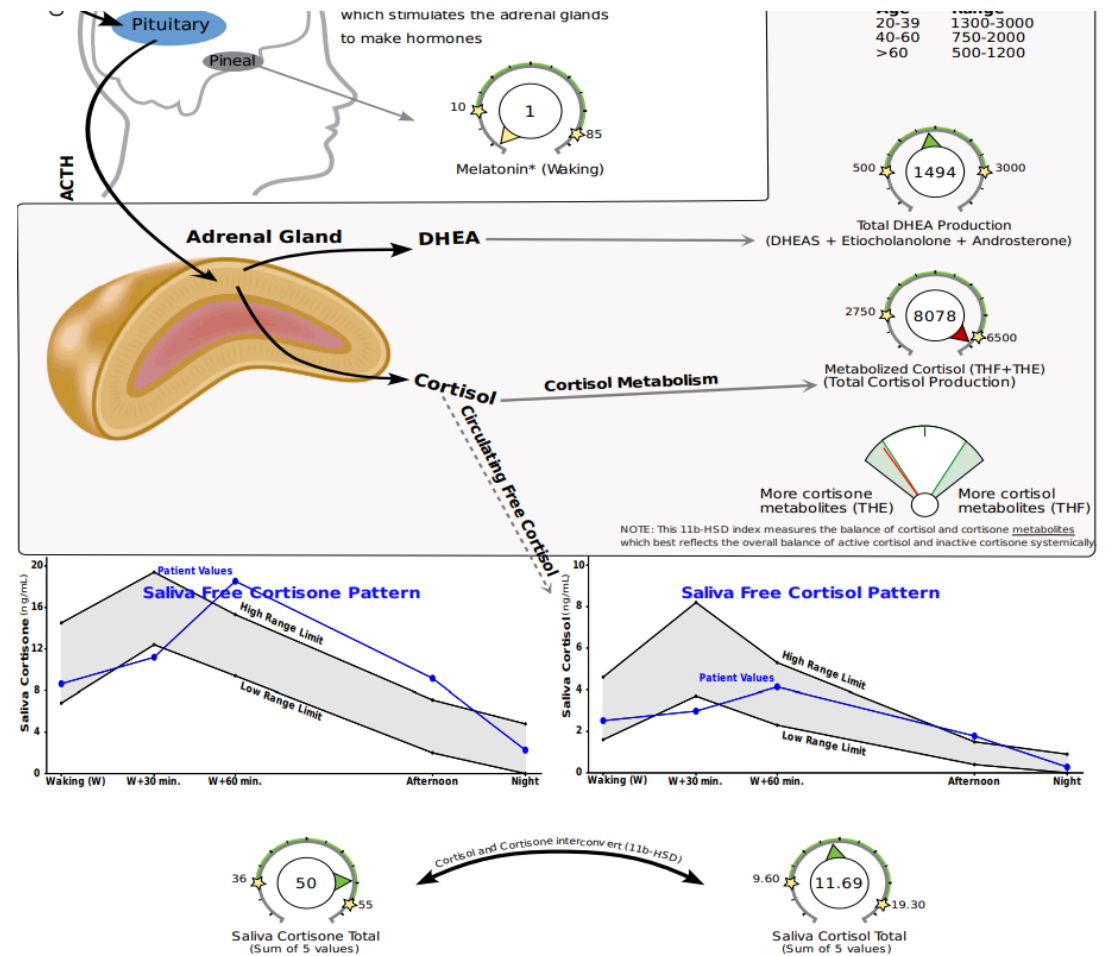




- Androgen levels and metabolites
- Remember from previous slides: Androgens are aromatized in the peripheral tissues into estrogen and in menopause this is the ONLY source of estrogen!



- Adrenal output, circadian rhythm insights



# 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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