

# Estrogen in Males

# The Three Main Estrogens

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The three main estrogens are estrone (E1), estradiol (E2) and estriol (E3)

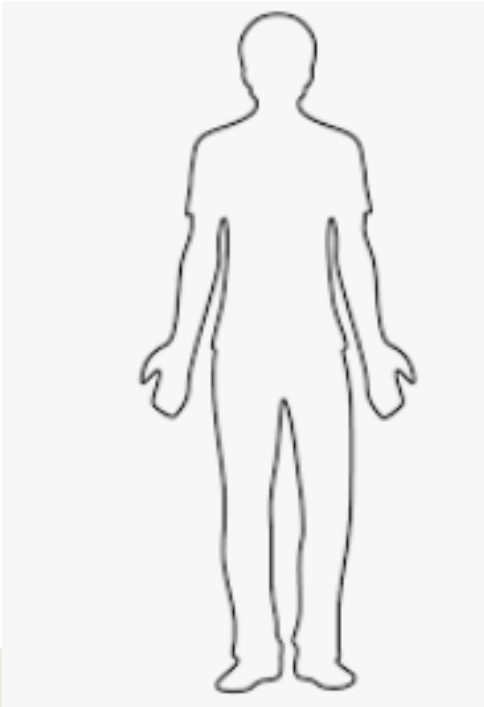
- **Estrone (E1)** serves as a moderate strength estrogen receptor agonist and a precursor for the strongest estrogen, estradiol.
- **Estradiol (E2)** is most potent, biologically active estrogen in males and females.
- **Estriol (E3)** is the weakest of the three and a downstream metabolite of estradiol and 16-OH-E1.



# Estrogen Production

- In males, only 20% of estradiol is synthesized by the Leydig cells in the testes. The remainder of estradiol is derived from aromatization of testosterone in fat cells, bone, brain and skin.

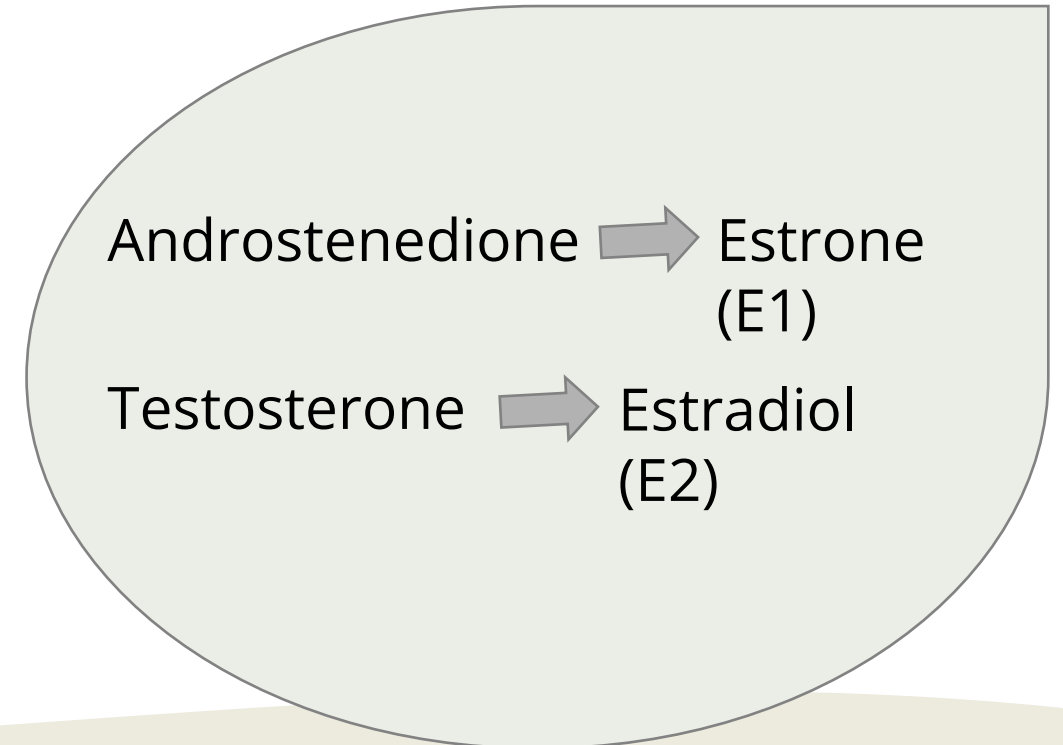
## Males



Estrogen production:

- 80% aromatization from androgens
- 20% testes

## Fat Cell



# Supportive Roles of Estrogen in Males

In males, estradiol (E2) that is well balanced with testosterone is beneficial for:

- Bone mineral density
- Tissue (including muscle) building and maintenance
- Healthy weight management
- Mood
- Concentration
- Memory
- Hair & skin
- Cardiovascular health
- Libido
- Ability to achieve and maintain an erection



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# Healthy Estrogen

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Estrogen keeps Sean healthy.

- Great bone health
- Healthy weight
- No mood issues
- Good memory
- Able to focus
- Healthy hair & skin
- Healthy cholesterol
- Great libido
- Easily able to achieve and maintain an erection

# Estrogen Deficiency

In males, estrogen deficiency may result in:

- Hot flashes
- Unfavorable lipid profile
- Low bone mineral density
  - (Even when total testosterone levels are within the normal range)
- Erectile dysfunction
- Infertility



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# Estrogen Deficiency

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Charlie



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Charlie has low estrogen.

- Fatigue
- Osteopenia
- High cholesterol

# Estrogen Excess

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In males, estrogen excess may result in:

- Breast tissue enlargement (gynecomastia)
- Obesity
- Mood changes
- Low sex drive
- Impaired erectile function



# Estrogen Excess



James

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James has low androgens and high estrogen.

- Fatigue
- Obese, gynecomastia
- Low libido

# Estrogen on the DUTCH Test

# DUTCH Estrogen Metabolites

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DUTCH urine estrogen metabolites:

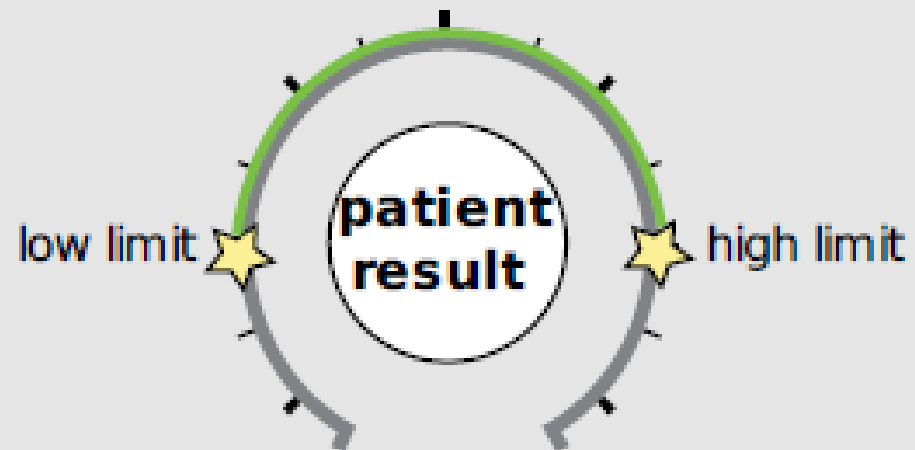
- E1
- E2
- E3
- Phase 1 estrogen metabolites:
  - 2-OH-E1 & 2-OH-E2
  - 4-OH-E1 & 4-OH-E2
  - 16-OH-E1
- Phase 2 estrogen metabolite:
  - 2-methoxy-E1



# Interpreting Estrogens on the DUTCH Test

# Interpreting Estrogen on the DUTCH Test

## Key (how to read the results):



The green shaded region in between the two stars on the androgen dials represents the reference range for males 18 years and older.

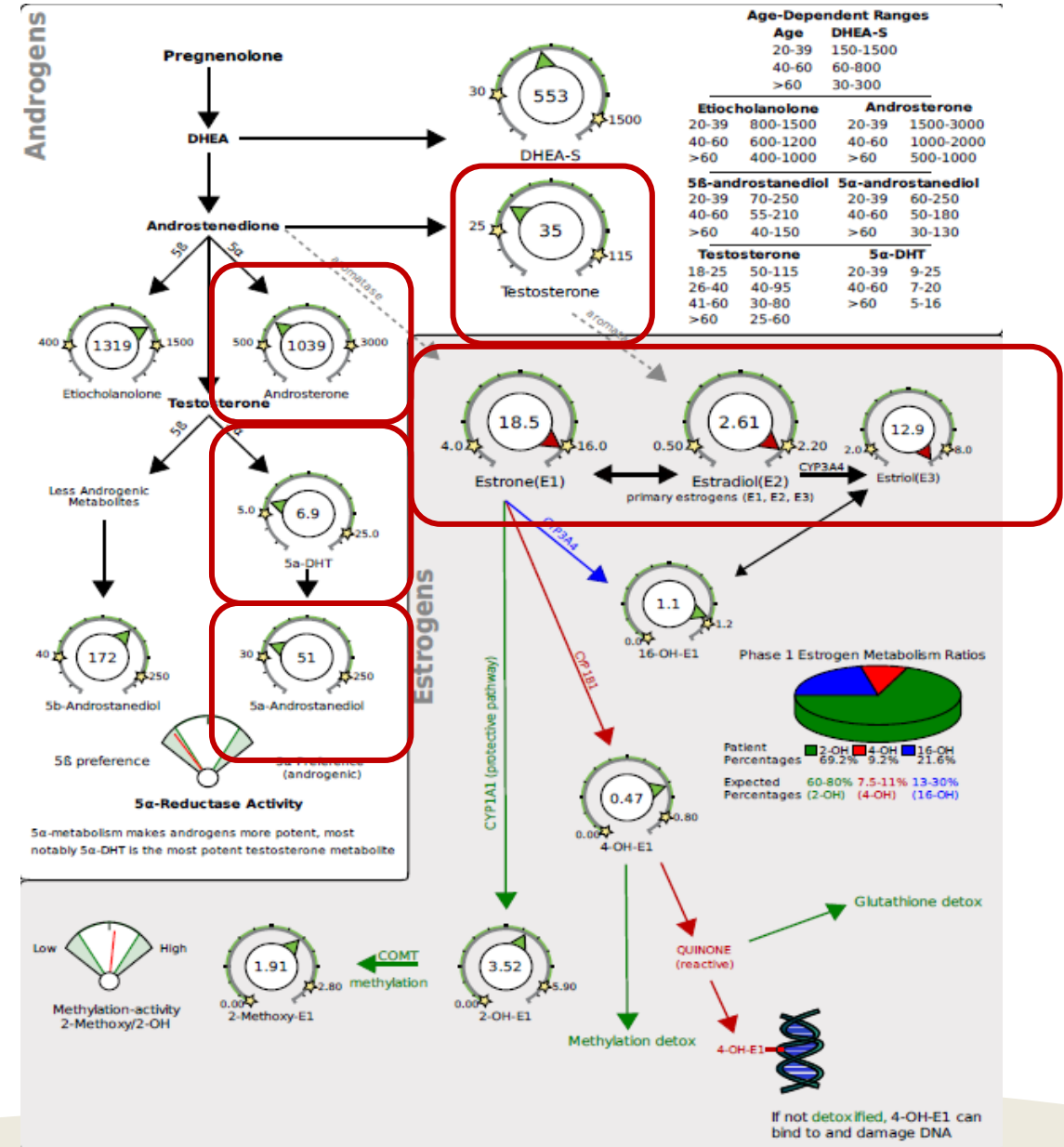
# Interpreting Estrogen on the DUTCH Test

It can be helpful to compare the direction of the estrogen dials to the direction of the androgen dials (especially the testosterone, 5a-DHT, 5a-androstanediol and androsterone dials) when assessing the testosterone to estradiol ratio.

It is generally preferred to see the nose of the testosterone/androgen gauges at the same level or higher than the estrogen gauges.

This pattern shows more estrogen in comparison to androgen levels.

It can also be helpful to assess estrogen metabolism patterns, as poor detoxification can impact estrogen levels in the body.



# Key Points

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- In males, estrogen supports bone mineral density, healthy weight management, mood, concentration, memory, hair, skin, cardiovascular health, healthy lipid profile, libido and ability to achieve and maintain an erection.
- Estradiol is the most potent, biologically active estrogen in the body.
- On the DUTCH Test, it can be helpful to compare the direction of the estrogen dials to the direction of the androgen dials (especially the testosterone, 5a-DHT, 5a-androstenediol and androsterone dials) when assessing the testosterone to estradiol ratio.

# References

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- Newman M, et al. Evaluating urinary estrogen and progesterone metabolites using dried filter paper samples and gas chromatography with tandem mass spectrometry (GC-MS/MS). BMC Chem. 2019; 13(1): 20.
- O'Donnell L, Stanton P, de Kretser DM. Endocrinology of the Male Reproductive System and Spermatogenesis. In: Feingold KR, Anawalt B, Boyce A, Chrousos G, de Herder WW, Dhatariya K, et al., editors. Endotext. South Dartmouth (MA)2000.
- Rochira V, Madeo B, Diazzi C, Zirilli L, Daniele S, Carani C. Estrogens and male reproduction. In: Feingold KR, Anawalt B, Boyce A, Chrousos G, de Herder WW, Dhatariya K, et al., editors. Endotext. South Dartmouth (MA)2000.



# 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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