

MODULE 3 & 4

The Physiology of Menopause



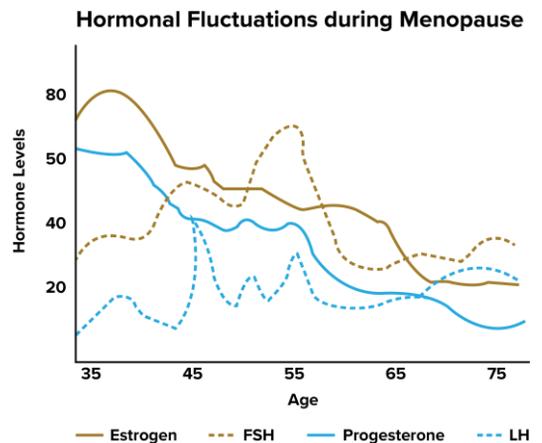
- Understanding the endocrine system and hormonal physiology.
- Understanding how, due to ageing and menopause changes, our endocrine system adapts.

Anatomy is the study of 'what and where' but Physiology is the study of 'how and why'.

- What happens to the body in menopause?
- How do hormones change as we age?
- What are the overall effects around the body of reproductive hormones changing as we move through menopause?

Oestrogen is an important sex steroid hormone which serves an important role in the regulation of a number of biological functions, including:

- regulating bone density,
- brain function,
- cholesterol mobilization,
- electrolyte balance,
- skin physiology,
- the cardiovascular system,
- the central nervous system
- female reproductive organs

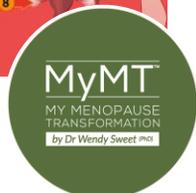
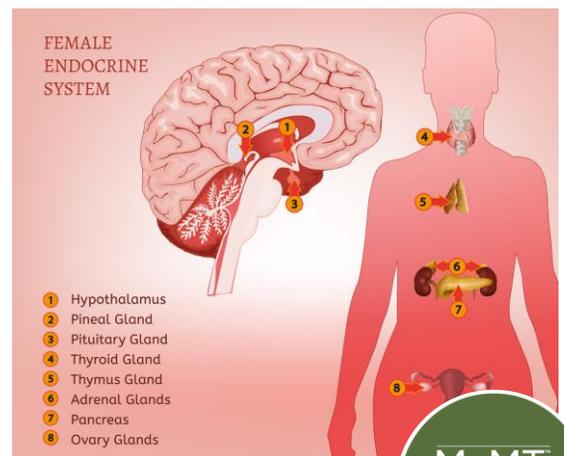


Production by ovaries decreases from 250-300mcg/day down to 20mcg/day.

Reflection: If oestrogen exerts effects around the body, then what happens to other physiological systems as we move through menopause and into post-menopause ... our 'third age'?

ENDOCRINE SYSTEM

Hormones are produced by the cells of the endocrine glands. These glands are ductless so hormones are secreted directly into the bloodstream, where they move to the various sites of action.



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WHAT DO HORMONES DO?

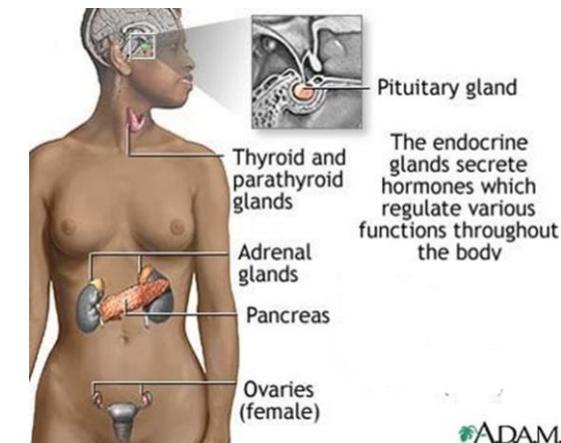
Hormones act as regulators of various bodily functions including the release of other hormones. Some of the factors that affect endocrine organs include:

- Ageing
- Certain diseases and conditions
- Stress
- The environment
- Genetics



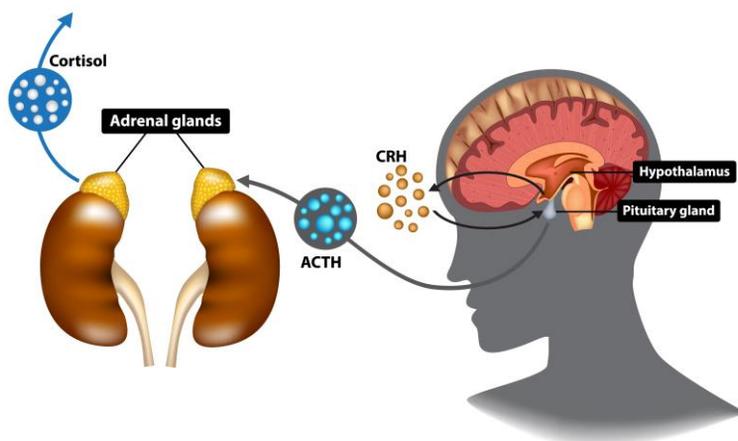
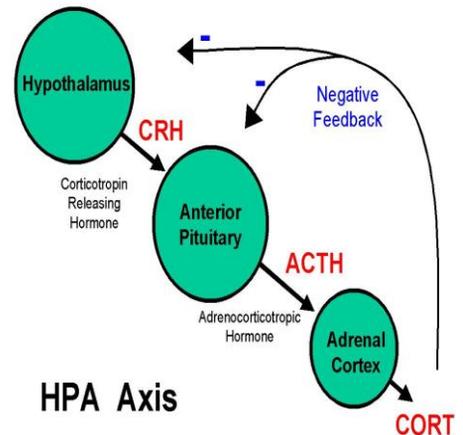
NEGATIVE FEEDBACK SYSTEM

The endocrine system operates on a negative feedback system, so low reproductive hormones cause changes in other hormones too.



HPA AXIS

The hypothalamus controls appetite, sleep cycles, hormones and body temperature. This interconnection is critical to manage in menopause.



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EFFECT OF AGEING ON THE PITUITARY GLAND

Almost all pituitary hormones are altered by ageing in humans, often in a manner dependent upon sex, body composition, stress, comorbidity, intercurrent illness, medication use, physical frailty, caloric intake, immune status, level of exercise, and neurocognitive decline.

Changes to pituitary hormones with age, disrupts circadian function.

[Veldhuis, 2013]

EFFECT OF AGEING ON THE CARDIOVASCULAR SYSTEM

- Vascular Stiffness
- High LDL Cholesterol
- Increased Triglycerides
- Lower Cardiac Output

EFFECT OF AGEING ON THE NERVOUS SYSTEM

- Increased irritability
- Changes to myelin sheath
- Increased thickening of the nerve

EFFECT OF AGEING ON THE MUSCULO-SKELETAL-LYMPHATIC SYSTEM

Advancing age represents a major risk factor for low bone mass and strength and a decline in muscle mass and function, leading to an increased risk of falls and fractures.

- Bloating/ Water retention
- Joint Pain
- Sarcopenia
- Osteoporosis
- Fractures

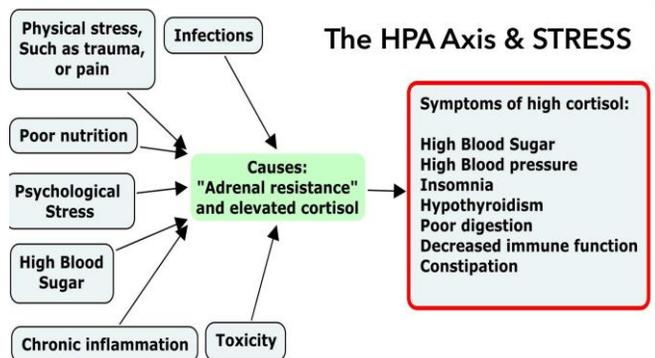
EFFECT OF AGEING ON THE THYROID GLAND

One of the subclinical thyroid function disturbances is subclinical hypothyroidism, which is characterized by normal free thyroxine (FT4) and increased thyrotropin (TSH) levels.

Intriguingly, thyroid hypofunction, as well as elevated thyrotropin (TSH) levels may contribute to the extended lifespan.

EFFECT OF AGEING ON THE ADRENAL GLANDS

- Increased Cortisol secretion
- Elevated glucocorticoid levels
- Elevated stress response



EFFECT OF AGEING ON THE LUNGS IN WOMEN

- Lower capacity/ volume
- Increased respiratory rate
- Loss of elasticity

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SUMMARY

The study of physiology is, in a sense, the study of life. It asks questions about the internal workings of organisms and how they interact with the world around them.

Physiology explains how organs and systems within the body work, how they communicate, and how they combine their efforts to make conditions favorable for survival.

The clinical significance of an ageing endocrine system includes:

- Reduced protein synthesis
- Decrease in lean body mass and bone mass
- Increased fat mass
- Increased risk for insulin resistance
- Higher cardiovascular disease risk
- Increase in vasomotor symptoms
- Fatigue
- Depression
- Anaemia
- Poor libido
- Decline in immune function.

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