

Module 1

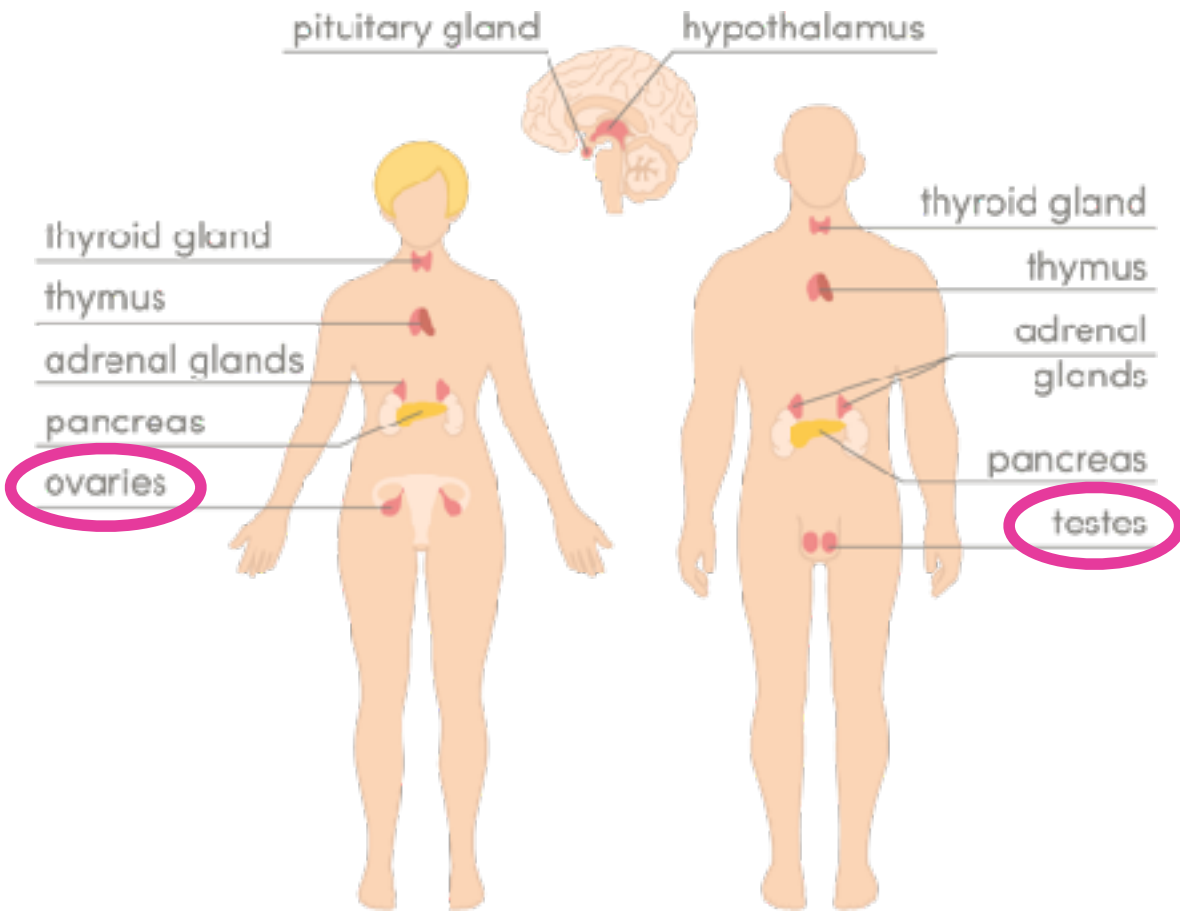
The Adrenals, 'Adrenal Fatigue', Cortisol and History of Stress Theory

Lesson 2

NOURISH & FLOURISH
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Sex Hormone Review

ESTROGEN, PROGESTERONE, TESTOSTERONE



Women make estrogen in the ovaries and fat cells

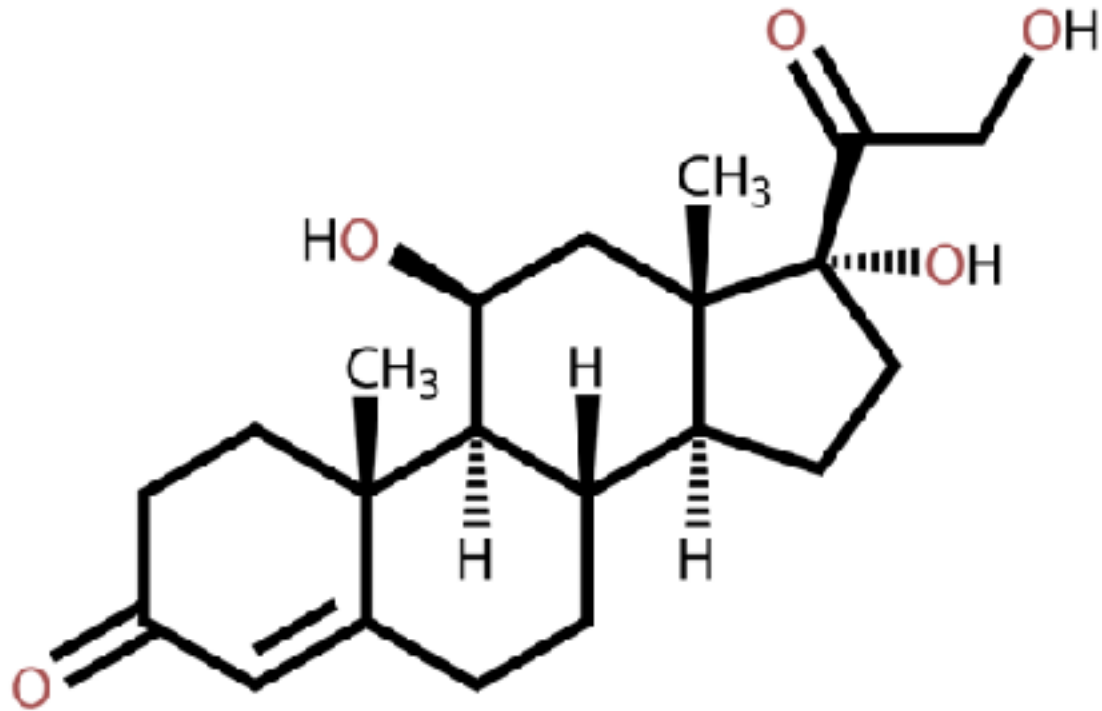
Progesterone is made by the corpus luteum during ovulation

Testosterone is made by the ovaries and adrenal glands

In men, testosterone is made by the testes

Adrenal Hormones

CORTISOL



The hormone that helps buffer stress

DHEA-made in the adrenals and the brain

Helps to counteract the catabolic effects
of cortisol

CLINICAL PEARL:

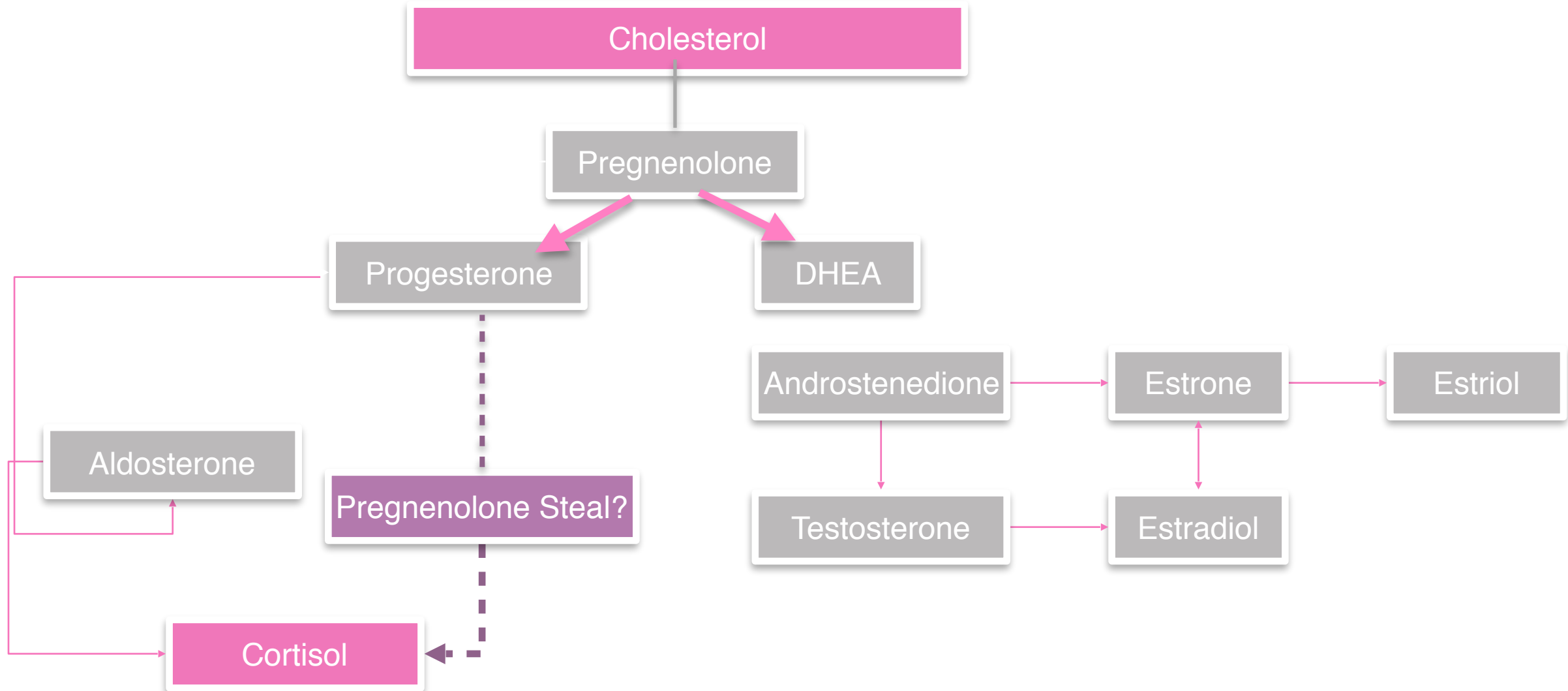
High amounts of insulin cause women to make more testosterone & men to make more estrogen.

The Hormone Cascade

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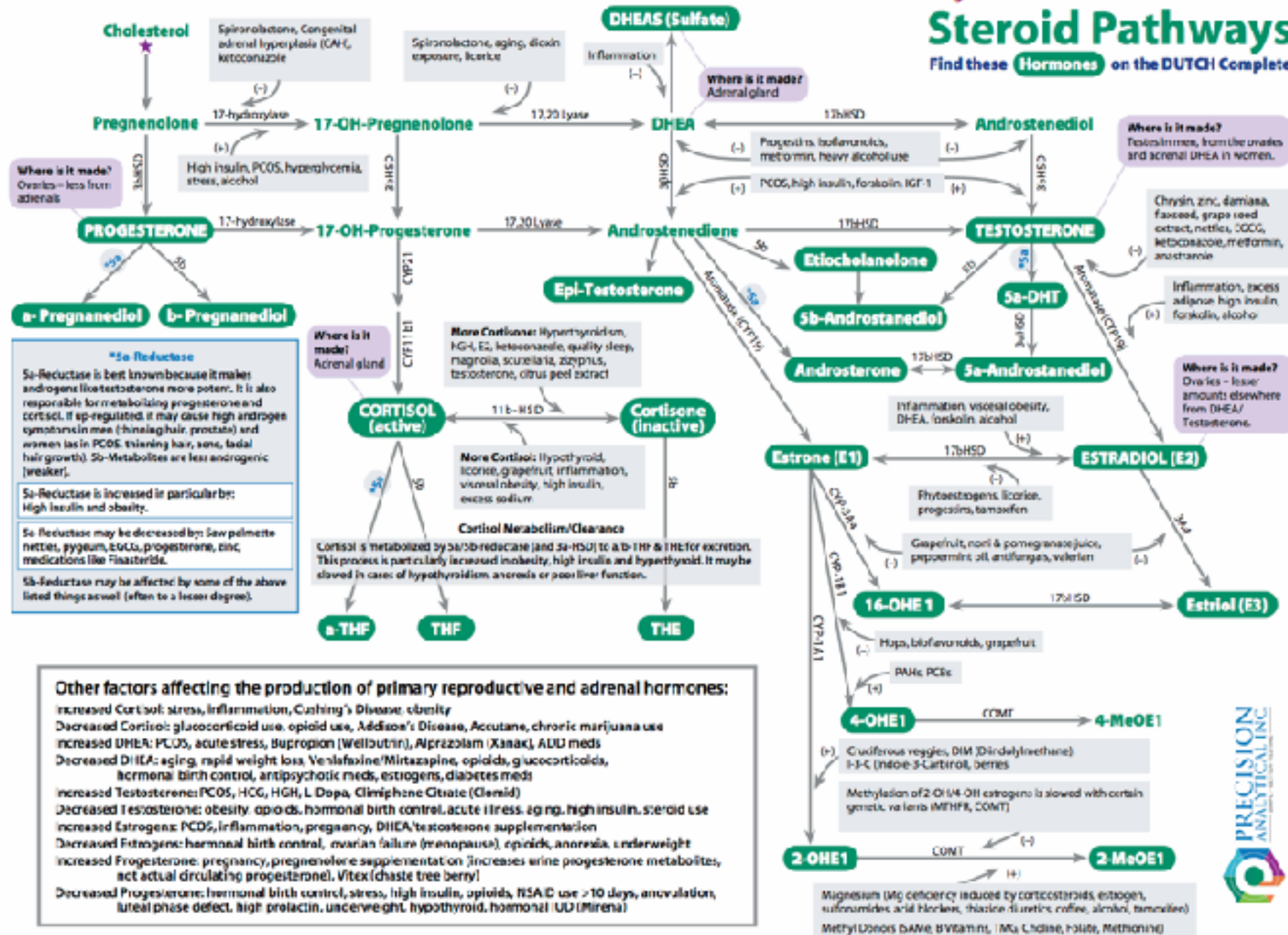
The Hormone Cascade

An extremely over simplified way of looking at steroidogenesis



Steroid Pathways

Find these **Hormones** on the **DUTCH Complete**



Adrenal Glands



What are the adrenal glands and what do they do?

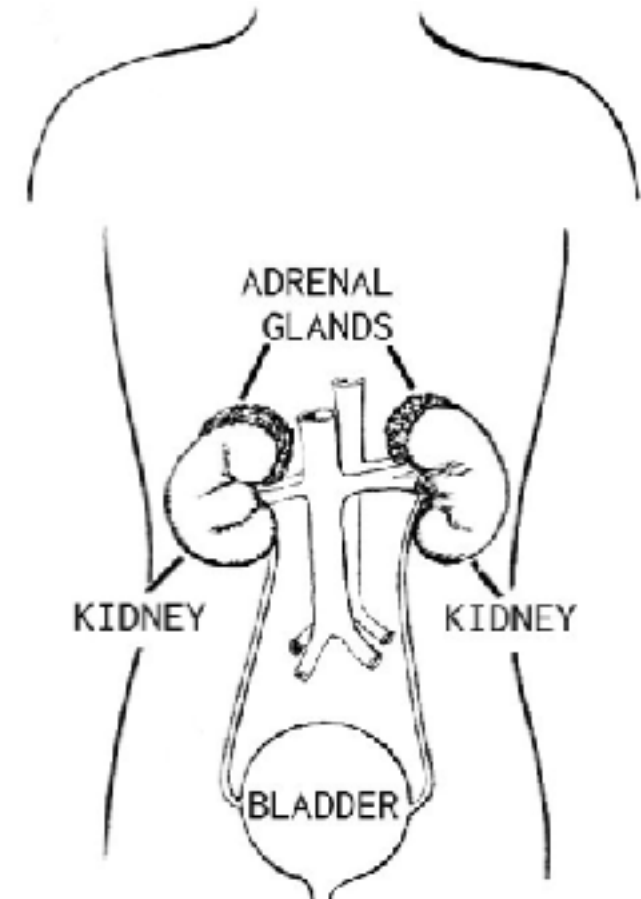
Adrenals are a pair of glands that sit atop the kidneys

Comprised of 2 very different parts:
Cortex & Medulla

Cortex contains 3 zones of cells:

1. *Zona glomerulosa* (produces aldosterone)
2. *Zona fasciculata* (cortisol)
3. *Zona reticularis* (DHEA)

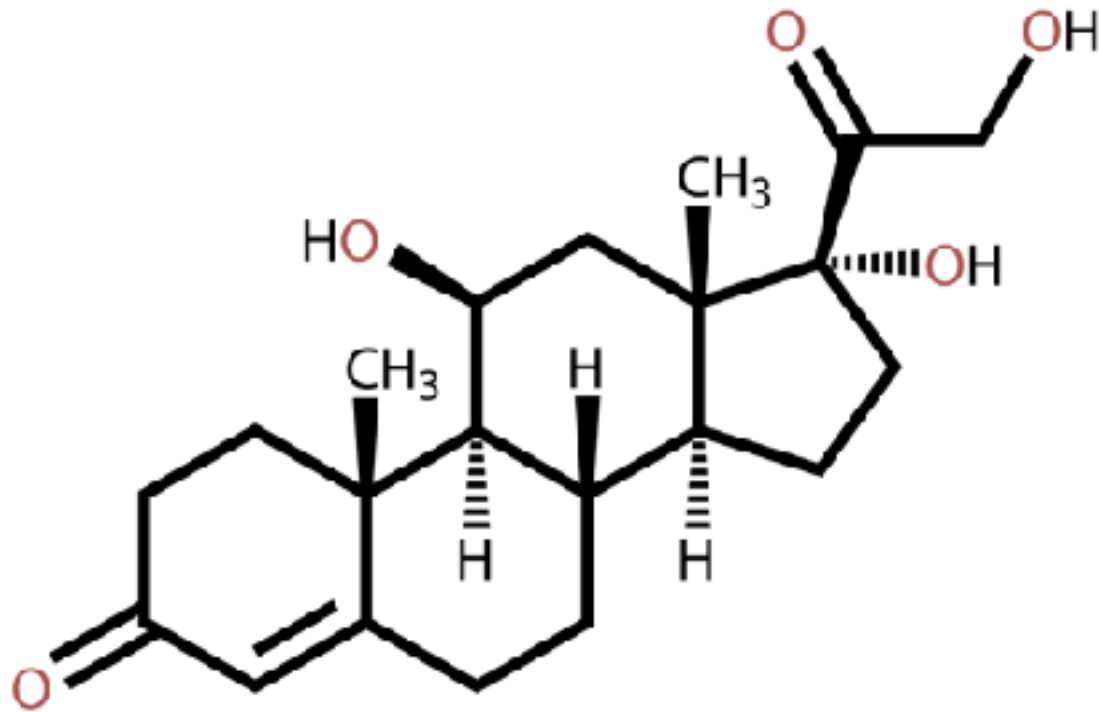
The adrenal medulla produces epinephrine & norepinephrine (adrenaline & noradrenaline)



Cortisol



UNDERSTANDING CORTISOL



Cortisol is a steroid hormone

95% of cortisol is bound to protein carriers

Secreted in a diurnal rhythm

Controlled by HPA Axis

Has 3 main functions:

1. *Raise blood pressure*
2. *Raise blood sugar*
3. *Modulate inflammation*

Aids in digestion, helps metabolize protein, fat and carbs and regulates blood pressure

Circadian Rhythm

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What is the Circadian Rhythm?

- Our 24 hour clock
- Humans are diurnal
- Cortisol is secreted in a diurnal fashion
- It is highest in the morning
- Lowest at night
- Cortisol and melatonin oppose each other

Cortisol B (Morning)	Within range	73.9	ng/mg	38 - 120
Cortisol C (Afternoon)	Low end of range	8.5	ng/mg	7.3 – 21
Cortisol D (Night)	Within range	3.0	ng/mg	0 - 10

GETTING SUN IS NOT JUST ABOUT VITAMIN D

Sunlight in the eyes transmits to a small bundle of neurons in the hypothalamus

This controls the SCN

The SCN causes the hypothalamus to release CRH

The CRH causes the pituitary to release ACTH causing the adrenals to make and release cortisol



High Cortisol

Symptoms

- High blood pressure
- High blood sugar
- Insulin resistance
- Cravings for carbs
- Tired but wired feeling
- Anxiety, depression
- Increased belly fat
- Frequent infections
- Easily bruise
- Poor wound healing
- Decreased muscle mass

What it Feels Like

1. Frequently stressed out
2. Trouble falling asleep
3. Anxiety and irritability
4. High blood sugar levels
5. Waking up tired
6. Sweaty often

Low Cortisol

Symptoms

- Fatigue
- Inflammation
- Pain
- Allergies
- Muscle weakness
- Low blood pressure
- Low blood sugar
- Poor stress handling
- Brain fog
- Depression
- Low libido

What it Feels Like

1. Trouble staying asleep
2. Being a slow starter in the morning
3. Afternoon fatigue
4. Feeling run down
5. Often overwhelmed
6. Cravings for salt and sweets
7. Postural hypotension
8. Afternoon headaches

Is it Adrenal Fatigue?

THE HISTORY OF STRESS THEORY

Hungarian endocrinologist Hans Selye coined the word stress in 1936.

He defined it as “the non specific response of the body to any demand made upon it.”

In 1950, he introduced the “general adaptation syndrome”

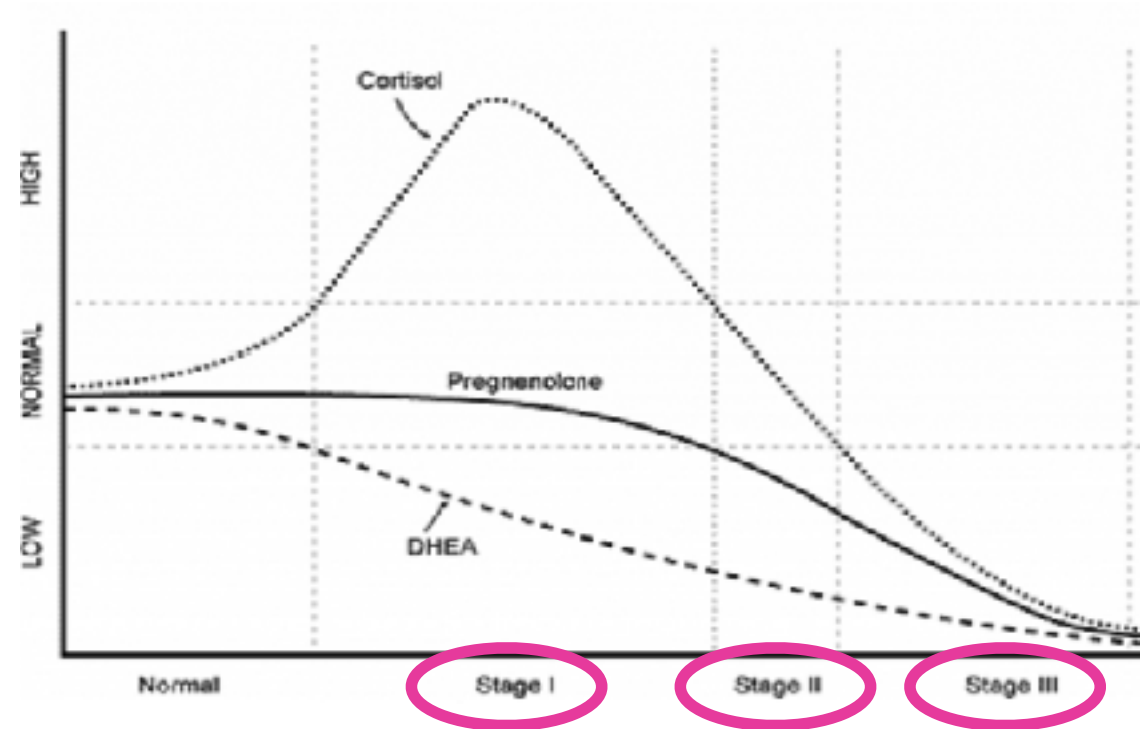


THE HOLISTIC PRACTITIONERS PARADIGM

Stage 1: ACUTE PHASE

Stage 2: COMPENSATORY PHASE

Stage 3: EXHAUSTION PHASE



Is this paradigm accurate?

Adrenal fatigue has been the dominant way of understanding chronic fatigue and other related health issues for a long time in the alternative medicine community but fresh thinking by new researchers is discovering that this is vastly oversimplified.

Both cortisol **production** and **availability** must be measured to determine the function of the HPA axis.

Saliva testing only measures cortisol availability.



So, if it's not adrenal fatigue, then what is it?

The stress response and cortisol are good things.

They are meant to keep us alive in the face of a threat to our well being. But we not meant to handle constant stressors.

When stress remains constant, the body goes into an adaptive state and may choose to lower cortisol output to protect tissues from the damaging effects of long term high cortisol, which is catabolic.



So, if it's not adrenal fatigue, then what is it?

So, while it is not adrenal fatigue, there certainly is something else going on if your client presents with symptoms discussed previously.

Lab testing is only a part of an evaluation. Sometimes hormone levels are tissue specific and this cannot be determined from a lab test.



BIG QUESTION TO ASK:

When you look at your client's intake form do you see risk factors for HPA Axis dysfunction?

Some big ones are shift work, divorce issues, poor diet, lack of down time, head trauma, injuries, drug use.

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