The Endocrine response to Stress

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The Physiology of Stress

- To understand the stress response, we must process a fundamental knowledge not only of psychology but of physiology as well.


Stressful Situation:
Co-worker accuses you of spilling company secrets
Fight
Say something back
Flight
Physically leave the area
Freeze
Don't say anything, and hope that the person will leave

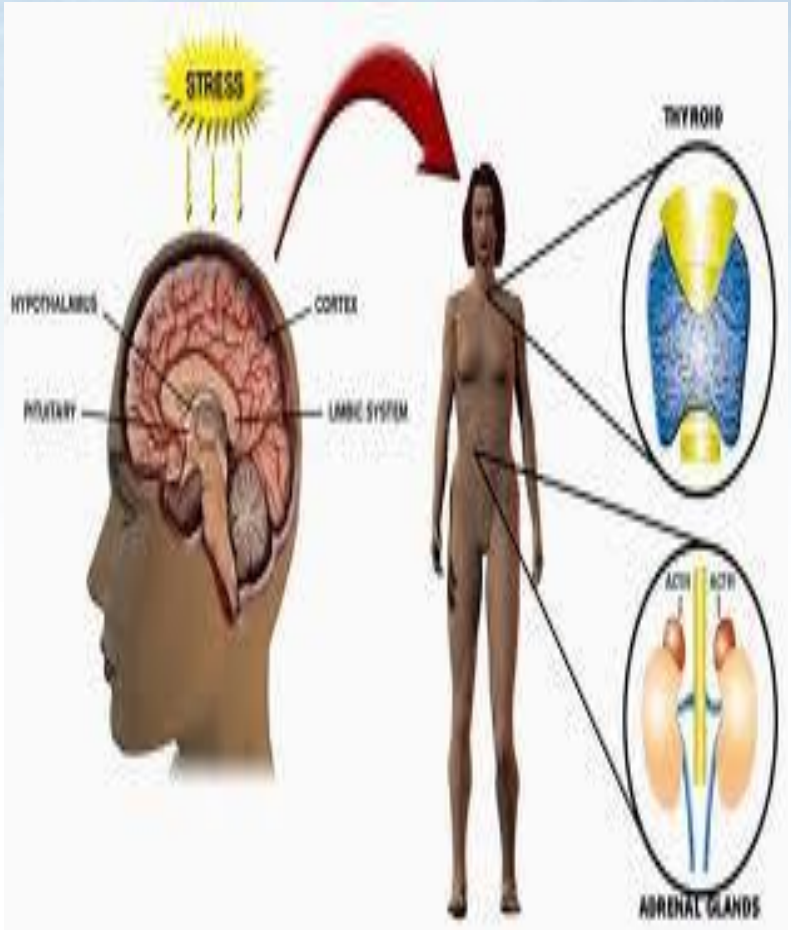
The Physiology of Stress (continued)

Hans Selye, considered by many as the father of the study of stress, developed the idea that a direct relationship exists between chronic stress and excessive wear and tear throughout the body.

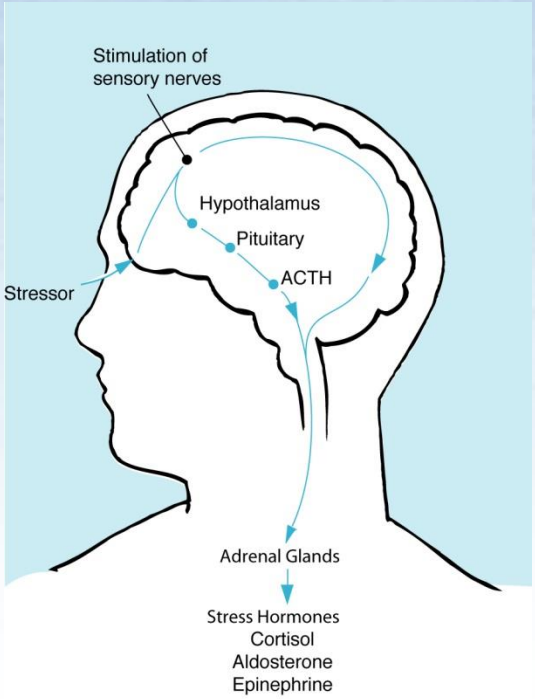
The Endocrine System

The glands most closely involved with the stress response are the:

- pituitary
- thyroid
- adrenal

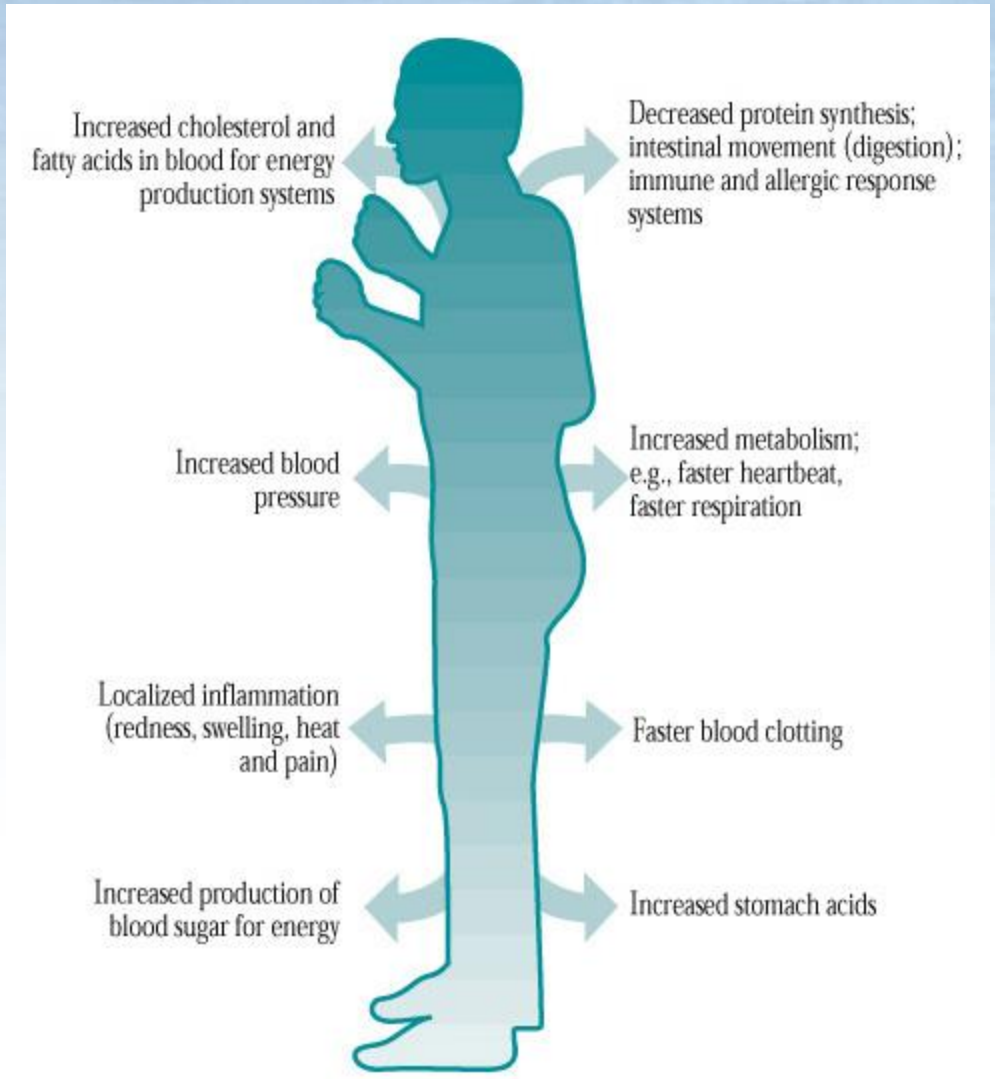


The ACTH Pathways



The Stress Response

Increased neural excitability
Increased cardiovascular activity
  Heart rate, stroke volume,
  cardiac output, blood pressure
Increased metabolic activity
  Gluconeogenesis: turning
  glycogen into sugar for energy
  Protein mobilization
    Decreased antibody producer
    Muscle wasting
  Fat mobilization: for breakdown
  into sugar
Increased sodium retention (salt)
Increase in neurological sweating
Change in salivation
Change in GI system tonus and motility


Increased cholesterol and fatty acids in blood for energy production systems
Decreased protein synthesis; intestinal movement (digestion); immune and allergic response systems
Increased blood pressure
Increased metabolism; e.g., faster heartbeat, faster respiration
Localized inflammation (redness, swelling, heat and pain)
Faster blood clotting
Increased production of blood sugar for energy
Increased stomach acids


Senses and perception sharpen
Blood flow to musdes increases
Sweating increases
Heart beats faster
Breathing speeds up
Blood thickens
Digestion stops
Bladder and bowels want to empty

The Somatotropic Axis

Growth hormone
stimulates the release of the mineralocorticoids, produces a diabetic-like insulin-resistant effect, as well as mobilization of fats stored in the body.

The Thyroid Axis

In humans, psychosocial stimuli have generally led to an increase in thyroidal activity.
thyroid hormones have been shown to increase metabolism , heart rate, heart contractility, peripheral vascular resistance, thereby increasing blood pressure.

The Posterior Pituitary Axis and Other Phenomena

The posterior pituitary release the hormones, **vasopressin (anti diuretic hormone, ADH) and oxytocin** into the systemic circulation.

ADH increases the permeability of the collecting ducts to water resulting in water retention.

The Posterior Pituitary Axis and Other Phenomena

Oxytocin,

Its role in the human stress response is currently unclear but may be involved in psychogenic labor contractions & premature birth.

According to several studies ,there are sex related differences in testosterone responses to stress. **Testosterone** levels in males decrease under psychosomatic or psychic stress & even with the anticipation of stressful events, whereas testosterone concentrations in females rise.

Finally, the hormone **prolactin** has clearly shown responsiveness to psychosocial stimulation as well. prolactin is associated with premenstrual dysfunction.

Other Stress-Related Hormones

- Serotonin(happy hormone)
- Melatonin(anti stress hormone)

Other Stress-Related Hormones

Repeated release of stress hormones produces hyperactivity in the hypothalamic-pituitary-adrenal (HPA) system, and disrupts normal levels of **serotonin**, the brain chemical that is critical for feelings of well-being.

Various factors affect serotonin levels as emotional stress, which in turn affect **melatonin** levels.

A deficient production of melatonin can result in anxiety and mood disorders, lowered basal body temperature insomnia, elevated estrogen/progesterone ratio, and immune suppression associated with cancer.

Head out for a morning walk to boost your serotonin levels.

10 Worst Foods to Eat When You're Stressed

1. **Candy Bars**

I'm often guilty of turning to chocolate myself after a particularly perilous day. However, foods and treats that are high in refined sugar only ***increase stress hormones (i.e., cortisol)*** and send blood sugar levels soaring so high that a sugar crash landing is unavoidable not soon after.

10 Worst Foods to Eat When You're Stressed

2. Coffee

There is no such thing as a calming cup of coffee. And even though you might feel at ease burying your stress in an extra large double caramel macchiato, the killer trifecta of caffeine, sugar, and fat will only increase agitated, caffeine jitters, and leave you regretting your sugar crash.

10 Worst Foods to Eat When You're Stressed

3. Red Meat

Sure, red meat is known for its high iron content. But before you slice into that thick, juicy steak, bite off this little piece of nutritional wisdom—studies link high protein diets with ***increased levels of dopamine*** (your brain's reward and pleasure center), ***which can increase stress signals to the brain.***

10 Worst Foods to Eat When You're Stressed

4. French Fries

Munching away on a crispy pile of fat-laden French Fries, waffle chips, or even sweet potato fries (they're still fried) might give you a quick energy boost. However, your choice in high fat, high sodium, empty carb snack will leave you void of any actual energy later on.

10 Worst Foods to Eat When You're Stressed

5. Energy Drinks

You might think you're reaching for a can of white lightening when in fact all you're guzzling down is an inevitable sugar crash. Energy drinks are some of the worst beverages you can drink to deal with stress. A single can of an energy drink, like Red Bull, will often leave you ***feeling so anxious that you'll be unable to concentrate on anything*** but your caffeine jitters!

10 Worst Foods to Eat When You're Stressed

6. Alcohol

A nice glass of wine might seem like the perfect reward after making it through a stressful day. However, ***alcohol doesn't calm you—it actually stimulates the body's natural stress response.*** In fact, studies show that heavy drinkers have naturally ***higher cortisol levels*** than moderate and non drinkers

10 Worst Foods to Eat When You're Stressed

7. Chips & Snack Crackers

Your favorite bag of chips or boxed snack crackers promise very little in the way of nutritional value. In fact, the whole bag is not much more than a ripe pile of processed fat, artificial additives, and a whole whack of sodium. Sure, it might feign little comfort at first sight or third handful—but really, has no actual reward when it comes to reducing stress and boosting mood.

10 Worst Foods to Eat When You're Stressed

8. High Fat Dairy

Cream, higher fat milk, and rich cheeses are known to be rather ***difficult on the digestion system.*** And digestion issues will inevitably stress out the body further, particularly if you consume them late in the evening and disrupt your sleep patterns

10 Worst Foods to Eat When You're Stressed

9. Spicy Foods

Oftentimes, when our bodies are stressed we feel the ramifications in our digestive systems in the form of gas, abdominal pain, and bloating. That means a ***spicy meal will just aggravate the digestive upset and leave you with a nasty case of heart burn or acid reflux***.

10 Worst Foods to Eat When You're Stressed

10. Vegetable Oil s & Margarine

Not all edible oils and spreads are created equally. For instance, canola oil and margarine contain high levels of trans-fats, ***which not only contribute to high cholesterol and high blood pressure, but also amplify your risk of heart disease.***

THANK YOU FOR ATTENTION