



Dr. K's Guide to Mental Health

Meditation Module | Science of Meditation | Notes

Stress Physiology

The Hypothalamic Pituitary Adrenal (HPA) axis is the major circuit that regulates stress by the release of hormones such as cortisol. Cortisol not only plays an important role in the body's response to stress but also has effects on metabolism and immune response.

Cortisol hormone release:

- Activates the Reticular Activating Formation (RAF) which governs alertness/sleep
- Hyperactivates our immune system

Studies show that meditating for about 20 minutes a day over a period of 8 weeks helps shut off cortisol production in the HPA axis.

Autonomic Nervous System (ANS)

Sympathetic Nervous System (SNS) Fight or Flight Yang Surya/Sun	Parasympathetic Nervous System (PNS) Rest and Digest Yin Chandra/Moon
<ul style="list-style-type: none">• Regulates fight and flight response• Is activating• Primes us for action• Adrenaline surges are part of the SNS (leads to an increase in heart rate, increases blood pressure)• Routes blood to our limbs• Routes blood to danger and survival sections of our brain.• Are also associated with high-stress states.	<ul style="list-style-type: none">• Regulates rest and digest• Is calming• Primes us to chill, digest, clean things out• Mediated through the vagus nerve (which lowers our heart rate, decreases blood pressure)• Routes blood to our internal organs.• Routes blood to contemplative and empathic sections of our brain.• Associated with low activity states.

Central Nervous System (CNS)

On a neuroscientific level, meditation trains the following parts of our brain:

- Frontal Lobes which are associated with impulse control and executive function (planning and following through with tasks).
- Limbic System which regulates emotion
- Ventral Medial Prefrontal Cortex which involves empathy
- Association Cortices which attaches meaning to events