

# ***Holistic Leadership: The Role of Psychoneuroimmuno logy and the Importance of Self- care***

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The Psychophysiology of Mind-Body-  
Healing: The Science and the Experience

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# Abstract

- **The psychophysiology of mind-body healing**

What do **neuroplasticity, epigenetics**, and mind modulation have to do with the stress response, your health, and your illness propensity? How are the endocrine system, nervous system, and immune system interconnected in such a way that emotions are expressed in our body and reflected by our health status?

This presentation will focus on the science of the psychophysiologic stress response as it affects the nervous system, and clarify how self care and holistic modalities decrease the nervous system's sympathetic response, while increasing the nervous system's parasympathetic response to facilitate body-mind healing. The participants will also have an opportunity to experience a relaxation exercise to facilitate their understanding of the mind-body healing process.

- Lastly, the participants will focus on stress and its relationship to holistic nursing leadership



# Objectives!

Upon completion of the interactive session, the participants will have:

- A basic introduction to or review of the body's stress response and how the ANS (sympathetic and parasympathetic nervous systems) interacts to manage allostasis.
- The learners will participate in an interactive discussion about the latest findings around psycho-neuroimmunology and the stress response as related to holistic leadership
- Experience with activating the parasympathetic nervous system response to facilitate relaxation response through mind body healing techniques.
- The learners will create a support and follow up system for reviewing their goals related to self-care, role modeling, and holistic leadership.



# Mind Body Medicine: Definition

- 60-90% MD visits are stress related
- The Benson-Henry Institute's work is based on the inseparable connection between the mind and the body - the complicated interactions that take place among thoughts, the body, and the outside world. Mind body medicine integrates modern scientific medicine, psychology, nutrition, exercise physiology and belief to enhance the natural healing capacities of body and mind. The end result is **self-care**, a complement to the conventional medical paths of surgery and pharmaceuticals.
- The Institute's mind/body interventions are **scientifically proven**, and have the same foundation in traditional medicine as surgery and pharmaceuticals, as opposed to alternative medicine, which is often not scientifically validated.
- Henry Benson Institute: <http://www.massgeneral.org/bhi/basics/>

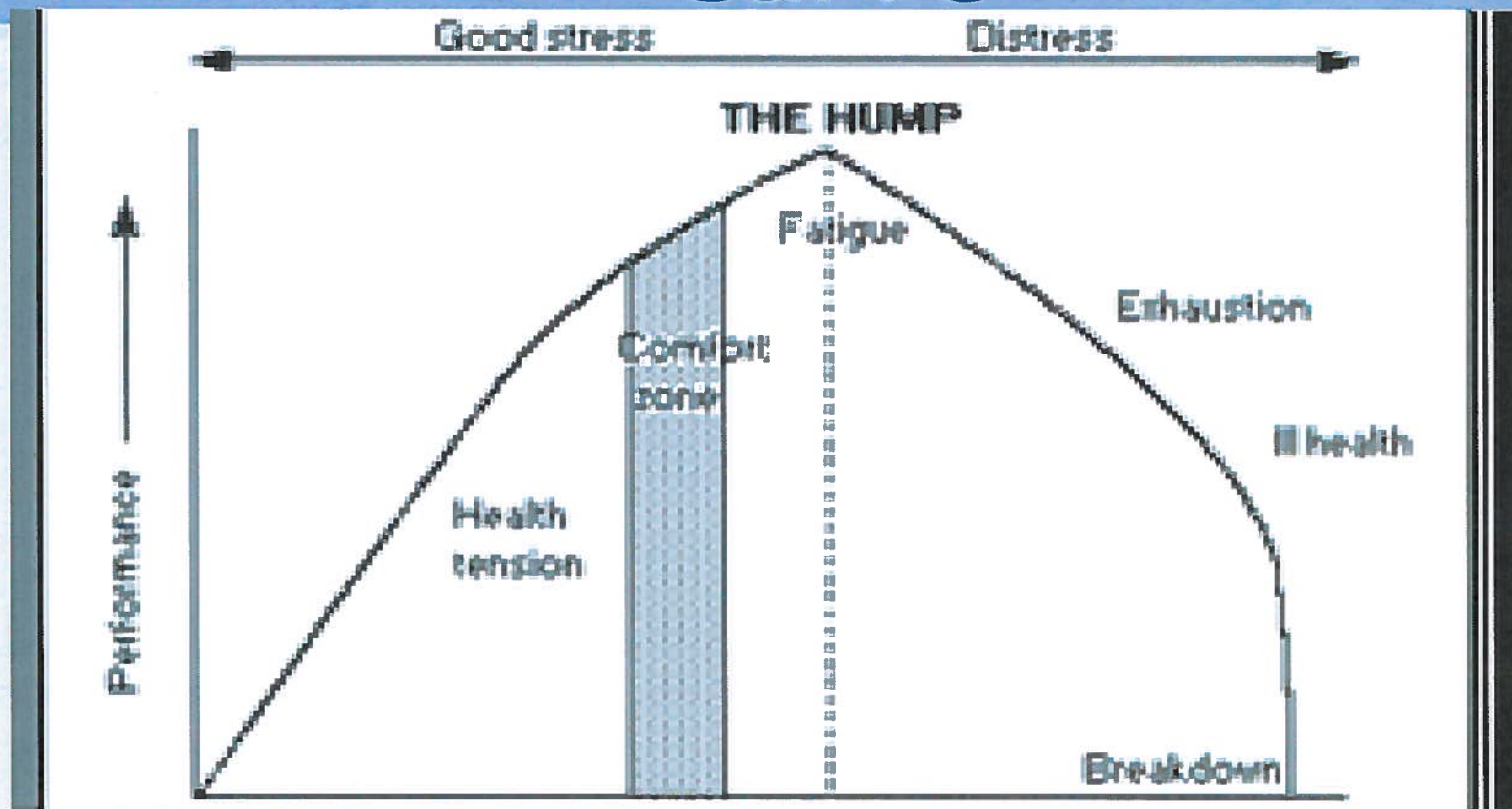


# STOP



- Stop
- Take A Breath
- Observe/ Body Scan
- Proceed ...and smile!

# The Human Function Curve



Stress differs for each of us (related to stress resilience, adverse childhood events)

Limited supply of adaptive energy

<http://www.stress.org/what-is-stress/> REF



# Stress response

- SNS> Increased metabolism, increased heart rate, muscle tension, decreased blood flow to internal organs, inhibit immune system and digestive system function, increases release of glucose
- Stress/ anxiety> not all bad! Leads to increased performance and efficiency until stress overload.
- + (stimulated) or – (threatened) depending on perception.

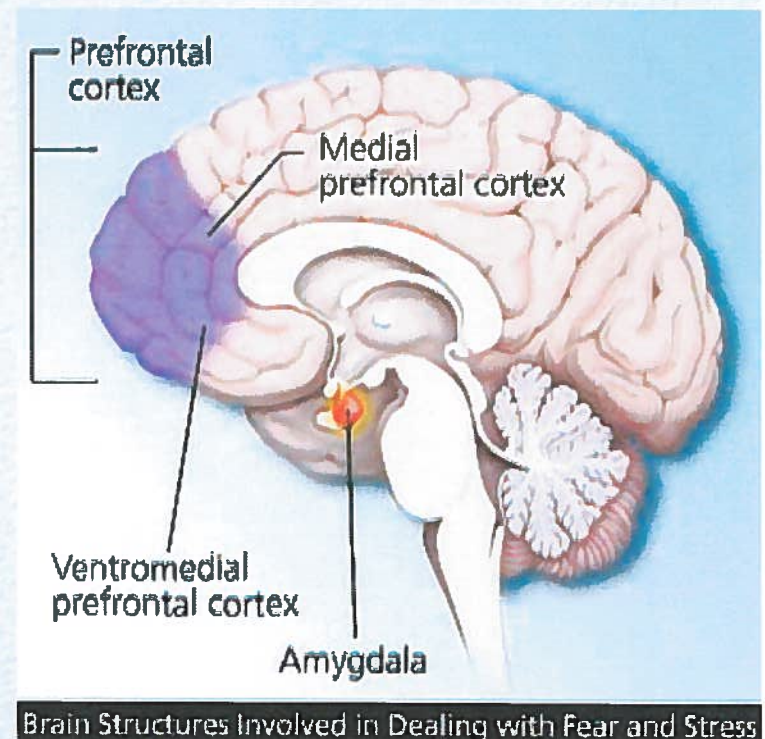




# “Stress”: What is it?

- Fight or Flight
- Body's reaction: amygdala, limbic system scans environment for stress: activate the hypothalamic-pituitary adrenal system to maintain allostasis or stability through change.
- Release of hormones> cortisol (organizes body system response)
- Release of neurotransmitters>  
catecholamines (dopamine,  
epinephrine-body, and nor epinephrine-brain)  
related to the emotional response  
to stress.

Streeter et al, 2012





# Categories of stress

- Positive stress: short-lived, normal, coping
- Tolerable stress: adverse experiences, increased intensity, relatively short lived, overcome with support.
- Toxic stress: intense adverse experiences, over long periods of time, prolonged stress response activation> permanent changes in the brain.
- Disruption of brain responses due to changes to brain circuits secondary to stress in childhood> over-reactivity to stress in adulthood.
- High cortisol> effects immune system and hippocampus (learning and memory).
- See adverse childhood events.

(Middlebrook & Audage, 2008).



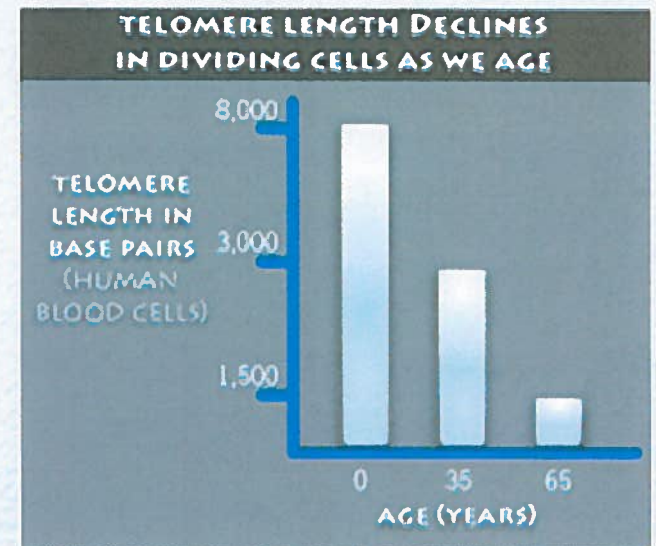
# Contemporary Stress

- 50% of Americans report feeling highly stressed on a daily basis (HBI, 2013).
- Pervasive, persistent, insidious as it tends to be psychological vs physiological
- Depression, anxiety, loneliness, poverty, bereavement, discrimination, food/diet, sedentary lifestyle, childhood experiences
- “It’s not the stress that kills us, it’s our reaction to it” “Only the dead have no stress”. Hans Selye
- One of the biggest issues is with the prefrontal cortex (most evolved part of the brain, highest order cognitive abilities) and most sensitive to detrimental effects of stress> Mild acute uncontrollable stress can lead to changes in PFC dendrites and hippocampus (Arnsten, 2009). Extreme changes noted in mental illness. Chronic stress also strengthens amygdala response.



# Telomeres

- Telomere, end of the chromosomes in cells; stretches or sequences of DNA, like the plastic tip of shoelace (prevent fraying/ sticking together)
- Protect our genetic data, support cellular division> fraying sticking lead to cancer secondary to DNA scramble. Cell division leads to shrinking telomere (aging)
- Telomere length shrinks with age, oxidation, chemical insults... and now stress due to hormones shortening telomeres. <http://youtu.be/cvjzwTBjXMI>





# Allostatic Load: Oh Know!

- Homeostasis: brain/ body meet survival needs with least cost.
- Allostasis- adaptive process of maintaining stability when we move out of homeostasis
- Allostatic load- frequent fight or flight process > frequency of stress responses to many novel stressors, failure to habituate to repeated similar stressors, delayed shut down of stress response. “Cost to the body” when we move out of homeostasis.
- Accelerated disease process due to chemical imbalance in autonomic nervous system, central nervous system, neuroendocrine, and immune system.
- Influence of childhood up to age 18-20 that effects how brain develops stress response. ACES studies. (Ultimately impacts Neuroplasticity (brain changes), but also we are now discovering genetic impacts at the telomere level.

Streeter et al (2012); McEwen (2007); Middlebrooks & Audage (2008)



# Telomeres continued

- Study on stress and exhaustion: Job stress impacts leukocyte telomere length, wear/ tear secondary to stress (Ahola, et al 2012). Shortened telomere = poor clinical outcome (Ornish et al (2008))
- Telomerase: enzyme protects telomeres; research into compassion, caring, connection. University Utah (2013)

Increase telomerase: Dr Ornish et al (2008) and UCSF; change lifestyle



# Epigenetics

- How environment and choices impact DNA code
- Changes in gene activity that don't alter code; yet still passed down to the next generation
- Epigenome: sits on top of the genome; markers related to turning genes on or off.
- Diet, stress, prenatal nutrition effect epigenome> lead to imprint on genetic expression (preconception).
- .



# Epigenetics continued

- Genetics are not your destiny
- Can epigenetic changes be permanent? Possibly, but it's important to remember that epigenetics isn't evolution. **It doesn't change DNA.** Epigenetic changes represent a biological response to an environmental stressor. That response can be inherited through many generations via epigenetic marks, but if you remove the **environmental pressure**, the epigenetic marks will eventually fade, and the DNA code will — over time — begin to revert to its original programming. That's the current thinking, anyway: that only natural selection causes *permanent* genetic change. Read more:<http://www.time.com/time/magazine/article/0,9171,1952313,00.html#ixzz2N3HSVb8P>

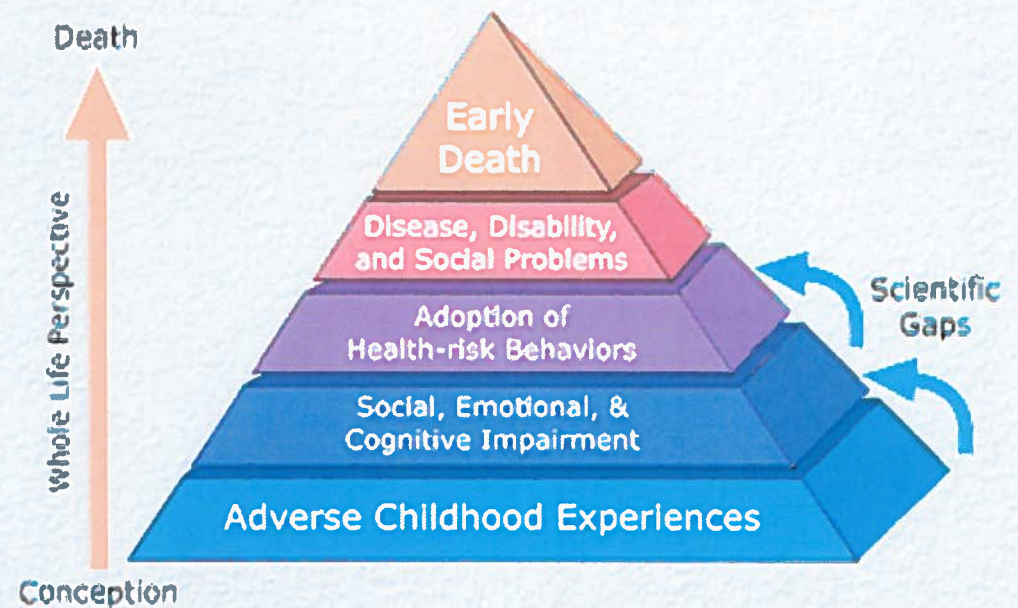


# ACES

- Examines adverse childhood events: neglect, abuse, drug/ alcohol- drug use, divorce, mental illness with family of origin.
- 60 publications since first study 1998; original study looked at 17000 people
- Increasing ACE score > over 4 (out of 10) increased risk for COPD (390%) , hepatitis (240%), depression (460%), suicide (1,220 %).

CDC/ Kaiser Permanente

[http://acestudy.org/ace\\_score](http://acestudy.org/ace_score)





# Let's breathe





# Relaxation Response: GABA

- GABA neurotransmitter inhibitor.
- Decreases stress signals to the cell.
- Regulates neuronal excitability; slows thing down.
- Released may reduce fear and anxiety; enhance sleep (know this in part by studying benzodiazepines/ valerian root and how they enhance natural effect of GABA).
- Found in/ produced by cortex, prefrontal cortex.



# Prefrontal Cortex: Top-Down

- Prefrontal cortex regulation is the norm during alert, non-stress conditions; links attention, memory, and supports cognitive abilities/ higher ordered thinking.
- Relaxation response: opposite to stress response, no good drug to enter into this.
- Physiological changes: decreased metabolism, slower heart rate, slower breathing, BP decreases.
- HBI: 10-20 minutes, 1-2 x/day (before breakfast, before dinner): repetition of word, sounds, phrase, prayer, muscular activity. Passive disregard of everyday thoughts, return to phrase.





# Neuroplasticity

- Regardless of age, your brain can make new neural pathways.
- Redesign brain; new growth to reconnect neurons around damaged areas. “axonal sprouting”.
- Stimulation is needed. Correct stimulation (deafness/ringing in ears).
- Brain can change secondary to our thoughts (why CBT works on OCD). Mind changing brain.
- Use your mind to change your brain and decrease stress response!

Begley (2007). <http://youtu.be/iAzmyB9PFt4>



# Genetic protection with meditation

- BHI study: 8 weeks of training using relaxation response for 17.5 minutes/day for inexperienced meditators – 19 participants
- First measured genetic expression of long term meditators: unique expression of 2209 genes associated with health (anti-oxidative genes!)
- Measured markers on RNA and DNA; 1561 gene markers changed from onset with the experimental groups
- Compared with meditators of 9 years experience: 433 similar genetic expressions (probability of this happening one in 10 billion)
- These were the genetic expression of health, anti-stress genetic activity (less premature aging, less stress, stronger immune systems, less oxidative stress, less thinning of cortex of brain)
- Benefit increases over time; takes about 2 years to realize full benefit (Benson & Proctor 2010).



# Stress: Let's Move Toward Relaxation

## Response

- “The good experience” exercise. Thinking positively/ CBT. (Mayo clinic, 2013; HBI, 2013) (vs distorted/ unrealistic thoughts; Byron Katie)
- Movement with attention creates new neural pathways (yoga, slow movements, tai chi, etc ); vagal stimulation, resting state of muscle reinforced. (Streeter et al, 2012; Ando et al, 2011)
- Mindfulness, meditation; brain changes via MRI in 8 weeks (Holz et al, 2011). Quietude in brain 10-20 minutes, 1-2 x/ day.
- Sleep! Regenerates brain cells- shown by MRI (Walker et al, 2005). Partial sleep deprivation > stress (Dinges et al, 1997).



# Relaxation Response Continued

- Diet: avoid toxins, sugar, alcohol, nicotine, caffeine (stress.org); take Omega-3 (decrease inflammation due to cytokines – mediators/ regulators of immune processes/ immune responders/ genetic level; regulates mood ) (Ohio State).
- Exercise! (endorphin release, moving meditation, self awareness, history of physical movement being spiritual nature).
- Therapeutic tools: neurofeedback, stress journal, talking
- Community, connection, pet therapy (oxytocin release; decrease cytokines- inflammation, inhibit cortisol. Decreases fear and anxiety)
- Breath work (slow deep breath> PNS; release melatonin)
- What else?





# Stress and Holistic Leadership

- In smaller groups:
- Based on evidence provided why is compassion for self and others key in managing stress and acting as a holistic leader?
- How can we as leaders build healthy environments to reduce stress and rewire brain systems?
- Brainstorm, for self and others: threading self-care and relaxation response throughout the day. What is your plan
- Spreading the word
- Follow up plan for small groups



# Writing Goals

- Time Sensitive: By when?
- Action-based.
- Measurable: How will you know you met the goal?
- Resources you will need.
- Follow up plan.



# Mind Body Healing Resources

- Henry Benson Institute: 40 years of research:  
<http://www.massgeneral.org/bhi/research/published.aspx> cancer program, cardiac program, chronic pain
- Easy ways to take the edge off (Hebert Benson):  
<http://abcnews.go.com/video/playerIndex?id=7392433>
- Benson, H. & Proctor, W. (2011). *The relaxation response: The science and genetics of mind-body healing*. New York, NY: Scribner.
- Byron Katie: changing thought patterns: <http://www.thework.com/index.php>
- UCLA: Mindfulness Awareness Research Center, Dr. Dan Siegel:  
<http://marc.ucla.edu/body.cfm?id=28>
- Dr. Dean Ornish: <http://www.ornishspectrum.com/proven-program/the-research/#telomere-study>



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