

# Taking Care of You: Mindfulness-Based Stress Reduction

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## Mindfulness Based Stress Reduction

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## Faculty Disclosure

Company	Nature of Affiliation	Unlabeled Product Usage
• None	• None	• none

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## got stress?

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- **Stressors**
  - Acute Physical Stressors
  - Chronic Physical Stressors
  - Psychological and Social Stressors

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## Principles

- You must be able to **turn on** the stress response:
  - Addison's disease:
    - cannot secrete glucocorticoids: weakness, GI dysfunction, weight loss, irritability, skin changes, low BP, shock, death
  - Shy-Drager syndrome:
    - cannot secrete adrenaline and noradrenalin: BP drop on standing, inability to sweat, impotence, bladder dysfunction,
- You must be able to **turn off** the stress response:
  - The "stress-related" disorders are those of excessive stress response

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## The Stress Response

### Three parts:

1. Immediate
2. Delayed
3. Chronic


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## 1. Immediate Response

- Brain: protectively dulls the body's sense of pain; thinking and memory improve
- Eyes: pupils dilate for better vision
- Lungs: take in more oxygen
- Liver: sugar stored as glycogen is converted to glucose
- Adrenals: secrete fight or flight hormones
- Spleen: releases extra blood cells
- Intestines: divert blood flow away making more available to muscles and brain
- Hair: becomes erect making animals look bigger and more dangerous

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## 2. Delayed Response (minutes)

- Immune system: infection fighting is diminished, increasing available energy
- Liver: fat is converted to usable fuel
- Adrenal glands: secretes cortisol to regulate metabolism and immunity
- Brain: the hippocampus, a center of memory and learning, gets activated to process the stress

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### 3. Chronic Response

- Brain: cortisol becomes toxic to brain cells, potentially damaging cognitive ability; fatigue, anger and depression increase
- Immune system: repeated suppression of disease-fighting cells ultimately weakens resistance to infection
- Intestines: decreases in blood flow leave mucous lining vulnerable
- Circulatory system: elevated blood pressure and heart rate damage elasticity of blood vessels

Repeated activation can be harmful

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- **Psychological and Social Stressors**


– A large body of evidence suggests that these can *chronically* activate physiological systems that evolved for acute physical stressors.

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### Epidemiology of Stress

- In the post-industrial revolution era, the types and numbers of stressors have changed
- Stress affects the diseases of accumulation




Yuppies fighting over the last double latte

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### Causes of Death

- 1900
  - Pneumonia
  - Tuberculosis
  - Influenza
- 2000
  - Heart disease
  - Cancer
  - Stroke




1918 influenza pandemic

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## Variability in the face of stress

- Biological variability
- Psychological variability: specific styles useful
- Behavioral strategies supported by trials
  - **Exercise:** lower scores on tests of anxiety, improved electrocerebral function.
  - **Touch/Massage:** increased wt. gain in preemies, improved lung function in asthmatics, improved immune function in HIV, improved math scores
  - **Social support:** fewer recurrences in melanoma and breast cancer patients
  - **Meditative disciplines:** reduced stress hormones, lowering HR and BP, improved healing time in psoriasis, other


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## Behavioral Medicine

- Mental and emotional factors can effect our physical health and the capacity to recover


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## Behavior and Stress

- Exercise
- Sleep habits, rest, relaxation
- Dietary
- Organization, planning
- Relationships
- Meaning, interests

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## Physiological Responses to Thoughts

- Thoughts alone can result in physiological responses
  - “Every cell in your body is eavesdropping on your mind”
    - Blushing
    - Salivation
    - Tears
    - Muscle tension
    - Etc.

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## Management Options

- Reduce stressors
- Alter the response to stress

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## Mindfulness

- **Mindfulness Based Stress Reduction Clinic**
  - Known: stress affects psychological and physiological well being.
  - The Clinic: a response to the need within the traditional medical community to address these issues.
  - MBSR: A compliment to medical care; not a substitute for traditional medical treatment, and not a rescue service.

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## Mindfulness

The diagram consists of two parts. The top part shows a box labeled 'Stimulus' with a large arrow pointing to a box labeled 'Reaction'. The bottom part shows a box labeled 'Stimulus' with a small arrow pointing to a box labeled 'Mindfulness', which in turn has a small arrow pointing to a box labeled 'Response'.

“Between stimulus and response, there is a space. In that space is our power to choose our response. In our response lies our growth and our freedom.”  
— Viktor E. Frankl, *Man's Search for Meaning*

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## MBSR Course

- Teaches mindfulness
  - More than a course about stress reduction
  - More than a practice that can have medical and psychological benefits
  - It is a way of being that can reveal much about who we are, even in times of suffering

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## Brain vs Mind


- Brain (Most Complex)
  - Brainstem=reflex
  - Paleocortex=emotion
  - Neocortex=higher cognitive functions
- Mind (Most Powerful)
  - Higher cortical functions
    - » Language
    - » Judgment
    - » Hypothesis generation
    - » etc

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## What is Mindfulness?

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## Moment to moment non-judgmental awareness

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## Cultivated by paying attention

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*Paris in the  
the Spring*

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unconscious  
•  
on autopilot

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awake

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## Stress Course

- Discipline the mind
- Attention practice
  - Sensations in the body
  - Movement of the body
  - Thought
- Mindfulness
  - Paying attention, on purpose, non-judgmentally

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## 8-Week Course

- 27 hours of in class instruction
  - 2.5 hours each Monday night
  - 6 hours one Saturday
- 45-60 minutes of “homework” daily

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## Meditation experience is associated with increased cortical thickness

*Psychiatry Research: Neuroimaging,*  
Sara W. Lazara, Catherine E. Kerrb, Rachel H. Wassermana,b, Jeremy R. Grayc, Douglas N. Greved, Michael T. Treadwaya, Metta McGarveye, Brian T. Quinnnd, Jejerly A. Dusekf,g, Herbert Benson, Scott L. Raucha, Christopher I. Mooreh,i and Bruce Fischld,

Participating in an 8-week mindfulness meditation program appears to make measurable changes in brain regions associated with memory, sense of self, empathy and stress.

Massachusetts General Hospital (MGH)

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## Neurobiology of Mindfulness Practice

- Increased cortical/gray matter thickness
  - Right anterior insula
  - Hippocampus
  - Left temporal gyrus
  - Prefrontal cortex
  - Sensory cortex

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Richard Davidson, U. of Wisconsin  
8 wks Mindfulness increases left sided prefrontal activation associated with more adaptive responses to stressful events

The bar chart displays Log Right Atrial Power in µV/Hz on the y-axis (ranging from -0.25 to 0.25) against Assessment at Time 1 and Time 2 on the x-axis. Two groups are compared: Control (black bars) and Treatment (gray bars). At Time 1, the Control group has a power of approximately -0.08, while the Treatment group is at approximately 0.02. At Time 2, the Control group's power has decreased to approximately -0.15, whereas the Treatment group's power has increased to approximately 0.12. Error bars represent standard deviation.

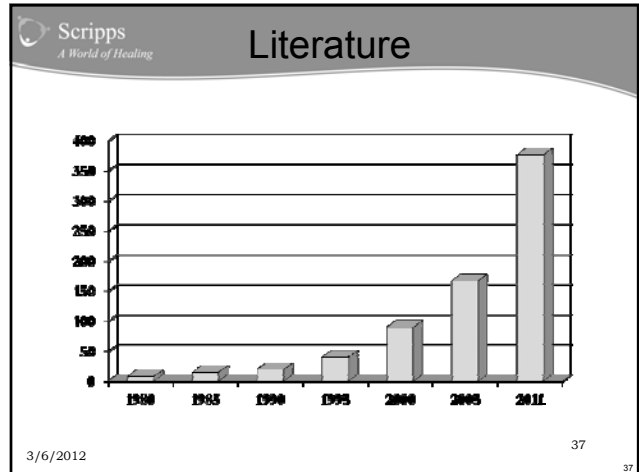
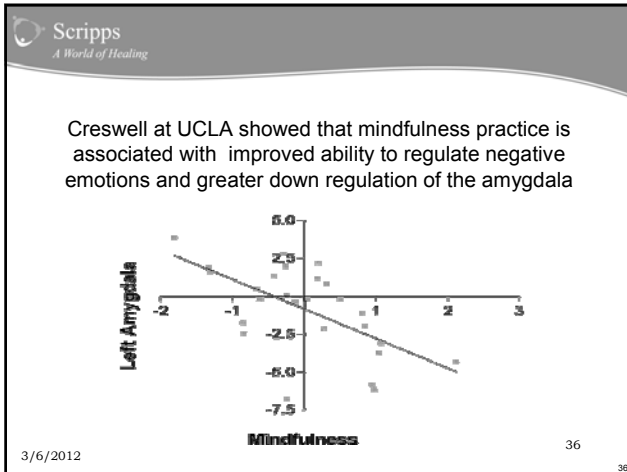
Assessment	Control (µV/Hz)	Treatment (µV/Hz)
Time 1	-0.08	0.02
Time 2	-0.15	0.12

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### Mindfulness

- Potential Applications in TBI
  - Improved attention
  - Improved behavioral regulation
  - Improved stress management
  - Improved adjustment

A 3D rendering of a human brain, viewed from a slightly elevated side angle. A white, textured band is wrapped around the brain in a crisscross pattern, symbolizing support, care, or a therapeutic intervention.

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### Mindfulness and TBI: ClinTrials.Gov as of 3-5-12

- Recruiting Mindfulness-Based Cognitive Therapy Intervention to Treat Depression in Individuals With a Traumatic Brain Injury Conditions: Depression; Traumatic Brain Injury Intervention: Behavioral: Mindfulness-Based Cognitive Therapy 2
- Recruiting Neural Bases of Cognitive Rehabilitation for Brain Injury Condition: Brain Injury Interventions: Behavioral: Goal-based Self Management; Behavioral: Brain Health Education; Behavioral: Pathfinder Attention Process Training; Behavioral: Brain Health Education with Motor Skills Training (EDU/MOTOR); Behavioral: Tonic and Phasic Alertness Training (TAPAT); Behavioral: Object Discrimination Training (ODT) 3
- Recruiting Mind-Body Skills Groups for the Treatment of War Zone Stress in Military and Veteran Populations Conditions: Stress Disorders, Post Traumatic; Brain Injuries; Depressive Disorder; Anxiety Disorders; Anger Interventions: Behavioral: Mind-Body Skills Groups; Other: Standard Treatment

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