

THE MINDFUL BRAIN

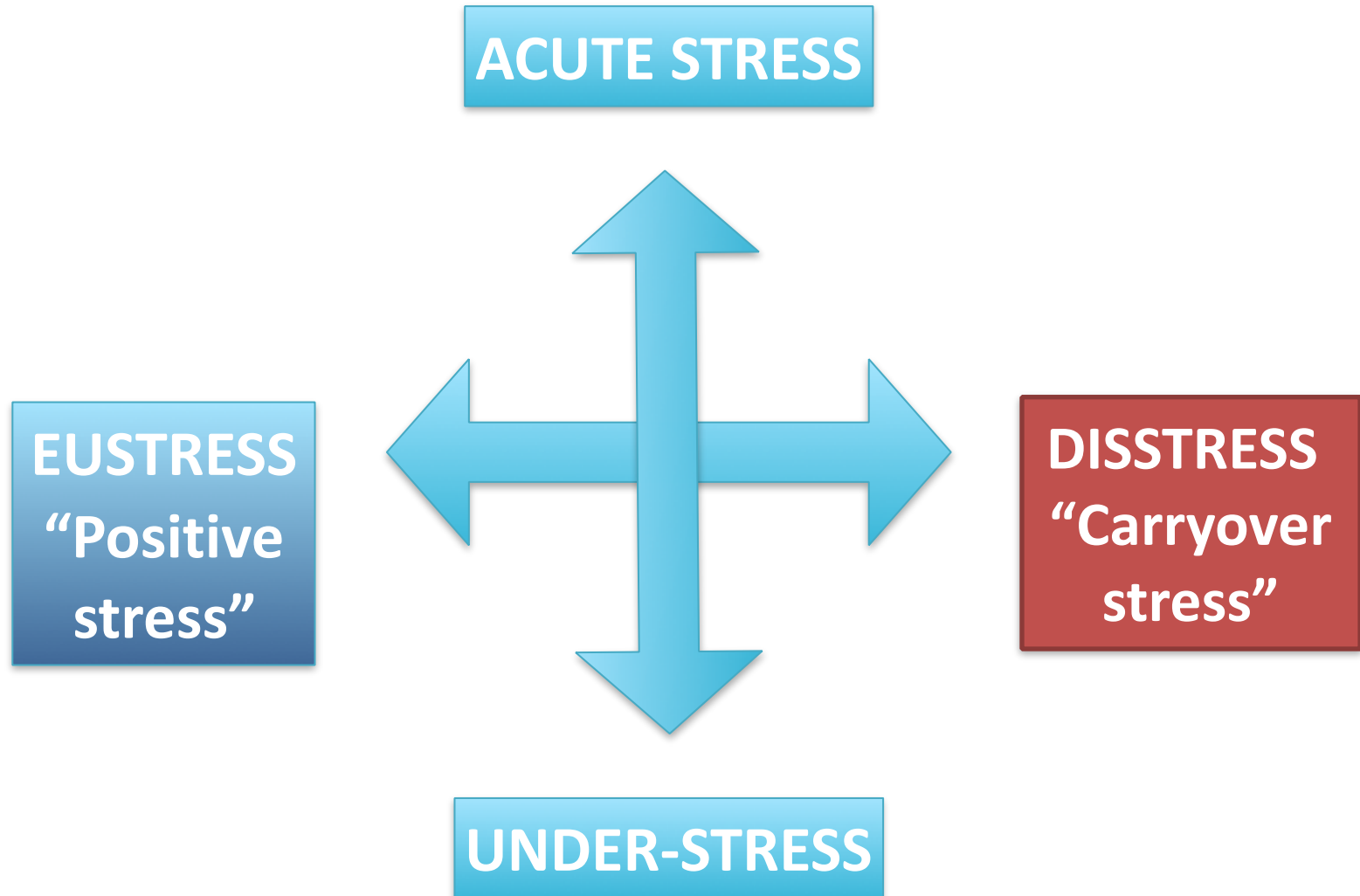
The Science of Mindfulness Practice



Presented by
Tim Burns

[**www.TimBurnsEducare.com**](http://www.TimBurnsEducare.com)

Autonomic Nervous System



Autonomic Nervous System

Sympathetic Nervous System (SNS)



Increases:

Blood pressure
Fuel availability
Activity
Blood clotting
Adrenal hormones

Parasympathetic Nervous System (PNS)



Increases:

Digestion
Fuel shortage
Rest and recovery
Resistance to infection
Endorphins

GENERAL ADAPTATION SYNDROME

Autonomic Nervous System

Sympathetic Nervous System

“Fight or flight”

Expend energy

Outer focused

High brain-wave frequencies

Parasympathetic Nervous System

“Rest and digest”

Store energy

Inner focused

Low brain-wave frequencies

GENERAL ADAPTATION SYNDROME

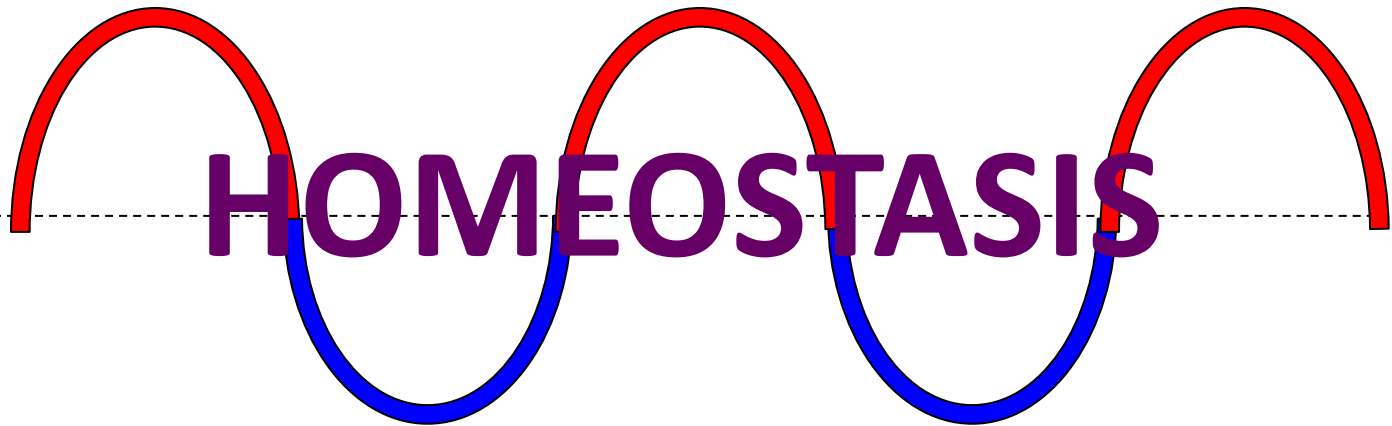
Autonomic Nervous System

Sympathetic NS

Normal

HOMEOSTASIS

Parasympathetic NS

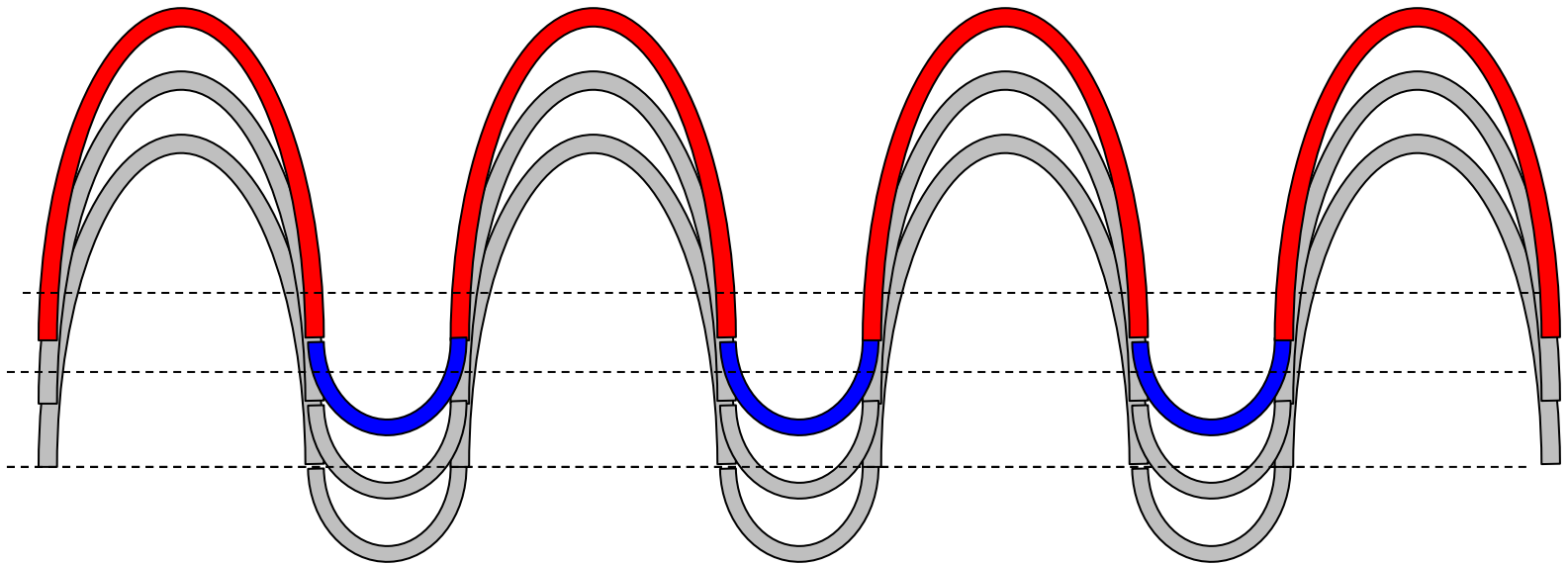


GENERAL ADAPTATION SYNDROME

ALLOSTATIC LOAD

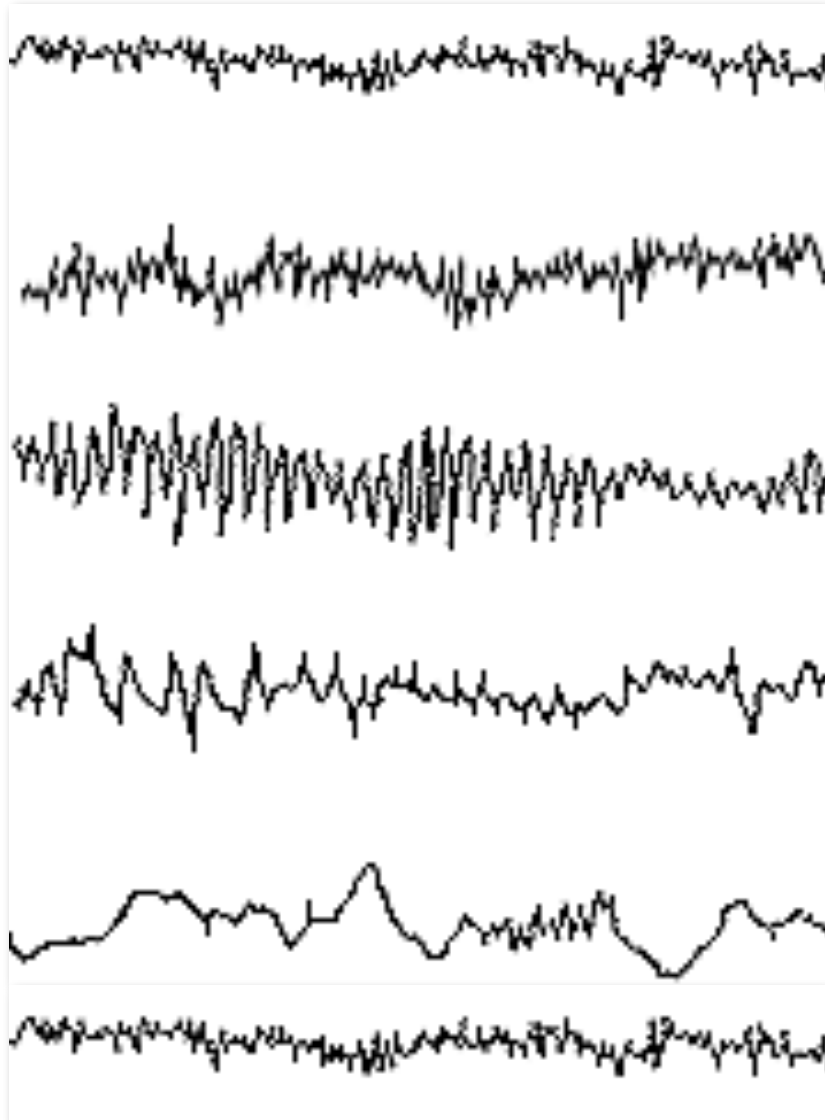
Sympathetic NS

**New
Normal**



Parasympathetic NS

BRAIN-BODY-MIND STATES



Gamma - 25-100 Hz (40hz typical).

Binds conscious perception

Beta – 13-30 Hz. Active, alert, concentration

Alpha – 9-13 Hz. Relaxed focus, light trance, enhanced serotonin production

Theta – 4-8 Hz. Trance-like state; enhanced catecholamine aids retention of learning

Delta – 1-3 Hz. Dreamless sleep; HGH produced

REM – Rapid Eye Movement; dreaming

GENERAL ADAPTATION SYNDROME

High and sustained stress in students can foster:

- impaired cognition
- impaired creativity
- increased pressure on attention
 - diminished social skills
 - discipline problems
 - motivation problems

GENERAL ADAPTATION SYNDROME

ALLOSTATIC LOAD

- The physiological costs of chronic exposure to the stress response.
- Used to explain how frequent activation of the body's stress response can in fact damage the body in the long run.
- When chronic and pervasive the new stable base-line is difficult to withdraw from.

Mindfulness-Based Stress Reduction

30-years of MBSR research:

Improved brain function

Enhanced immune function

Improved affect (reduced depression, anxiety)

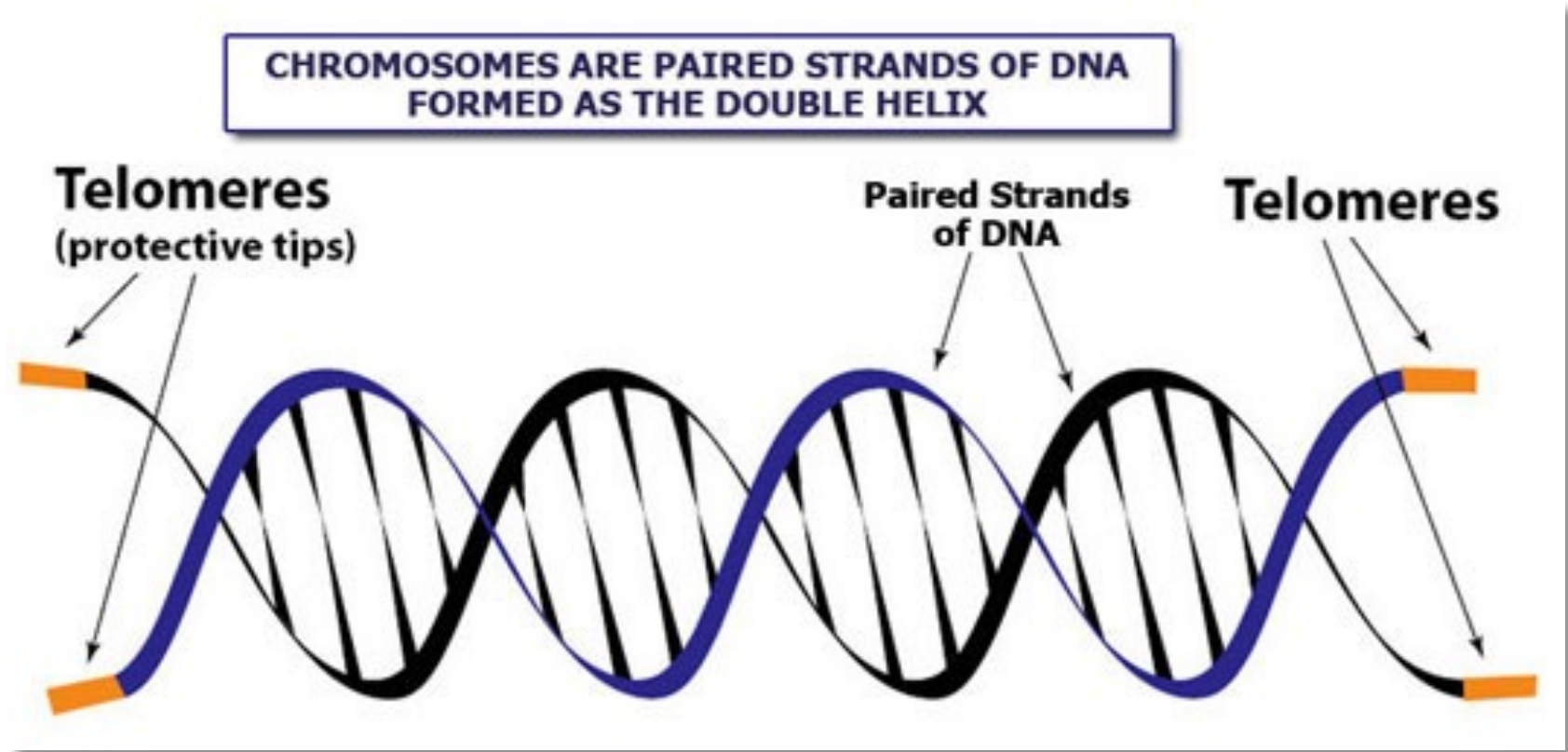
Reduction in pain levels

Enhanced ability to cope with pain that may not go away

Greater energy and enthusiasm for life

An ability to cope more effectively with both short and long-term stressful situations.

Mindfulness and Aging



Telomeres

Proven Benefits of the Relaxation Response

- **Increases awareness of whether you are tense or relaxed**
 - **Reduces the resting level of your autonomic nervous system**
 - **Improves concentration**
- **Increases hemispheric communication**
- **Transforms brain cells and establishes new neural pathways**

Source: Benson, 1975, 1987, 2003.

The Relaxation Response

Eliciting the Relaxation Response:

- Metabolism decreases
- The heart beats slower and muscles relax
 - Breathing slows
 - Blood pressure decreases
- Levels of nitric oxide are increased

Relaxation Response

- 1. Sit comfortably with your eyes closed.**
- 2. Pay attention to your breathing, and repeat a word or phrase or prayer silently to yourself as you exhale.**
- 3. When you notice your mind wandering (it will) just notice it and passively bring your attention back to your breathing.**
- 4. Practice for approximately 20 minutes every day (or at least 3-4 times per week).**

Source: Benson (1975, 1987, 2004)

The Relaxation Response

Other techniques for evoking the relaxation response:

Imagery

Progressive muscle relaxation

Repetitive prayer

Mindfulness meditation

Repetitive physical exercises

Breath focus

From the Massachusetts General Hospital/Benson-Henry Institute website

<http://benzonhenryinstitute.org/>

Mindfulness in the Schools

