Boosting Happiness and Managing Stress

Dr. Marc Milstein

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The Happiness Formula

- The happiness of over 18,000 people worldwide has been predicted by a mathematical equation:

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1.Robb B. Rutledge, Nikolina Skandali, Peter Dayan, and Raymond J. Dolan. **A computational and neural model of momentary subjective well-being**. *PNAS*, 2014
DOI: 10.1073/pnas.1407535111

The Happiness Formula:

$$\mathbf{Happiness}(t) = w_0 + w_1 \sum_{j=1}^{t} \gamma^{t-j}\,\mathbf{CR}_j + w_2 \sum_{j=1}^{t} \gamma^{t-j}\,\mathbf{EV}_j + w_3 \sum_{j=1}^{t} \gamma^{t-j}\,\mathbf{RPE}_j$$
$$+ w_4 \sum_{j=1}^{t} \gamma^{t-j} \max\left(\mathbf{R}_j - \mathbf{O}_j, 0\right) + w_5 \sum_{j=1}^{t} \gamma^{t-j} \max\left(\mathbf{O}_j - \mathbf{R}_j, 0\right)$$

1.Robb B. Rutledge, Archy O. de Berker, Svenja Espenhahn, Peter Dayan, Raymond J. Dolan. **The social contingency of momentary subjective well-being**. *Nature Communications*, 2016; 7: 11825 DOI: 10.1038/ncomms11825

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$$\text{Happiness}(t) = w_0 + w_1 \sum_{j=1}^{t} \gamma^{t-j} \text{CR}_j + w_2 \sum_{j=1}^{t} \gamma^{t-j} \text{EV}_j + w_3 \sum_{j=1}^{t} \gamma^{t-j} \text{RPE}_j$$

$$+ w_4 \sum_{j=1}^{t} \gamma^{t-j} \max(\text{R}_j - \text{O}_j, 0) + w_5 \sum_{j=1}^{t} \gamma^{t-j} \max(\text{O}_j - \text{R}_j, 0)$$

- Where t is the trial number, w0 is a constant term, other weights w capture the influence of different event types, 0 ? ? ? 1 is a forgetting factor that makes events in more recent trials more influential than those in earlier trials, CRj is the certain reward if chosen instead of a gamble on trial j, EVj is the average reward for the gamble if chosen on trial j, and RPEj is the RPE (reinforcement prediction error) on trial j contingent on choice of the gamble. The RPE is equal to the reward received minus the expectation in that trial EVj. If the CR was chosen, then EVj = 0 and RPEj = 0; if the gamble was chosen, then CRj = 0. The variables in the equation are quantities that the neuromodulator dopamine has been associated with in previous neuroscience studies. The additional term w4 relates to advantageous inequality (guilt) when the reward received by the subject Rj exceeds the reward received by the other player Oj, and w5 relates to disadvantageous inequality (envy) when Oj exceeds Rj.

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Two Take Home Messages

- 1. Results shows that moment-to-moment happiness reflects not just how well things are going, but whether things are going better than expected.

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Two Take Home Messages

- 1. Results showing that moment-to-moment happiness reflects not just how well things are going, but whether things are going better than expected.

- 2. How well things are going for those around us.

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Does It Really Matter If You Are Happy?

Happy Older People Live Longer

- Increase in happiness is directly proportional with a reduction in mortality. Across gender.
- The likelihood of dying due to any cause was 19 percent lower for happy older people.
- Every increase of one point on the happiness score lowered the chance of dying due to any cause among participants by an additional nine percent.
- Even small increments in happiness may be beneficial to older people's longevity.
- Programs for happiness?

1.Choy-Lye Chei, June May-Ling Lee, Stefan Ma, Rahul Malhotra. **Happy older people live longer**. *Age and Ageing*, 2018; DOI: 10.1093/ageing/afy128

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Is The Secret To Happiness….

Are Happier Workers More Productive?

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Professor Andrew Oswald, Dr Eugenio Proto and Dr Daniel Sgroi, Department of Economics at the University of Warwick

Happiness made workers
12% to 25% more productive

Can You Teach Happiness?

Happiness Interventions?

Tricky?

What Is Happiness?

Lots of theories

Now we can look in the brain.

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Stress……Good or bad?

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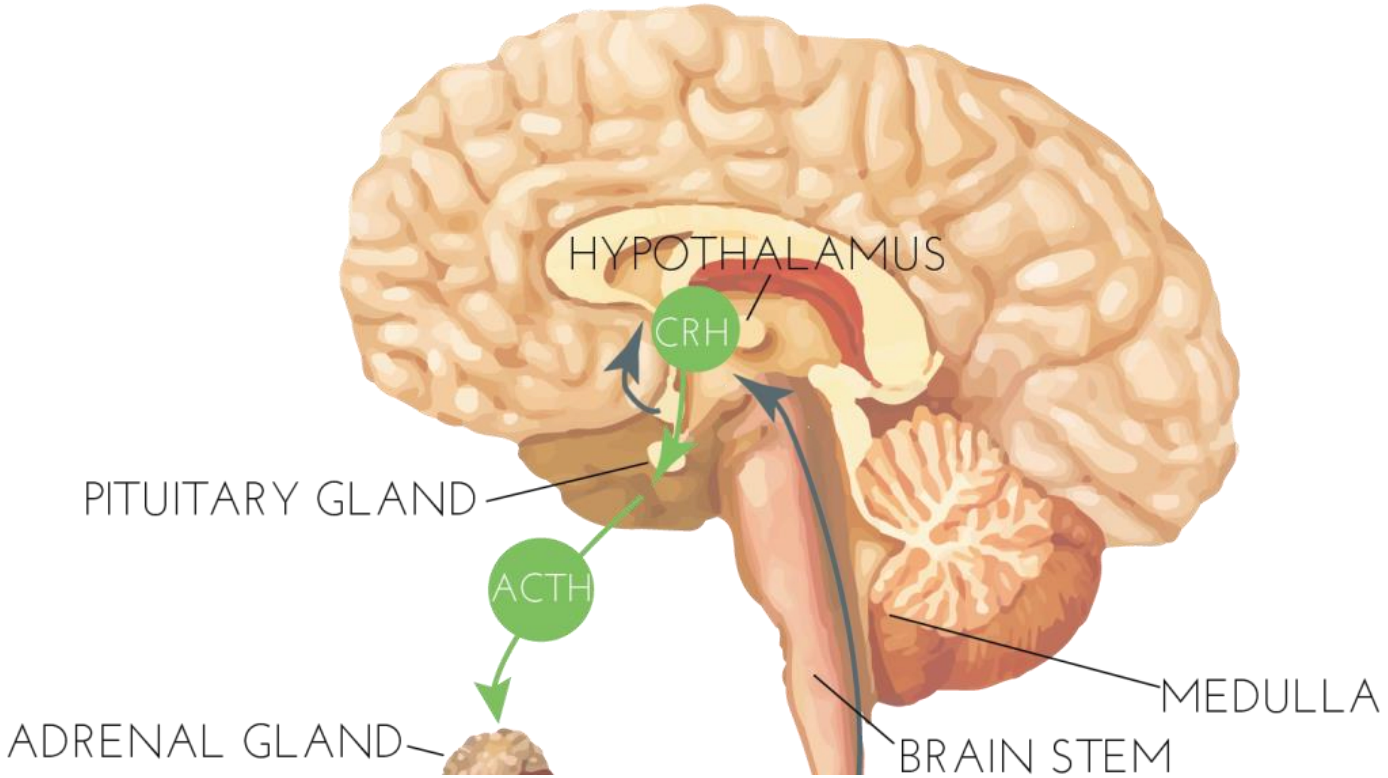
What Does a Burst of Stress Do To Your Brain?



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Stress Free Is NOT Realistic And Not Ideal

Without Stress We Probably Wouldn't Do Much

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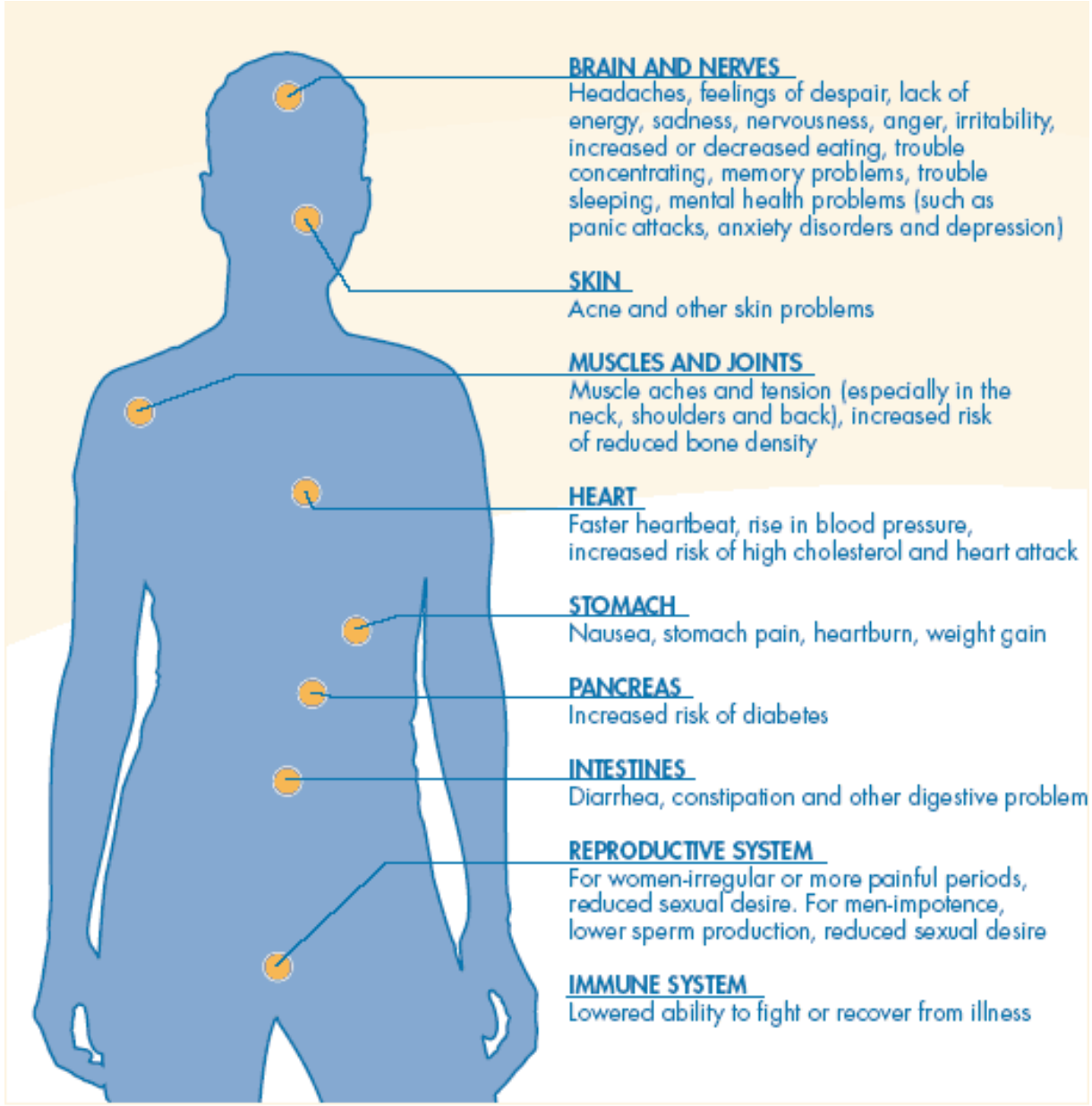
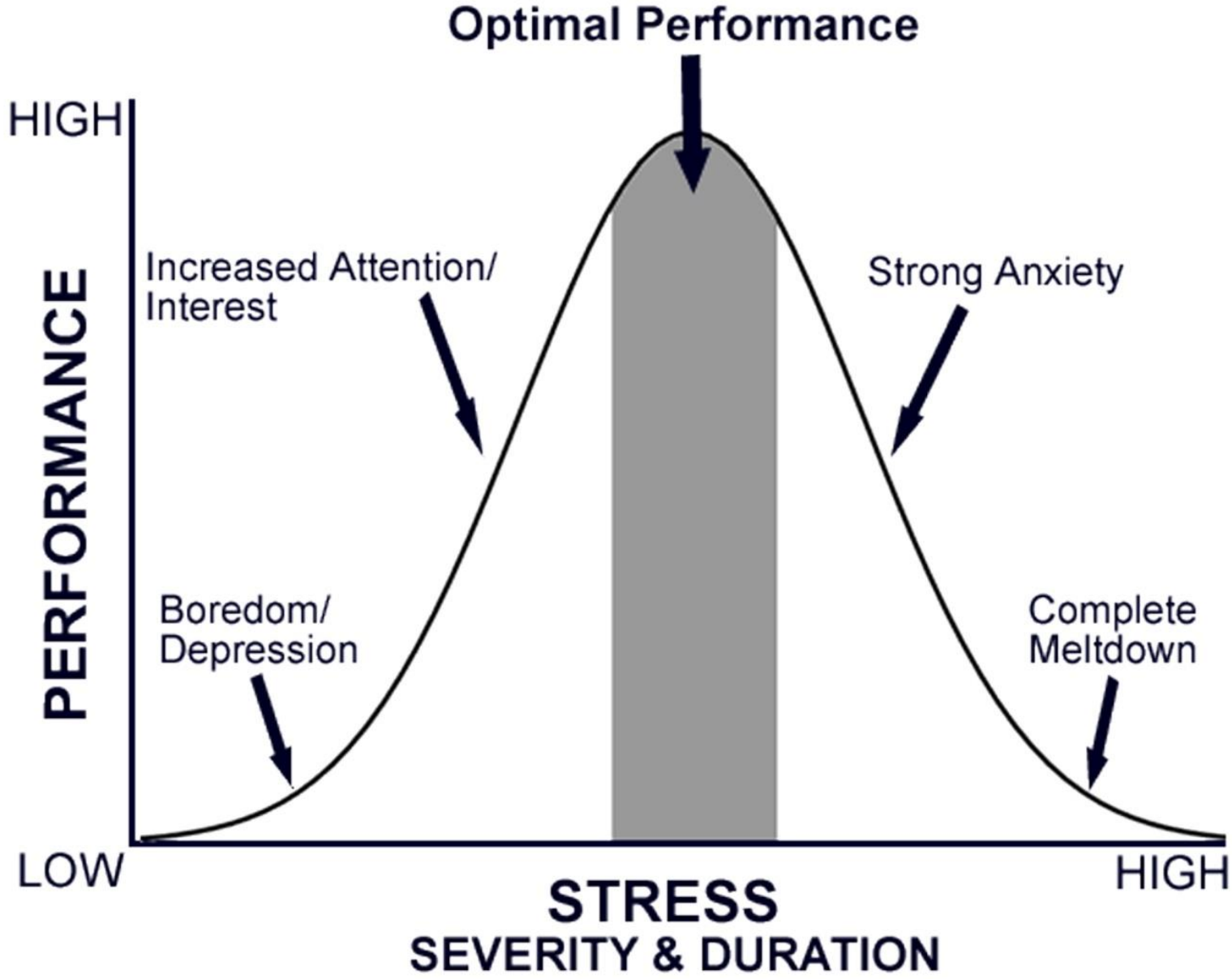
Impacts Of Chronic Stress

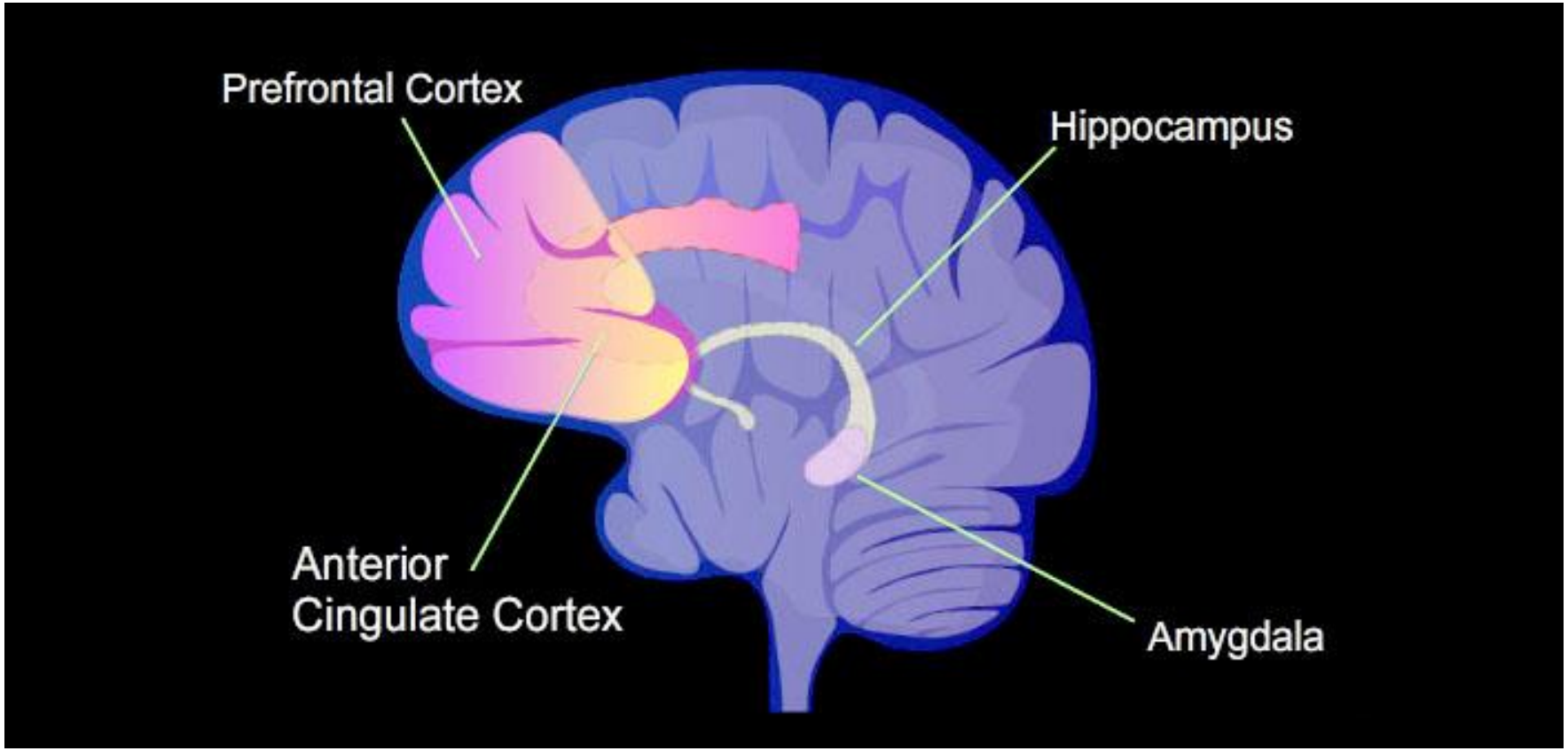


Strategies To Manage Stress



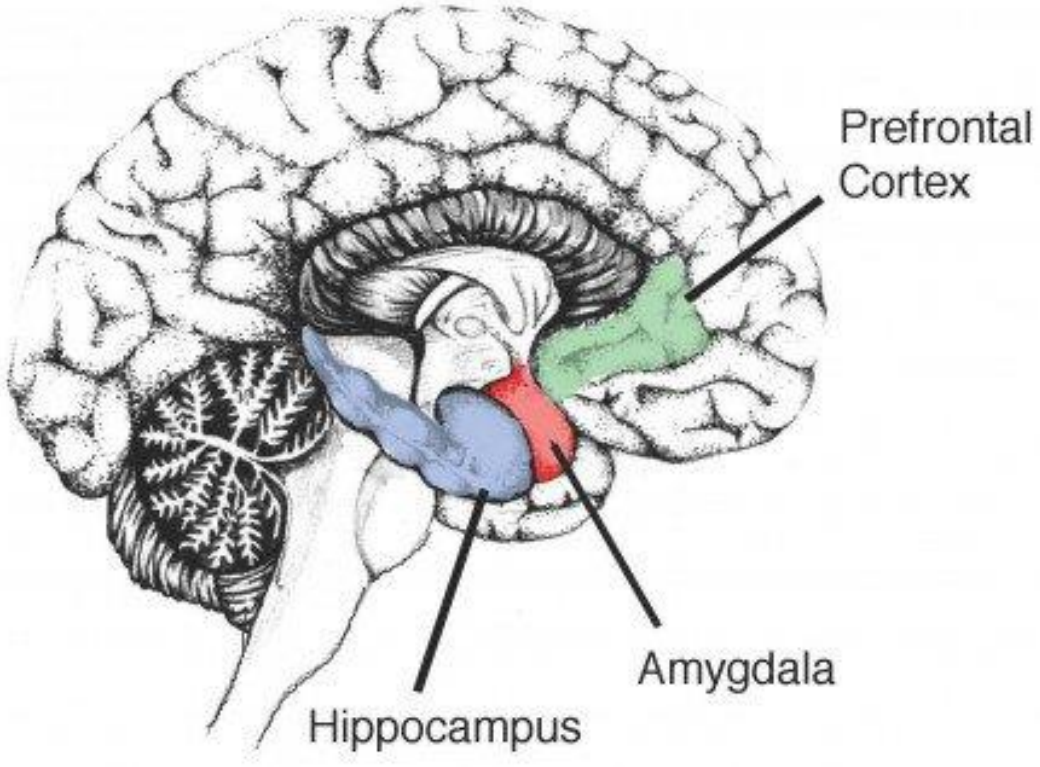
The Brain Learns To Deal With Stress Through Practice (But The Right Practice)

What doesn't work?



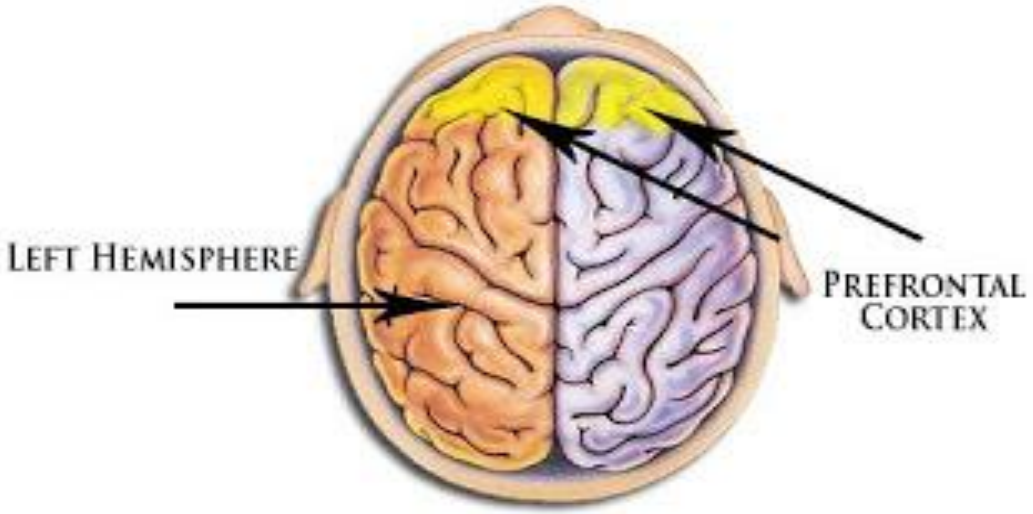
A Unique Study on Mind Wandering and Happiness

Matthew A. Killingsworth, Daniel T. Gilbert A Wandering Mind Is an Unhappy Mind Science 12 November 2010: Vol. 330 no. 6006 p. 932



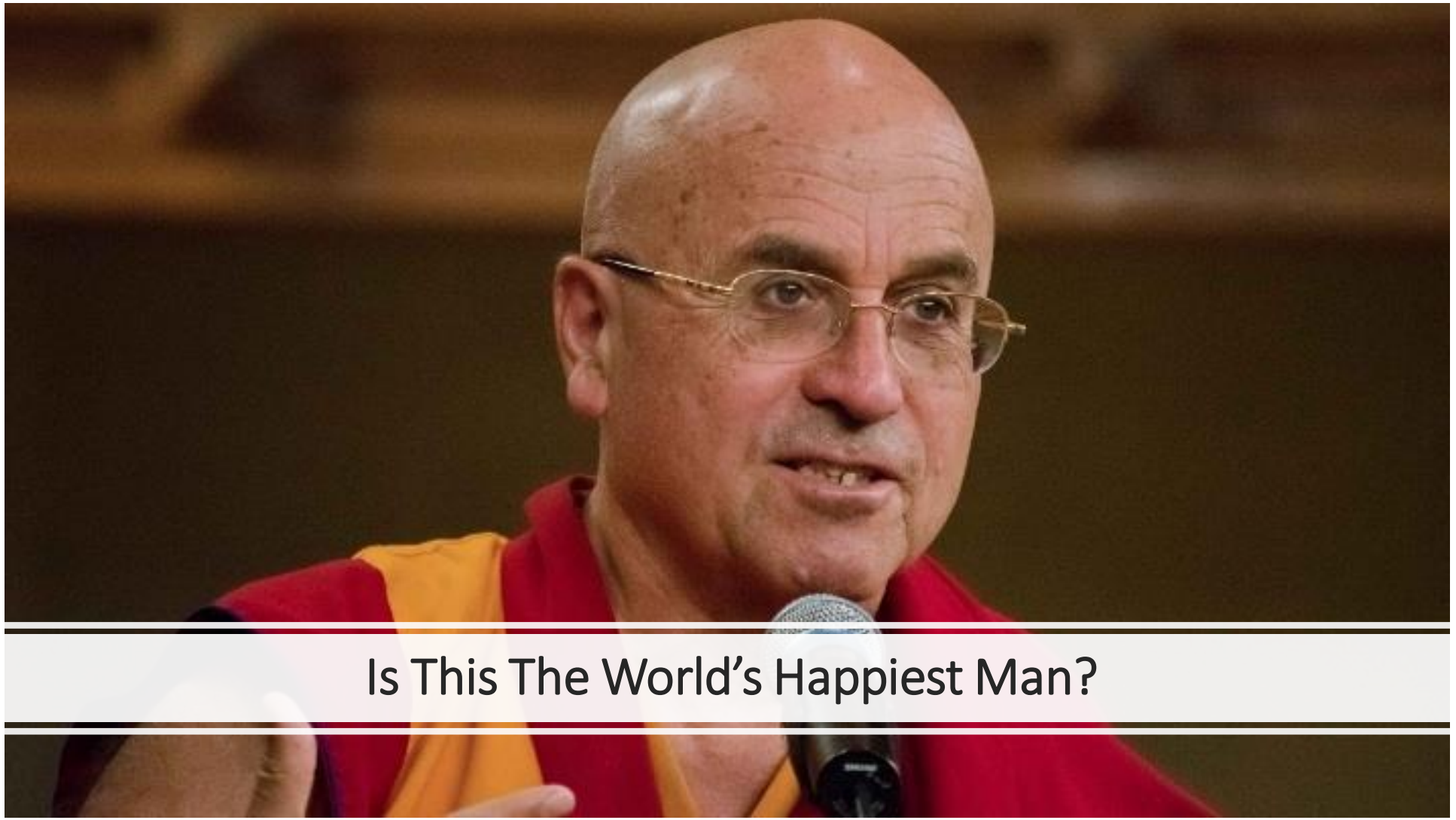
A Happy Brain

Left Prefrontal Cortex Is More Active When People Feel Happy



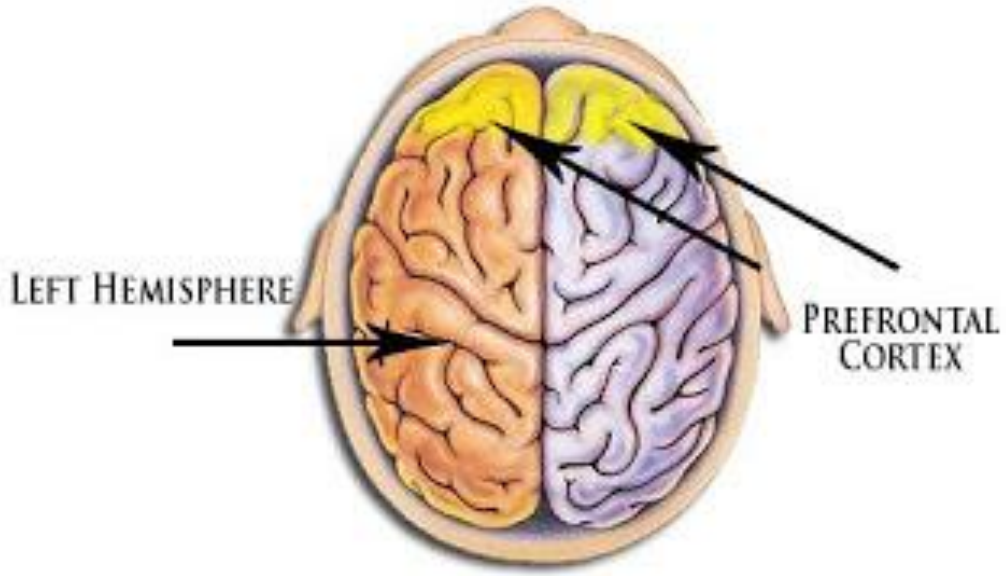
Tested thousands of people....

Antoine Lutz, Julie Brefczynski-Lewis, Tom Johnstone, Richard J. Davidson. **Regulation of the Neural Circuitry of Emotion by Compassion Meditation: Effects of Meditative Expertise**. *PLoS ONE*, 2008; 3 (3): e1897



Is This The World's Happiest Man?

Why Is Ricard's Left Prefrontal Cortex So Active?



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Mindfulness Is A Core Element Of Meditation

<u>2 key elements:</u>

- **Maintaining attention on the immediate experience.**
- **Attitude of acceptance towards the experience.**

Monks Practice Mindfulness: Put A Bunch Of Monks In Brain Scanners

Monks Seem To Have Robust Connections In Scattered Parts Of Their Brain

You Might Be Thinking....

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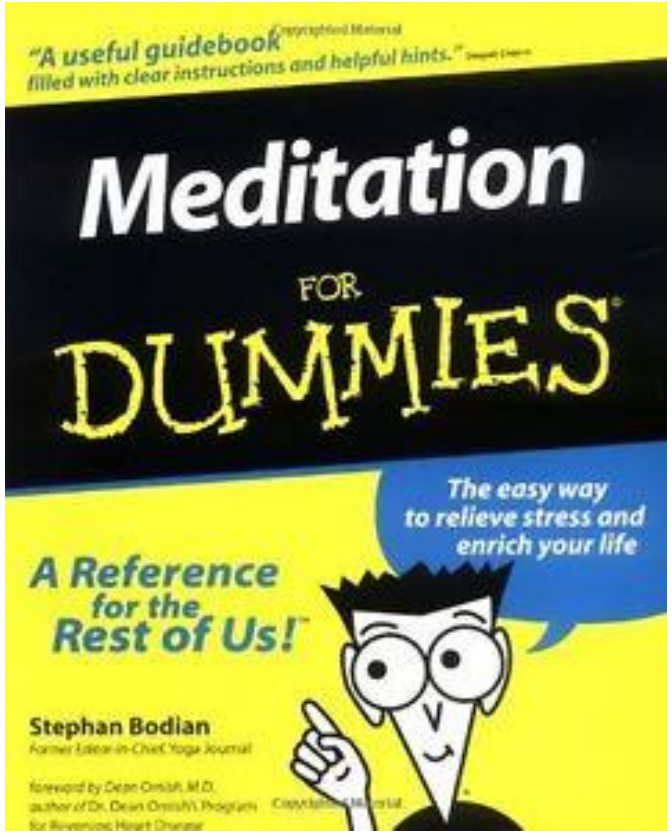
How Many Hours Have The Monks Meditated By The Time They Were Involved In These Studies?

34,000 hours!

- That’s 11.5 years of meditating 8 hours a day, every day!

- That’s A LOT of meditating!!!!

Is There A Cliff Notes Version???



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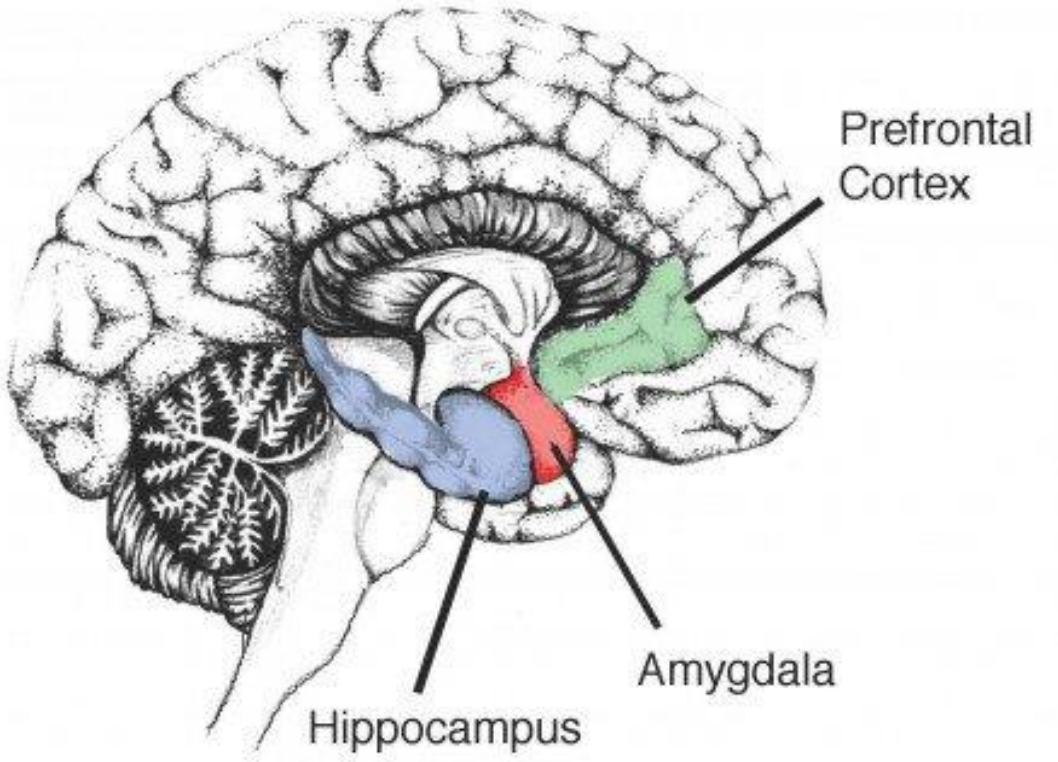
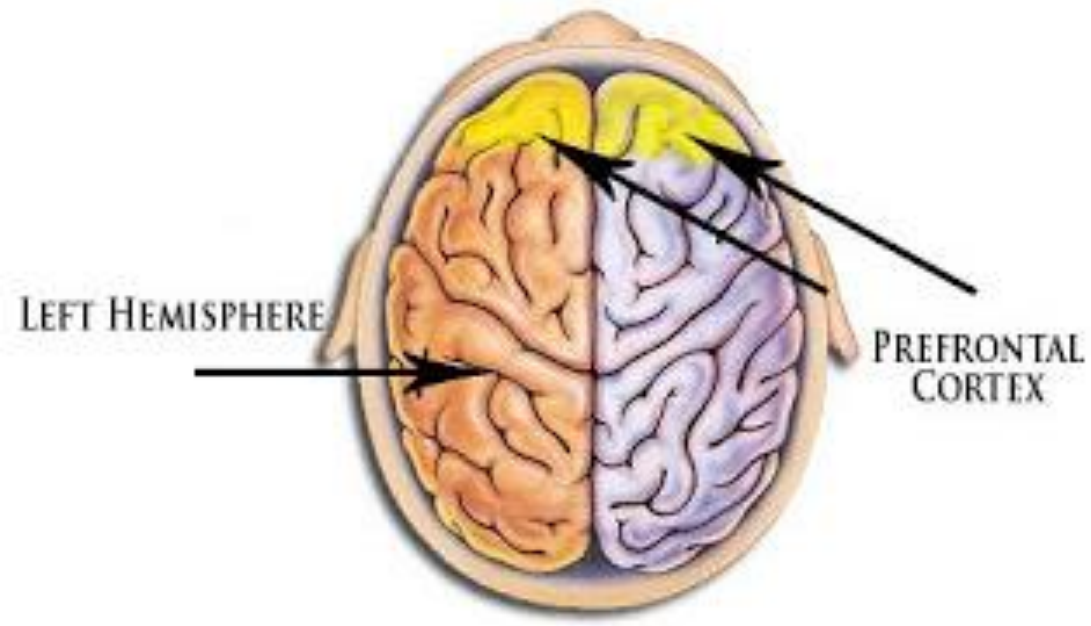
Prefrontal Cortex Grows
Emotional Part Of The Brain Shrinks



What about those that did not meditate?

What Are These Meditators Actually Doing????

Breathe in calmness, breathe out anxiety.



27 Minutes A Day Of Practicing Mindful Meditation

- They reported that they felt less stressed.
- But were there any changes in their brain?

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Anxiety, Depression, Pain, Sleep

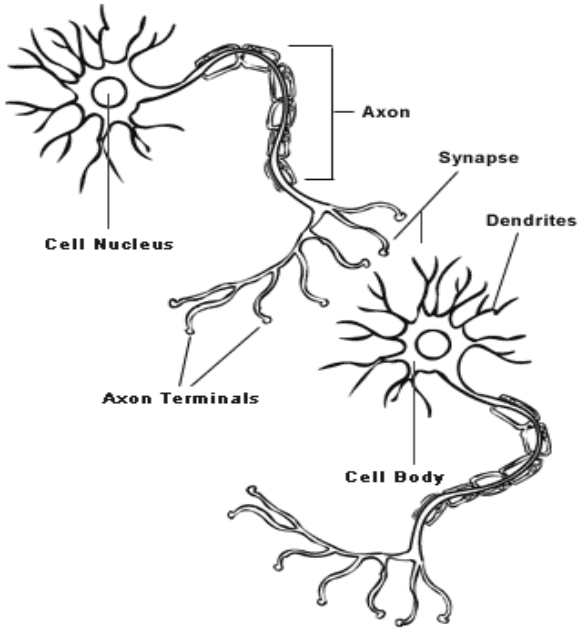
- 30 minutes of meditation per day significantly decreases the symptoms

- Improvements continued over the six months following the training.

Brain Changes….

UCLA psychiatry professor Dr. Jeffrey Schwartz

Whether We Are Learning The Piano, Golf, Or Studying The Brain



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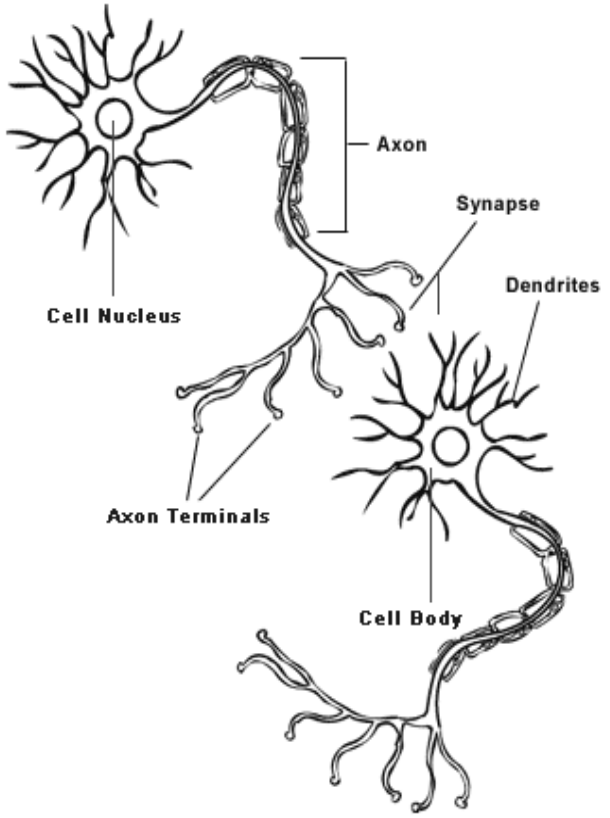
What if you don't practice?

Can You Learn To Be Happy?
Can You Train Yourself To Be Happy?

We Practice Our Emotions Too

Practicing being unhappy makes someone an expert at being unhappy.



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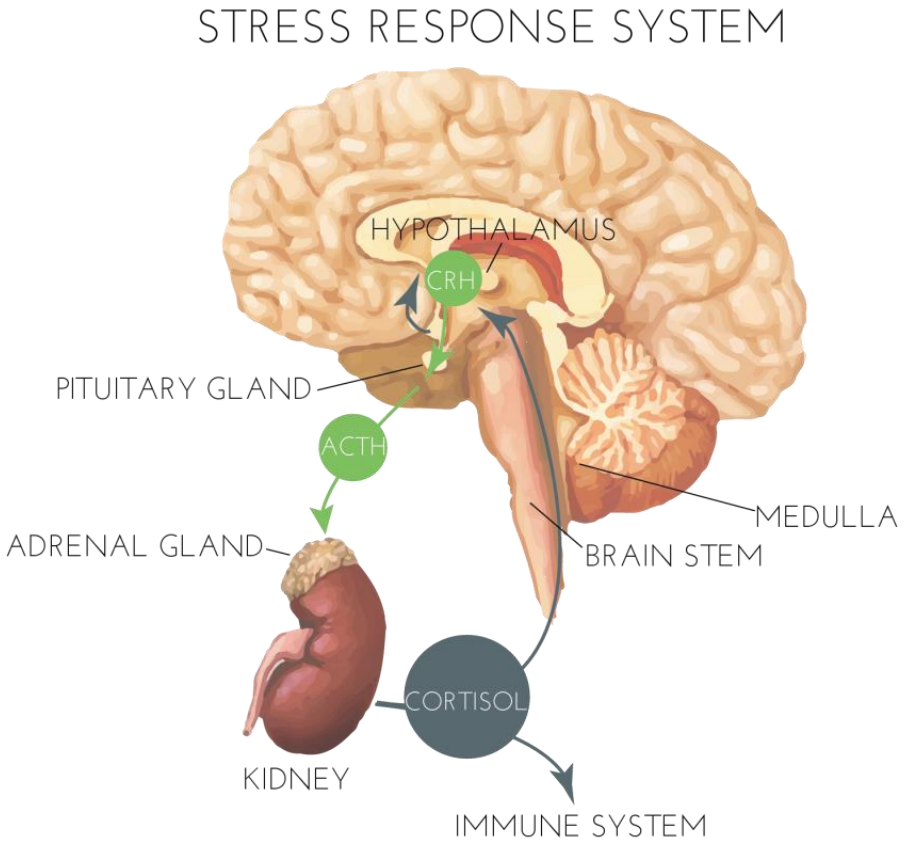
Practicing Mindfulness Keeps Our Brains From Wandering....



Is This The Only Type Of Mindfulness?

3 Simple Ways To Practice Mindfulness That You Can Start Doing Today

Simple Mindfulness

- **Mindful eating and gratitude....**

- **Sounds simple....**

A Modern Dinner
or
Lunch at Work?

A Mindful Walk and Green Time

Kobi Nazrul Centre
ACCOUNTANTS
071-375 1512
BALTI HOUSE
0171 247 5855
Mahib
TANDOORI
VEGETARIAN
BALTI
SPECIALIST
TEL
0171-247 7122
Mahib Indian Cuisine
OPEN
71-377 8495
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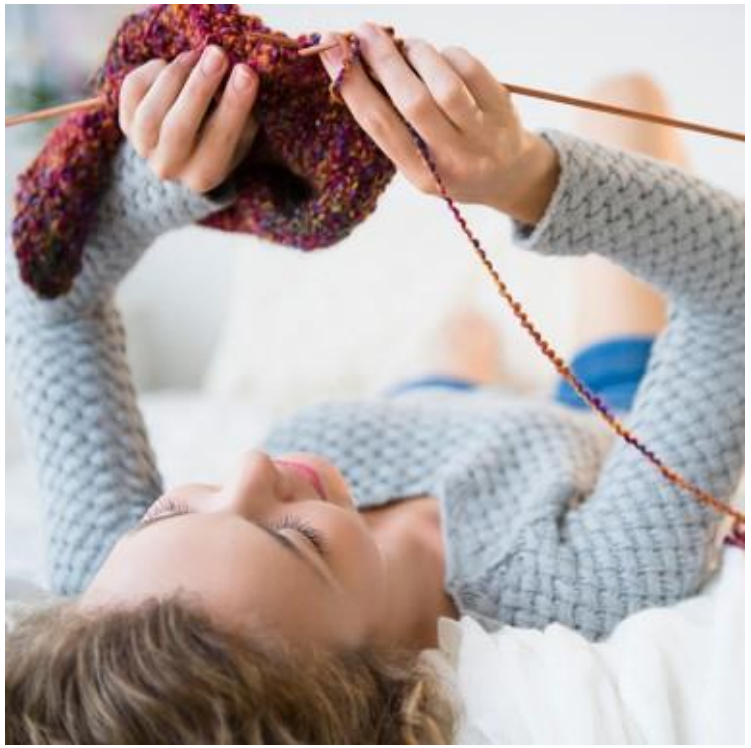

Other Ways To Practice Mindfulness: (Adults and Fun on To Do List)

A Big Area Of Anxiety Research: What Is Happening Here?

The Endless Stream….

Digital addiction increases loneliness, anxiety and depression

1.Erik Peper, Richard Harvey. **Digital Addiction: Increased Loneliness, Anxiety, and Depression**. *NeuroRegulation*, 2018; 5 (1): 3 DOI: 10.15540/nr.5.1.3

Grounding Exercise

Name 3 things

you see

you smell

you hear

you feel

Breathe in and out slowly 3x

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Some People Don't Feel Much Anxiety

- Key Aspect #1:

Deal with one stress at a time and take breaks.

- **#2 ????????**

What Do You See?

What's The Difference in Heart Rate/Blood Pressure?

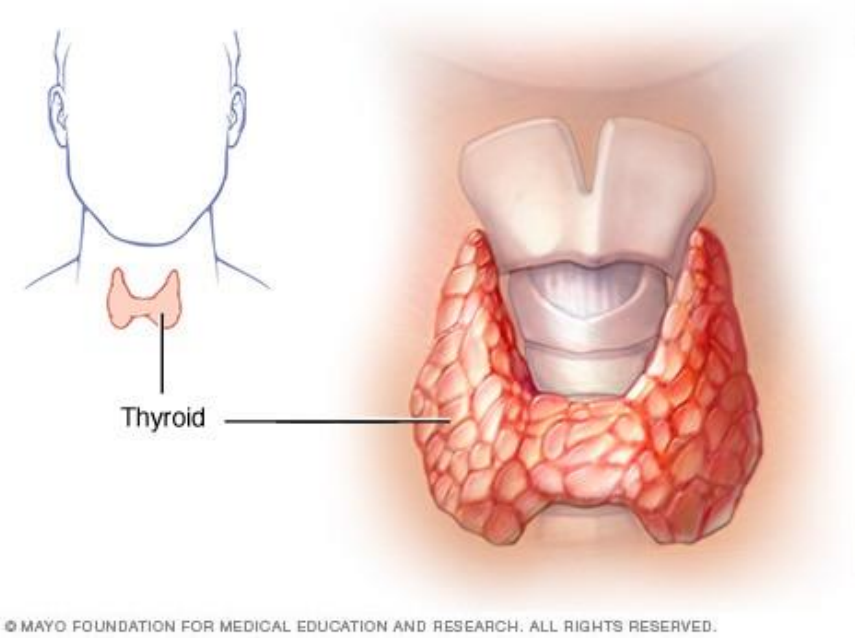
- Anxiety vs Excitement?
- Acknowledge vs Suppress?
- Tackle one task at a time and then take a quick break.

What If Someone Is Still Struggling?

Recently Published:

- **Patients with AIT account for more than 40 percent of all adult cases of depression and 30 percent of all cases of adult anxiety disorder.**

- Take home message.



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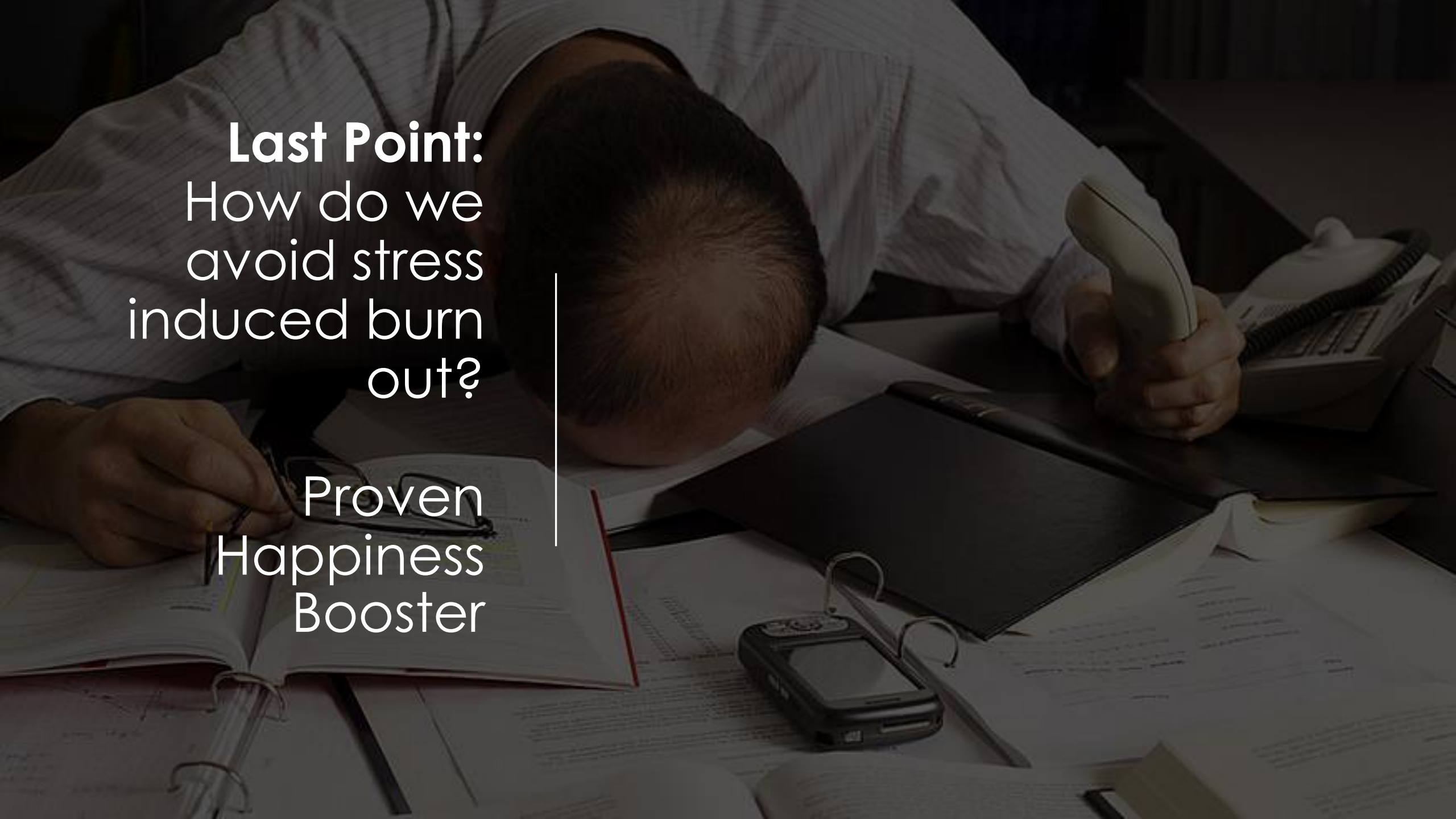
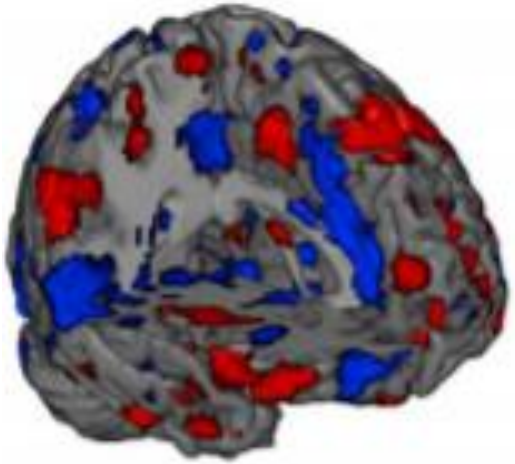
1.Eva-Maria Siegmann, Helge H. O. Müller, Caroline Luecke, Alexandra Philipsen, Johannes Kornhuber, Teja Wolfgang Grömer. **Association of Depression and Anxiety Disorders With Autoimmune Thyroiditis**. *JAMA Psychiatry*, 2018; DOI: 10.1001/jamapsychiatry.2018.0190

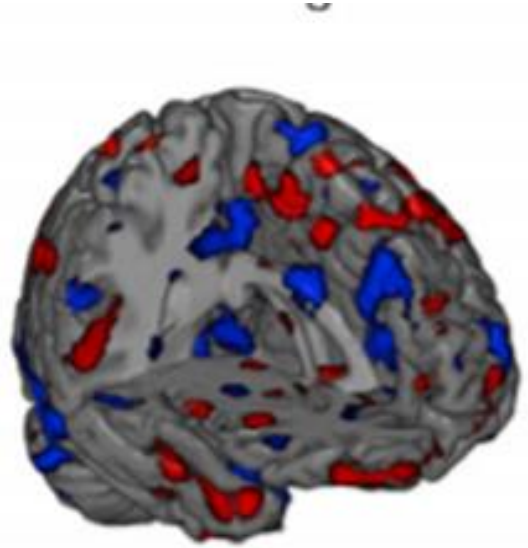


Last Point:
How do we avoid stress induced burn out?

Proven Happiness Booster

A Burned-Out Brain vs A Resilient Brain ?





Higher Risk Of Burnout

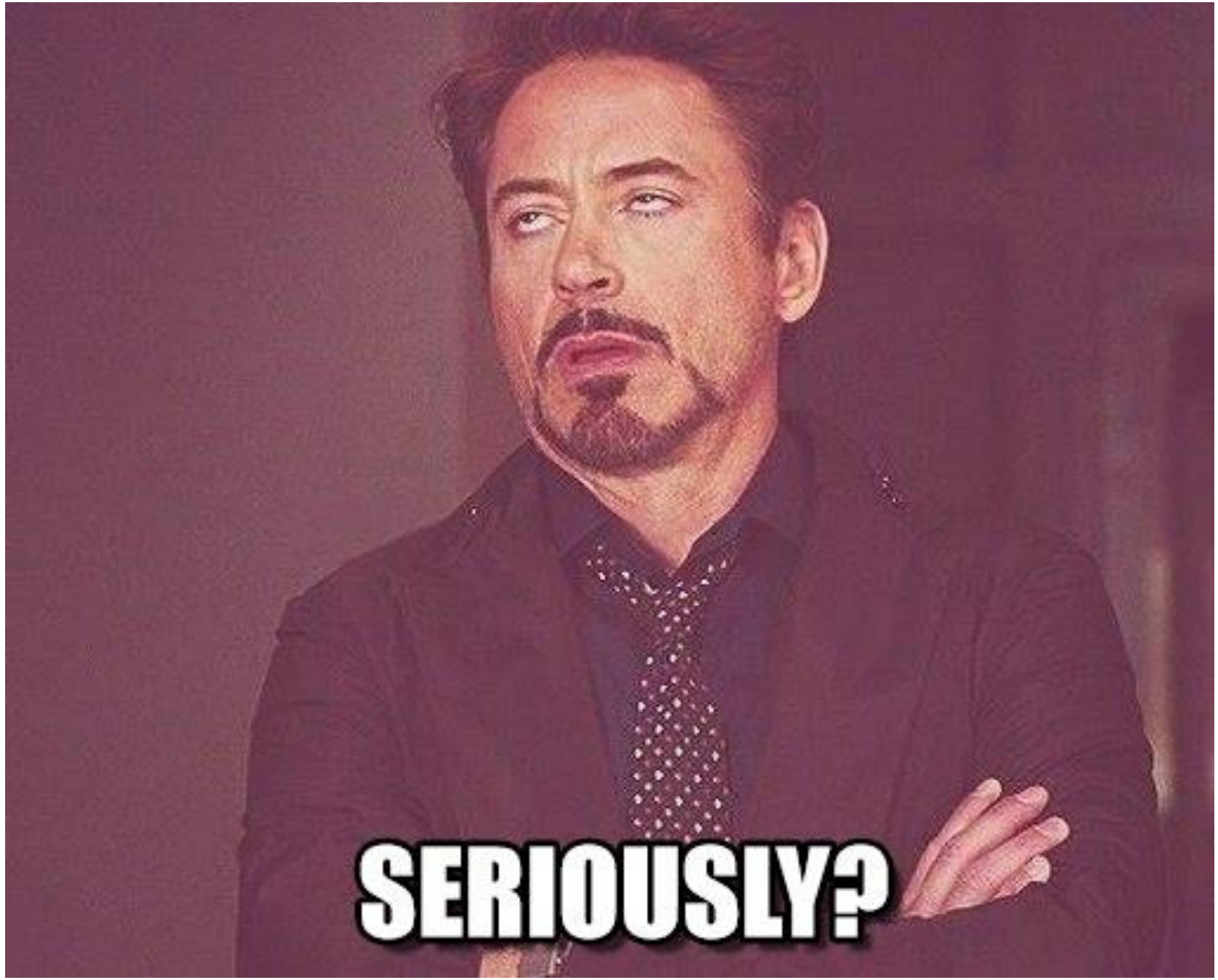
Resilient Brain

Subtle Difference: Both Under Stress

1.Yoni K. Ashar, Jessica R. Andrews-Hanna, Sona Dimidjian, Tor D. Wager. **Empathic Care and Distress: Predictive Brain Markers and Dissociable Brain Systems**. *Neuron*, 2017;
DOI: 10.1016/j.neuron.2017.05.014

The Brain Science of Compassion and Acceptance?

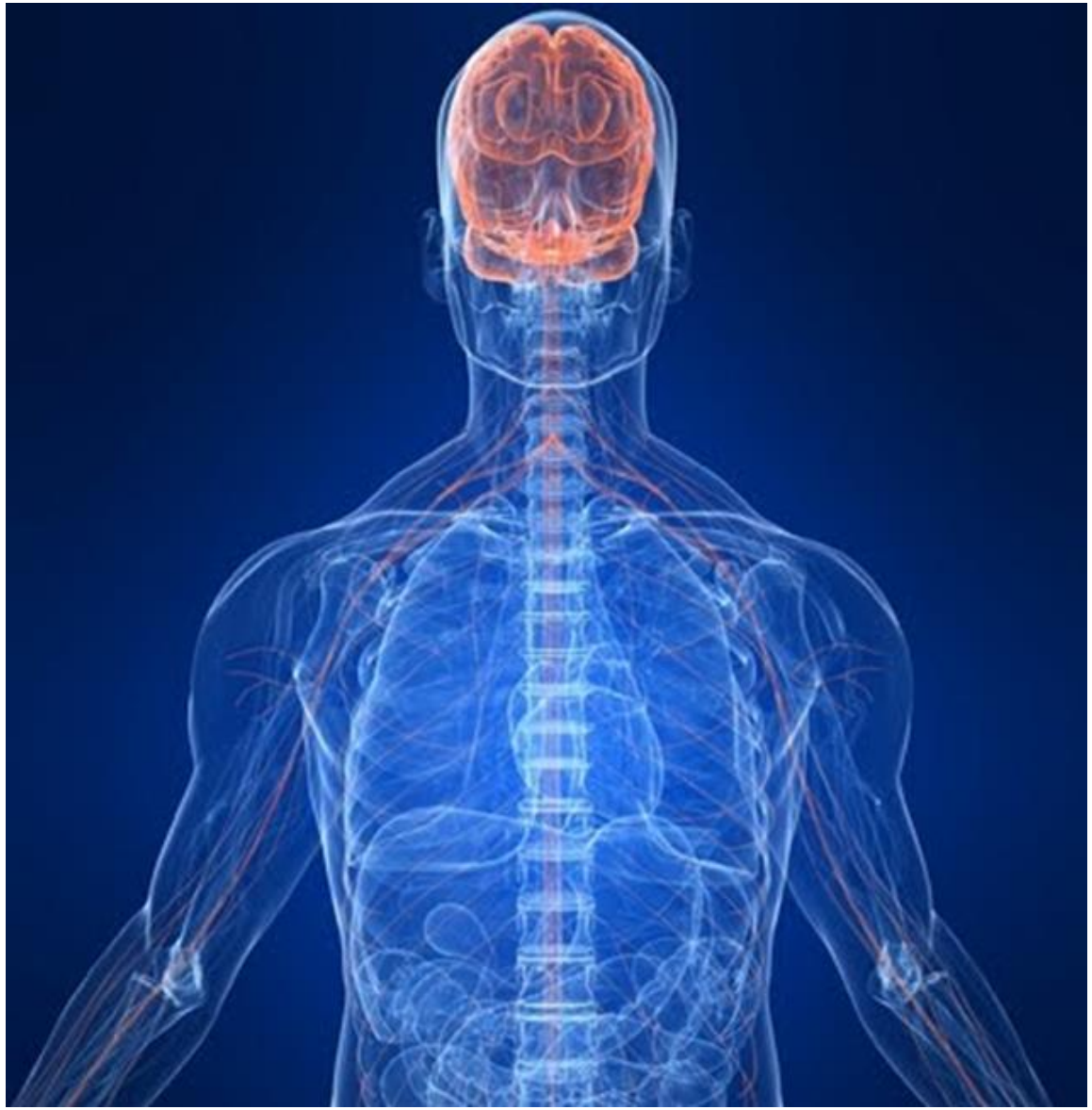
You Might Feel The Urge…


SERIOUSLY?

108 Years Without
Winning The World Series

Overall Health: (15 Minutes A Day)

- Reduction in physical signs of stress.
- Success in patient populations such as breast cancer survivors, PTSD.
- Lower levels of anxiety and depression.



Dr. Geshe Lobsang Tenzin Negi Emory University

3 Basic Steps (15 minutes a day)

- 1. Think of someone you love, care and have good feelings about

3 Basic Steps (15 minutes a day)

- 1. Think of someone you love, care and have good feelings about.
- 2. Apply same feelings to yourself.

3 Basic Steps (15 minutes a day)

- 1. Think of someone you love, care and have good feelings about….
- 2. Apply same feelings to yourself.
- **3. Apply those same feelings to other people you could be upset, frustrated with, etc…..**

Compassion Training For High Stress Jobs?

- **Still have empathy but don’t internalize and burnout.**

2 Key Points

- This is the second part of mindfulness…..
- Who gets skipped?
- Who is this for??

But Here's The Thing.....

NEGATIVE THOUGHTS

10 Things Happened Today

Why Negative Thoughts?

This Moment

What's Next?

Best Case Scenario?

Thanks!

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