

# The New Science of Stress

## Evidence Based Practices to Remain Resilient

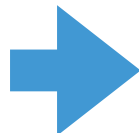
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School of Medicine

May 9, 2019

### Strong epidemiological evidence linking chronic stress to worse health

#### Chronic stressors

Work stress & burnout  
Difficult childhood environment  
Financial strain  
Interpersonal stress  
Caregiving  
Unsafe neighborhoods



#### Increased risk of worse health

Mortality  
High blood pressure  
Metabolic syndrome  
Type 2 diabetes  
Cardiovascular disease  
Cognitive functioning decline  
Physical functioning decline  
Cancer progression, not incidence

# Defining chronic stress

Life circumstances that include both  
an **objective stressor** and  
high **subjective stress**

Acute  
stressors

Daily events/  
daily hassles

Major life  
events

## Stress and mortality from national cohort study

Midlife in the United States (MIDUS) study 2

*N*=6,609 US adults recruited from random digit dialing in 2004-2006

Followed for 11.6 years with *N* = 870 deaths over that time period

Types of stress captured via questionnaire:

- Discrimination (lifetime, daily, job)
- Perceived social inequality (social comparison of home, job, and family life)
- Difficulty with friends, family members, and spouse/ partner
- Subjective stress within the last month
- Number of stressful life events across one's lifetime

# Research question

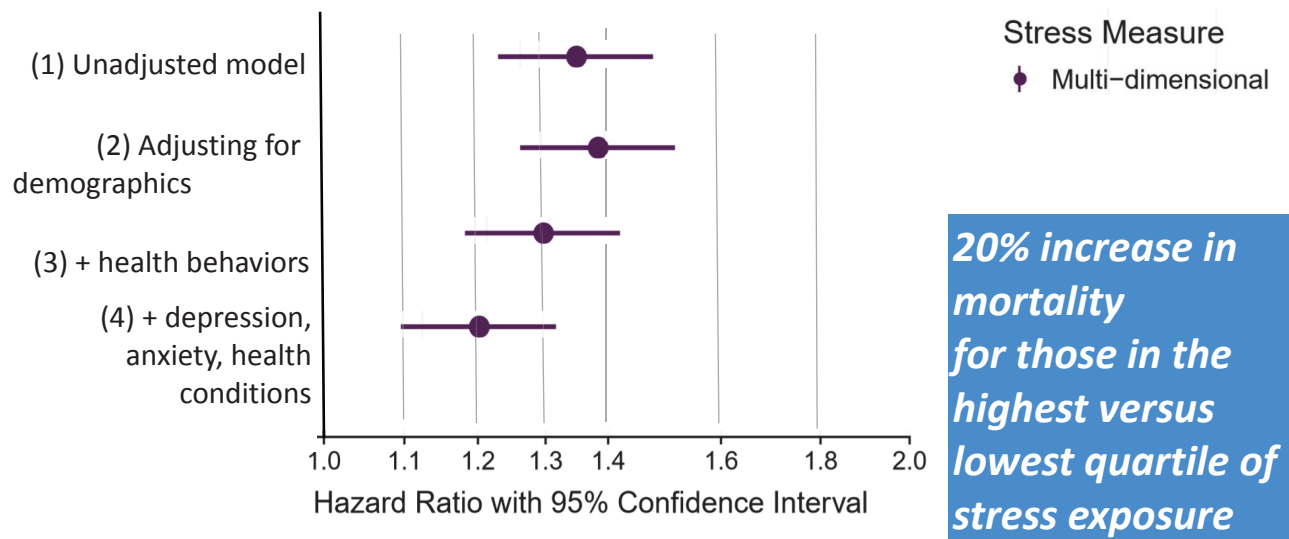
Does an accumulation of stress in someone's life increase their risk of dying...

*above and beyond known mortality predictors?*

Known mortality predictors are:

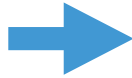
- Demographics: sex, age, race, participant education, parental education, child welfare, current employment status, health insurance
- Health behaviors: smoking, alcohol use, physical activity, waist-hip ratio
- Number of chronic health conditions in the past 12 months
- Current depression and/or anxiety

## Cumulative stress increases mortality risk above and beyond known risk factors



# How is this possible?

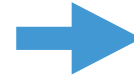
**Chronic stress**



**Biological dysregulation**

such as:

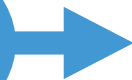
- Peripheral inflammation
- High blood pressure
- Metabolic processes
- Telomere shortening
- Endothelial function
- DNA repair
- Gene expression



**Disease**

# How is this possible?

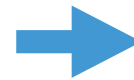
**Caregiving**



**Biological dysregulation**

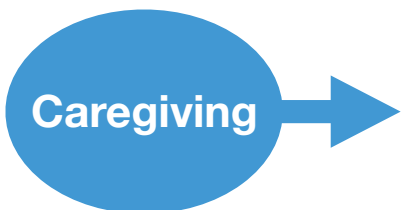
such as:

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**Disease**

# Family caregivers are chronically stressed

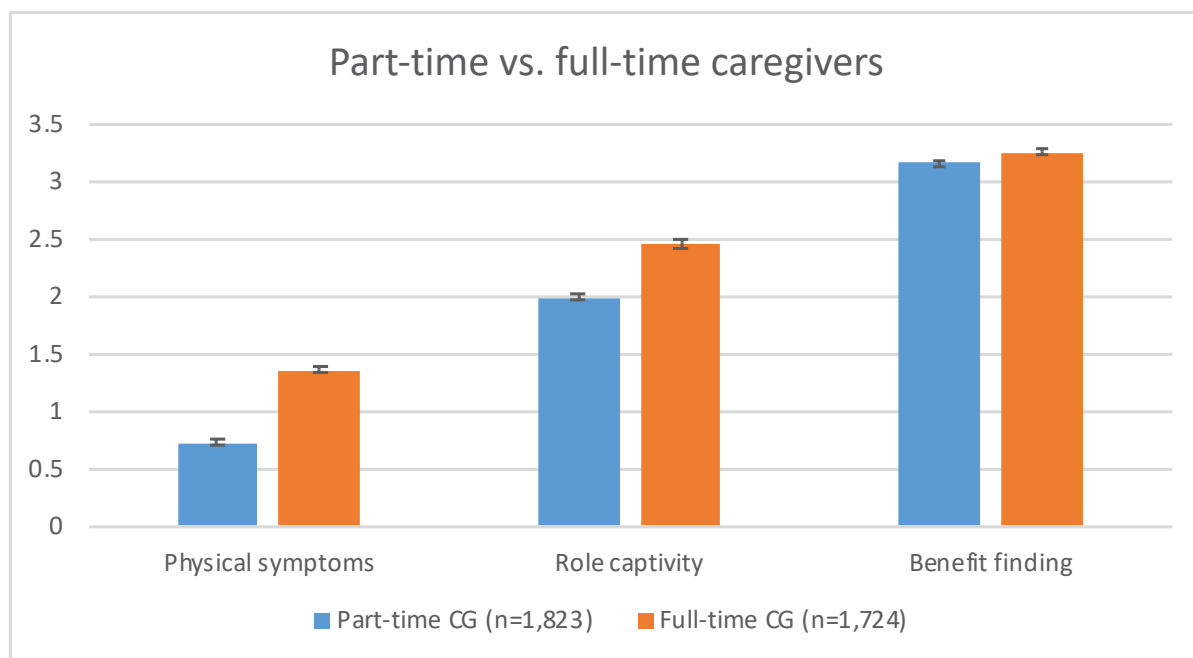


Decreased quality of life,  
including:\*

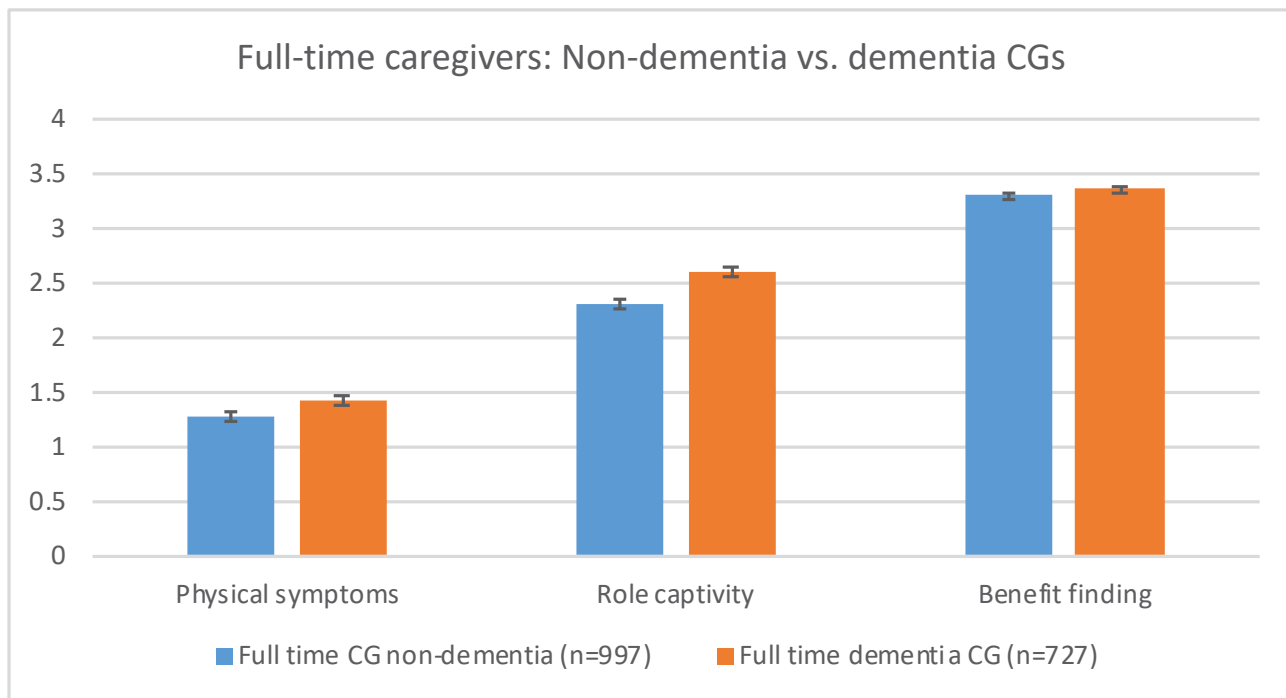
- Anxiety
- Depression
- Social isolation
- Weight gain
- Sleep problems
- Fatigue
- Pain

**\*Important note:  
This is not true for all caregivers!**

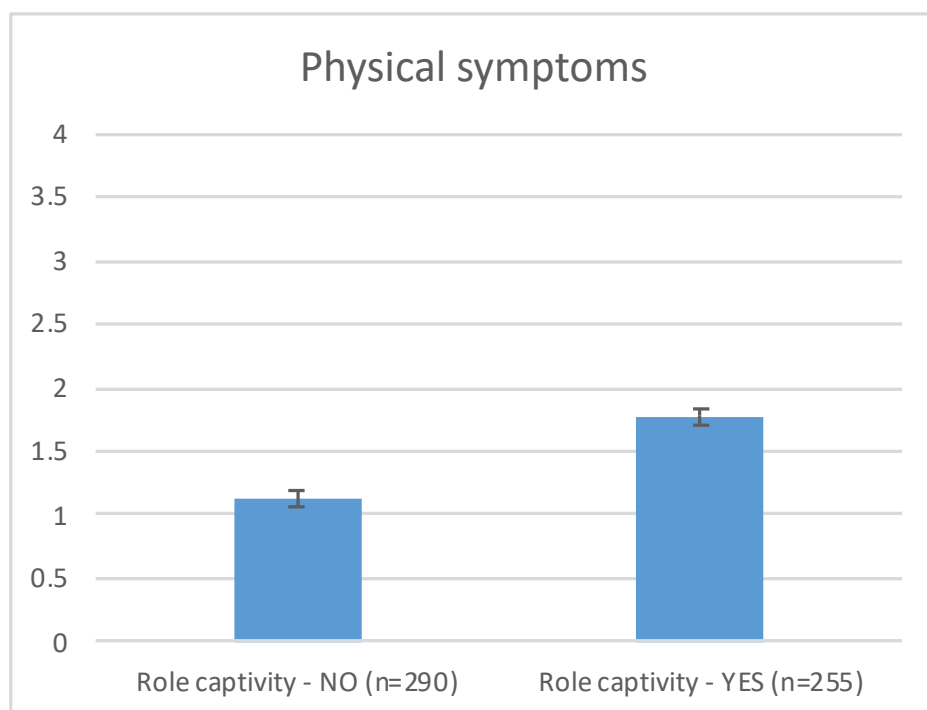
## Recent data on family caregivers



# Dementia caregivers impacted most



## Feeling trapped may be what is 'toxic' about caregiving

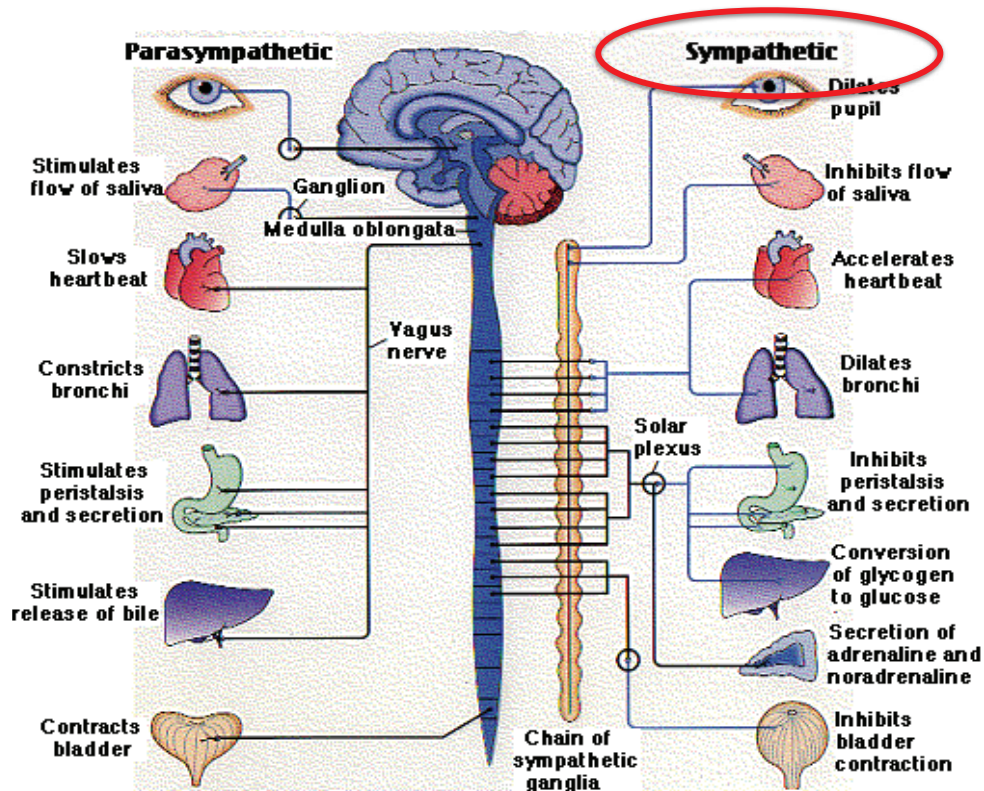


# Biological basis for the toxicity of feeling trapped



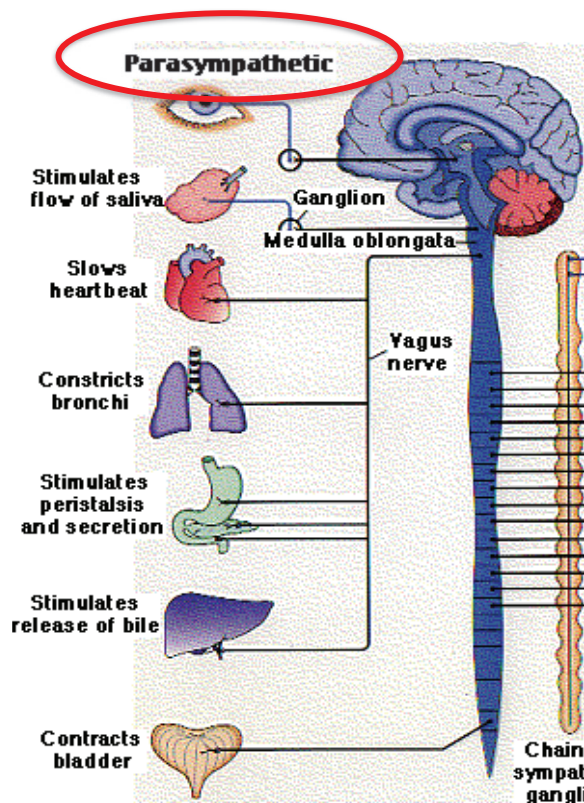
Feeling trapped activates our reptilian brain, leaving us in a permanent state of 'fight or flight' — with our sympathetic nervous system always on

## Fight or flight response is driven by sympathetic nervous system activation





# Parasympathetic activation drives healing



Activated in conditions of safety\*

\*Read the full theory of 'safety signally' here: Brosschot, Verkuil, & Thayer, *Psychosomatic Medicine*, 2018

## How can we signal safety to our brain and body?

- Paced, slow breathing
- Direct way to stimulate PNS - scientific fact
- Stimulating PNS shuts down ruminative thoughts (Burger, Van der Does, Thayer, Brosschot, Verkuil, 2019)
- Meditation is one way to slow the breath .. what else might work?
  - Sensory stimulation (aromatherapy, candles)
  - Nature, art, meaningfully connecting with a loved one — seeing beauty, manufacturing experiences of 'awe'
  - Intentional morning and evening ritual (cup of tea? journaling?)



# How can we signal safety to our brain and body?

- Communities and spaces of trusted others such as:
  - ✓ Support groups
  - ✓ Choir singing
  - ✓ “Sangha” (meditation groups)
  - ✓ Church services
  - ✓ Yoga classes
- Environments free of threats and judgments - implications for how we set up homes, work places, medical facilities

# Tools for coping with chronic stress

1. Purpose in life / meaning making
2. Breathing techniques
3. Gratitude exercises
4. Mindful savoring
5. Physical activity
6. Sleep quality
7. Deep social connection
8. Positive emotions of joy and awe

## Chronic stress: We can't avoid it

Especially true for caregivers - both family members and professional caregivers

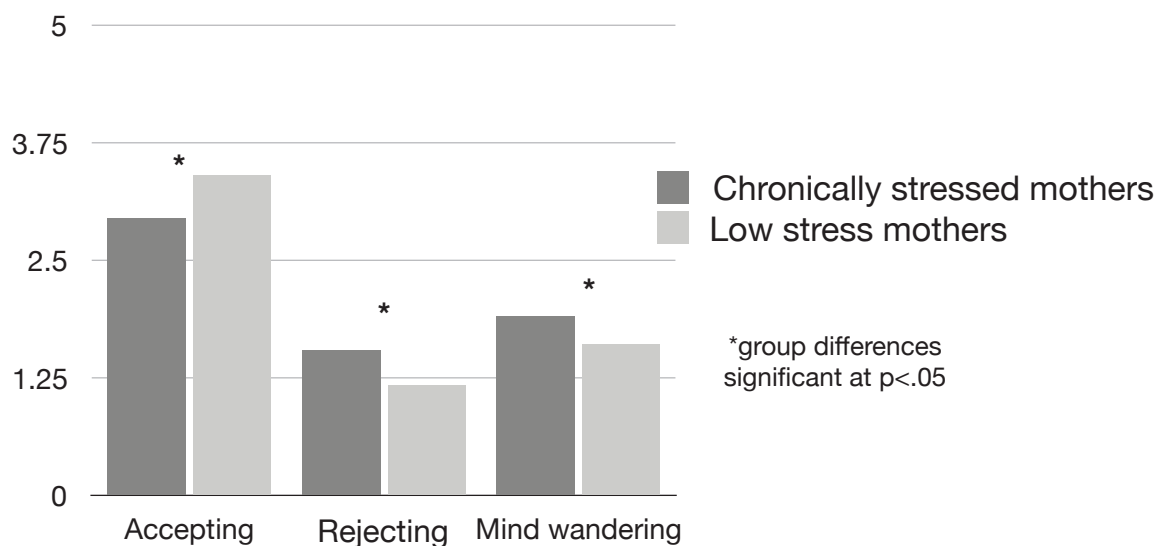
Instead of fighting it:

- Accept the current reality
- Set up environments and daily lives that activate the PNS
- Create moments of rest to heal from the damage (and build up resilience) to the demands of the chronic stressor

# Accepting versus rejection reality of the moment

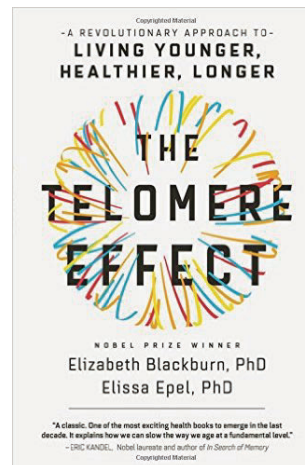
- Wisdom traditions have suggested that *acceptance of what is* is how we move through stressful times - don't fight the mud
- Recent empirical evidence from my research group supports this

## Chronic stress makes us more rejecting and less accepting



# Accepting the reality of the moment is associated with...

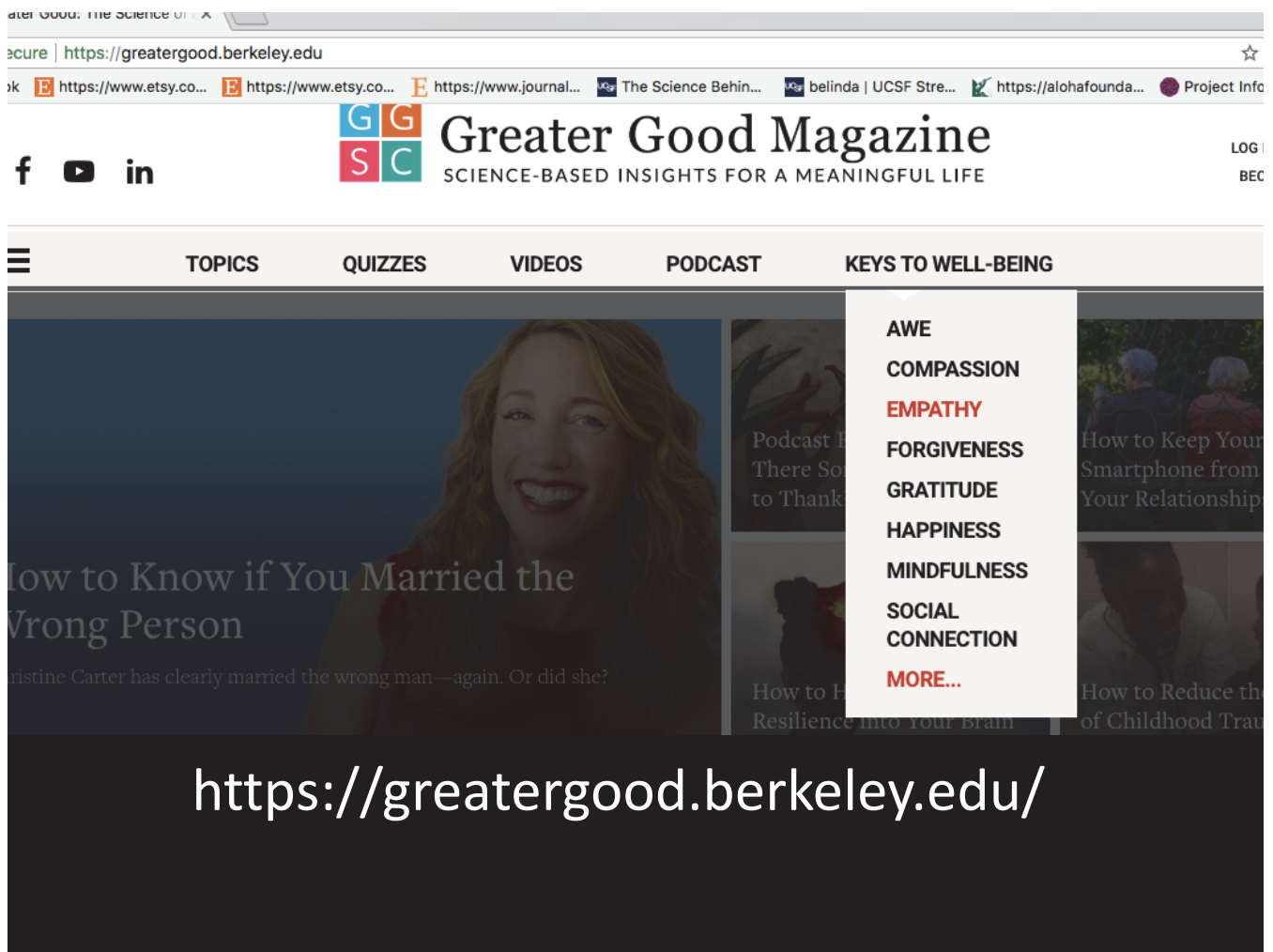
- ✓ Better mood
- ✓ Increased feeling of connection to marital partner
- ✓ Better sleep
- ✓ Better glucose regulation
- ✓ Higher telomerase



## More evidence-based tools for coping with chronic stress

1. Exercise
2. Sleep
3. Meaning making / finding purpose
4. Gratitude exercises
5. Social connection
6. Positive emotions of joy, awe, savoring

The Greater Good Science Center housed at UC Berkeley offers evidence-based exercises / practices



<https://greatergood.berkeley.edu/>

## Takeaway Message

We can't get rid of the sources of most chronic stressors.

Focus instead on ***creating environments and daily routines that signal subconsciously to your body that you are safe.***

This will allow your body to have moments of rest where it can turn on its natural healing capacities.

# We need research participants!

**Currently recruiting healthy adults for studies conducted by UCSF, at the Laurel Heights Campus (3333 California St., San Francisco)**

## 1. Stress Resilience Study

- Testing how innovative breathing techniques, meditation and physical exercises may improve mental and physical health
- Participation involves two in-person study visits to UCSF and engaging in a daily stress resilience technique for 3 weeks
- Contact: Samantha.Schilf@ucsf.edu

## 2. Cardiovascular Responses to Problem Solving Study

- Psychological and physiological study examining the body's responses during computer tasks
- Looking for participants ages 60 - 85
- Participants come to UCSF for one 1.5 hour visit to complete computer
- Contact: Sheyda.zebarjadian@ucsf.edu

# Thank you!

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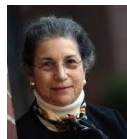
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Amy Abernethy,  
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**Read more about our Aging, Metabolism, and Emotions Research Lab:**

<http://www.amecenter.ucsf.edu/>