

Managing Stress, Building Resilience: An Experiential Introduction to *Mind-Body Medicine*

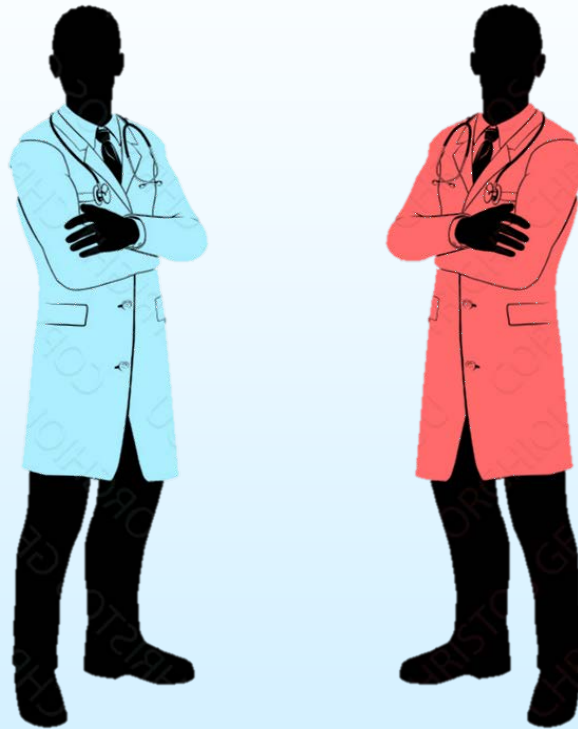


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Beer Sheva, Israel

1 in every 2 physicians experiences burnout



Shanafelt et al Arch Intern Med. 172(18):1377-1385, 2012

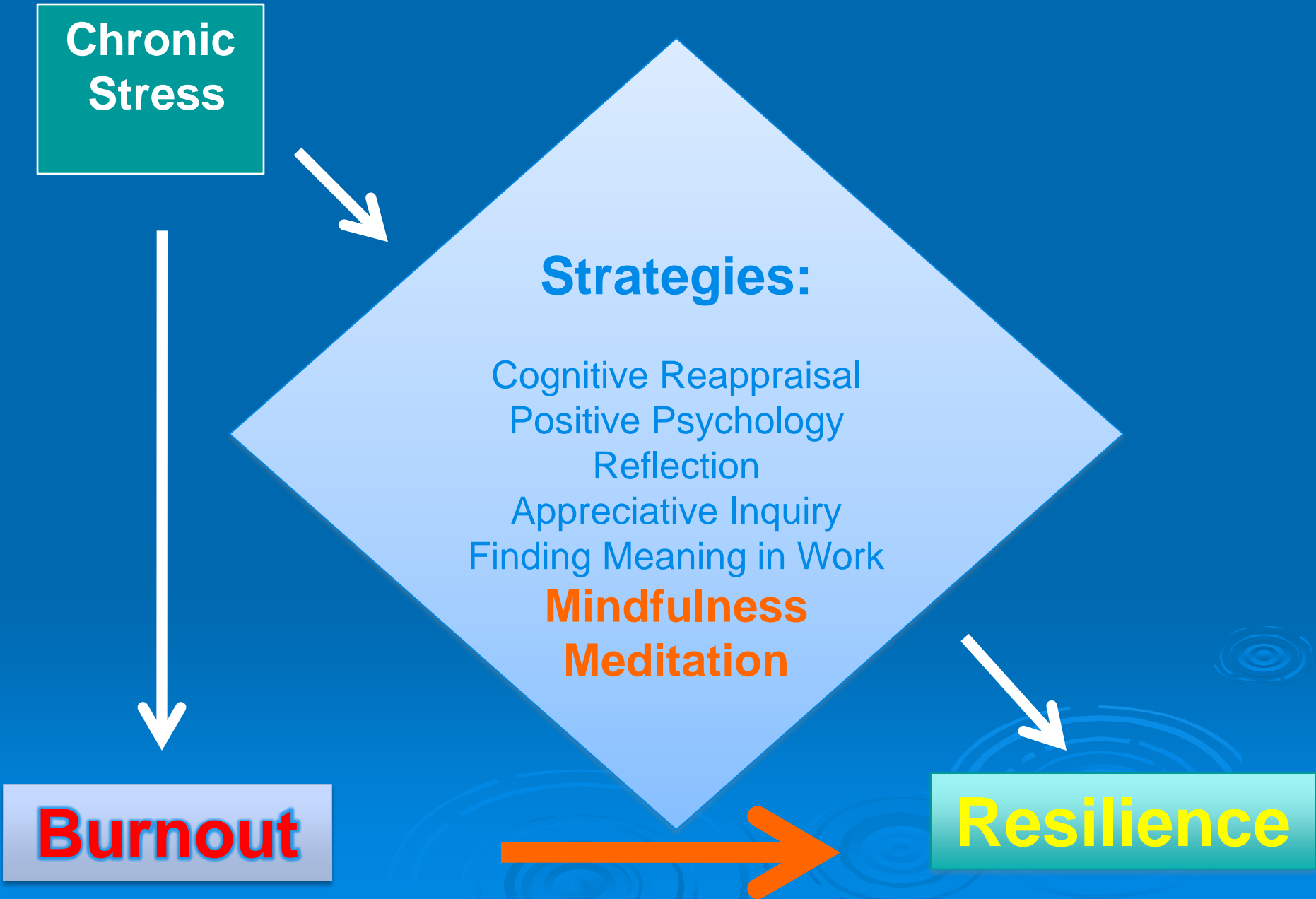
**Chronic
Stress**

Strategies:

Cognitive Reappraisal
Positive Psychology
Reflection
Appreciative Inquiry
Finding Meaning in Work
**Mindfulness
Meditation**

Burnout

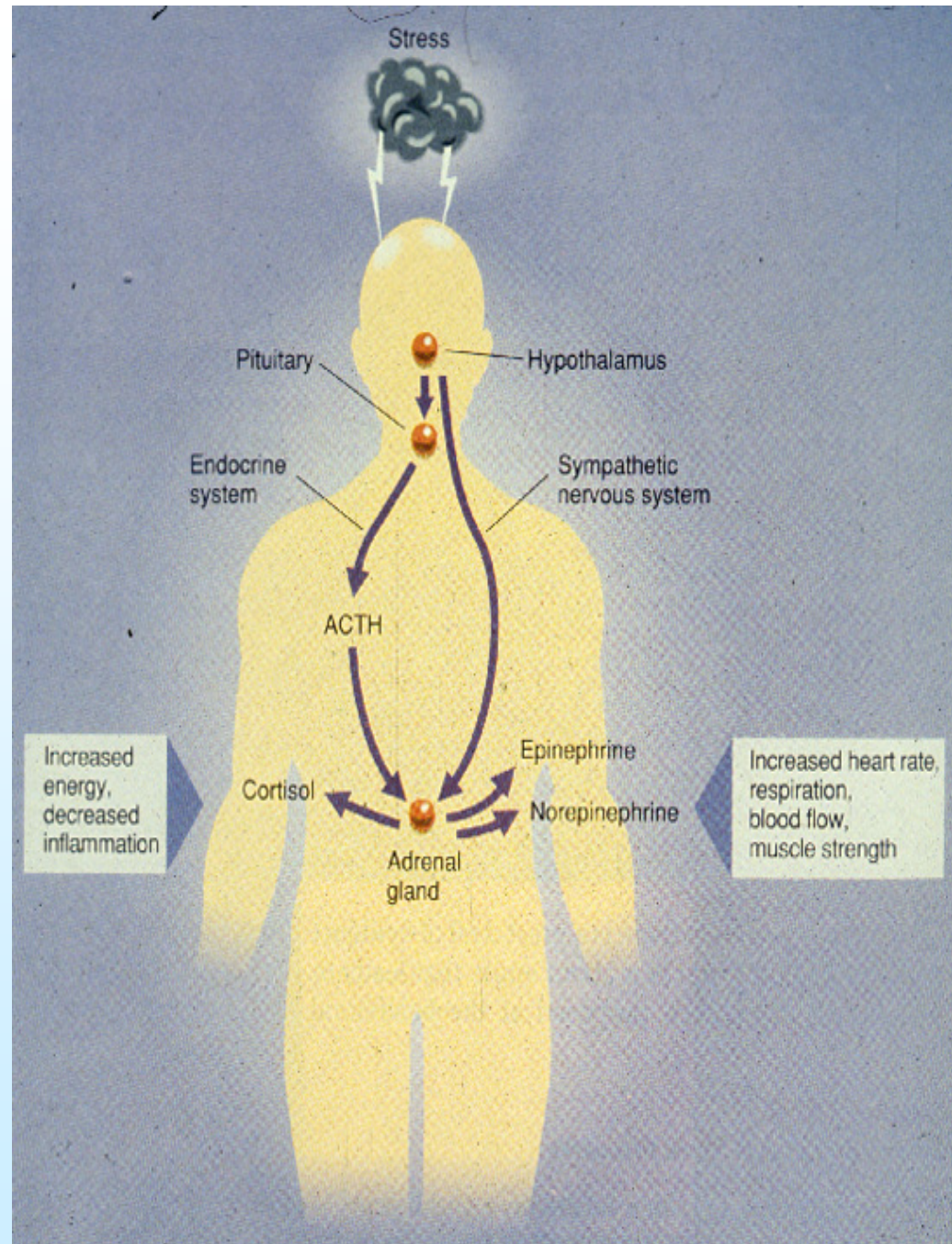
Resilience



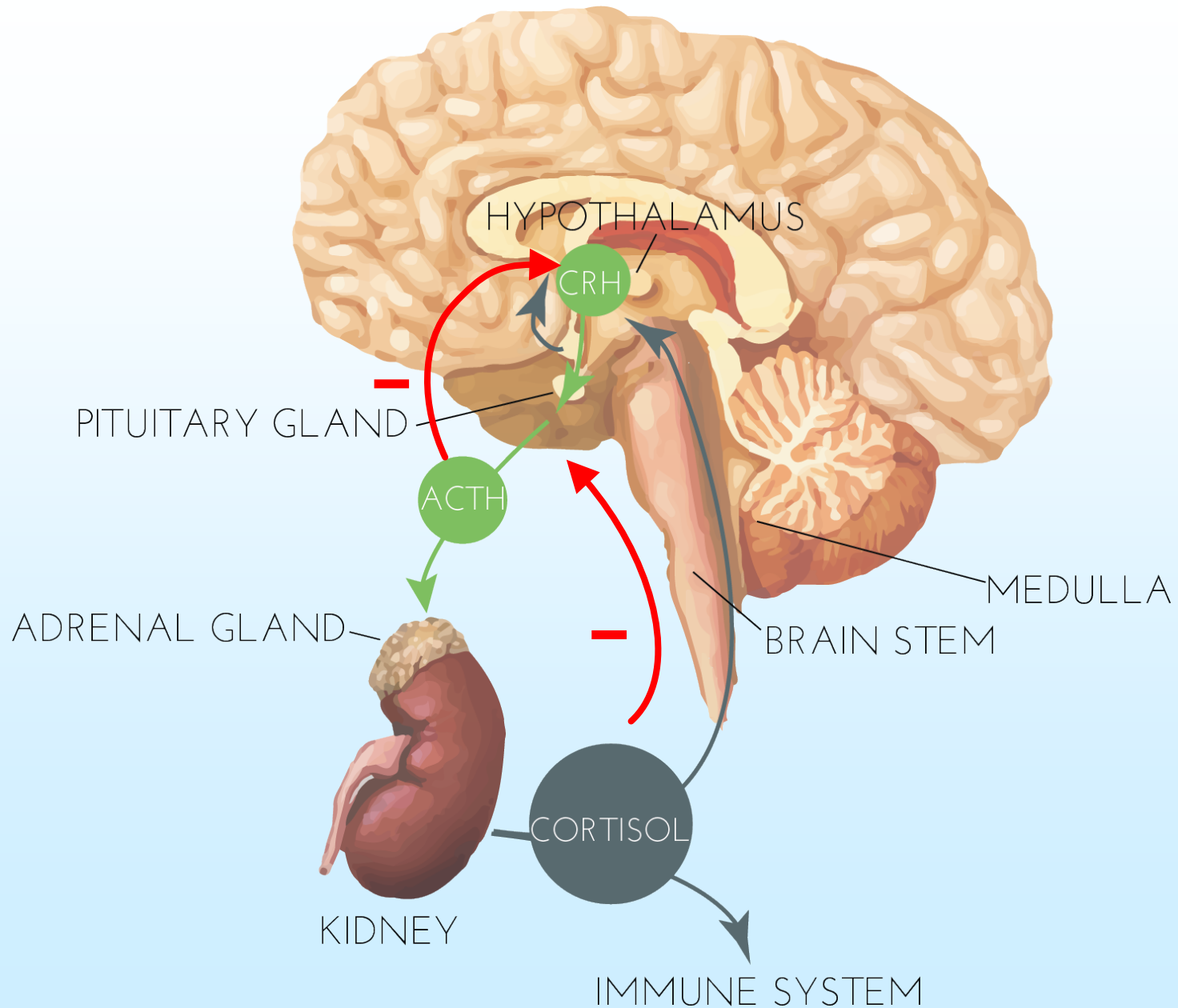
Stress Response

Effect on the Hypothalamic-Pituitary-Adrenal Axis

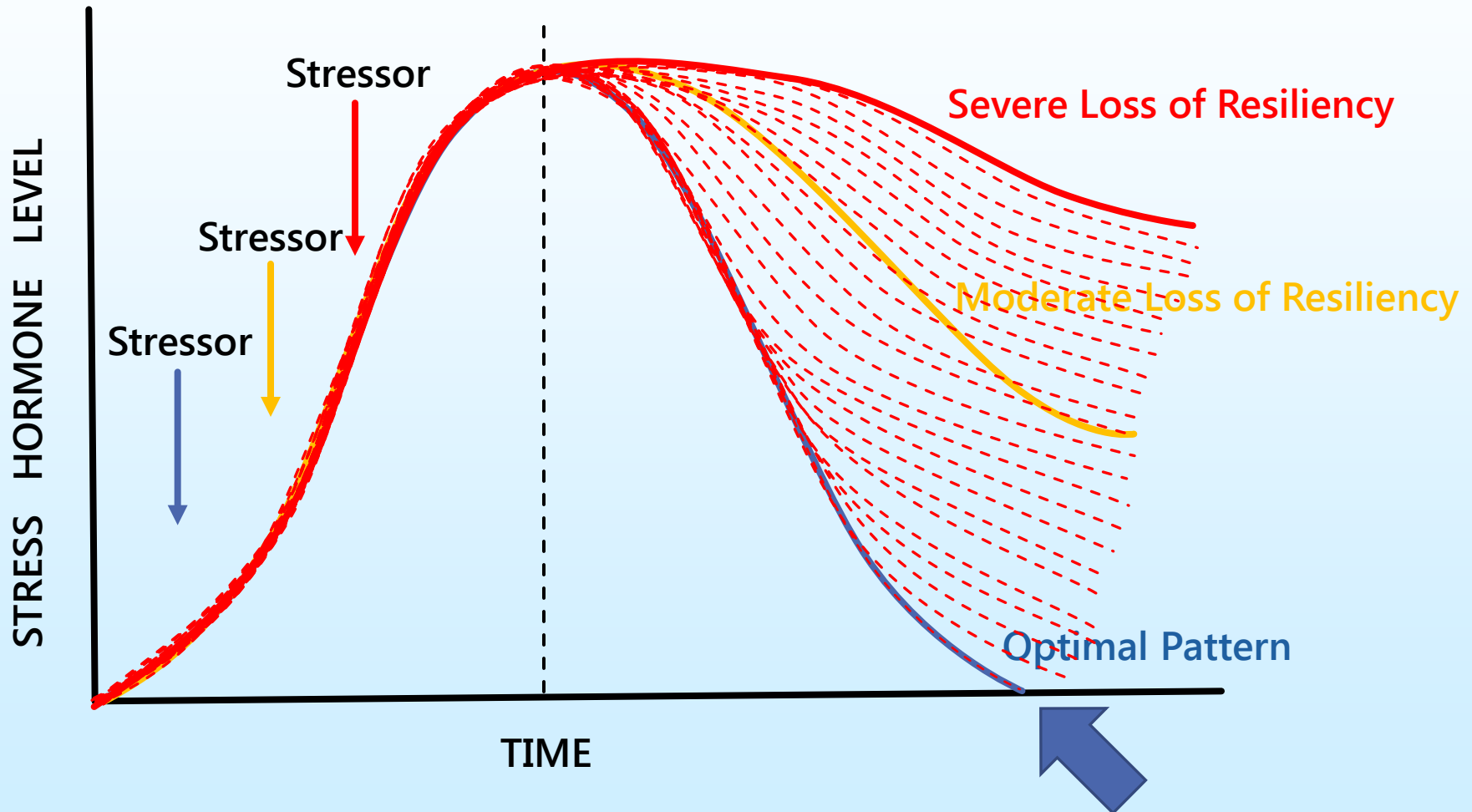
“Fight-or-Flight” Response



STRESS RESPONSE SYSTEM



Physiology of the Stress Response

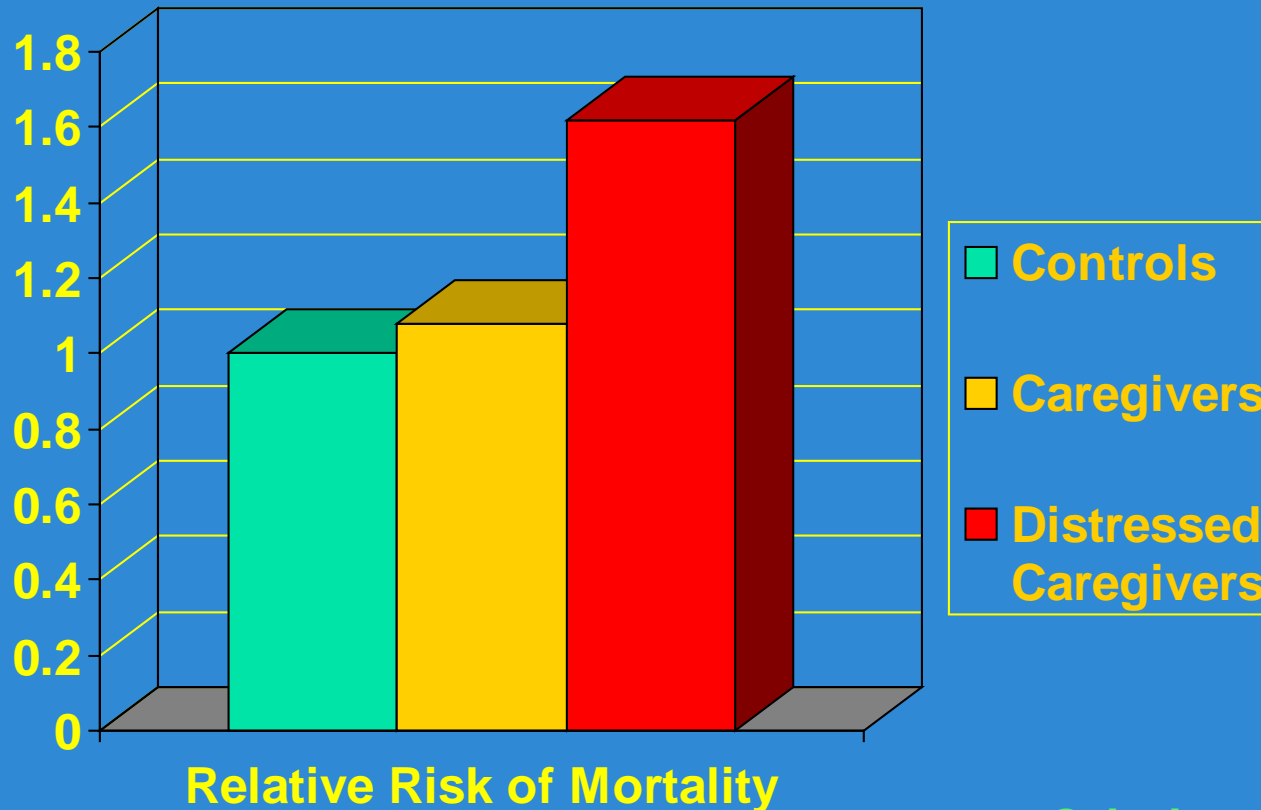


Importance of the return to baseline

- Sustained cortisol impairs feedback regulation:
Implications for coping with novel stressors
- Chronic stress impairs memory, learning
- Acute stress versus chronic stress

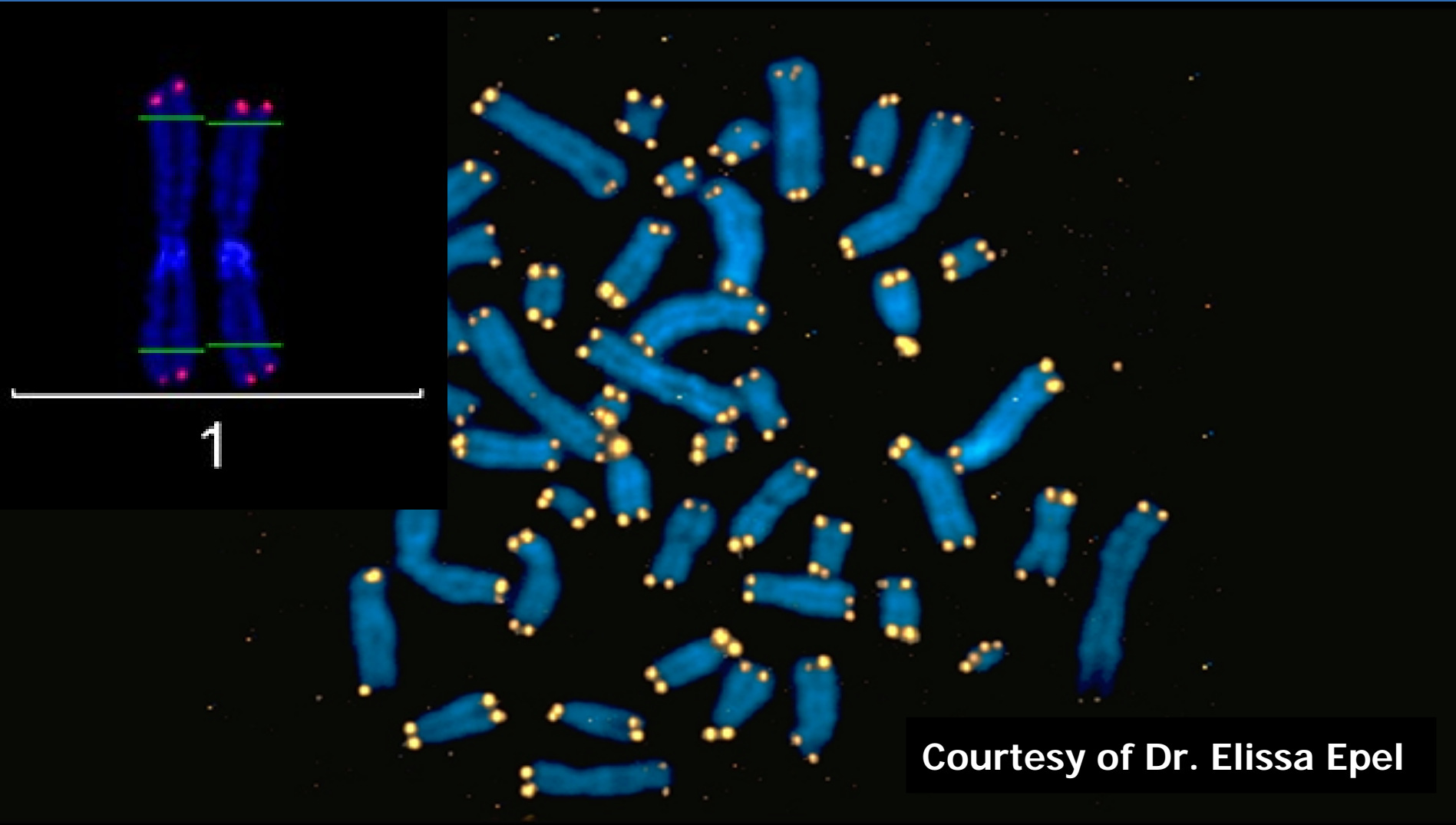
Stress and Mortality

- Distressed caregivers die earlier



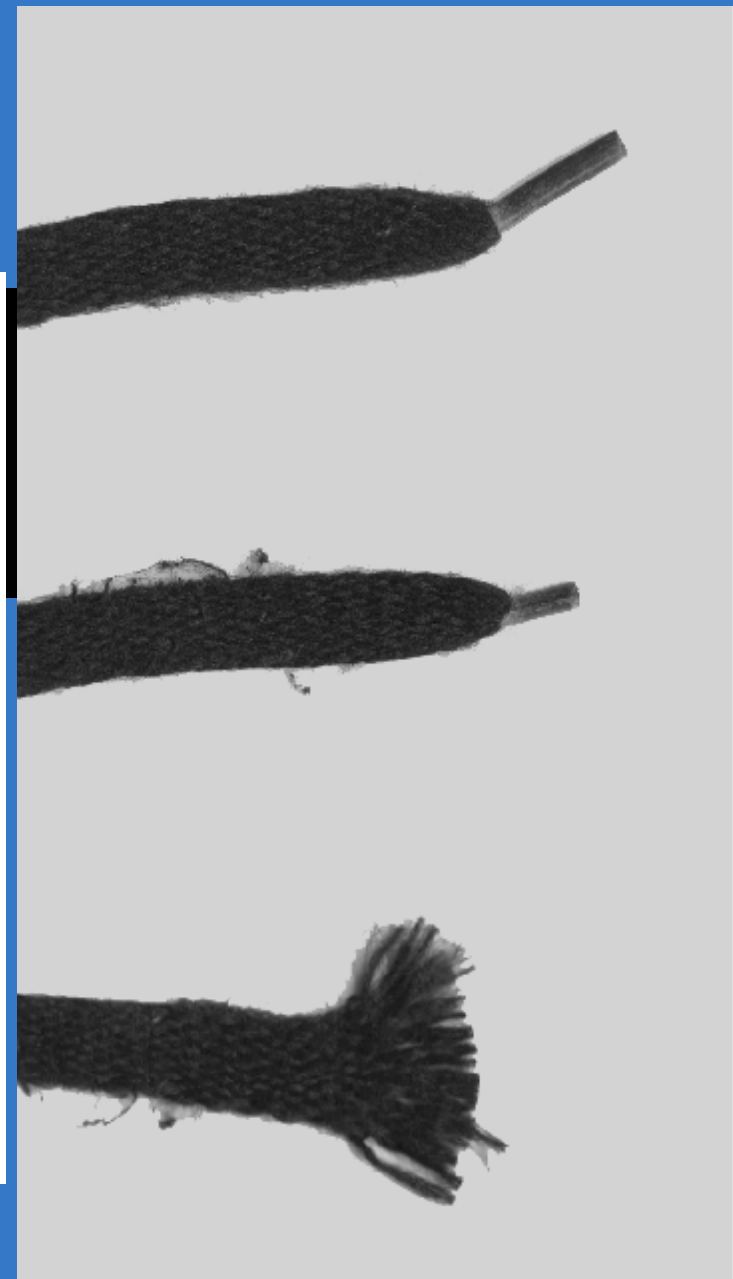
Schulz & Beach (1999) JAMA

Telomeres cap ends of chromosomes (Blackburn, 1978)



Courtesy of Dr. Elissa Epel

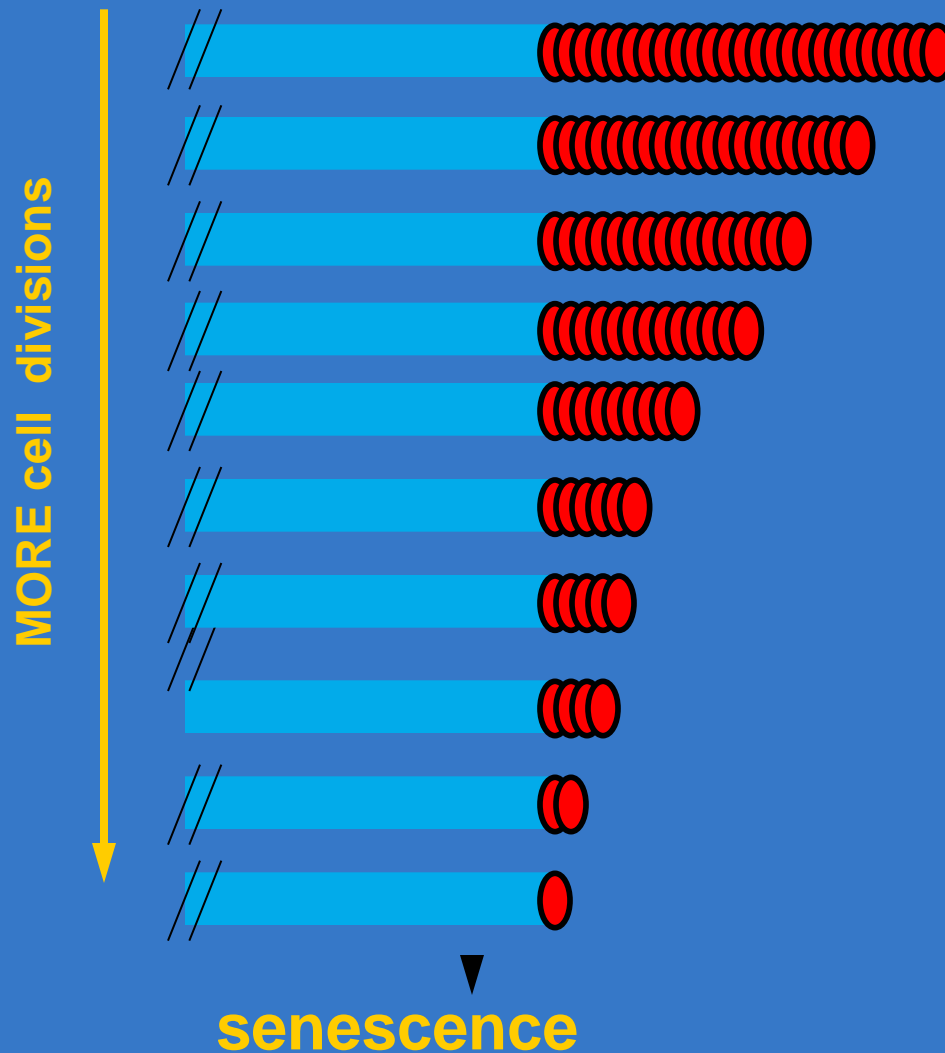
Telomeres are the aglets of our genome



Courtesy of Dr. Elissa Epel

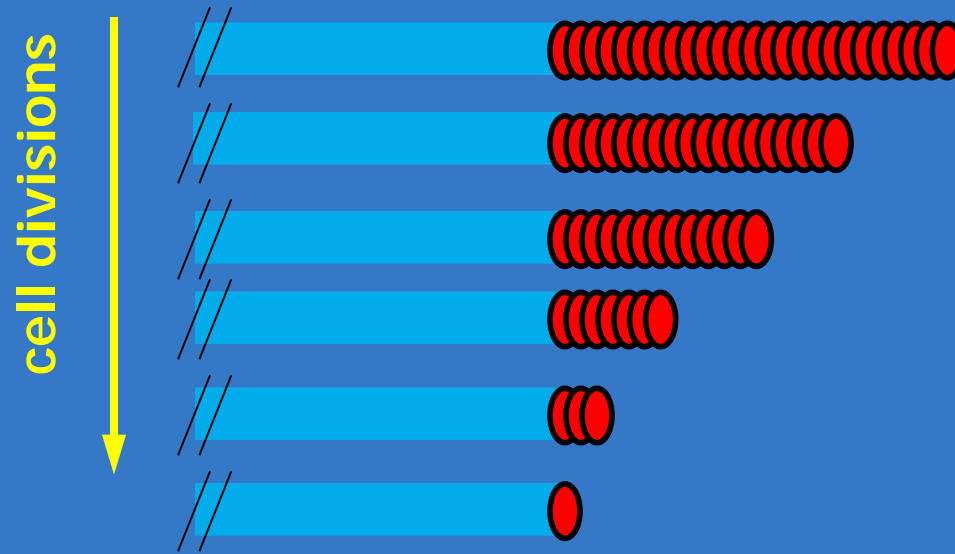
Common Shoelace, 10x, Blackburn Lab

With more telomerase, less loss of DNA each cell division



Courtesy of Dr. Elissa Epel

With less telomerase,
more loss of DNA each cell division

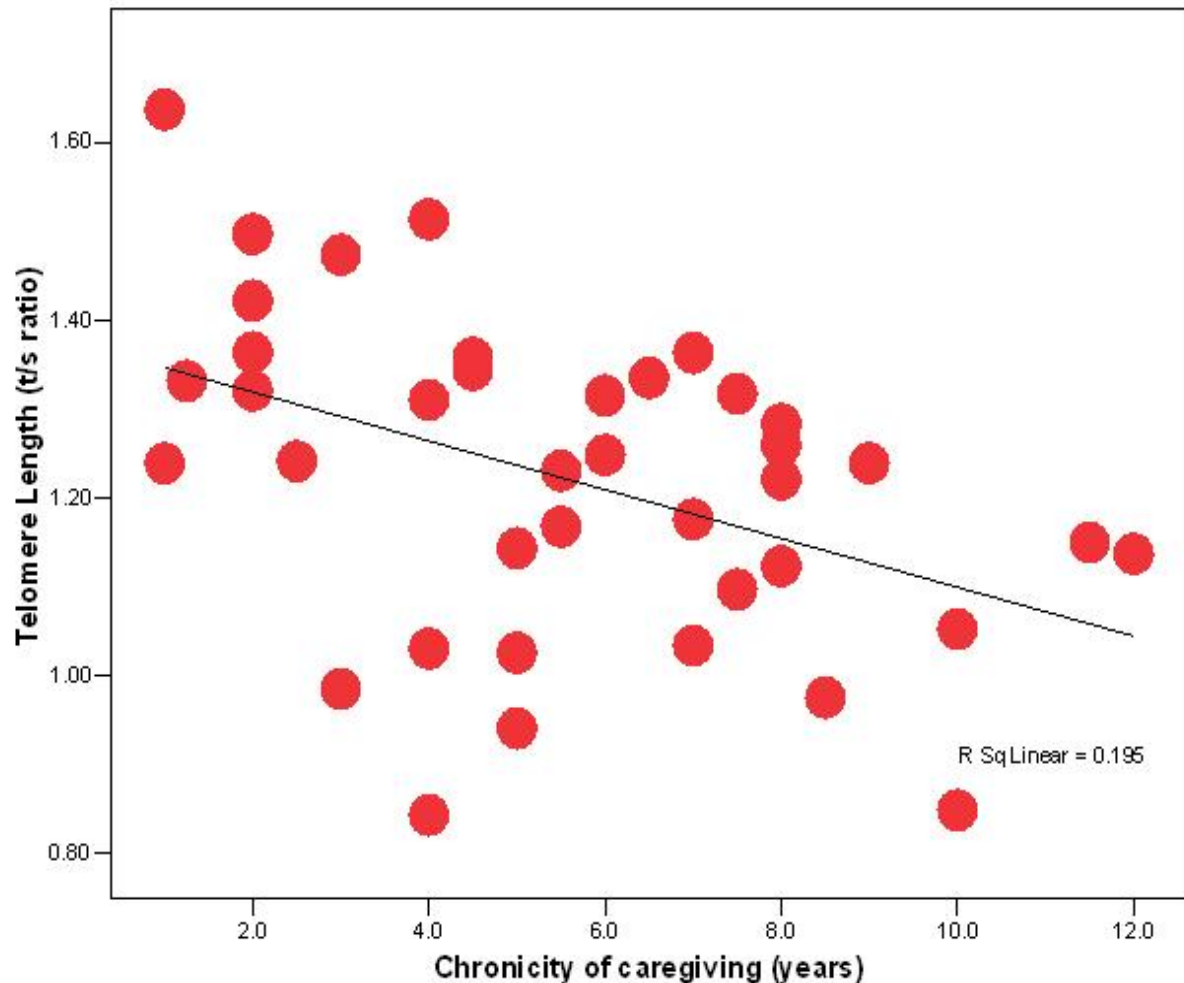


Faster senescence

Courtesy of Dr. Elissa Epel

Accelerated telomere shortening in response to life stress

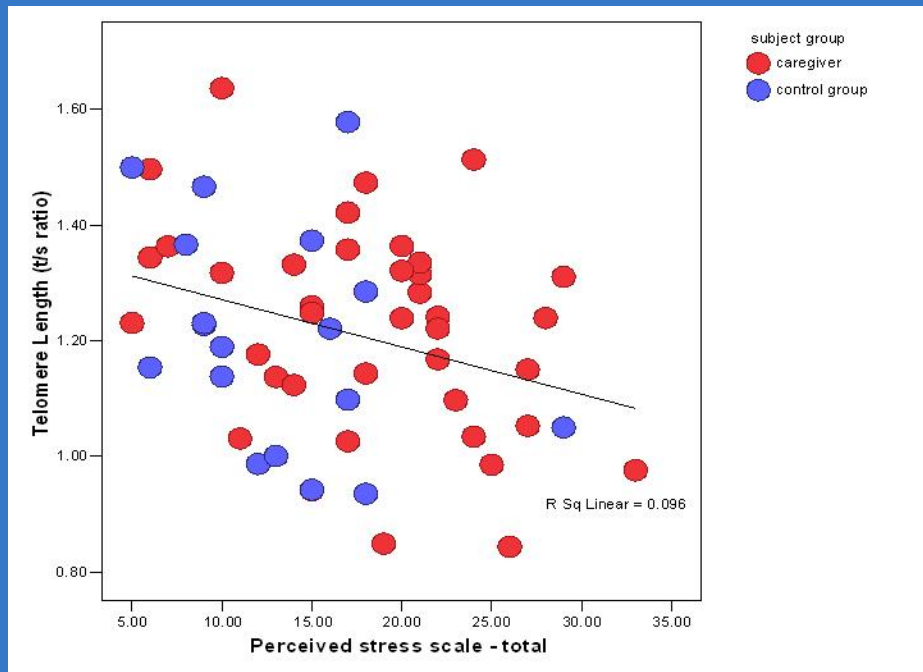
Epel et al PNAS USA 101: 17312-17315,2004



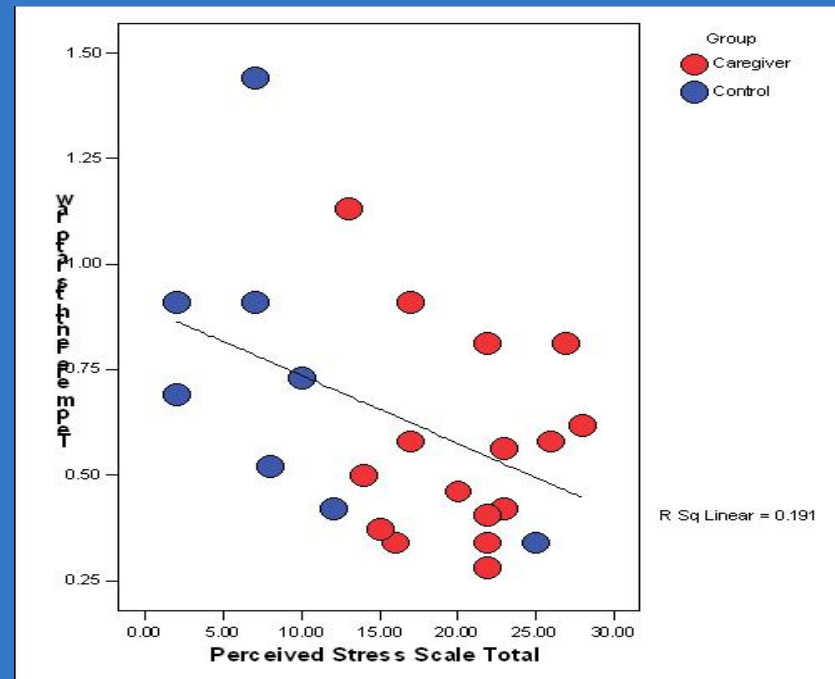
**Longer
stressor
duration
is associated
with reduced
telomere
length**

Perceived Stress and Telomere Length

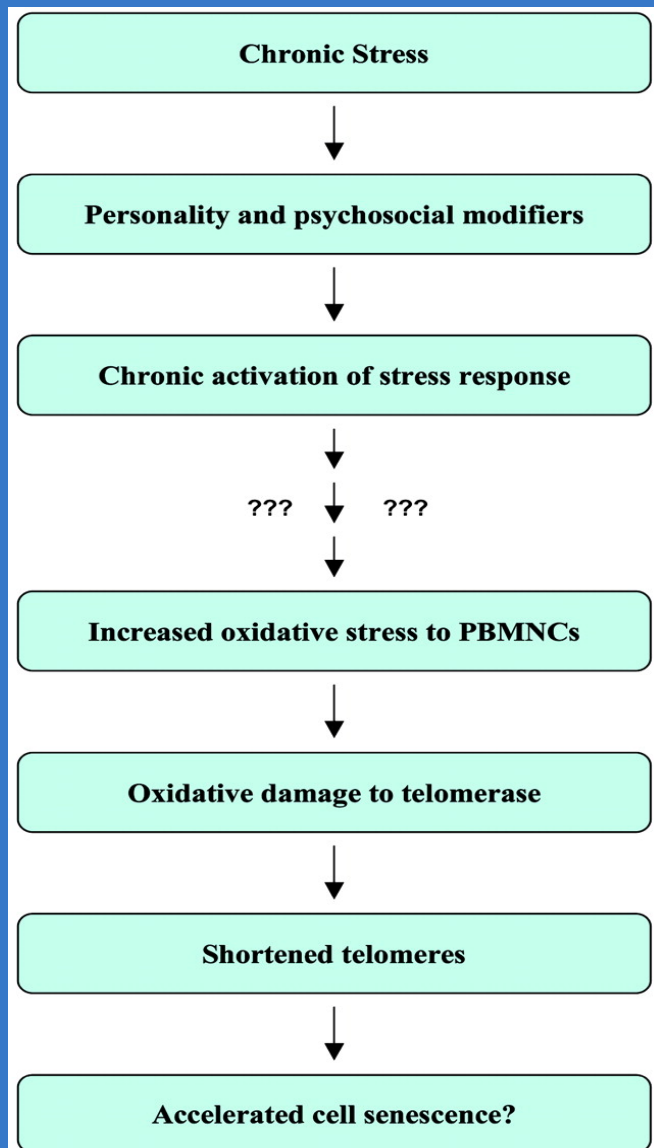
Young Women (20-45), $r = -.31$, $p < .01$



Older Women (50-80), $r = -.44$, $p < .01$

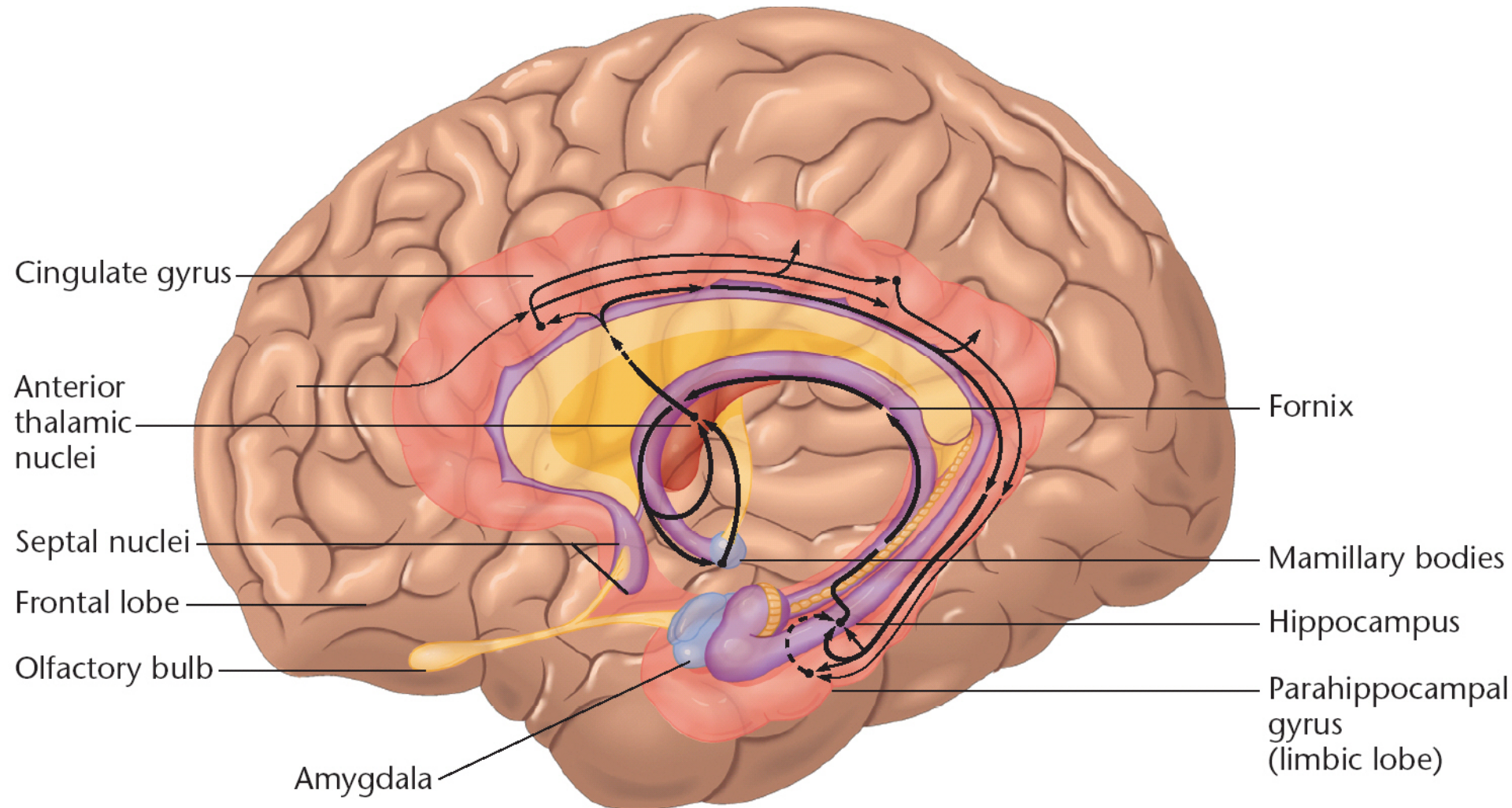


A possible pathway by which chronic stress impacts telomeres



*Sapolsky, Robert M.
(2004) Proc. Natl. Acad.
Sci. USA 101, 17323-
17324*

Neural Connections: Cognitive-Emotional-Autonomic







Mind-Body Medicine Program
at Georgetown U School of Medicine

Specific Aim

To increase student understanding of **self-awareness** and **self-care** by providing a unique experiential and didactic introduction to *Mind-Body Medicine*



Mind-Body Medicine Program at Georgetown U School of Medicine

Goal of Mind-Body Medicine Skills Program

- Mind-Body approaches are not only effective in helping to reduce stress and anxiety, but also teach the power of self-awareness and self-care.
- In order for students to understand the potential and applicability of mind-body approaches in healthcare, *we believe it is important for them to experience these techniques and gain insight about themselves.*



Mind-Body Medicine Program at Georgetown U School of Medicine

Objectives

- To increase self-awareness of emotional, physical, mental, social and spiritual aspects of one's life
- To increase personal self-care through guided experiences and daily practice.
- To foster non-judgmental, supportive collegial relationships



Mind-Body Medicine Program at Georgetown U School of Medicine

■ Format of groups:

- 10 students and 2 faculty facilitators per group
- Participants (voluntarily sign up for the course) meet once a week for 2 hours for 11 weeks per semester for this *“journey of self-discovery”*

■ Structure of Each Session

- A safe environment must be created that adheres to certain guidelines
 - confidentiality, respect, compassionate listening, non-judgment
- Check-in (sharing of new reflections and insights)
- Introduction of a new mind-body medicine skill
- Process the experiential exercise (sharing insights)



Mind-Body Medicine Program at Georgetown U School of Medicine

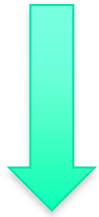
Skills and Experiences

- Meditation (mindfulness/awareness, concentrative)
- Guided Imagery (several types)
- Autogenic training/biofeedback
- Art (emphasis on non-cognitive approaches)
- Music (used in meditation and imagery sessions)
- Movement (shaking, dancing, exercise)
- Writing (journals, dialogues, service commitment)
- Group support



Mind-Body Medicine Program at Georgetown U School of Medicine

Outcomes



Perceived Stress (*Perceived Stress Scale*)



Mindfulness (*Freiburg Mindfulness Inventory*)



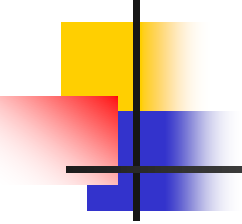
Empathy (*Interpersonal Reactivity Index*)



Mind-Body Medicine Program at Georgetown University School of Medicine

Survey Questions & Responses

1	What did this course mean to you?
2	How has it helped you as a medical student and as a person, if at all?
3	How will it contribute to your work as a physician, if at all?
4	How has it changed your attitude toward medicine and healthcare, if at all?
5	How has it changed your attitude toward medical school, if at all?
6	Has it changed your relationship with your classmates, if so, how?



Analysis of Student Responses to Six Open-ended Questions

- **Five central themes**
 - 1) Connections
 - 2) Self-discovery
 - 3) Learning
 - 4) Stress Management Skills
 - 5) Medical Education
 - Problems in health care
 - Awareness of CAM
 - Attitudes towards medical school

Saunders et al *Medical Teacher* 29:778-784, 2007



Theme 1: Connections

- Students' appreciation of the opportunity provided by the MBS group to meet others and make meaningful connections.
- Students' isolation at medical school



Examples – Connections

- “It also provided an outlet to discuss my feelings, which is so important to working out issues and resolving them. It has made me more aware and mindful in all aspects of my life.”
- “I have realized that I'm not alone in my fears to succeed in med school, and the insecurities and self-doubts that have plagued me on and off this first year. I realize everyone faces these issues as they come up. We are never really alone, and this is a fact that we as a society need to become more aware of.”



Theme 2: Self Discovery

- Students' process of self discovery stemming from their experience in the MBS group.
- They discover important things about themselves and their abilities to be better people and better medical students.
- The group helps students become more aware of their own priorities and limitations.



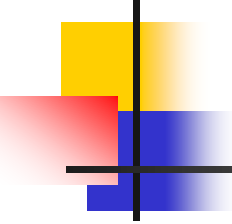
Examples – Self Discovery

- “I feel that I have reached new levels of understanding myself, and in that vein I am painfully aware of the giant disconnect between my intentions and feelings and my actions. So, in that way, I can see more clearly what I need to do in my life.”
- “Encouraged me to make my physical and mental health priorities.”



Theme 3: Learning

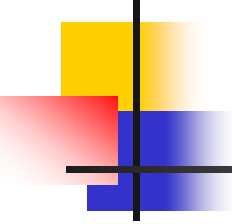
- Learning Mind-Body medicine skills
- Learning and academic improvement



Examples - Learning

- **Learning M-B skills**

- “Yes! I listen to my body more, I'm more attentive to my state of mind. I feel that I have more control over myself.”
- “This course was helpful in that I learned skills, practiced them, and have a better appreciation for mind-body practices, as well as how I might utilize them in my future practice.



Examples - Learning

- **Learning and Academic improvement**
 - “As a medical student, this course taught me ways to relax and focus. I actually have improved on my tests while reducing study time. Whether I have become more efficient at studying, a better test-taker, or simply more focused I am not sure. I like to think it is because I am more self-aware and relaxed-which is more important for my everyday existence as a person.”



Theme 4: Stress Relief

- Students felt the MBS group gave them relief from the stress of medical school.
 - “This course has been about self-awareness for me. I have learned to better recognize what is going on for me physically and emotionally. I have also learned a new set of tools for dealing with the stresses in life.”
 - “This course means health and relaxation and exploring. A way to take care of yourself and to be proactive.”



Theme 5: Medical Education

- Students were aware that the MBS group is a unique experience in medical education.
 - “It has made me more cognizant of the fact that med school as an environment does not foster healthy emotional life/human emotion weakness as normal qualities. It has also made clear to me that I am responsible for my own relaxation during these years.”



Specific Themes

- **Problems in the health care system** – In response to Question 4 – *“Has it (this course) changed your attitude toward medicine and healthcare? If so, how?”*
 - “I more strongly feel that there needs to be a large change in what is considered standard practice.”
 - “I fully see, now, how lacking medicine (and especially healthcare) is in the whole person approach to well-being. I also feel like more of these things could help prevent more progression of serious disease in the world.”



Specific Theme

- **Awareness of MB medicine and CAM**

Also response to Question 4 – *Has it (this course) changed your attitude toward medicine and healthcare? If so, how?*

- “I am definitely more of a believer in mind-body techniques and their effectiveness.”
- “It has enabled me to think about healthcare more holistically and as a partnership between the physician and the patient.”



Specific Theme

- **Attitudes** – In response to Question 5 – “*Has it (this course) changed your attitude toward medical school? If so, how*”
 - “It has changed my attitude toward Georgetown since they are willing to offer this course to their students.”
 - “It has changed my attitude in the sense of knowing that there are people who care about my well-being as a student. And because I have received, I also want to give back.”



Summary

A semester-long Mind-Body Medicine Skills course appears to be effective in improving the personal awareness and well-being of medical students through:

- Decreased perceived stress and reduced personal distress in response to others' distress
- Enhanced mindfulness
- Improved empathetic concern and attention to feelings



Conclusions

- Students gain knowledge of MBM skills and appear to appreciate and benefit from MBM groups
- Students express heightened self awareness and welcome the opportunity to learn skills to reduce stress.
- After participating in MBM groups, students express an understanding of the importance of self care

Methods

- 118 first year medical students
- Design of Mind-Body Skills course
 - Groups of 10 students with 2 faculty facilitators
 - Total of 11 sessions (one 2-hour session per week)
- Survey instruments were administered before and after the course
- Data from each pre- and post- survey was coded and analyzed using SPSS data software

Survey Instruments

- **Perceived Stress Scale (PSS)**

(J Health Soc Behav 24: 385-396, 1983)

- **Freiberg Mindfulness Inventory (FMI)**

(Personality and Individual Differences 40: 1543-1555)

- **The Positive Affect Negative Affect Schedule (PANAS)**

(J Personality and Soc. Psych 80:6; 1063-1070, 1988)

- **Emotional Intelligence Survey (EI)**

(Academic Med. 80:10: S34-S37, 2005)

Perceived Stress Scale (PSS)

n = 118	Mean	P-value	Effect size (d)
Pre-MBM	18.2 ± 6.0		
Post-MBM	13.7 ± 5.3		
Difference	-4.5 ± 5.7	< 0.001	0.76

Mindfulness (FMI)

n = 118	Mean	P-value	Effect size (d)
Pre-MBM	36.4 ± 6.4		
Post-MBM	42.5 ± 5.5		
Difference	6.1 ± 5.8	< 0.001	0.96

PANAS

Positive Affect

n = 117	Mean	P-value	Effect size (d)
Pre-MBM	34.2 ± 5.8		
Post-MBM	38.1 ± 5.9		
Difference	3.9 ± 5.2	< 0.001	0.67

Negative Affect

n = 117	Mean	P-value	Effect size (d)
Pre-MBM	21.7 ± 6.7		
Post-MBM	18.7 ± 5.5		
Difference	-3.0 ± 5.2	< 0.001	0.45

Bivariate Analysis with the Change in Mindfulness (FMI)

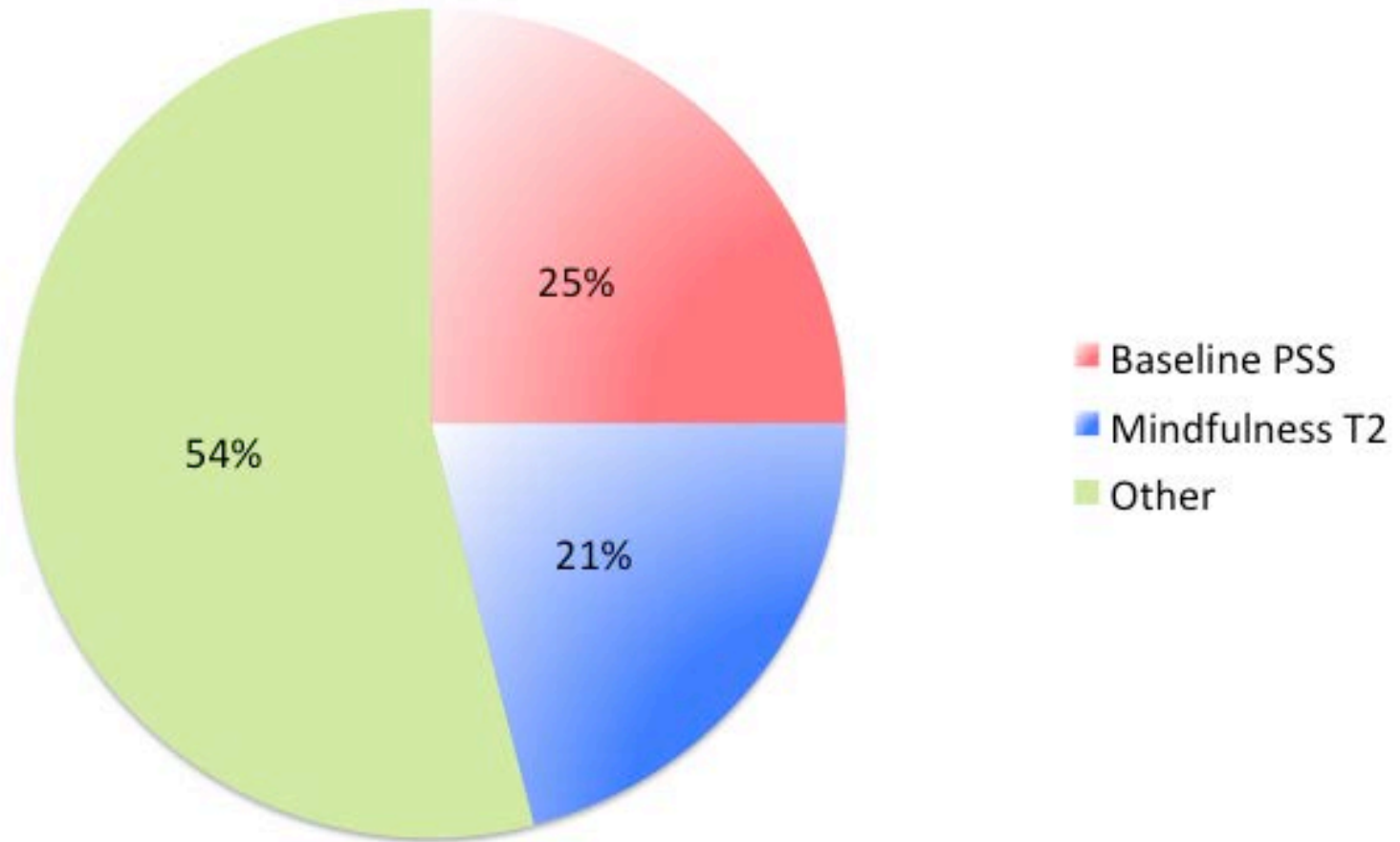
	r	P-value	n
ΔPSS	-0.627	< 0.001	117
ΔPANAS Positive	0.443	< 0.001	116
ΔPANAS Negative	-0.474	< 0.001	116

Multivariate Analysis with Mindfulness (FMI)

Post-Course (T2)	Model	Overall Model Variance	Stand. β	Unique Variance
PSS	Baseline PSS Mindfulness T2	$R^2 = 0.46^*$	0.40 -0.46	$R^2 = 0.21^*$
PANAS Positive	Baseline Pos. Mindfulness T2	$R^2 = 0.48^*$	0.43 0.39	$R^2 = 0.12^*$
PANAS Negative	Baseline Neg. Mindfulness T2	$R^2 = 0.50^*$	0.61 -0.29	$R^2 = 0.08^*$

**p* < 0.001

Post-Course Perceived Stress



Summary

- Improvements in mindfulness were strongly correlated with decreases in perceived stress and negative affect and with increases in positive affect.
- Further analyses showed that mindfulness level was an important predictor for the changes in perceived stress and affect.

Conclusion

- Enhancing mindfulness through an experiential mind-body medicine skills course may help decrease medical student stress and improve emotional intelligence.
- Such changes may foster better physician-patient communication and improve the quality of health care.



Implementation and Scope of the Mind-Body Medicine Skills Program

Over 13 years

- >90 trained faculty facilitators (clinicians, scientists, educators)
- >1,800 medical students participated
- >280 graduate students (MS and PhD)
- ~90 nursing students
- >160 students (Law, Business, Foreign Services Schools at GU)
- >70 faculty participants (including from curriculum committee)

Over 260 groups and over 2600 participants

Embraced by the School of Medicine as essential for a core competency (self-awareness and self-care)

November/December 2008
www.acphysci.com

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APDS



Students in Georgetown University School of Medicine's Mind-Body Skills course begin a session with a period of meditation.

● **Spotlight on Mind-Body Skills:** A unique program blends science and humanism by fostering student self-awareness and self-care. See page 2



Mind-Body Medicine Program at Georgetown University School of Medicine

Components

- **Level 1:** offered to 1st year medical students in second semester
- **Level 2:** offered to 2nd year medical students who have completed Level 1
- **Levels 3&4:** offered to 3rd and 4th year medical students who have completed Level 2
- **Supervision:** facilitators meet for 2 hours every other week
- **Faculty Group:** meet for 2 hours 1x per week for 8 weeks
- **Faculty Training Program:** four day intensive training program offered once a year
- **Offered in other Schools and Programs at Georgetown:** Law School, School of Foreign Service, Business School, School of Nursing, CAM Masters Program in Physiology



Faculty Training in Mind-Body Medicine

April 23–26, 2015

Educating for Enhanced Self-Awareness and Self-Care

Originating at Georgetown University School of Medicine, this experiential program provides faculty at health professional schools with the training, tools, and strategic thinking necessary to implement mind-body medicine skills groups in their institutions.

During a three-day weekend retreat on Maryland's Eastern Shore, faculty will be introduced to meditation, guided imagery, biofeedback, breathing techniques, and other mind-body approaches that can alleviate stress and foster self-awareness and self-care. Participants will experience the power of these approaches first-hand while learning how to lead mind-body groups for students.

The program includes seven group sessions, several individual activities, short didactic presentations, and daily yoga. Participants are provided with all course materials, enabling them to launch similar programs in their institutions after the retreat.

WHEN:

April 23–26, 2015

WHERE:

Aspen Wye River
Marriott Conference Center,
Queenstown, Maryland

Institutions Implementing Programs in Mind-Body Medicine

- *Georgetown University School of Medicine* *medical students, residents*
- *Oregon Health and Sciences University* *(medical students)*
- *University of Cincinnati College of Medicine* *(medical/allied health)*
- *University of Washington* *(medical students)*
- *University of Vermont* *(medical students)*
- *University of North Dakota Medical School* *(medical students)*
- *Charite University Medical School, Germany* *(medical students)*
- *University of Essen-Duisenberg Medical School, Germany* *(medical)*
- *University of Liverpool, UK* *(medical students)*
- *Texas College of Osteopathic Medicine* *(medical students)*
- *Stanford University, Anesthesia Residency Program*
- *University of Western States* *(chiropractic and other CAM professions)*
- *Oregon College of Oriental Medicine* *(acupuncture and DAOM)*
- *Mid-Sweden University, Sweden* *(nursing students)*
- *Ben Gurion University School of Nursing, Israel* *(faculty retreat)*



Goal of the Study

To determine whether facilitation of MBM groups is associated with any changes in professional identity, self-awareness and/or perceived stress in the **faculty** and **staff facilitators**.



Approach

We used a mixed-methods cross-sectional design to obtain qualitative and quantitative responses from 62 MBM facilitators. They were emailed a link to a secure, one-time online survey that took approximately 15 minutes to complete.

Quantitative Results

Perceived Stress Score (PSS)

	Mean
MBM Facilitators	13.0 ± 4.4
Normative Mean	14.7
P-value	= 0.02

Mindfulness Score (FMI)

	Mean
MBM Facilitators	41.9 ± 4.9
Normative Mean	34.5
P-value	< 0.001

Correlation between the FMI and PSS scores
(-0.461, $P < 0.01$)



Mind-Body Medicine Facilitator Survey

Open-ended Items

1	Please describe how being a mind body medicine facilitator has impacted your professional life .
2	In what ways, if any, has being a MBM facilitator affected how you interact with other faculty members ?
3	In what ways, if any, has being a MBM facilitator affected how you interact with the students in your group ? ?
4	In what ways, if any, has being a MBM facilitator affected how you interact with other students (i.e., students not in your MBM group)?
5	In what ways, if any, has being a MBM facilitator affected how you see yourself as a faculty member in an academic medical center?
6	Please describe how being a mind body medicine facilitator has impacted your personal life



Analysis of Facilitator Responses to Six Open-ended Items

Three central themes

- 1) Overall Professional Identity
 - Communication
 - Connections with Community
 - Empathy and Active Listening
 - Self-confidence
- 2) Self-care
- 3) Mindful Awareness

Talisman et al *Acad Med* 90:780-784 June 2015



Theme 1: Professional Identity

It has deepened my personal and professional identity

My professional identity has expanded and has made me feel more true to myself.



1a – Communication

In a way by being part of [an MBM] group, it has facilitated more open communication.

I speak more openly about mindfulness and mindfulness practices as ways to better our campus community.

I have experienced better communication with my colleagues, more empathy for their challenges, and our working relationships have therefore been improved.



1b – Connections and Community

I feel like the work that I do as a mind body medicine facilitator is the most important work that I do on campus. It has made more people connect with me about harmony and balance... My professional identity has expanded and has made me more true to myself

I fear rejection much less and have a strong sense that my connections with colleagues are meaningful .

There is a deeper connection, a shared sense of understanding and history.



1c – Empathy and Active Listening

Being a mind-body medicine facilitator has been a gift... to learn from them has been a joy. I have improved my own listening skills... which has increased my openness, empathy, and understanding with my colleague

[I have] more sense of empathy [for my students].

[Being an MBM facilitator with the group of students has] increased empathy and feelings of connectivity.



1d – Self-confidence

This work has created more space for me – both personally and professionally – to grow and expand. I am more confident in my identity.

I am much more confident about inviting students to explore what is real about their lives, even if it might be painful.

I feel that I have more confidence speaking to others in our institution about this work.



Theme 2: Self-care

[Being an MBM facilitator in an academic medical center means] participating in a very important channel of self-care and patient care.

[In my professional life,] more connections around self-care... [and] more mindful patient care practices [are] perceived.

. “[Being a mind body facilitator] has helped me to deal with stress better, [and] be more compassionate with others and with myself...



Theme 3: Mindful Awareness

Being a mind body medicine facilitator has increased my own mindful awareness of myself as a professional.

It has allowed me to connect better with these students, creating a different type of relationship. They are more willing to come to me with difficulties and look to me as a resource and ally rather than an administrator.



Conclusions

- The findings of the present study suggest that participation as a facilitator in a MBM program has tangible positive outcomes for the professional identity of facilitators through
 - improved communication
 - Stronger connections
 - Enhanced empathy
 - Greater self-confidence and self-care
- The significant impact of MBM facilitation to reduce perceived stress and enhance mindful awareness provides a strong rationale for its inclusion in the training of physicians and other health professionals.

Contributing Faculty and Students



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Supported by grants from **NCCAM** and the **Institute for Integrative Health**

Can Telomerase Activity Change?

Articles



Increased telomerase activity and comprehensive lifestyle changes: a pilot study

Dean Ornish, Jue Lin*, Jennifer Daubenmier*, Gerdi Weidner, Elissa Epel, Colleen Kemp, Mark Jesus M Magbanua, Ruth Marlin, Loren Yglecias, Peter R Carroll, Elizabeth H Blackburn

Summary

Background Telomeres are protective DNA–protein complexes at the end of linear chromosomes that promote chromosomal stability. Telomere shortness in human beings is emerging as a prognostic marker of disease risk, progression, and premature mortality in many types of cancer, including breast, prostate, colorectal, bladder, head and neck, lung, and renal cell. Telomere shortening is counteracted by the cellular enzyme telomerase. Lifestyle factors known to promote cancer and cardiovascular disease might also adversely affect telomerase function. However, previous studies have not addressed whether improvements in nutrition and lifestyle are associated with increases in telomerase activity. We aimed to assess whether 3 months of intensive lifestyle changes increased telomerase activity in peripheral blood mononuclear cells (PBMC).

Lancet Oncol 2008; 9: 1048–57

Published Online
September 16, 2008
DOI:10.1016/S1470-
2045(08)70234-1

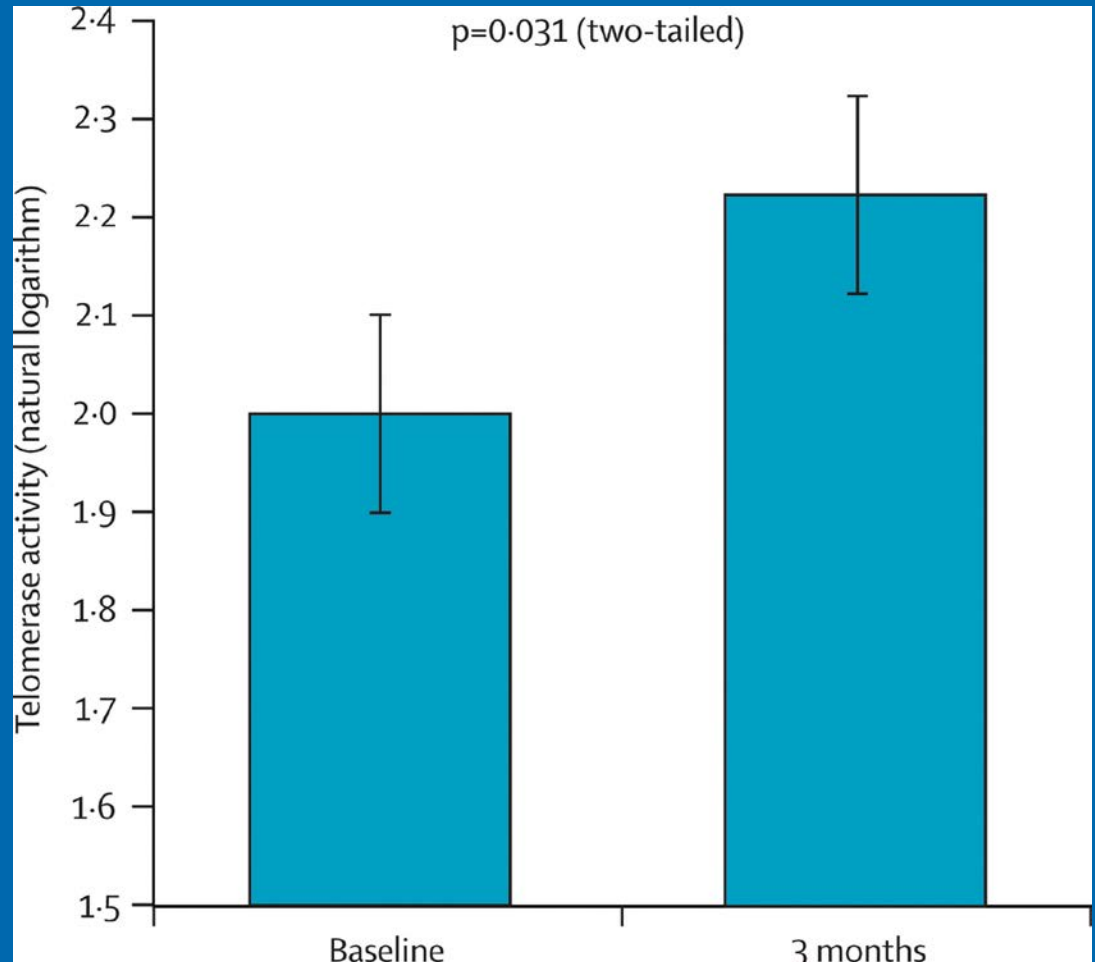
See [Reflection and Reaction](#)
page 1023

*These authors contributed
equally

Increase in Telomerase Activity in PBMC

Lifestyle Changes

- Low fat diet (<10%)
- Aerobic exercise
- Stress management
- Group support



Ornish et al Lancet Oncol 9:1048-1057, 2008

Increase in Telomere Length



Effect of comprehensive lifestyle changes on telomerase activity and telomere length in men with biopsy-proven low-risk prostate cancer: 5-year follow-up of a descriptive pilot study

Dean Ornish, Jue Lin, June M Chan, Elissa Epel, Colleen Kemp, Gerdi Weidner, Ruth Marlin, Steven J Frenda, Mark Jesus M Magbanua, Jennifer Daubenmier, Ivette Estay, Nancy K Hills, Nita Chainani-Wu, Peter R Carroll, Elizabeth H Blackburn

Summary

Background Telomere shortness in human beings is a prognostic marker of ageing, disease, and premature morbidity. We previously found an association between 3 months of comprehensive lifestyle changes and increased telomerase activity in human immune-system cells. We followed up participants to investigate long-term effects.

Methods This follow-up study compared ten men and 25 external controls who had biopsy-proven low-risk prostate cancer and had chosen to undergo active surveillance. Eligible participants were enrolled between 2003 and 2007 from previous studies and selected according to the same criteria. Men in the intervention group followed a programme of comprehensive lifestyle changes (diet, activity, stress management, and social support), and the men in the control group underwent active surveillance alone. We took blood samples at 5 years and compared relative telomere length and telomerase enzymatic activity per viable cell with those at baseline, and assessed their relation to the degree of lifestyle changes.

Findings Relative telomere length increased from baseline by a median of 0·06 telomere to single-copy gene ratio (T/S) units (IQR -0·05 to 0·11) in the lifestyle intervention group, but decreased in the control group (-0·03 T/S units, -0·05 to 0·03, difference $p=0\cdot03$). When data from the two groups were combined, adherence to lifestyle changes was significantly associated with relative telomere length after adjustment for age and the length of follow-up (for each

Lancet Oncol 2013; 14: 1112-20

Published Online

September 17, 2013

[http://dx.doi.org/10.1016/S1470-2045\(13\)70366-8](http://dx.doi.org/10.1016/S1470-2045(13)70366-8)

S1470-2045(13)70366-8

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Increase in Telomere Length in PBMC

Lifestyle Changes

- Low fat diet (<10%)
- Aerobic exercise
- Stress management
- Group support

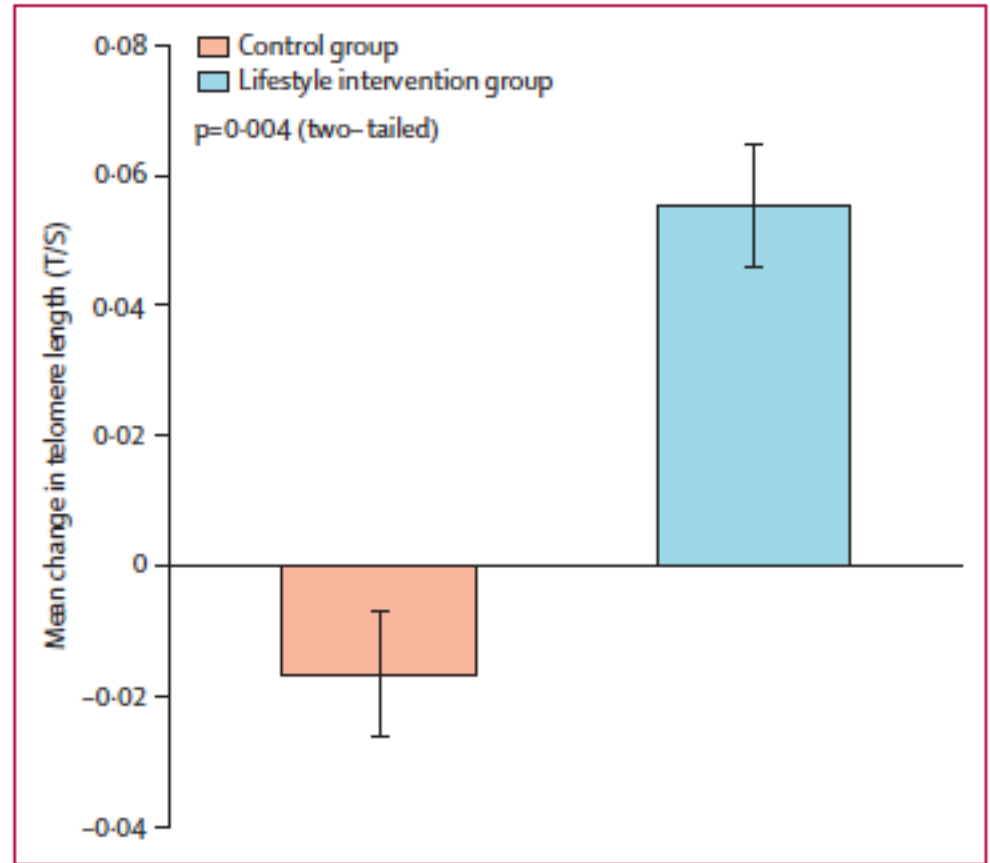


Figure 1: Mean change in relative telomere length over 5 years with lifestyle intervention compared with control
Vertical lines represent 1 SEM. T/S=telomere to single-copy gene ratio units.

Ornish et al Lancet Oncol 14:1112-1120, 2013