

Engaging Patients in Lifestyle Medicine

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Medicine

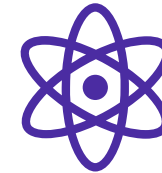
Disclosures

- None

Objectives



1. Define lifestyle medicine and identify the six pillars



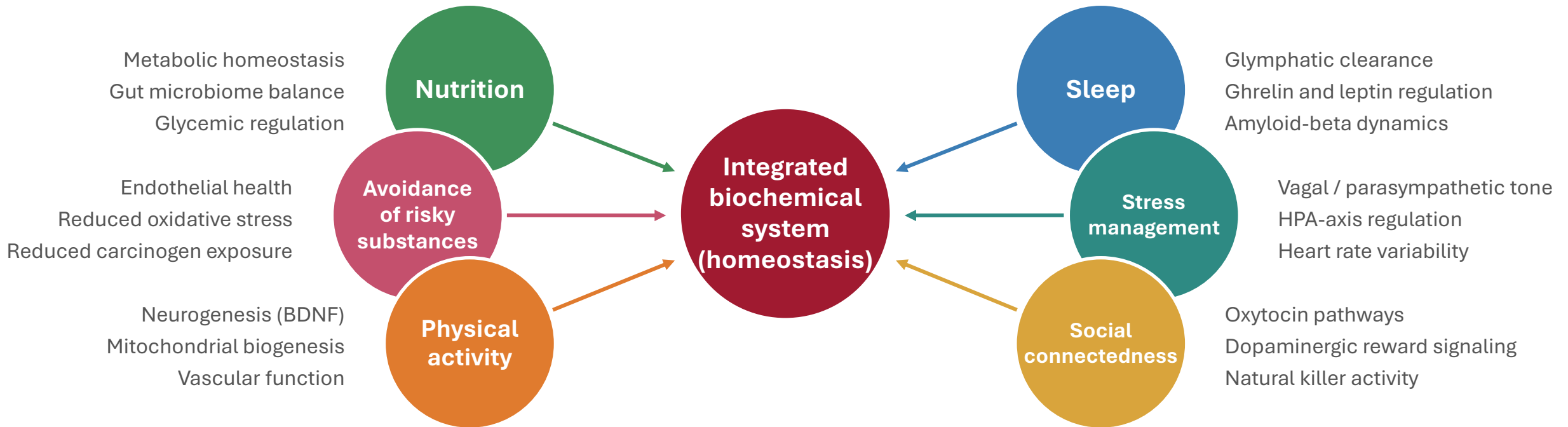
2. Review the science behind the six pillars



3. Identify strategies and tools to engage patients with the six pillars

The Lifestyle Medicine Network

Each pillar is a node in one integrated biochemical system, and every node interacts with every other.



Shared across all six pillars: an anti-inflammatory effect that lowers chronic inflammation and restores homeostasis.

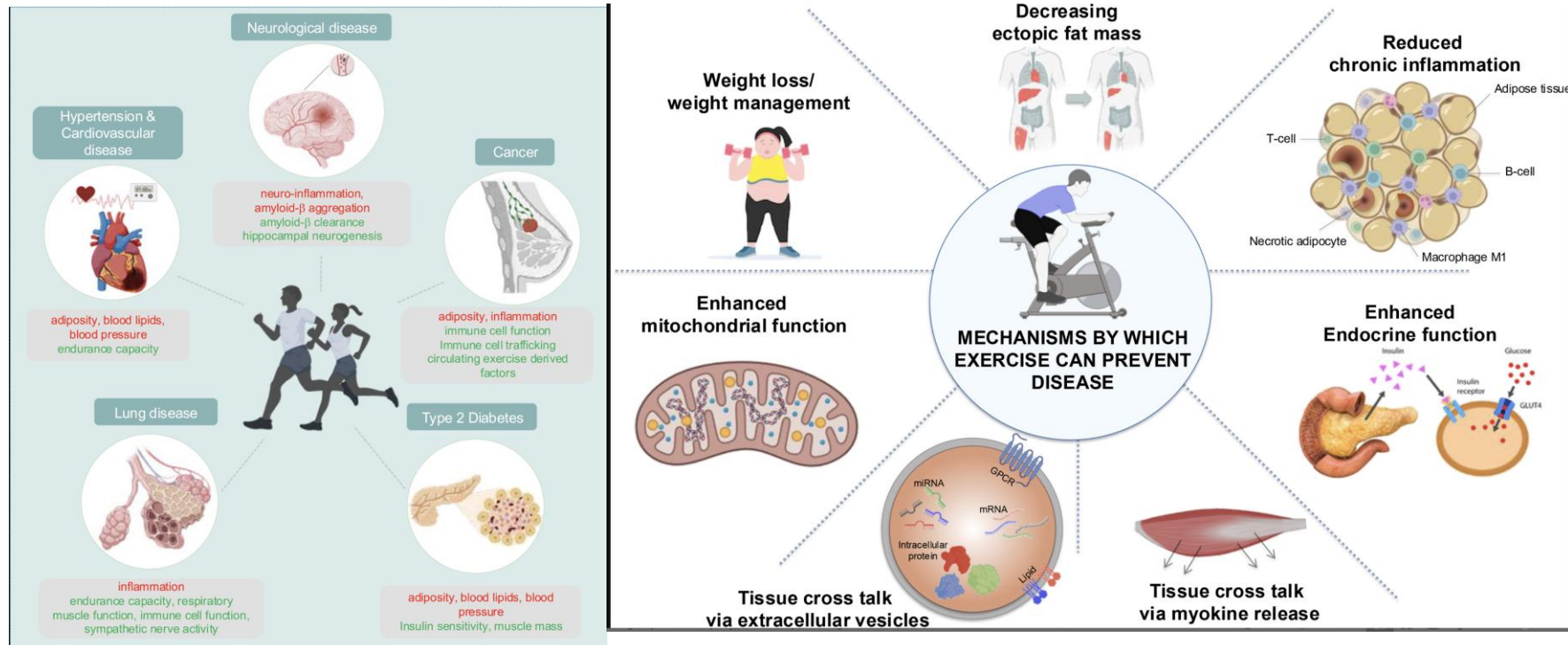
What is lifestyle medicine?

Updated 2022

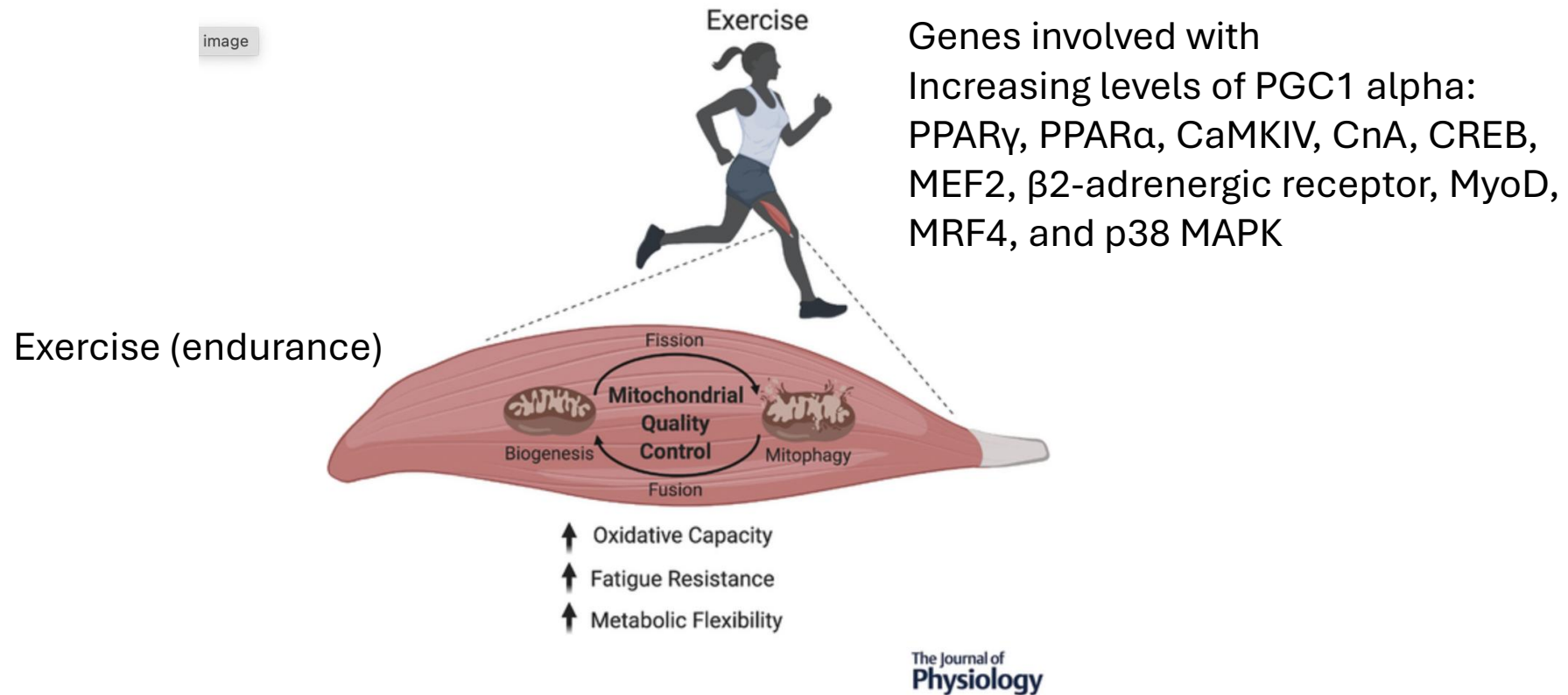
- Lifestyle medicine is a medical **specialty** that uses therapeutic lifestyle interventions as a **primary modality** to treat chronic conditions, including, but not limited to, cardiovascular diseases, type 2 diabetes, and obesity.
- Lifestyle medicine **certified clinicians** are trained to apply evidence-based, whole-person, prescriptive lifestyle change to treat and, when used **intensively**, often reverse such conditions.
- Applying the **six pillars** of lifestyle medicine—a whole-food, plant-predominant eating pattern, physical activity, restorative sleep, stress management, avoidance of risky substances and positive social connections—also provides effective prevention for these conditions.
- www.lifestylemedicine.org

Pillar 1: Physical Activity

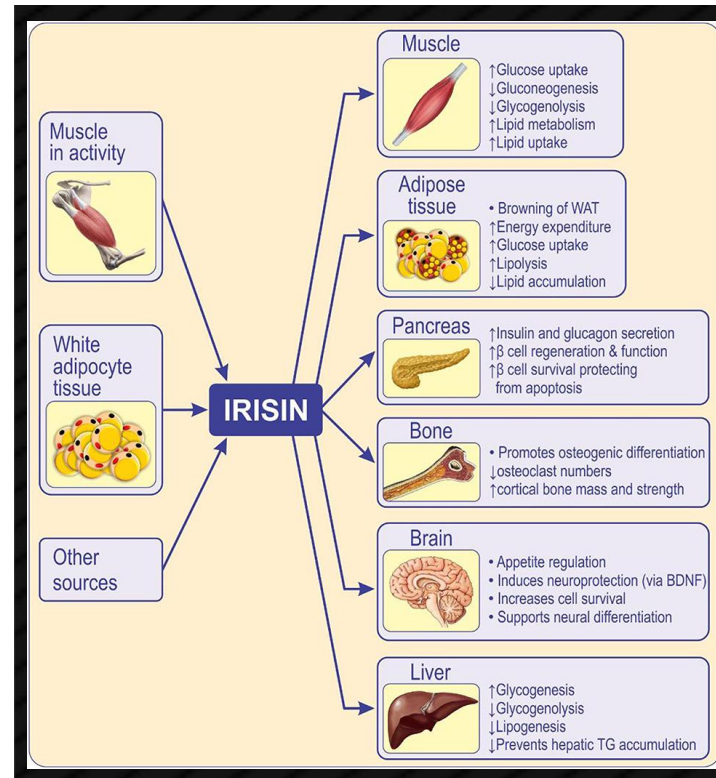
Exercise as a therapeutic intervention for chronic conditions



Febbraio MA, Pedersen BK. Exercise as a therapeutic intervention for long-lasting and chronic diseases. Cell Metab. 2026 May 5;38(5):844-862



Philp AM, Saner NJ, Lazarou M, Ganley IG, Philp A. The influence of aerobic exercise on mitochondrial quality control in skeletal muscle. J Physiol. 2021 Jul;599(14):3463-3476



Arhire, Lidia I., Laura Mihalache, and Mihai Covasa. "Irisin: a hope in understanding and managing obesity and metabolic syndrome." *Frontiers in endocrinology* 10 (2019): 524.

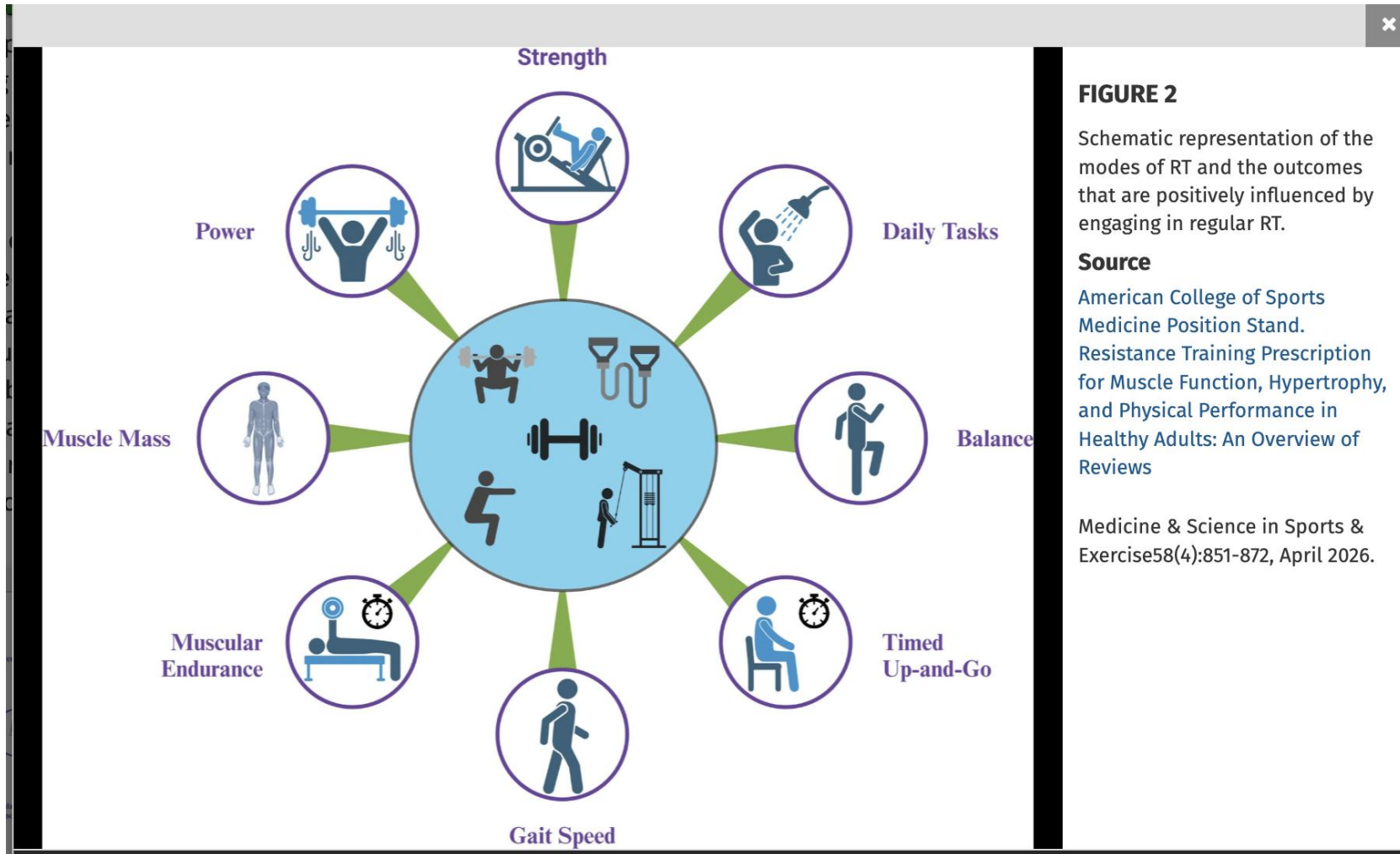


FIGURE 2

Schematic representation of the modes of RT and the outcomes that are positively influenced by engaging in regular RT.

Source

American College of Sports Medicine Position Stand. Resistance Training Prescription for Muscle Function, Hypertrophy, and Physical Performance in Healthy Adults: An Overview of Reviews

Medicine & Science in Sports & Exercise 58(4):851-872, April 2026.

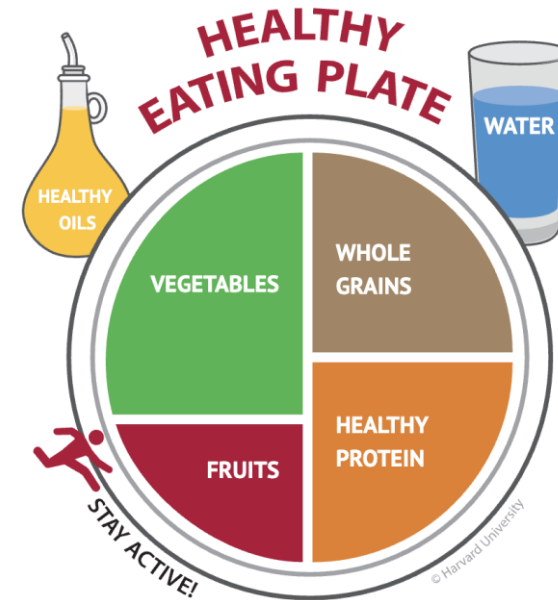
Pillar 2: Nutrition

Healthy Plates



[EatForum.Gov](https://eatforum.gov)

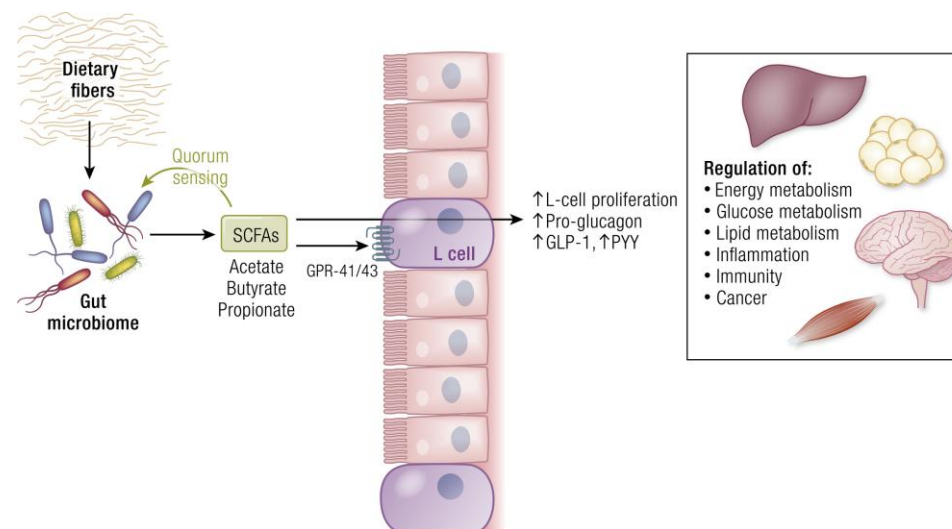
Eat Lancet Plate



<https://nutritionsource.hsph.harvard.edu/healthy-eating-plate/>

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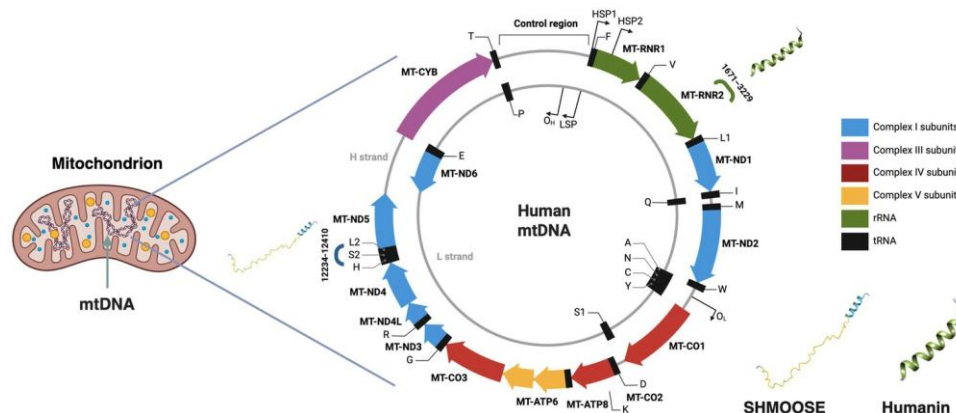
Figure 2. Microbiota-derived SCFAs influence host endocrine functions. Dietary fibers are substrates of the microbial ...



Marialetizia Rastelli, Patrice D Cani, Claude Knauf, The Gut Microbiome Influences Host Endocrine Functions, *Endocrine Reviews*, Volume 40, Issue 5, October 2019, Pages 1271–1284, <https://doi.org/10.1210/er.2018-00280>

Mediterranean Diet and Mitochondrial Microproteins

Humanin = improved insulin sensitivity, cardiovascular protection, longevity and preservation of cognitive function.

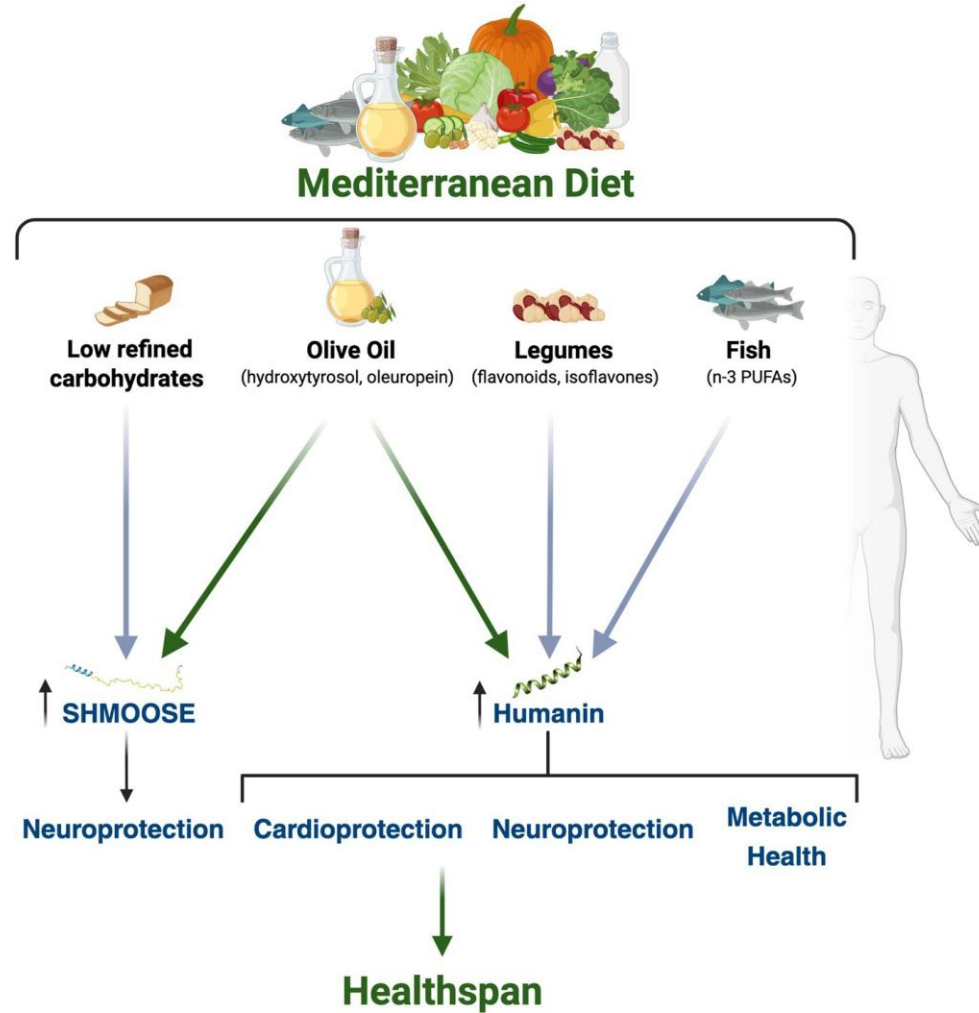


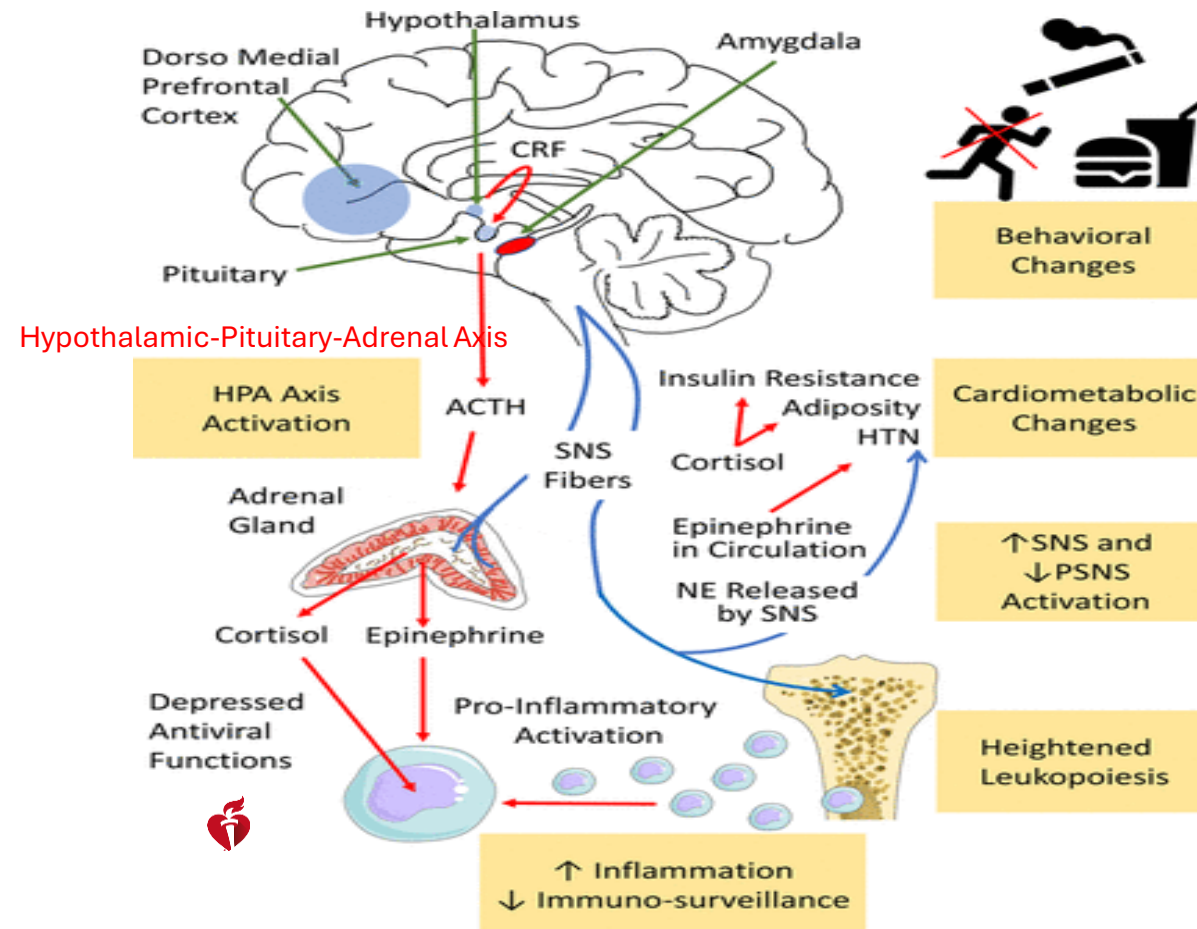
- (i) a positive association between adherence to the Med-Diet and circulating levels of mitochondrial microproteins SHMOOSE and Humanin supporting their role as potential mediators of Med-Diet benefits;
- (ii) a putative crosstalk between Humanin signaling and Nox2 activity, suggesting a novel cardioprotective mechanism of the Med-Diet.
- Collectively, these findings support mitochondrial microproteins as promising biomarkers for tailoring nutritional strategies for healthy aging.
- Further studies are warranted to elucidate the underlying mechanisms and determine the causal nature of these associations."

Small Human Mitochondrial ORF Over SERine tRNA= SMHOOSE

Protects from amyloid-related damage

Pignatelli P and Cohen P (2026) Mediterranean diet adherence is associated with mitochondrial microproteins Humanin and SHMOOSE; potential role of the Humanin–Nox2 interaction in cardioprotection. *Front. Nutr.* 12:1727012. doi: 10.3389/fnut.2025.1727012





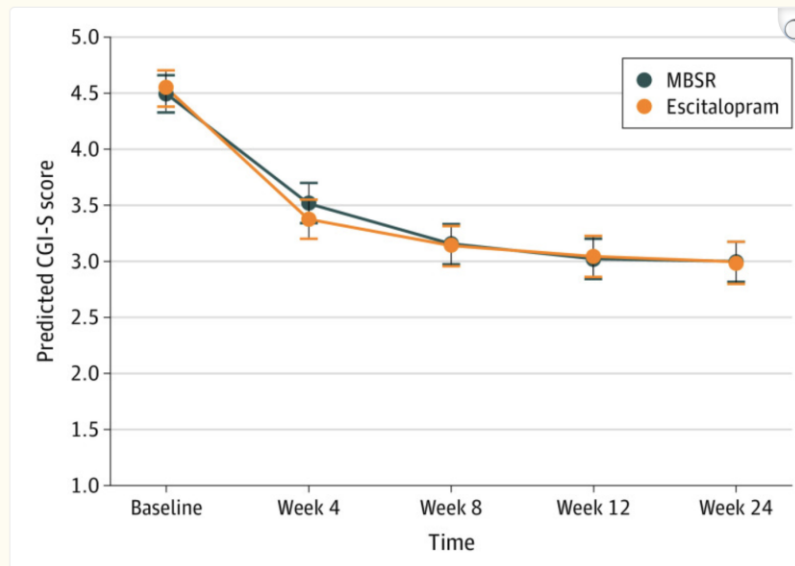
Michael T. Osborne. Circulation: Cardiovascular Imaging. Disentangling the Links Between Psychosocial Stress and Cardiovascular Disease, Volume: 13, Issue: 8, DOI: (10.1161/CIRCIMAGING.120.010931)

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Participants were 1:1 randomized to 8 weeks of the weekly MBSR course or the antidepressant escitalopram, flexibly dosed from 10 to 20 mg.

“The results from this randomized clinical trial comparing a standardized evidence-based mindfulness-based intervention with pharmacotherapy for the treatment of anxiety disorders found that MBSR was noninferior to escitalopram.”

Figure 3. Longitudinal Data.



[Open in a new tab](#)

Predicted Clinical Global Impression Severity scale (CGI-S) score based on a linear mixed model adjusted by age, sex, race, site, and total number of secondary diagnoses. MBSR indicates mindfulness-based stress reduction.

Palouse
Mindfulness:
Free-online

Hoge EA, Bui E, Mete M, Dutton MA, Baker AW, Simon NM. Mindfulness-Based Stress Reduction vs Escitalopram for the Treatment of Adults With Anxiety Disorders: A Randomized Clinical Trial. JAMA Psychiatry. 2023 Jan 1;80(1):13-21

Mindfulness Based Interventions—Systematic Review and Meta-Analysis

- Mindfulness-based interventions (MBIs) resulted in a steeper morning-to-evening decline
- MBIs increased measures of heart rate variability.
- MBIs reduced [salivary alpha amylase](#) concentrations.
- MBIs increased [antibody response](#) to a viral vaccine.
- MBIs reduced C-reactive protein concentrations.”



Heckenberg RA, Eddy P, Kent S, Wright BJ. Do workplace-based mindfulness meditation programs improve physiological indices of stress? A systematic review and meta-analysis. J Psychosom Res. 2018 Nov;114:62-71.

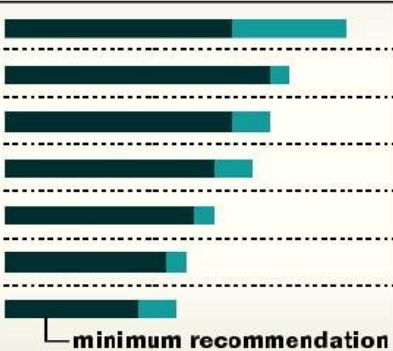
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Pillar 4 - Sleep

Sleep guidelines

Sufficient sleep has been found to help prevent chronic disease. The amount of sleep needed varies, based on person's age and health. Recommended sleep amounts by age group:

AGE	SLEEP NEEDED (IN HOURS)
Birth to 2 months	12 to 18
3 to 11 months	14 to 15
1 to 3 years	12 to 14
3 to 5 years	11 to 13
5 to 10 years	10 to 11
10 to 17 years	8.5 to 9.5
17 or older	7 to 9



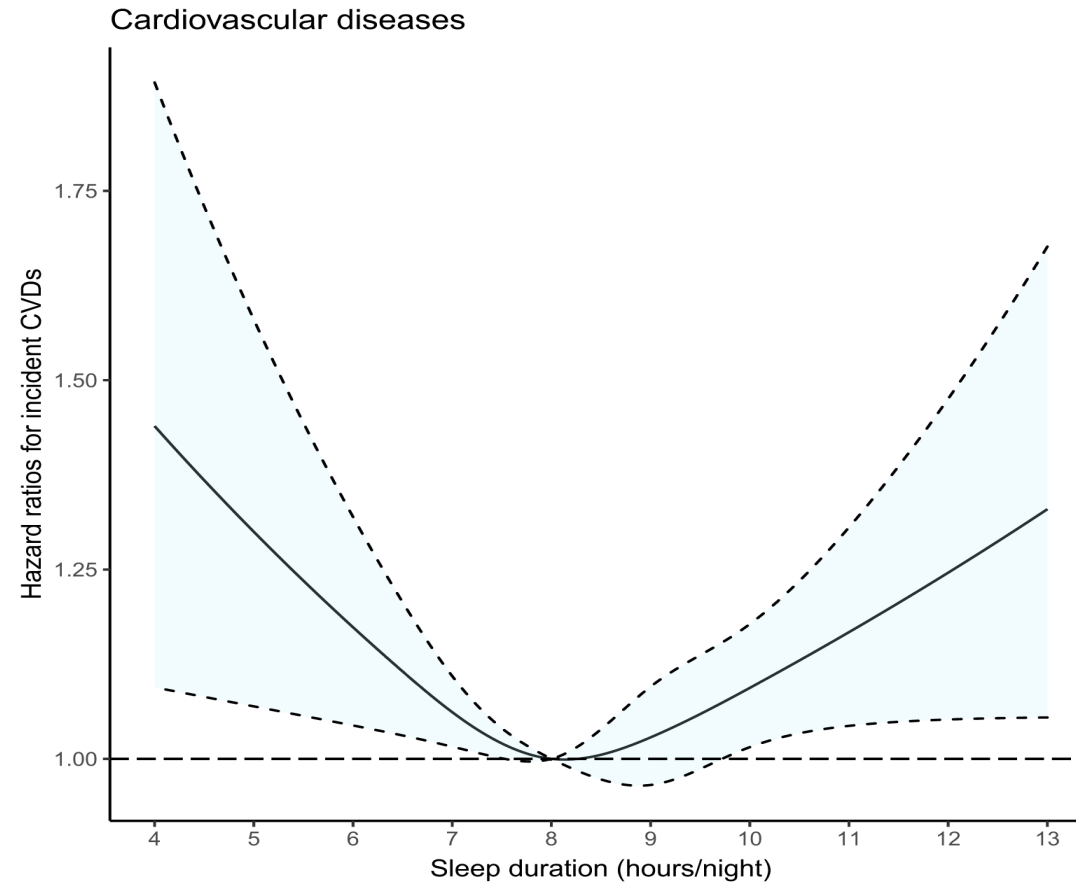
Source: National Sleep Foundation

THE COLUMBUS DISPATCH

- Night time
- Nap time
- Routine

ADRB1, DEC2, and SIK3—genes associated with natural Short sleepers which is 1-3% of the population.

<http://www.dispatch.com/content/stories/local/2012/08/26/health/7-to-9-hours-of-sleep-is-average.html>



Zhiyu Wang. Journal of the American Heart Association. Association of Sleep Duration, Napping, and Sleep Patterns With Risk of Cardiovascular Diseases: A Nationwide Twin Study, Volume: 11, Issue: 15, DOI: (10.1161/JAHA.122.025969)

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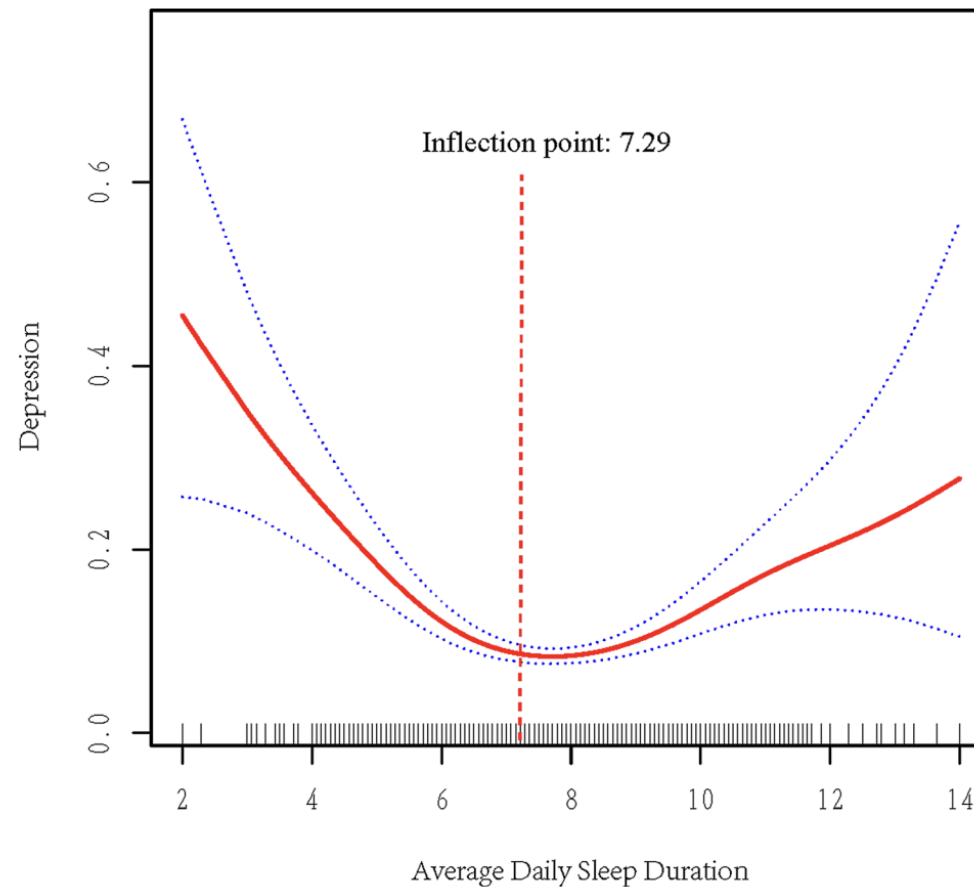
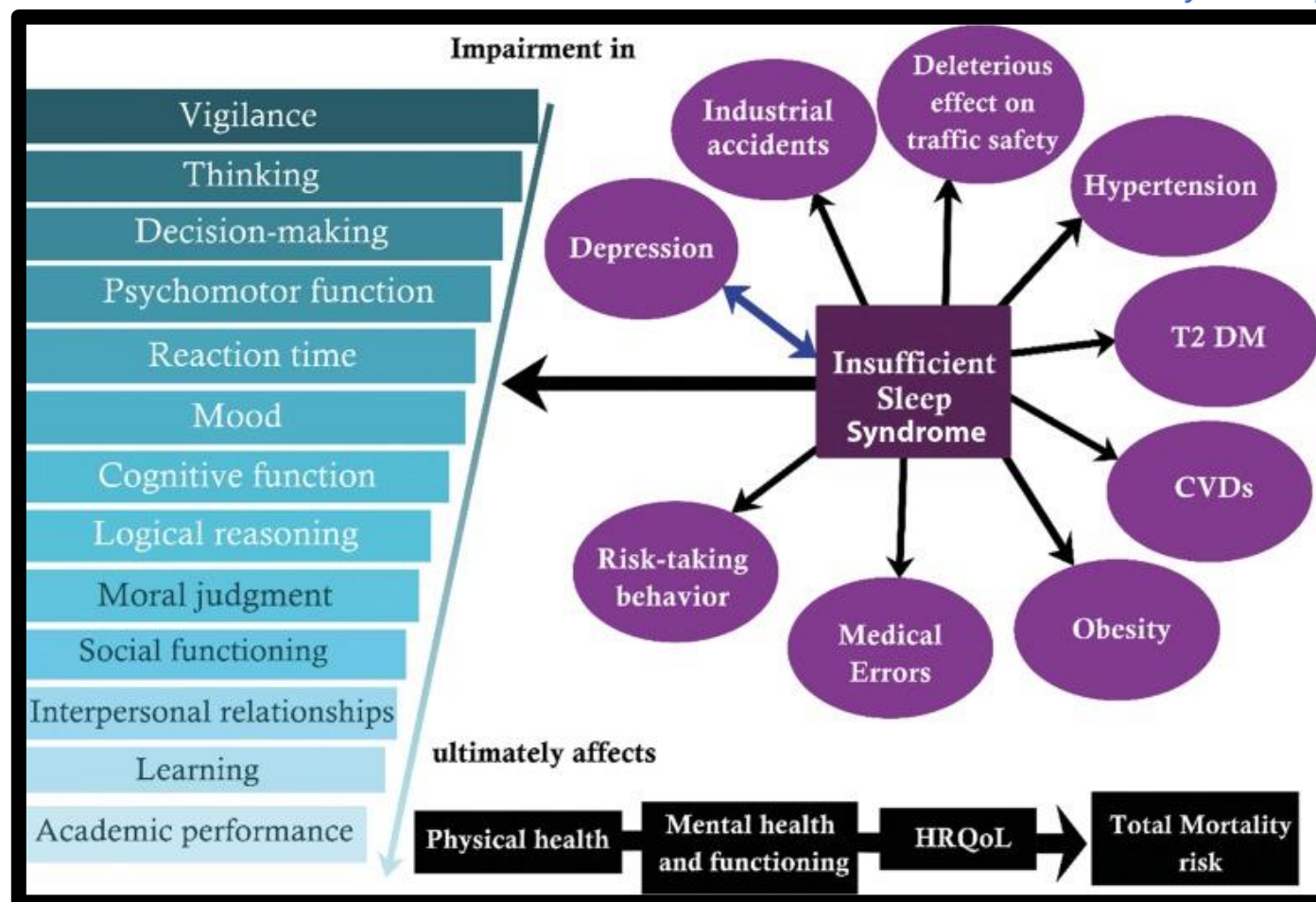


Fig. 2 The red curve on the graph represents the smoothed fit between the variables, while the blue lines indicate the 95% confidence intervals surrounding the fit

Cai Z, Ye Y, Chen S, Cai H, Lin J, Peng H, Yang W, Zeng L, Li R, Chen M, Chen W. U-shaped association between average daily sleep duration and depression among individuals with hypertension: a cross-sectional study based on NHANES 2017-2020. BMC Psychiatry. 2025 Jul 1;25(1):608.



Chattu VK, Sakhamuri SM, Kumar R, Spence DW, BaHammam AS, Pandi-Perumal SR. Insufficient Sleep Syndrome: Is it time to classify it as a major noncommunicable disease? *Sleep Science*. 2018;11(2):56.

Sleep Hygiene

- Cave
- Quiet-
 - Ear plugs
- Cool-
 - 60-70 degrees
- Dark-
 - Avoid blue wavelengths
 - It blocks melatonin



Caffeine



<http://www.precisionnutrition.com/coffee-and-hormones>

- Binds to same receptor as adenosine.
- Opposite effect as adenosine.
- It revs up cell activity.
- Adrenal gland responds by producing adrenaline.
- Has a $\frac{1}{2}$ life of 4-6 hours
- Metabolism varies

Pillar 5: Social Connections

Low quality and quantity of social ties linked with

- Development and progression of cardiovascular disease
- Recurrent heart attack
- Atherosclerosis
- High blood pressure
- Cancer
- Delayed cancer recovery
- Slower wound healing



Umberson D and Montez JK. Social Relationships and Health: A Flashpoint for Health Policy.
J Health Soc Behav. 2010;51(Suppl):S54-S66.

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ANALYTIC REVIEW

Jessica Martino, Jennifer Pegg, and Elizabeth Pegg Frates, MD

The Connection Prescription: Using the Power of Social Interactions and the Deep Desire for Connectedness to Empower Health and Wellness

Abstract: *Social connection is a pillar of lifestyle medicine. Humans are wired to connect, and this connection affects our health. From psychological theories to recent research, there is significant evidence that social support and feeling connected can help people maintain a healthy body mass index, control blood sugar, improve sleep,*

Keywords: connection; lifestyle medicine; healthy habits; social life; friendships; loneliness

It is time to appreciate and utilize connection and social bonds as part of lifestyle counseling. Individuals need connections in their lives in the workplace and at home. Fostering these connections is critical to health and wellness. Lifestyle

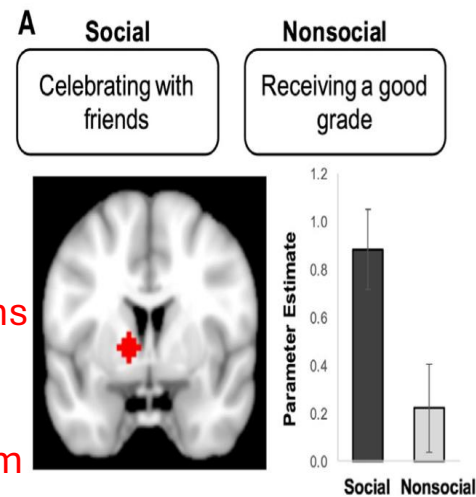
overall health and for healthy habits to be sustainable. The social ecological model of change stresses that we exist in communities and these groups have an important impact on individuals and their behaviors. There are decades of research that support the importance of social connection. Moreover, humans have lived in groups for thousands of years. In a meta-analysis by Hale Tvedsted and

Please cite this article in press as: Delgado et al., Characterizing the mechanisms of social connection, Neuron (2023), <https://doi.org/10.1016/j.neuron.2023.09.012>

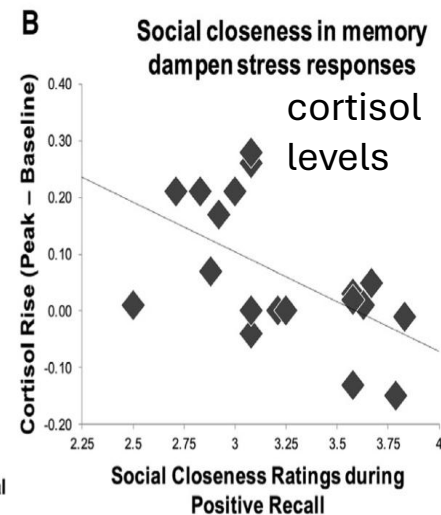
CellPress

Neuron
Review

Response
in
striatum



Functional
MRI



Memories involving close
friends

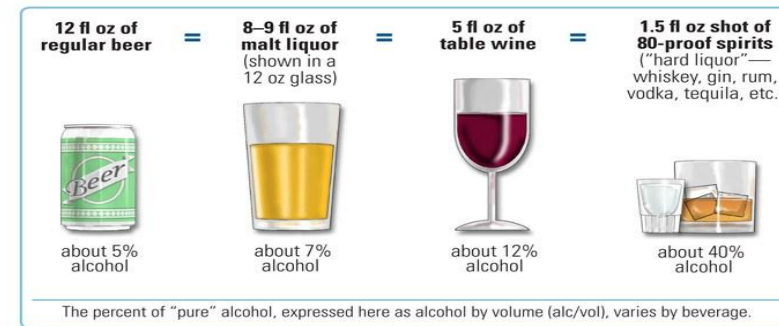
Figure 2. Social memories and reward-related neural circuitry

(A) Recalling positive memories that elicit the same subjective positive feeling yet differ in terms of level of social context inherent in the memory recruits reward-related neural activity. Responses in the striatum as measured by fMRI during memory recall are greater for more social memories (e.g., celebrating with friends) compared with non-social memories (e.g., receiving a good grade).

(B) Increased social closeness during positive memory recall correlates with dampening of salivary cortisol following acute stress exposure. Figure adapted from Speer and Delgado.⁷¹

Pillar 6: Risky Substances Alcohol

- 12 ounces of regular beer, which is usually about 5% alcohol
- 5 ounces of wine, which is typically about 12% alcohol
- 1.5 ounces of distilled spirits, which is about 40% alcohol



Heavy Drinking:

For women—4 or more drinks on any day or 8 or more per week

For men—5 or more drinks on any day or 15 or more per week

<https://www.niaaa.nih.gov/health-professionals-communities/core-resource-on-alcohol/basics-defining-how-much-alcohol-too-much>

<http://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/standard-drink>

Recommendations

- Do not start drinking if you do not currently drink. (CDC and AHA)
- For cancer prevention- no alcohol is recommendation
 - <https://www.cancer.gov/about-cancer/causes-prevention/risk/alcohol/alcohol-fact-sheet>
 - British Journal of Cancer 2015; 112(3):580-593.
 - BMJ 2015; 351:h4238.
 - Lancet Public Health. 2023 Jan;8(1):e6-e7.



From: **Yoga for Opioid Withdrawal and Autonomic Regulation: A Randomized Clinical Trial**

JAMA Psychiatry. Published online January 07, 2026. doi:10.1001/jamapsychiatry.2025.3863

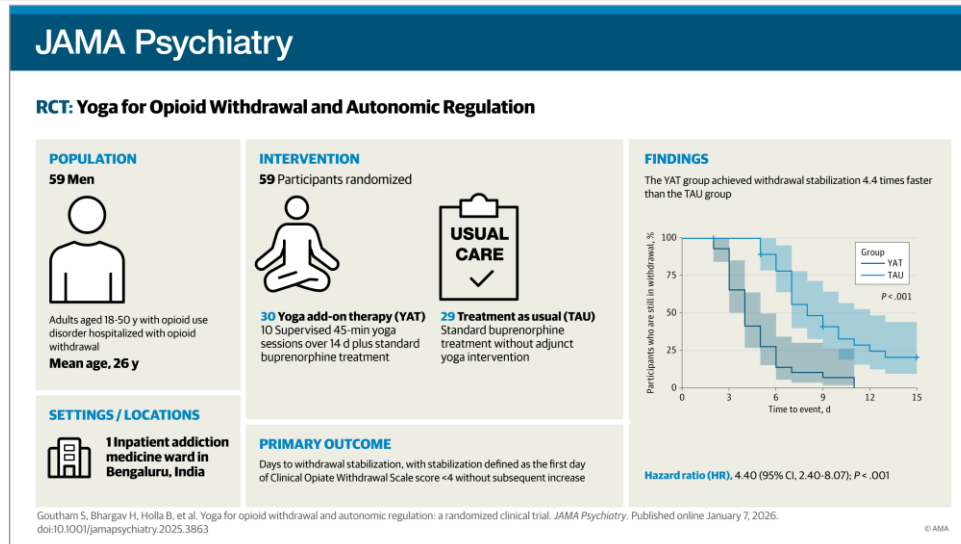


Figure Legend:

Yoga for Opioid Withdrawal and Autonomic Regulation

Quotes from Medical Xpress
Yoga accelerates opioid withdrawal recovery when combined with standard care, study finds.
 By [Krystal Kasal](#),
 1-10-26

Date of download: 1/25/2026

“a median 5 day recovery period, compared to 9 days for controls.”

“The yoga group also showed significant improvements in HRV, indicating improved autonomic regulation. Yoga also led to improved sleep latency, as the YAT group fell asleep 61 minutes faster, on average. There were also significant improvements in anxiety measures and pain perception.”

The Lifestyle Medicine Health Behavior (LMHB) Scale

Pangalangan J, Puma J, Tollefson M, Frates B. Am J Lifestyle Med. 2024. doi: 10.1177/15598276241280207

What it is

The first **validated, multidimensional self-report scale** to assess all six pillars of lifestyle medicine in a single instrument — sleep, social connection, stress management, physical activity, nutrition, and avoidance of risky substances.

PSYCHOMETRIC PROPERTIES

n = 399 adults; confirmatory factor analysis supports a five-factor structure plus one observed item. Good reliability.
Strong content + face validity.

Who uses it

Lifestyle medicine physicians • primary care clinicians • Health coaches • program evaluators and Health Enthusiasts

The first lifestyle-medicine instrument with rigorous content, face, and construct validity + reliability.

1

Lifestyle Medicine Health Behavior Survey

The Lifestyle Medicine Health Behavior (LMHB) scale, validated by Pangalangan and Frates (2024), is a self-report tool designed to assess the six evidence-based pillars of lifestyle medicine (sleep, social connection, stress management, physical activity, nutrition, and avoidance of risky substances).

Practitioners can administer this survey to patients to gain an overall picture of well-being. The results serve as a basis for discussing health behaviors and assessing readiness for change across the six pillars. Additionally, the LMHB scale can be used periodically to monitor trends and track health behavior changes over time.



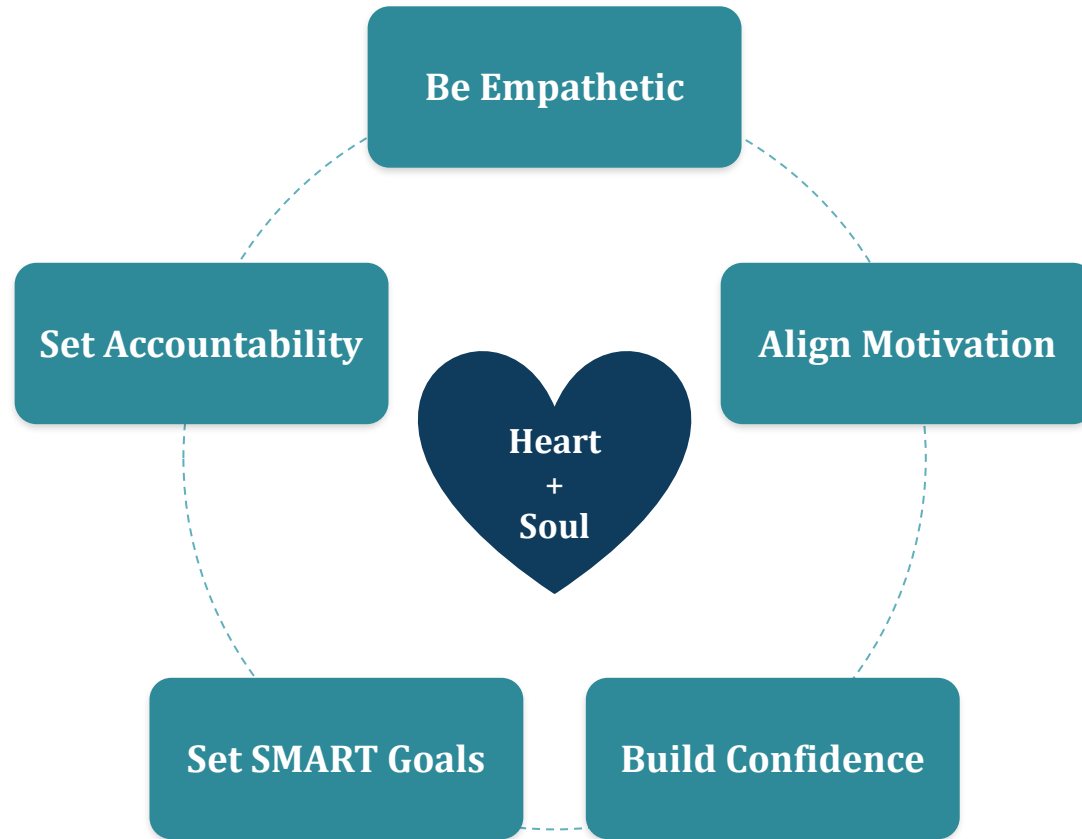
INSTRUCTIONS

Circle the response that best answers the question. Each section will measure your lifestyle habits on a scale. For example, in the first section on sleep, you should rank yourself on a scale of 0 to 4. Note that on some questions scoring is reversed. As you complete each section of the survey, add up and log your scores. At the end of the survey, you will add up your total points and plot your score for each pillar.

Pangalangan J, Puma J, Tollefson M, Frates B. Development and Psychometric Evaluation of the Lifestyle Medicine Health Behavior Scale. American Journal of Lifestyle Medicine. 2024;0(0). doi:10.1177/15598276241280207

5-Step Cycle for Collaborating with Patients

Frates EP, Moore MA, Lopez CN, McMahon GT. *Am J Phys Med Rehabil.* 2011;90(12):1074–82.



A roadmap for the coaching visit

Iterative — but never the same. Each cycle is shaped by who the patient is becoming and by the experience and wisdom the patient brings to the room.

The coach's role: draw the inner beauty and true wisdom out of the patient — by using Empathy, MI, Strengths-Based Approach, SMART goals, and Accountability.

PREPARATION

Deep breaths ·
Mindfulness · Self-care

GOAL OF EACH VISIT

Patient feels understood ·
motivated · supported ·
engaged · hopeful

“People will forget what you said, people will forget what you did, but people will never forget how you made them feel.” **Maya Angelou**

Summary

- 1. Exercise, Nutrition, Sleep, Social Connectedness, Stress Resilience, and Avoidance of Risky Substances are the six pillars of lifestyle medicine.
- 2. Assess the six pillars of lifestyle medicine with patients.
- 3. Follow the 5 Step Cycle of Collaboration as a roadmap.
- .