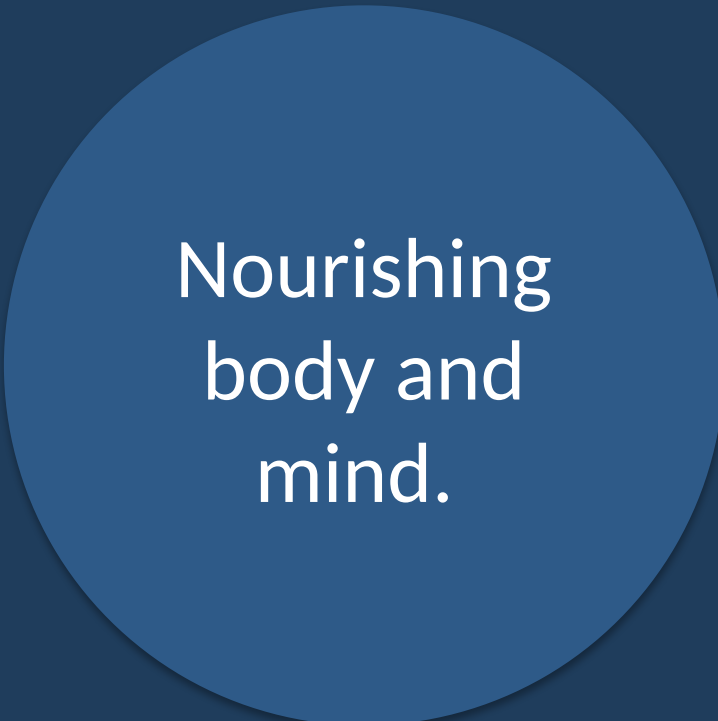


Lifestyle Medicine: The Power and Interconnection of the Six Pillars



Nourishing
body and
mind.

UMass Chef Culinary Conference • June 2026

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Our Recipe for the Presentation

- 1. Define Lifestyle medicine
- 2. Compare chefs and doctors
- 3. Review each pillar and its impact on health
- 4. Share the science behind the pillars



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

The Six Pillars of Lifestyle Medicine

1 Nutrition

Whole-food, plant-predominant

2 Physical Activity

Regular, dose-responsive movement

150 minutes of moderate-intensity exercise
each week

Strength train 2x per week

3 Restorative Sleep

Consistent, circadian-aligned

National Sleep Foundation recommends
7-9 hours

4 Stress Management

Downregulate the HPA axis

Practice deep breathing or other relaxation
techniques daily (5-20 minutes each session)

5 Avoid Risky Substances

Quit smoking

AHA—ETOH recommendations

Men $\leq$ 0-2 and Women $\leq$ 0-1 drink

6 Social Connection

Community and belonging

Connect with at least one supportive
person each day.

What Do Chefs and Doctors Have in Common?



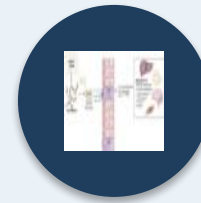
Wear White coats

They both wear them — a shared badge of cleanliness, discipline, and expertise.



Both are patients

They are human beings who need care too, not just givers of care.



Both nourish people

Each one spends their working life trying to nourish others.

Chefs vs. Doctors — Same Pressures, Six Shared Pillars

Pillar	Chefs (esp. line cooks / trainees)	Doctors (esp. residents)
Sleep / circadian	Late service, early prep, doubles, rotating shifts — chronic circadian disruption	Residents avg ~6.2 h sleep, 24–36 h shifts, 80-h weeks (ACGME cap) <i>Mansukhani et al. 2012</i>
Stress / burnout	High work-driven stress and burnout — long hours, relentless pace, understaffing	62.8% of US physicians had ≥ 1 burnout symptom in 2021, down to 45.2% by 2023 <i>Shanafelt et al. 2022 and Shanefelt et al. 2025</i>
Physical activity	Active on the job, but little protective aerobic exercise — no time	Same — long hours crowd out intentional exercise
Risky substances	Food prep/serving: highest at-work substance use of any occupation, young US workers (2025) <i>Oh et al. 2025</i>	~13%-25% of physicians/surgeons screen positive for alcohol abuse/dependence; women at a higher rate <i>Wilson et al. 2022; Oreskovich et al. 2012, 2015</i>
Social connection	Built-in brigade community; unsocial hours isolate from outside life	Built-in care team; unsocial hours isolate similarly
Nutrition	Professional cooking skill — know how to make healthy food delicious	Little training: 71% of med schools below 25 hours; only ~13–14% residents and attendings feel adequately trained <i>Adams et al. 2015; Vetter et al. 2008; Harkin et al. 2019</i>

The One Pillar Where Chefs Clearly Win — Nutrition

Chefs hold the tool medicine is scrambling to teach: turning food into health, deliciously.

71%

of US medical schools fall short of the recommended 25 h of nutrition education

8% to 74%

Rise in residents' confidence in “plant forward” dietary counseling after culinary-medicine curriculum

29% → 92%

Rise in students' confidence to discuss nutrition after a culinary-medicine course

Caveat: there is no published prevalence of how many physicians cook at home — the literature measures training and confidence, which is consistently low at baseline.

Why the Kitchen Is Hard on the Body

- Late and irregular hours, shift work, high acute stress, alcohol access, and meals eaten off-cycle.
- **Mechanism:** circadian misalignment raises blood pressure and inflammatory markers (CRP, IL-6) and impairs glucose tolerance when meals are eaten at night.
- The same lifestyle inputs dysregulated in kitchen life are four of the six pillars.

What gets disrupted

- Blood pressure ↑
- Inflammation (CRP, IL-6) ↑
- Glucose handling ↓
- Cortisol rhythm mistimed

Pillar 1 — Nutrition: Food as Cellular Information

- Every ingredient is biochemical information reaching the cell, mitochondria, immune system, and brain.
- **Pathways:** inflammation, oxidative stress, mitochondrial function, the gut microbiome, tryptophan–kynurenine, the HPA axis, and neuroplasticity via BDNF.

Food can increase Brain-Derived Neurotrophic Factor (BDNF)

Diet acts on...

- Inflammation
- Oxidative stress
- Gut microbiome
- Tryptophan–kynurenine
- HPA (stress) axis
- BDNF / neuroplasticity

Nutrition & Depression — The Landmark Trial (SMILES)

- The first randomized controlled trial to test diet as a treatment for clinical depression.
- **Design:** 67 adults with moderate-to-severe depression — dietitian-led Mediterranean-style support vs. social-support control, 12 weeks.
- **Result:** significantly greater improvement in depression scores (Montgomery-Åsberg Depression Rating Scale= MADRS) than controls, with a substantial effect size.

$p < 0.001$

greater improvement in
depression scores for the
dietary-support group vs.
control at 12 weeks

Nutrition & Depression — The Weight of Evidence (2025)

- **Replication:** the HELFIMED RCT found a Mediterranean diet plus fish oil improved mental health over 3–6 months.
- **Observational breadth:** a meta-analysis of 41 studies linked healthier dietary patterns with lower depression risk.
- **Newest (2025):** a meta-analysis of 25 RCTs found small reductions in depressive symptoms with low-fat and low-calorie diets, low certainty.

Framing:

- Promising, not conclusive
- Well-tolerated
- Low-risk adjunct
- Strongest for whole-diet Mediterranean patterns

Anxiety & Food — What the Evidence Shows

- Medical literature on eating patterns and anxiety — younger and more mixed than the depression evidence.
- **Pattern signal:** healthier, Mediterranean-style patterns tend to track with lower anxiety.
- **Other direction:** a 2024 BMJ umbrella review found higher ultra-processed intake linked to greater anxiety risk.
- **Limitations:** the 2025 meta did not establish diet as a proven anxiety treatment — it's about patterns and risk.

Bottom line

- Patterns & risk: supported
- Diet as treatment: not yet proven
- Ultra-processed food: a red flag

Stress & Eating Patterns — The Connection

- **Bidirectional:** stress pushes people toward less-healthy eating; diet quality is in turn linked to perceived stress.
- **Mechanism:** circadian misalignment mistimes the cortisol rhythm — the conditions of kitchen life.
- Shift work flattens and mistimes cortisol--a flat slope is a fingerprint of chronic stress.

Cortisol Response

- Blunted morning peak
- Higher night levels
- Flatter day-night slope
- Flattening = the harm signal

Can Improving Diet Reduce Mental Health Problems? — Intervention Trials

- **General adults:** a 12-week RCT (n=60) found Mediterranean-diet instruction reduced DASS-21 stress, anxiety, and depression after adjustment — modest in magnitude.
- **Pregnant women:** the IMPACT-BCN RCT (n=1,221) reduced perceived stress and improved well-being.
- **Young adults:** a 3-week RCT improved depression.
- **Limitations:** small trials, varied populations, none in chefs.

The evidence is...

- Real but early--seedling
- Small samples
- Mixed populations
- No chef-specific trial yet

The Cellular Mechanisms Behind Food & Mood

- **Inflammation & oxidative stress:** fiber, polyphenols, and omega-3s lower the low-grade inflammation tied to depression and chronic conditions.
- **Gut-brain axis:** fiber feeds microbes that produce short-chain fatty acids and neuroactive metabolites.
- **Neuroplasticity:** healthier eating patterns support BDNF and hippocampal health.

The through-line

- Less inflammation
- Healthier microbiome
- More resilient brain

Nutrition Beyond Mood — The Cardiometabolic Payoff

- Broaden from brain to body — the whole-health case for the food chefs design.
- **PREDIMED:** in ~7,400 high-risk adults, a Mediterranean diet with extra-virgin olive oil or nuts reduced major cardiovascular events vs. control.
- The same delicious, plant-forward pattern that helps mood also protects the heart.

Results

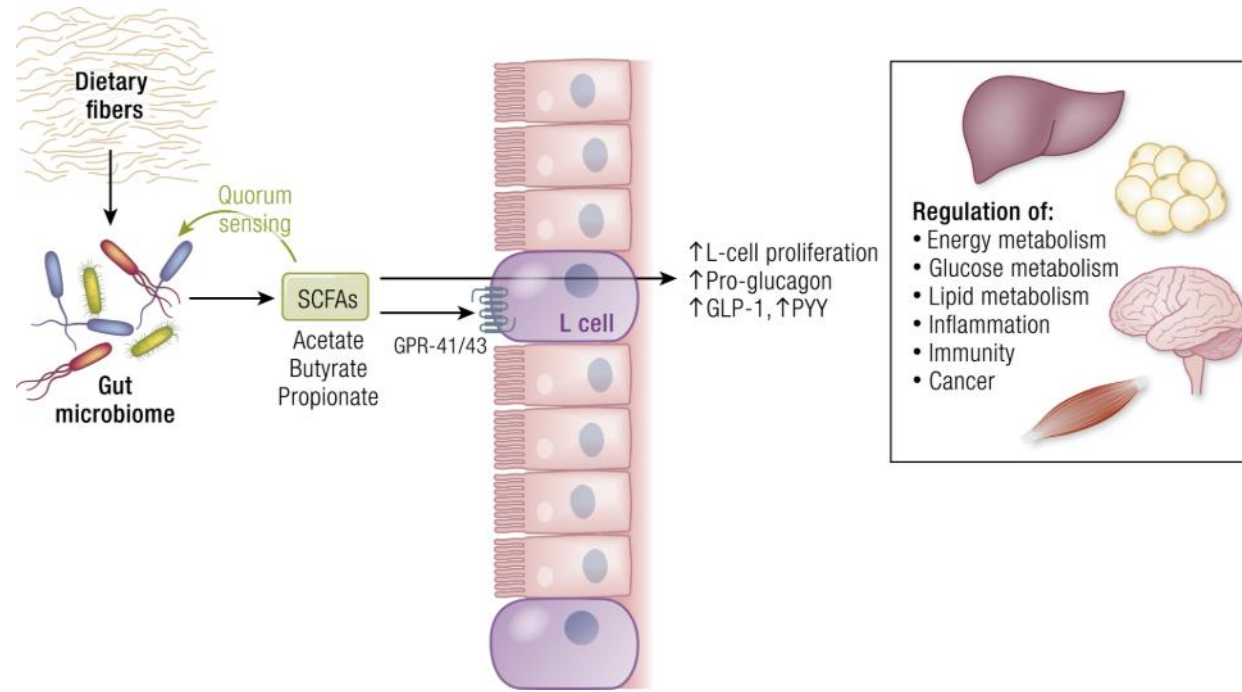
In high-risk adults, Mediterranean diet reduced major cardiovascular events, and difference in rates of cardiovascular events was greater among participants with better adherence.

Fiber helps increase number and diversity of friendly bacteria in the microbiome



- WHO recommends 25 and 29 gms of fiber each day
- Lower incidence of [type 2 diabetes](#), [heart disease](#), [stroke](#), and [colon cancer](#)
- Eat fiber and then friendly bacteria ferment it.
- SCFAs--acetate, propionate, and butyrate.
- SCFAs play key roles in regulating host metabolism, immune system, and cell proliferation.

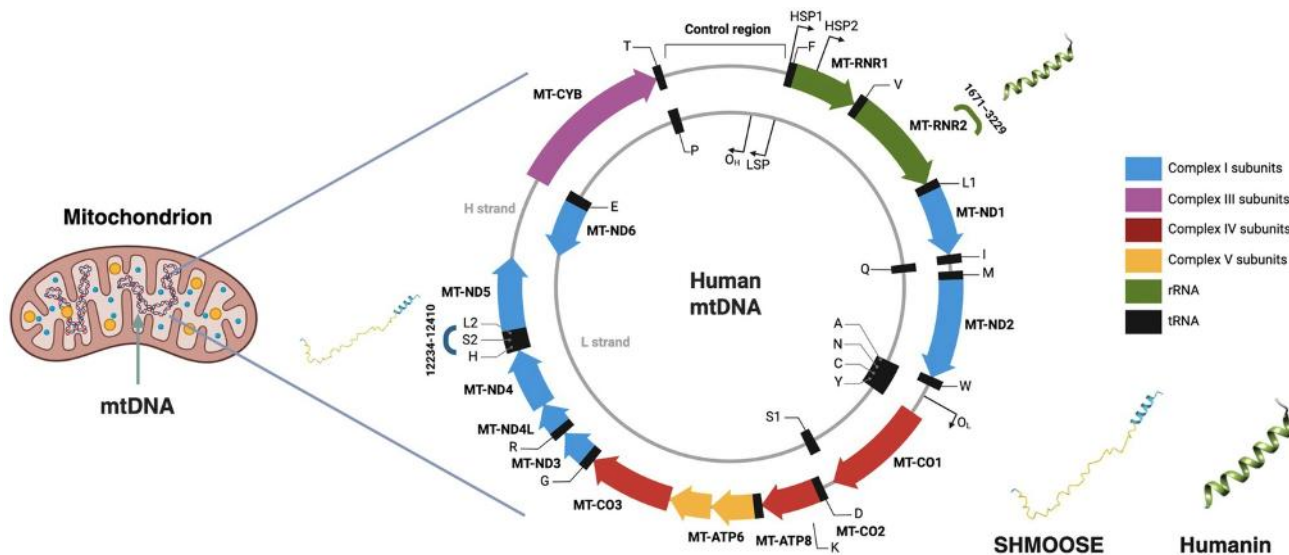
Figure 2. Microbiota-derived SCFAs influence host endocrine functions. Dietary fibers are substrates of the microbial ...



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](#).



Small Human Mitochondrial ORF Over SERine tRNA= SMHOOSE
Protects from amyloid-related damage

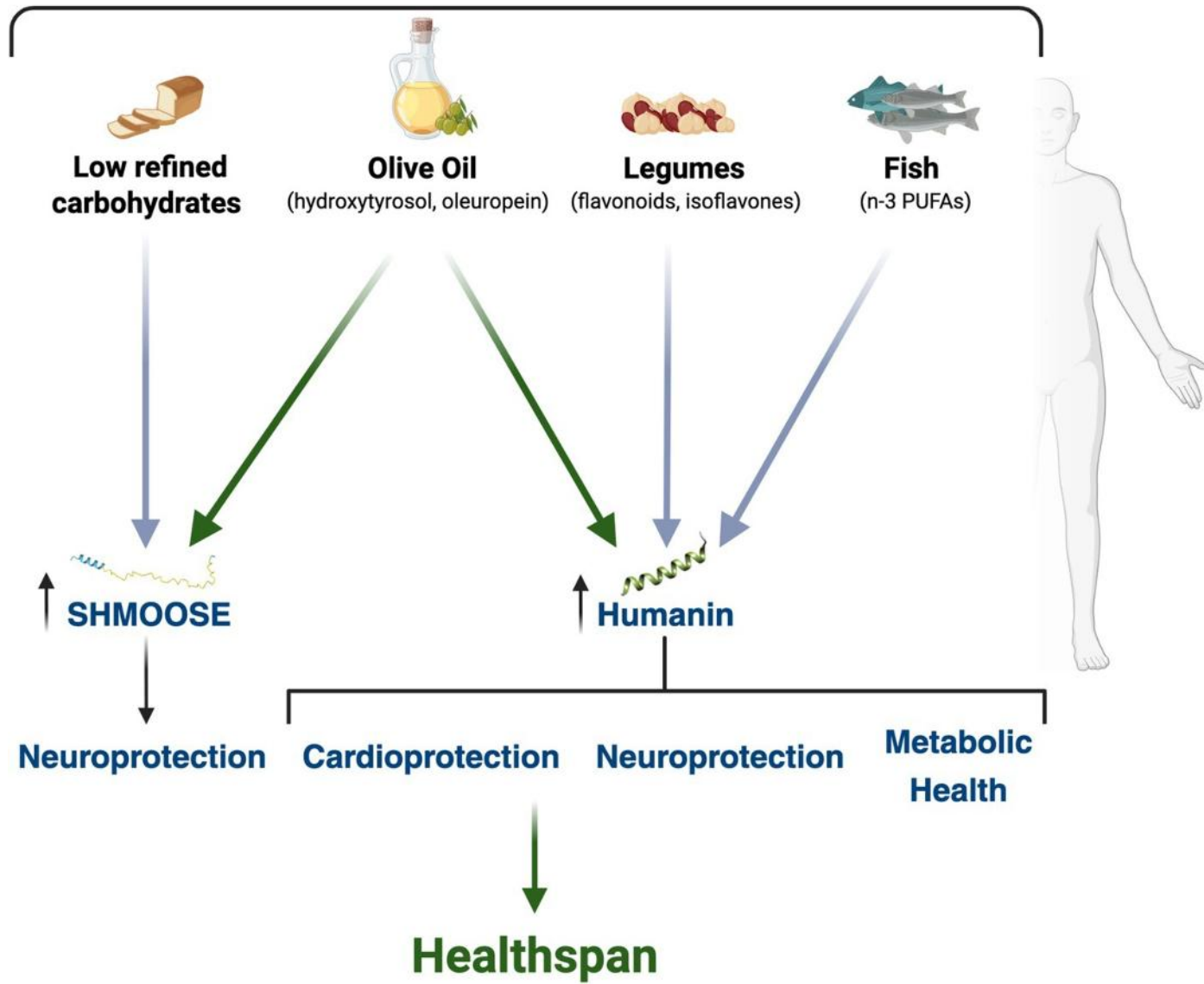
Pignatelli P and Cohen P (2026) Mediterranean diet adherence is associated with mitochondrial microproteins Humanin and SHMOOSE; potential role of the Humanin-Nox2 interaction in cardioprotection. Front. Nutr. 12:1727012.

doi: 10.3389/fnut.2025.1727012

- “(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.”



Mediterranean Diet



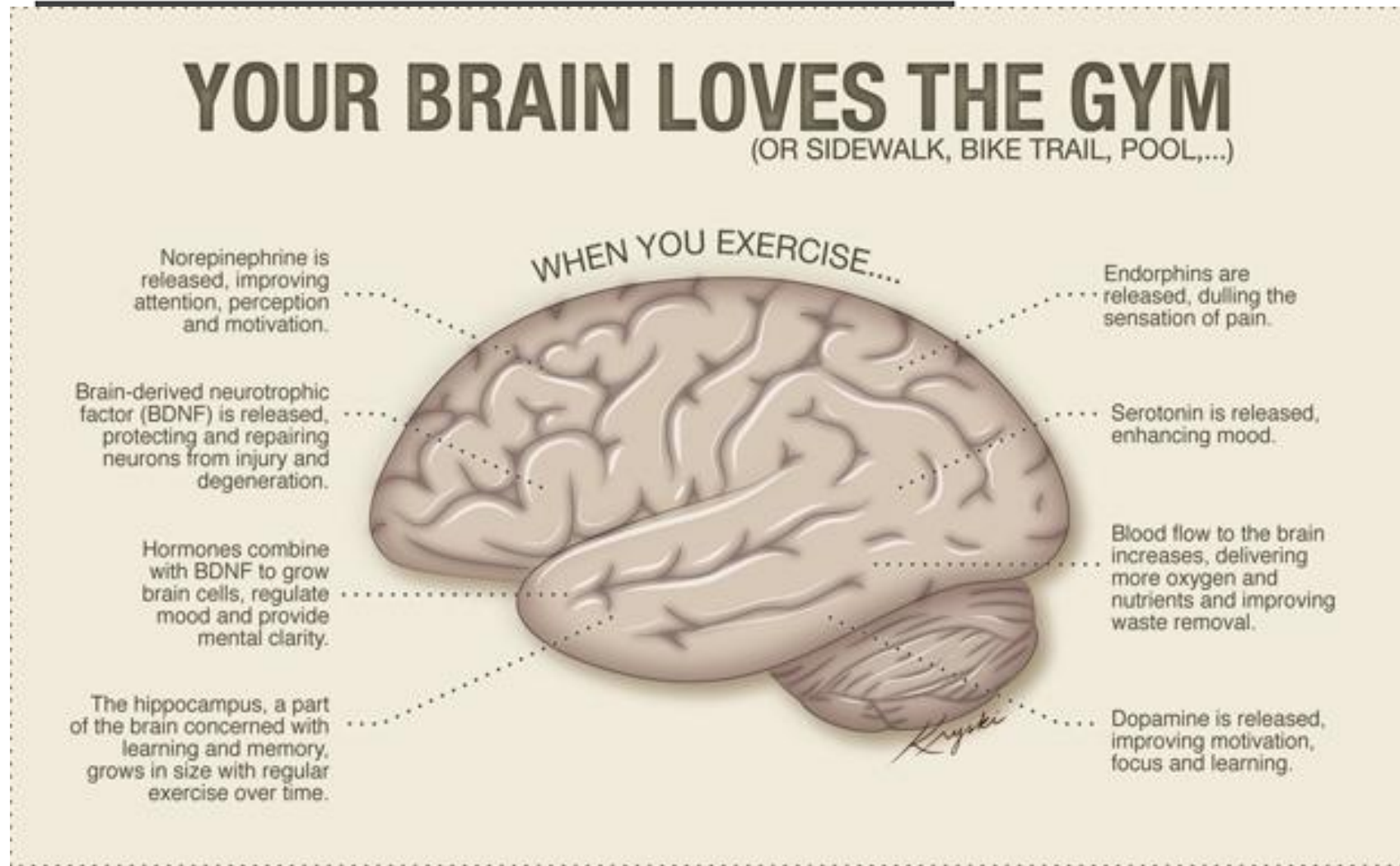
Pillar 2 — Physical Activity

- **Key finding:** a meta-analysis of prospective cohorts found higher physical activity protects against the future onset of depression.
- Kitchen work is demanding but not the same as protective aerobic activity; intentional movement and recovery still matter.
- Even modest, regular activity confers measurable mental-health protection — a dose-responsive medicine.

↓ **risk**

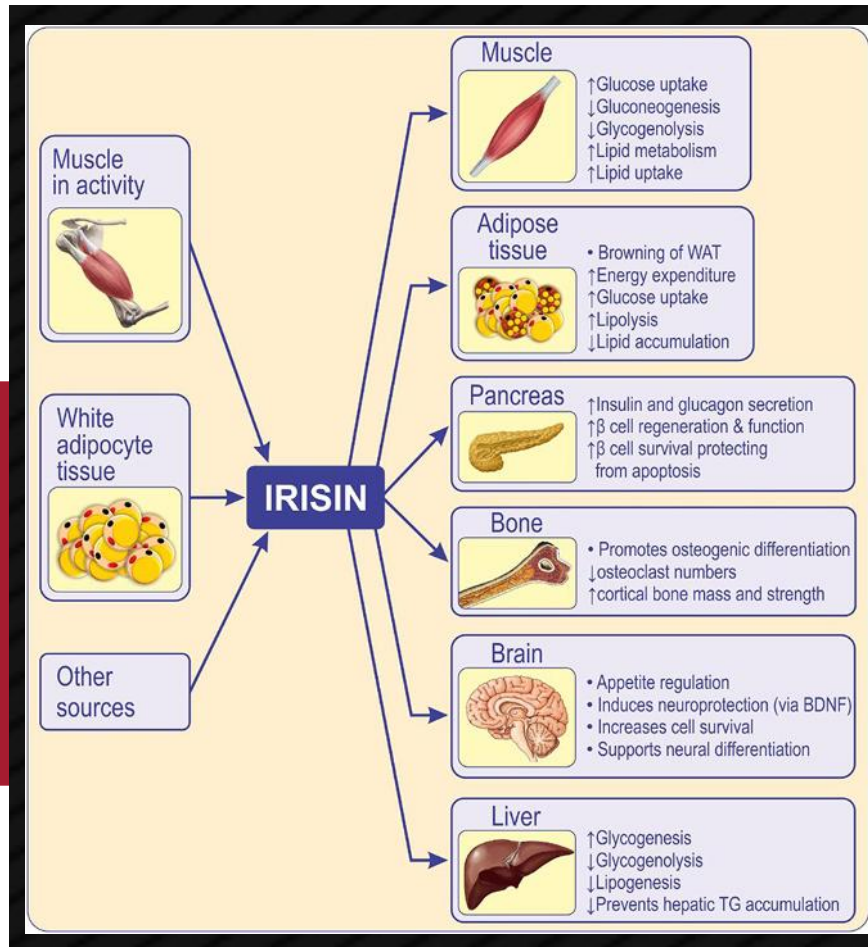
of incident depression with higher
physical activity (prospective
cohorts)

Pillar 1—Routine Physical Activity



Oxytocin

PNAS 2025 May 27;
122(21):
e2503675122.



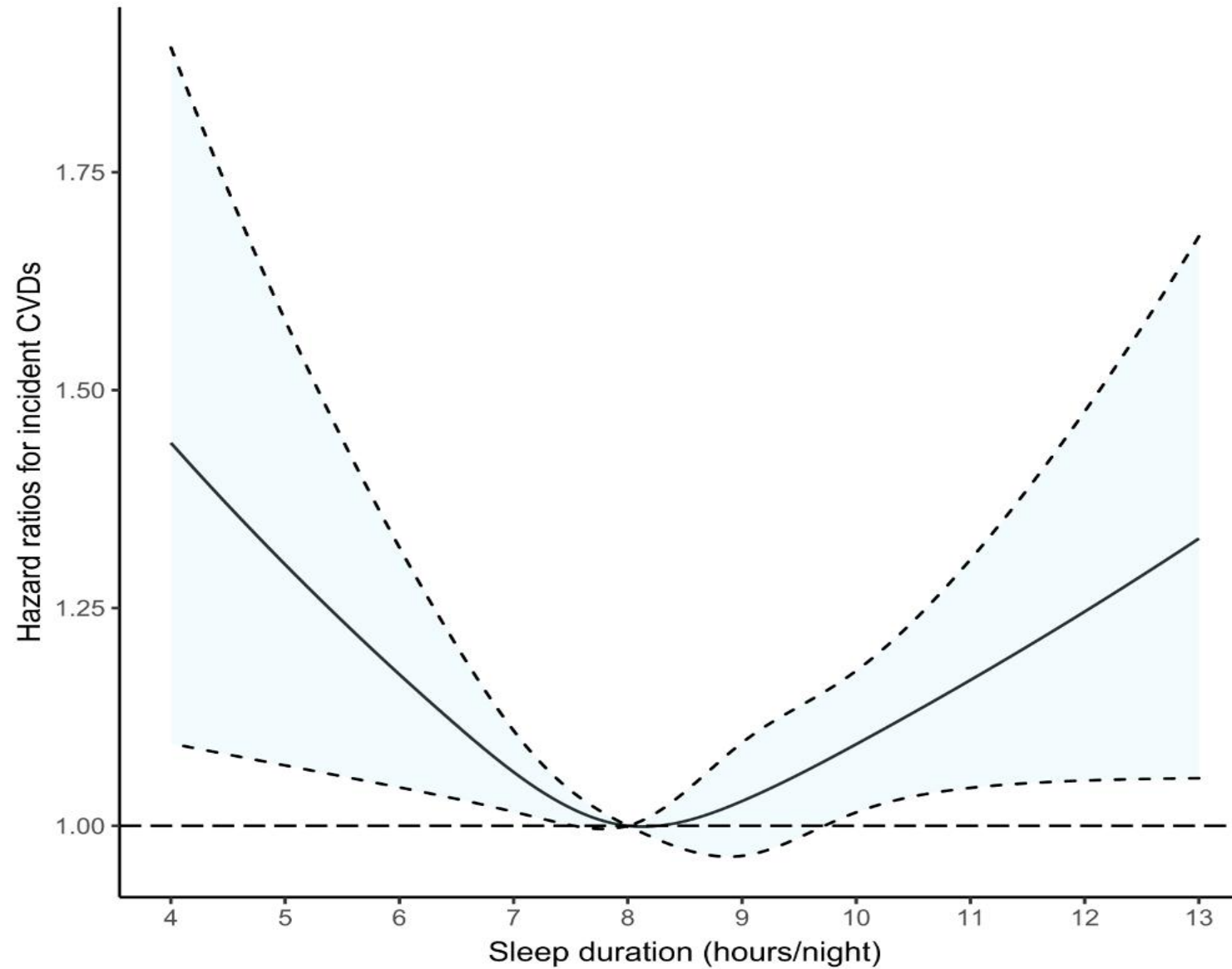
Arhire, Lidia I., Laura Mihalache, and Mihai Covasa. "Irisin: a hope in understanding and managing obesity and metabolic syndrome." *Frontiers in endocrinology* 10 (2019): 524.

Pillar 3 — Restorative Sleep

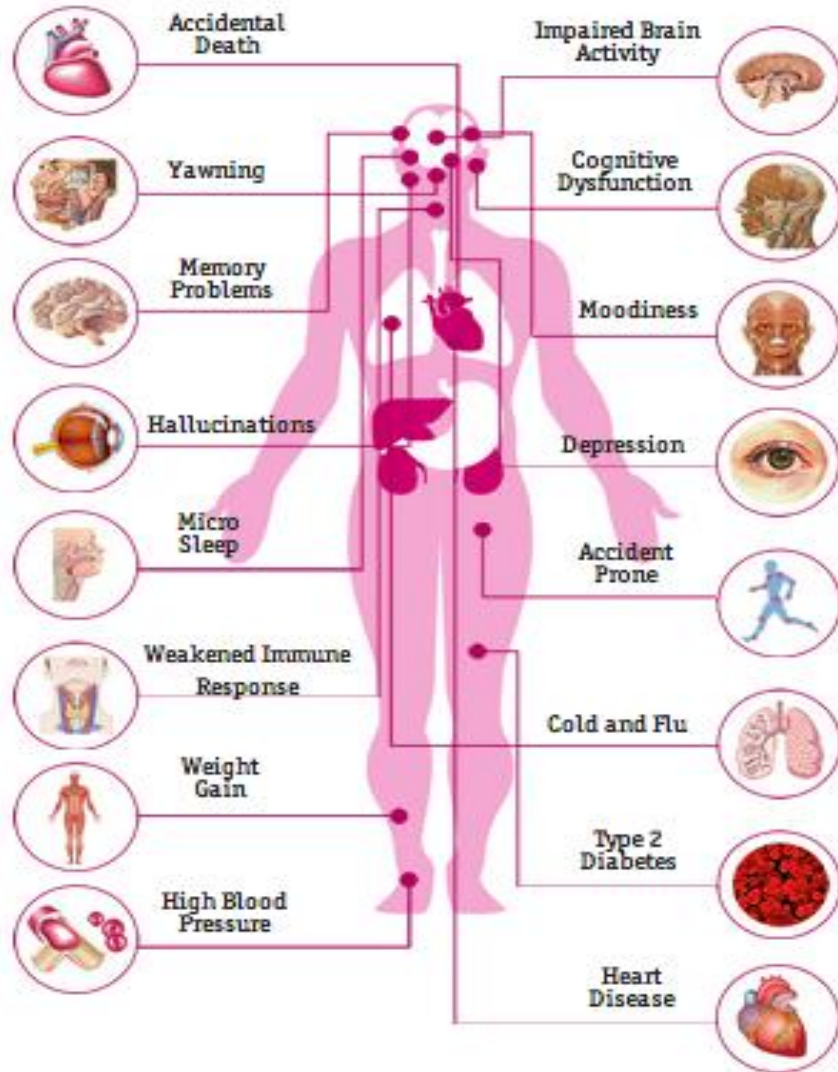
- The pillar most under siege in kitchen life: late finishes, early prep, rotating shifts.
- **Mechanism:** circadian misalignment raises blood pressure and inflammation and impairs glucose handling.
- **Actionable:** in a simulated-night-work study, daytime eating (vs. night) prevented the glucose disruption even with mistimed sleep.

Practical levers

- Consistent sleep window
- Anchor meal timing
- Daytime eating when possible
- Get morning light exposure



Sleep Deprivation



High blood pressure

Heart disease

Obesity

Diabetes

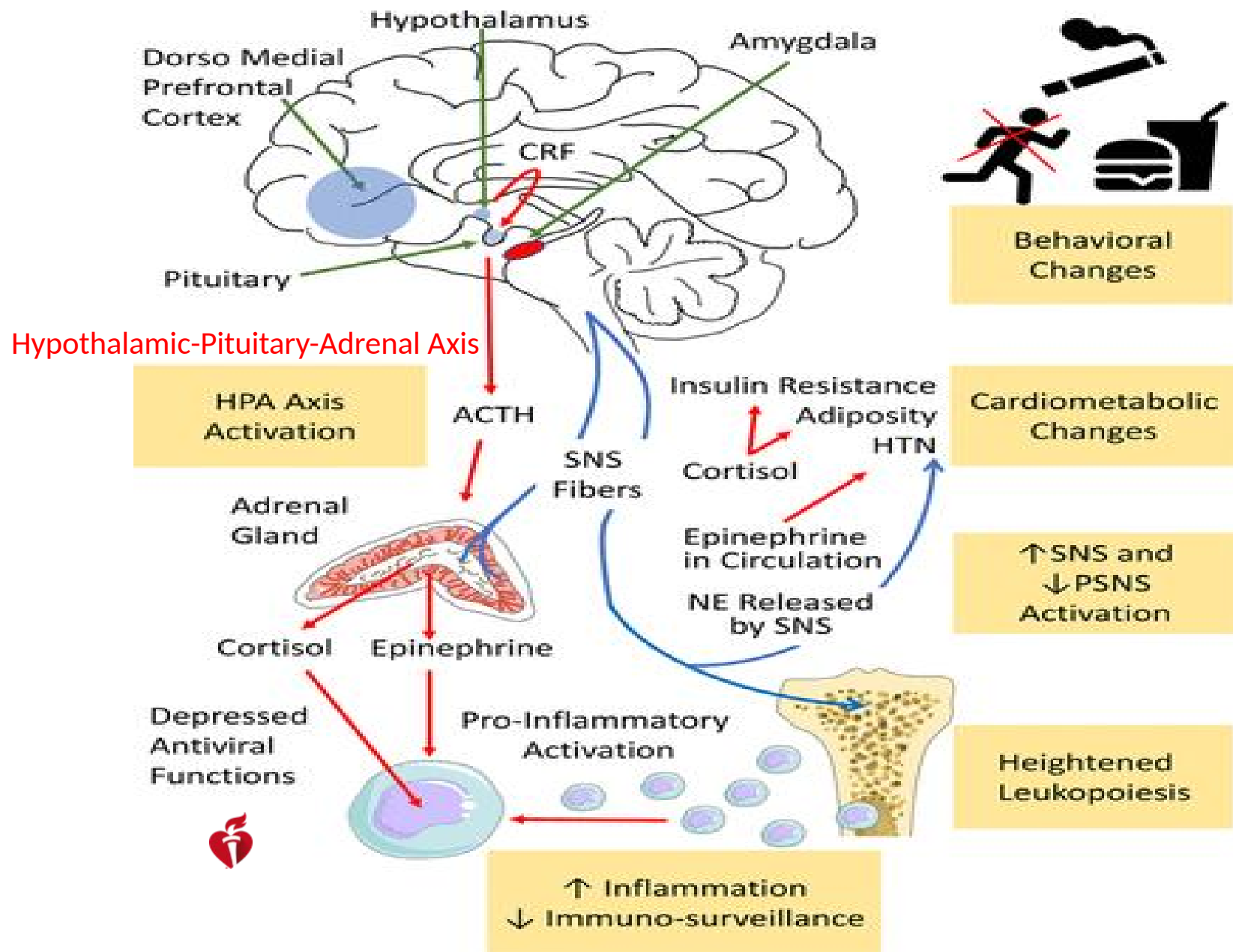
<https://www.cdc.gov/sleep/index.html>

Pillar 4 — Stress Management

- Repeated acute stress drives the HPA axis and cortisol, interacting with metabolism, mood, the gut, and food choices.
- **Cortisol:** chronic shift work flattens and mistimes the rhythm rather than simply raising or lowering it — a marker of chronic stress.
- **Tools:** brief breathing/down-regulation between services, recovery time, and boundaries — framed as performance and longevity.

In the moment

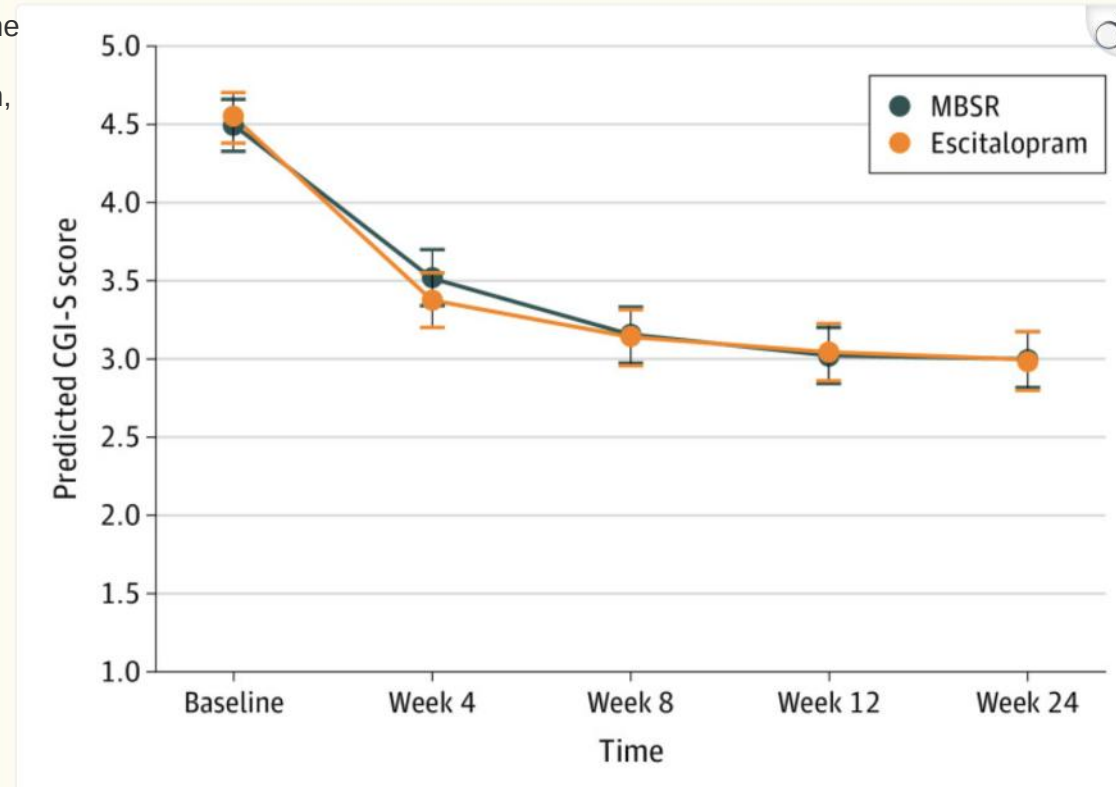
- Box-breathing between services
- Protect recovery time
- Set boundaries
- Reframe rest as performance



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.

Lexapro

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

Pillar 5 — Avoiding Risky Substances

- The Chefs-vs-Doctors comparison.
- **Key finding:** the Global Burden of Disease 2016 analysis concluded the level of alcohol that minimizes health loss is zero — risk rises with consumption.
-

Monitor

Tobacco, alcohol, and other drugs

Pillar 6: Risky Substances

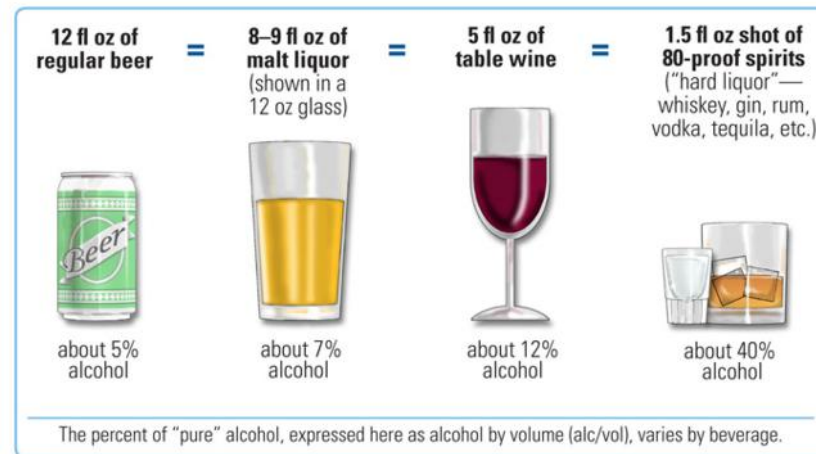
Alcohol

- 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

AHA Recommendations:

0-1 drinks for women

0-2 drinks for a men



<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.

Pillar 6 — Positive Social Connection

- **Landmark:** stronger social relationships are associated with ~50% greater likelihood of survival — comparable to major risk factors.
- **Recent (2023):** a meta-analysis of 90 cohorts (>2.2M people) found social isolation linked to ~32% higher all-cause mortality.
- **Strength of the profession:** the kitchen creates a built-in community — a protective asset when the culture is healthy.

~50%

greater likelihood of survival
with strong relationships

871,000

deaths a year linked to loneliness —
WHO 2025; 1 in 6 people affected

Results from 1979 prospective 9-year study

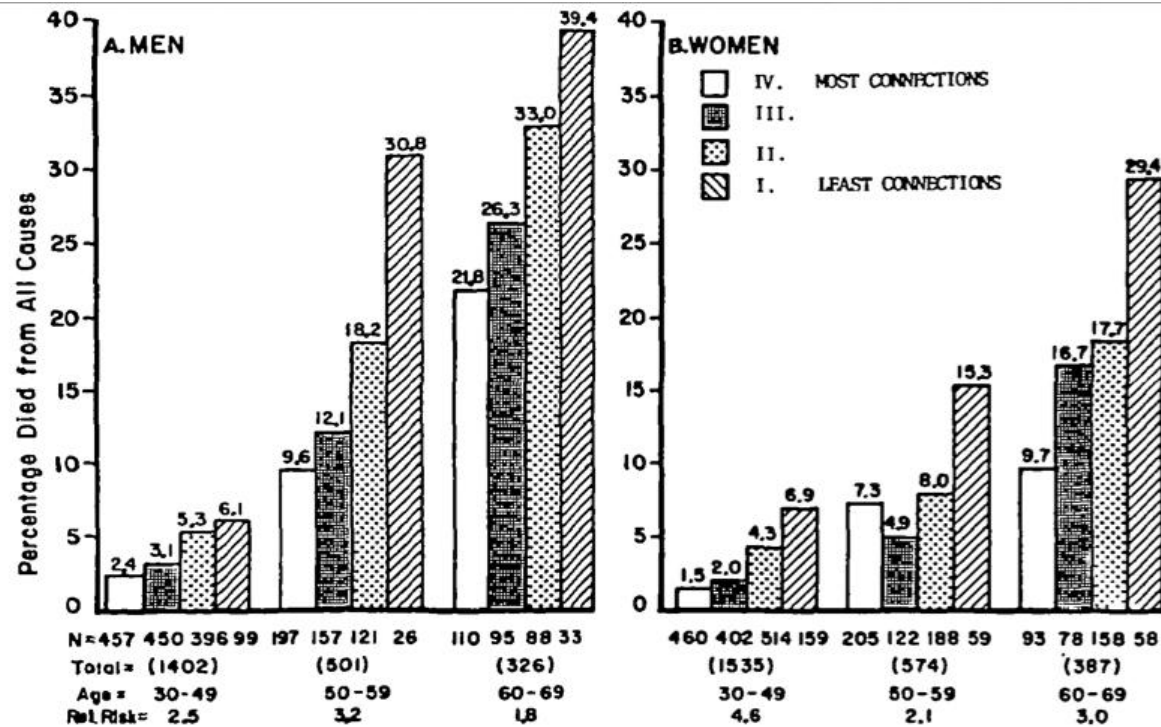


FIGURE 1. Age and sex-specific mortality rates from all causes per 100 for Social Network Index, Human Population Laboratory Study of Alameda County, 1965-1974.

Berkman LF, Syme SL. Social networks, host resistance, and mortality: a nine-year follow-up study of Alameda County residents. *Am J Epidemiol* 1973;77:1203-1213.

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.

Lifestyle Medicine Health Behavior Scale —Validated Tool for all Six Pillars

Lifestyle Medicine Health Behavior Scale

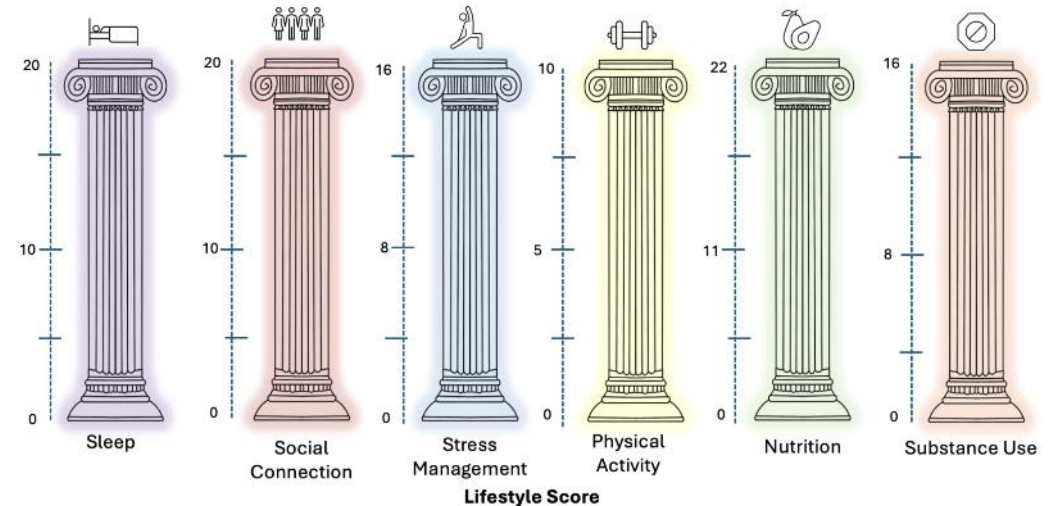
The Lifestyle Medicine Health Behavior (LMHB) scale is a valid and reliable tool to assess the six lifestyle medicine pillars (sleep, social connection, stress management, physical activity, nutrition, and substance use) (Pangalangan et al., 2024).

How to score: Each of the six lifestyle pillars can be scored individually by adding the point values seen by the response they selected for each question. A higher score is indicative of a healthier lifestyle in that pillar. Scores can be plotted on the lifestyle pillar visual.

*Note that all of the social connection items and 2 of the stress items are reverse coded. These items are highlighted. The scoring beside these items are already reversed for ease of scoring.

Use: This is a self-report tool to obtain an overall picture of wellbeing. If used in practice or an academic setting, please be sure to include the appropriate [citation](#):

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



Instructions: Add up the total score for each lifestyle medicine health behavior and plot it on the appropriate pillar.

Citation: 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

Bringing the Pillars Together

- The six pillars interlock: better sleep steadies stress and appetite; better food supports mood, anxiety, and metabolism; connection buffers stress and substance risk.
- The chef is uniquely positioned — the one professional who can make the healthy choice the delicious default.
- The ripple effect: a chef who lives the pillars changes their own trajectory and the health of an entire dining room.

Recap of 6 Pillars

- Nutrition
- Physical activity
- Sleep
- Stress management
- Avoid risky substances
- Social connection

Takeaways You Can Use Upon Return

- **For yourself:** protect a consistent sleep window; build in recovery and brief stress down-regulation; reconsider alcohol with the data in mind; stay connected.
- **For your food:** lean into plant-forward, Mediterranean-style cooking — evidence-based for mood, anxiety, stress, and the heart.
- **The mindset:** treat food and lifestyle as cellular medicine, deliciously delivered.

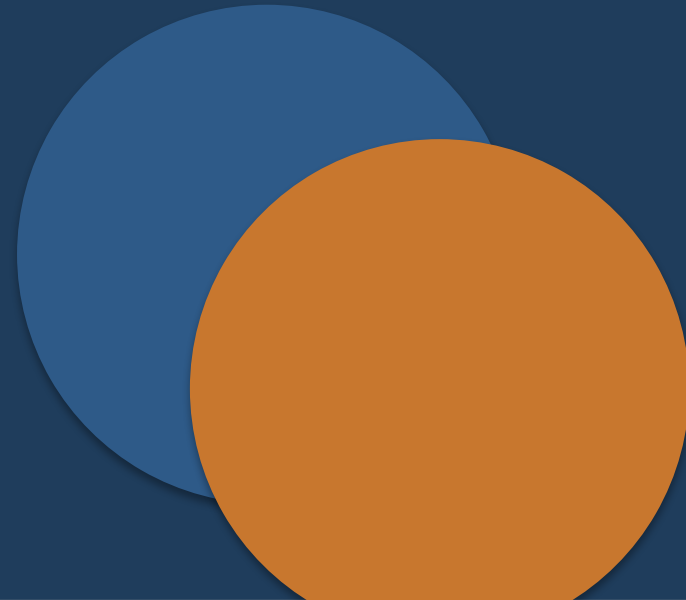
Checklist

1. What pillars are going well for you?
2. Take the Lifestyle Behavior Health Survey
3. Monitor your own pillars of lifestyle medicine
4. Find ways to make the pillars fun.
5. Create routines.
6. Create culture.
7. Create community.
8. Find ways to make the healthy choice the easy choice.
9. Remember, we are in this together.
10. Take time for yourself.

Questions & Discussion

The biology of nourishing yourself is as real and actionable.

Thank you · full reference list –slides at end



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