



**Brigham and Women's Hospital**  
Founding Member, Mass General Brigham

# **Aging and Longevity for the Internist: Why and Why Now?**

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Professor Emeritus of Medicine  
Division of Geriatrics, Department of Medicine  
University of California, San Francisco



# Louise Aronson, MD MFA



Medical school: **Harvard Medical School**

Internal Medicine Residency, Outpatient Chief  
Medical Residency, Geriatrics Fellowship: **University  
of California, San Francisco (UCSF)**

Current positions:

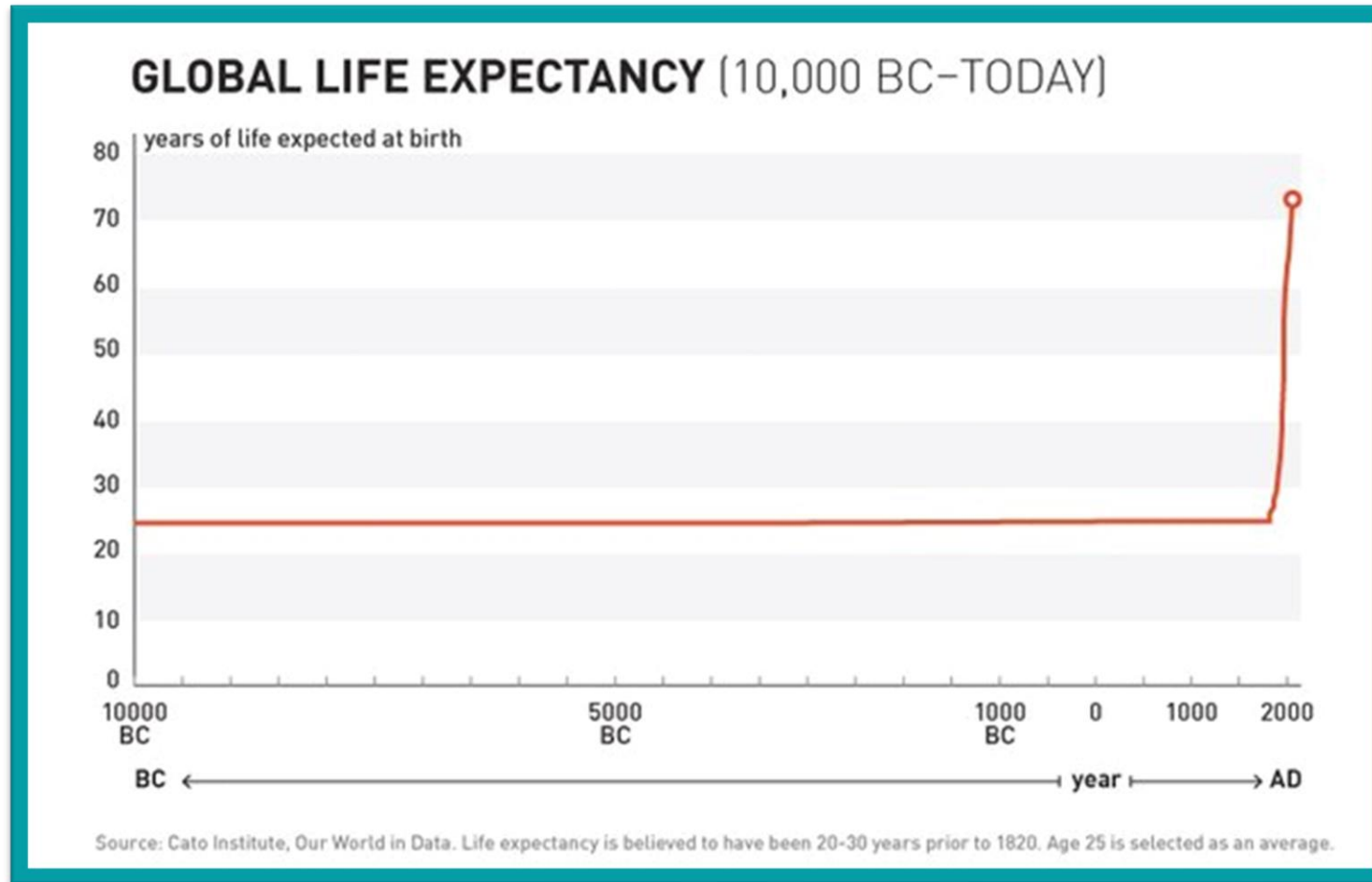
- Professor Emeritus, UCSF
- President, Harvard Medical Alumni Association
- Author, *Elderhood: Redefining Aging, Transforming Medicine, Reimagining Life*

# DISCLOSURES

I have no relevant financial relationships with ineligible companies.



# Recent History of Human Aging

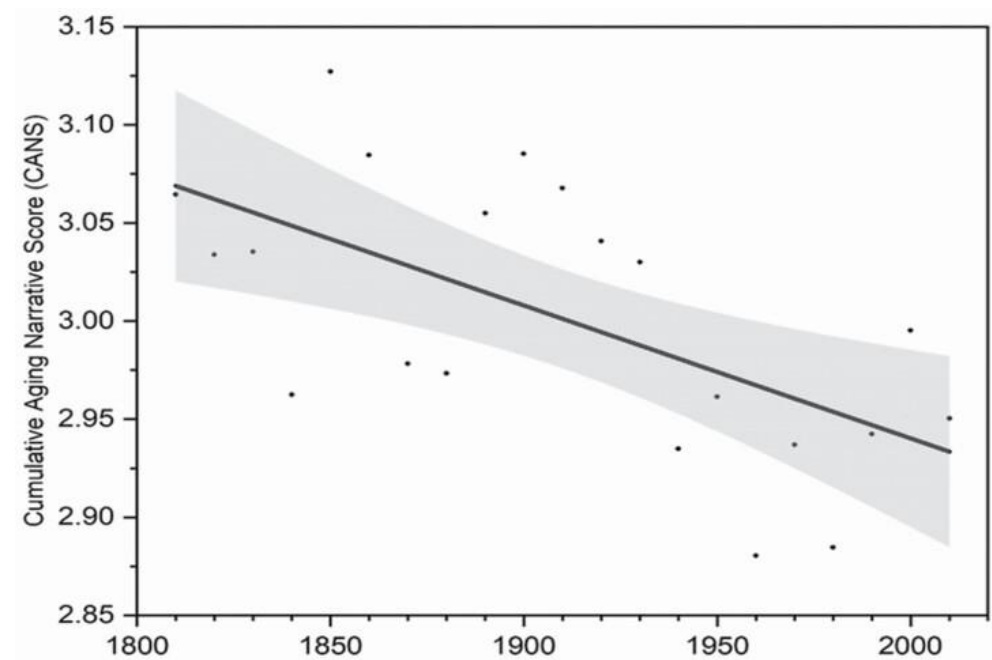


# OBJECTIVES

Identify	reasons for internists to learn longevity medicine
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# Aging Narratives Over 210 Years (1810-2019)

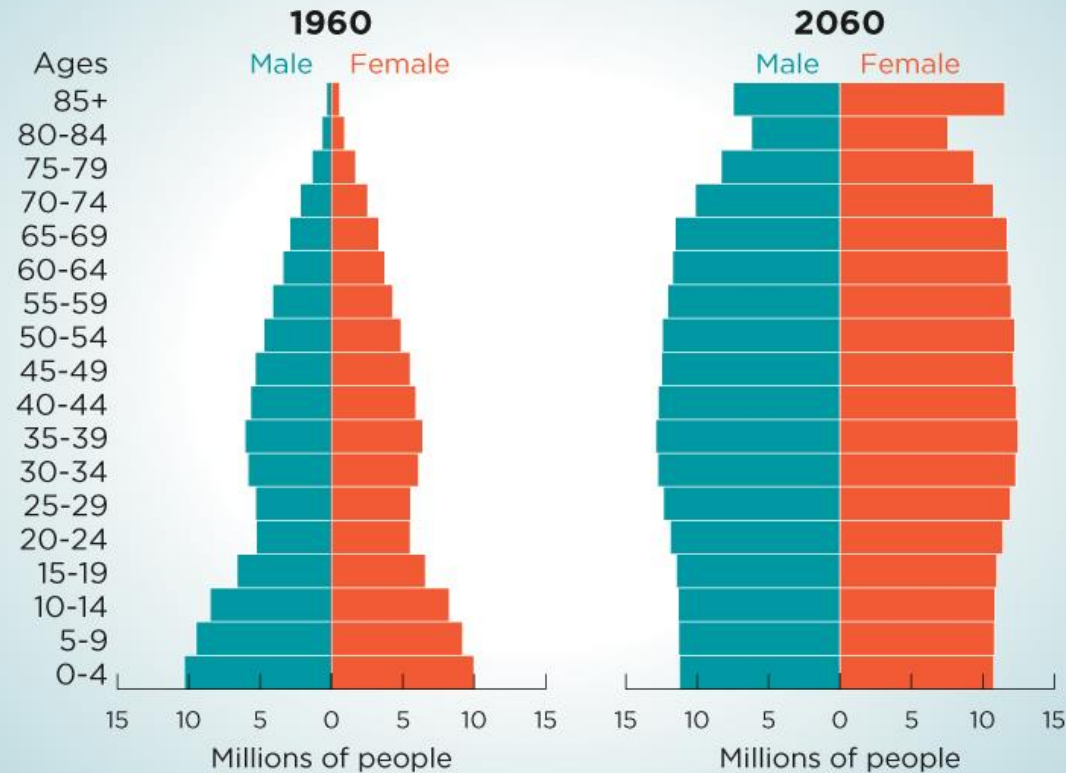


Genre	1800s Narratives	1900s Narratives
Newspapers	Marriage Family life Courtroom proceedings	Chronic conditions Social welfare Disability
Magazines	Family honor War heroism Love	Death Caregiving Nursing homes
Non-fiction books	Family relationships Marriage Royal families	Death Illness Healthcare
Fiction books	Courtship and romance War heroism Daily grind	Showbiz Retirement homes Courtship and romance



# From Pyramid to Pillar: A Century of Change

Population of the United States



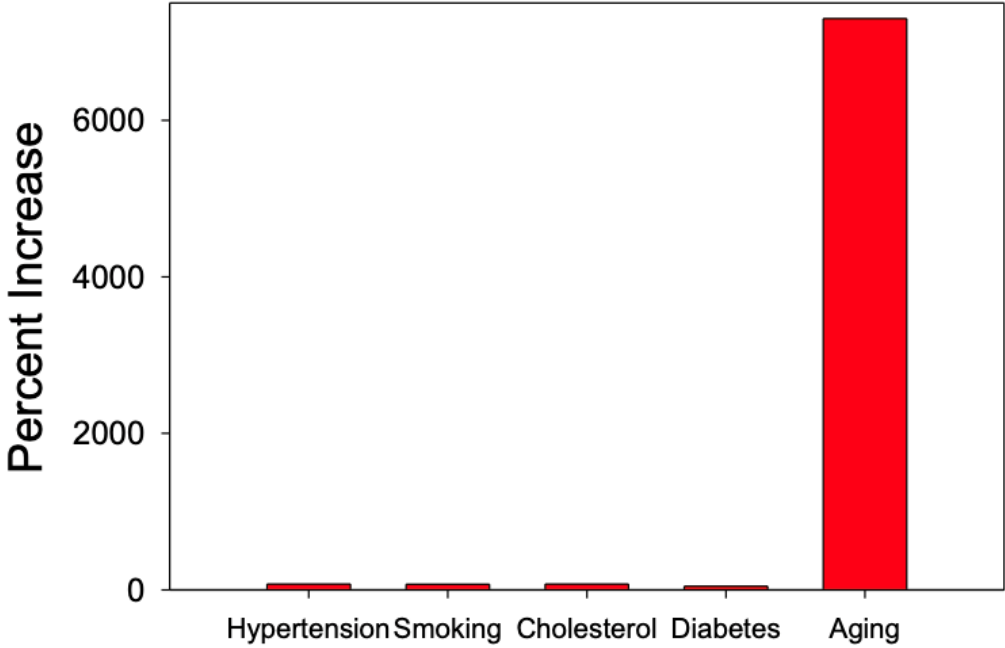
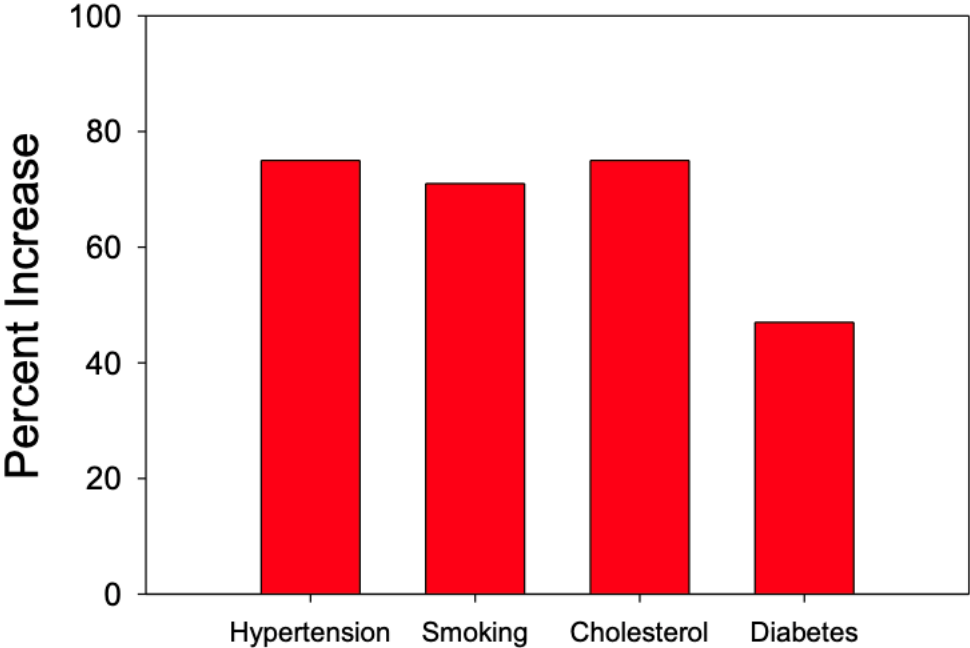
United States®  
**Census**  
Bureau

U.S. Department of Commerce  
U.S. CENSUS BUREAU  
[census.gov](https://www.census.gov)

Source: National Population  
Projections, 2017  
[www.census.gov/programs-surveys/popproj.html](https://www.census.gov/programs-surveys/popproj.html)

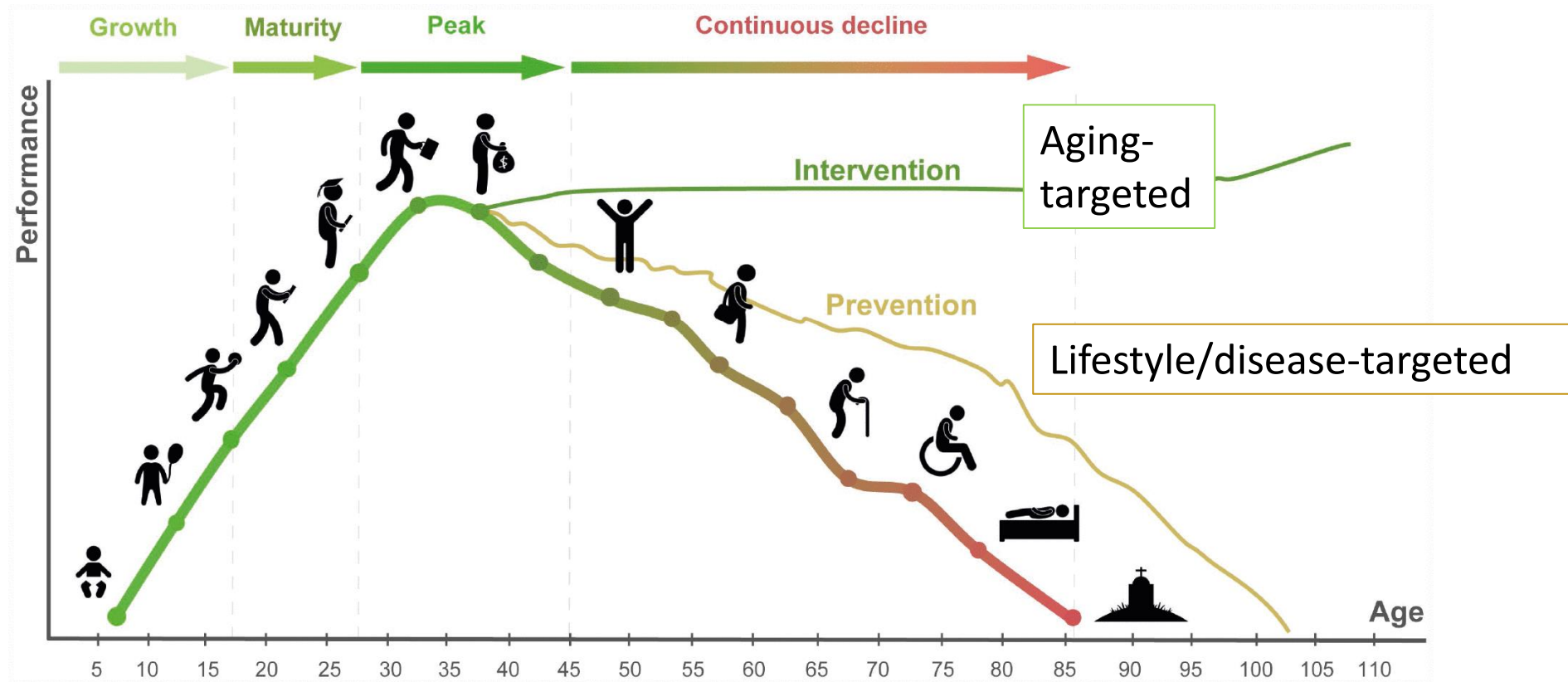


# Risk Factors for Heart Disease

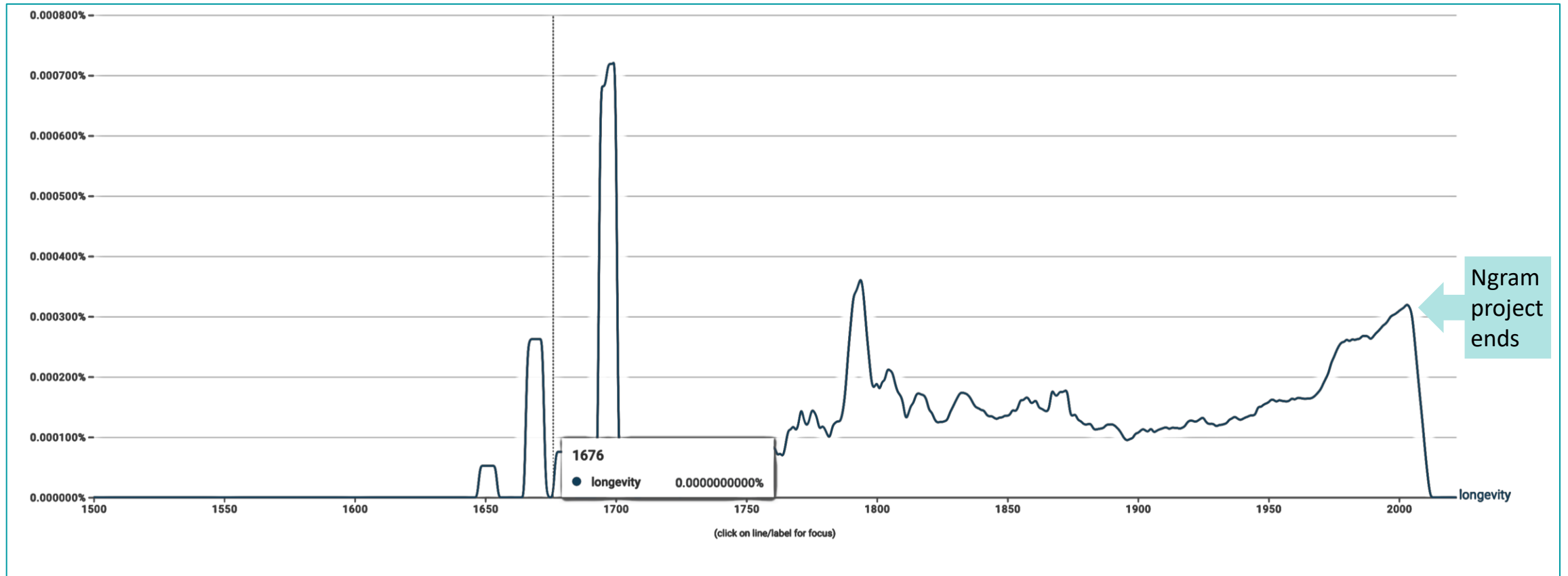




# Approaches to Longevity



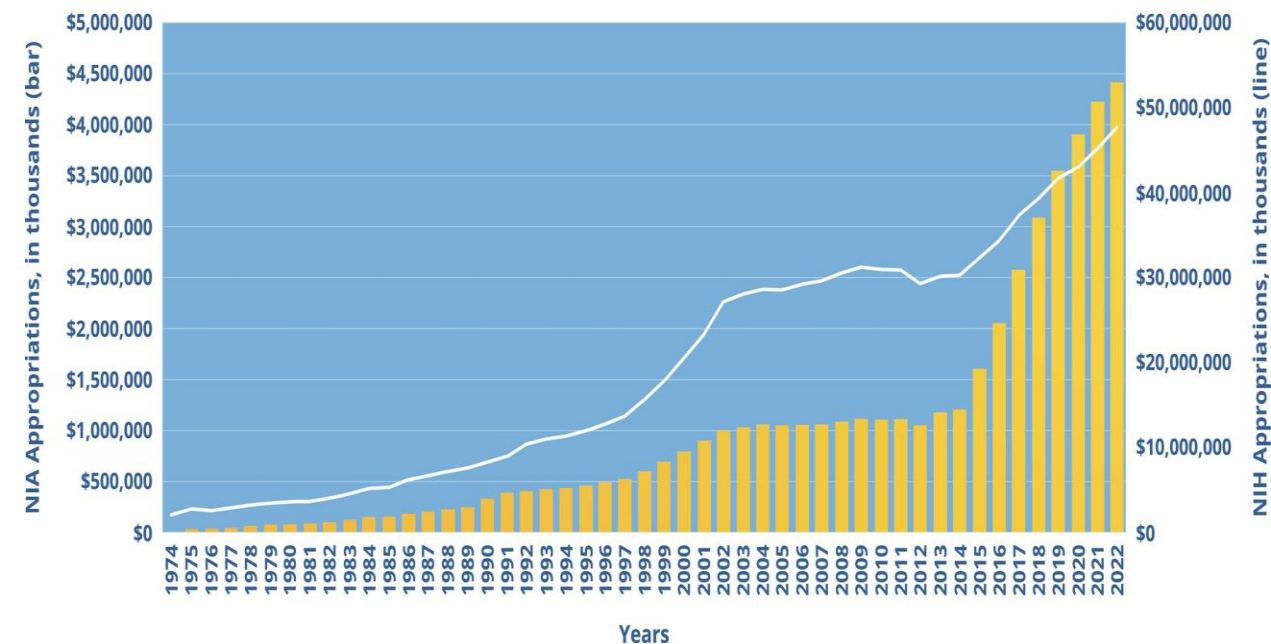
# Interest in Longevity: Not New but on the Rise



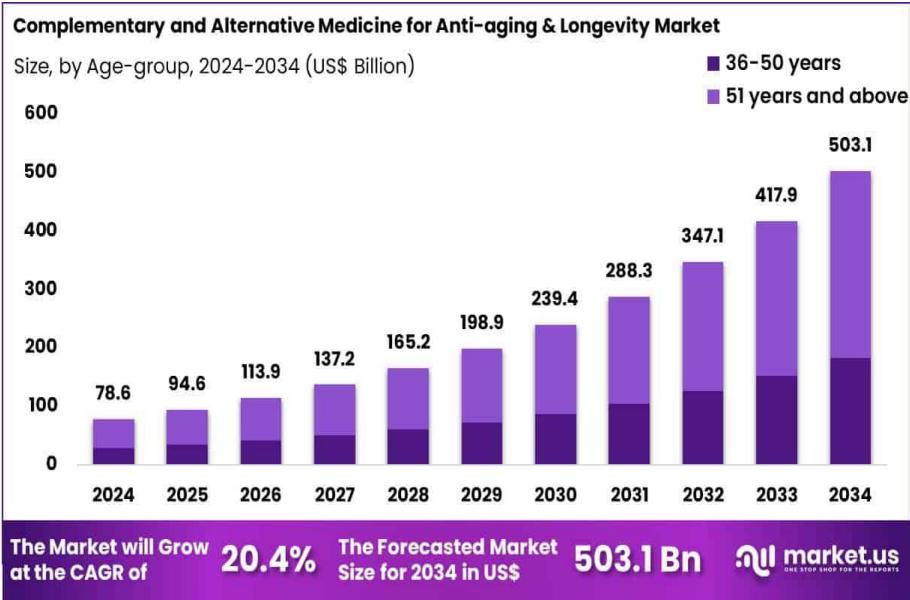
Google N-gram Viewer: Books on Longevity through 2019



# The Rapidly Rising Investment in Aging



NIA's yearly appropriations (yellow bars)  
 NIH appropriations (white line)



Complementary & Alternative Medicine  
 for Anti-Aging and Longevity







# Some people want to live forever



# The Goal: Increasing Healthspan



# Negative attitudes about aging correlate with

1. Higher cardiovascular risk
2. Biomarkers of Alzheimer's Disease
3. Dying 7 years before matched peers
4. Slower walking speed
5. None of the above
6. All of the above




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AGS Geriatrics Healthcare Professionals  
Leading Change. Improving Care for Older Adults.

ABOUT US MEMBERSHIP PROGRAMS PUBLICATIONS & TOOLS GER

## Our Mission

To improve the **health** independence, and quality of life of **all** older people.

### SPECIAL ARTICLES

#### Failing to Focus on Healthy Aging: A Frailty of Our Discipline?

*Susan M. Friedman, MD, MPH, AGSF, Krupa Shah, MD, MPH, and William J. Hall, MD*

*J Am Geriatr Soc 63:1459–1462, 2015.*

### Journal of the American Geriatrics Society



Special Article | [Free Access](#)

#### Healthy Aging: American Geriatrics Society White Paper Executive Summary

Susan M. Friedman MD, MPH, AGSF✉, Paul Mulhausen MD, MHS, AGSF, Maryjo L. Cleveland MD, Patrick P. Coll MD, AGSF, Kathryn M. Daniel PhD, RN, AGSF ... [See all authors](#) ▾

First published: 01 November 2018 | <https://doi.org/10.1111/jgs.15644> | Cited by: 2

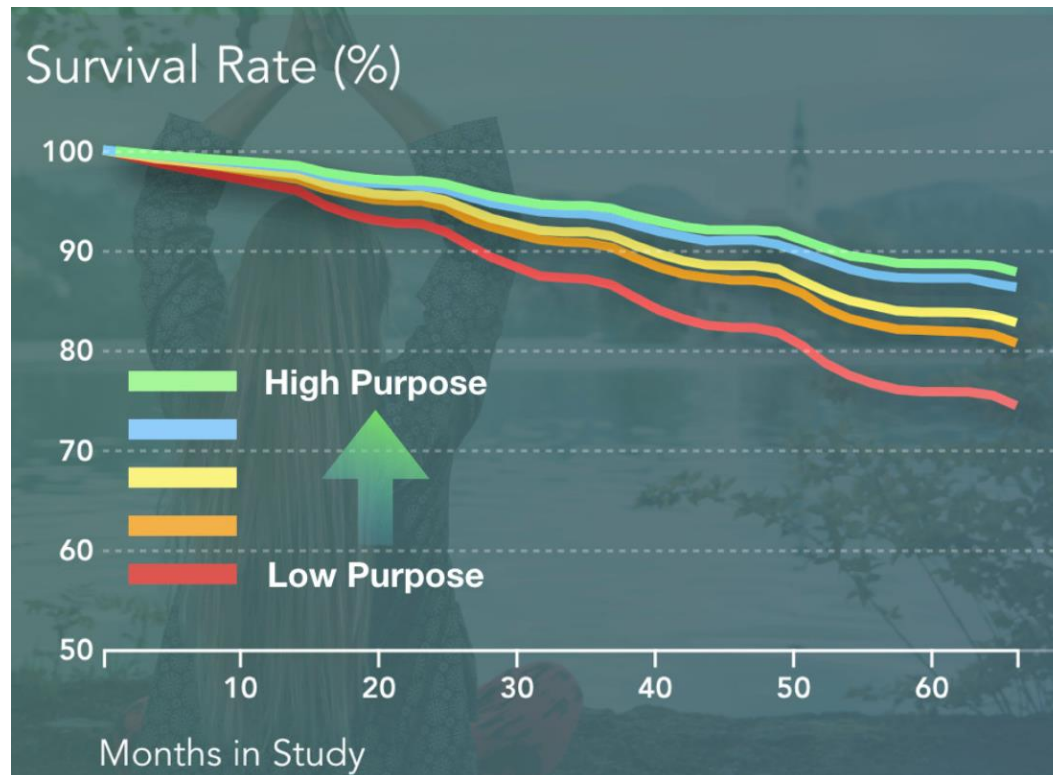


# Lifestyle Medicine



# Purpose Improves Health

## Longer Life



## Better Life



Better cognitive  
function



Better physical  
function



Better sleep &  
quality of life



Less heart and  
digestive disease



Better self-care  
(floss, exercise,  
go to doctor)

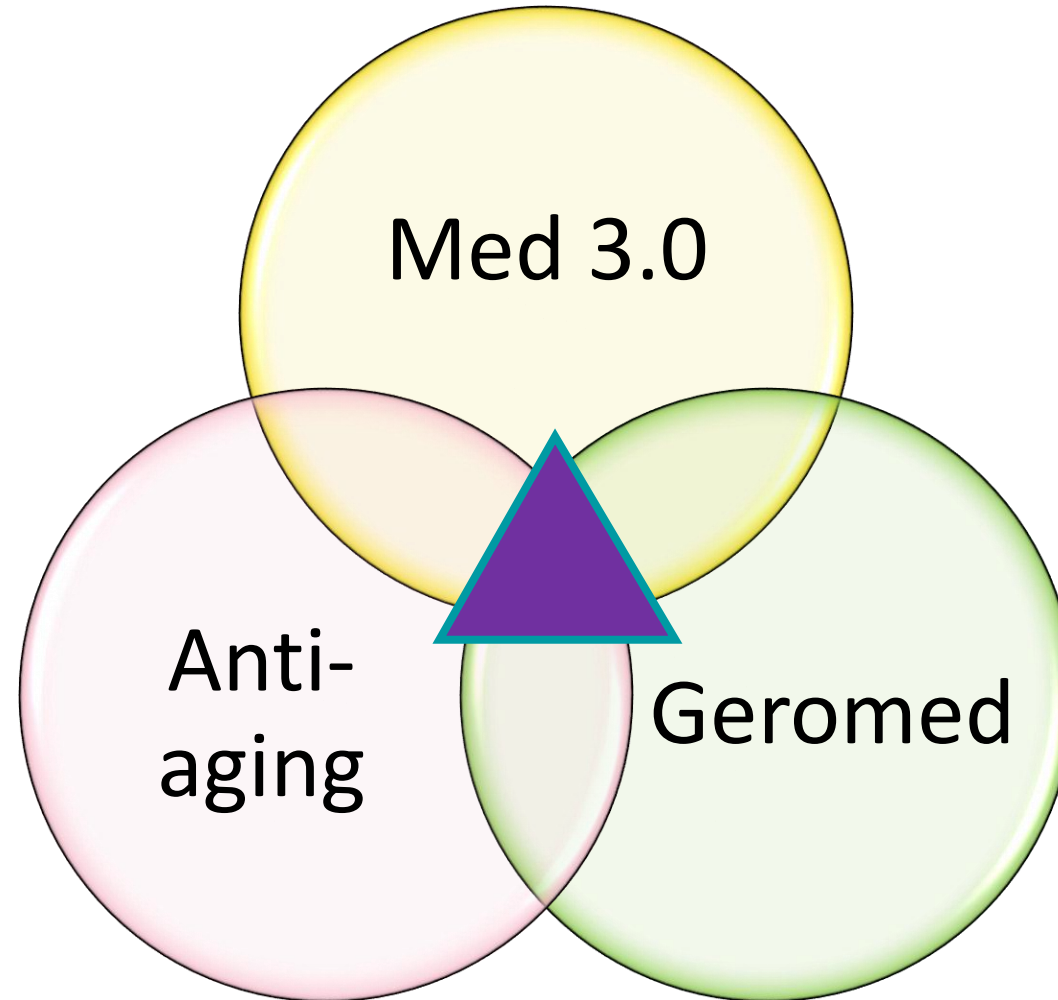


# Types of “Longevity” Medicine

	Anti-Aging	Medicine 3.0	Geromedicine
<b>Focus</b>	Reverse aging Look younger Live longer	Extend healthspan Slow aging	Prevent disease Optimize health Increase resilience
<b>Target patients</b>	Middle-aged to older adults	Healthy adults	All ages
<b>Tools</b>	Supplements Aesthetics Hormones Regenerative medicine	Aging clocks Wearables Imaging Lifestyle Senolytics	Biomarkers AI polygenic risk scores Multi-omics Gerotherapeutics
<b>Scientific Integrity</b>	Often Low	Varies	High
<b>Availability</b>	High, for \$	Often requires \$\$	Low/experimental
<b>Who</b>	A4M	Peter Attia	Buck Institute



# Types of Longevity Medicine



Proactive  
Age-informed  
Aging focused



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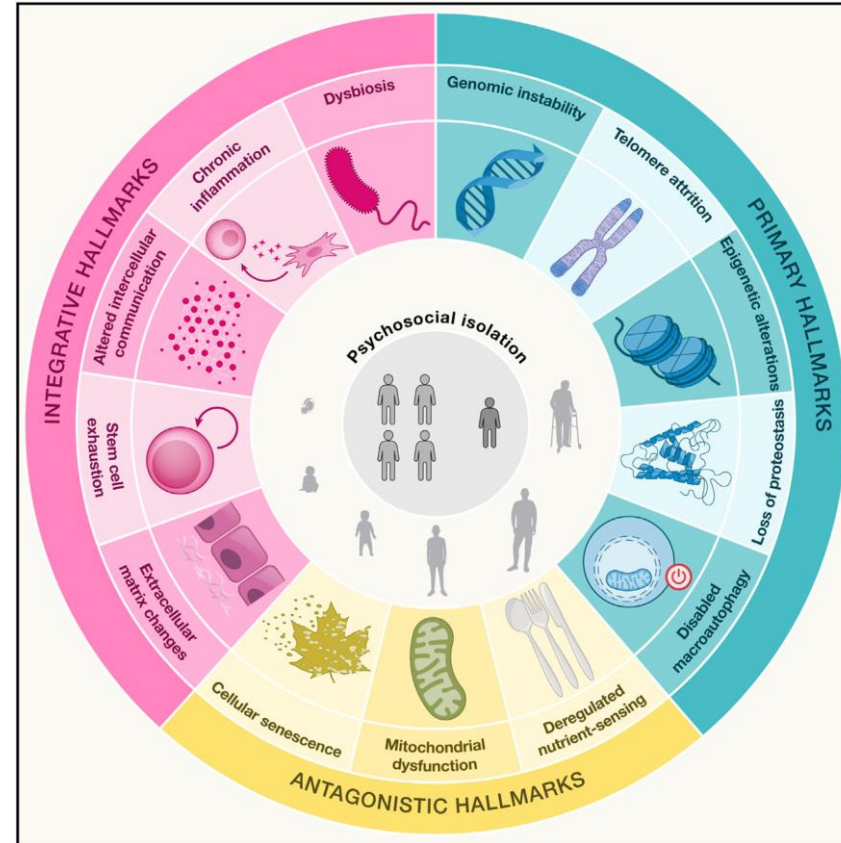
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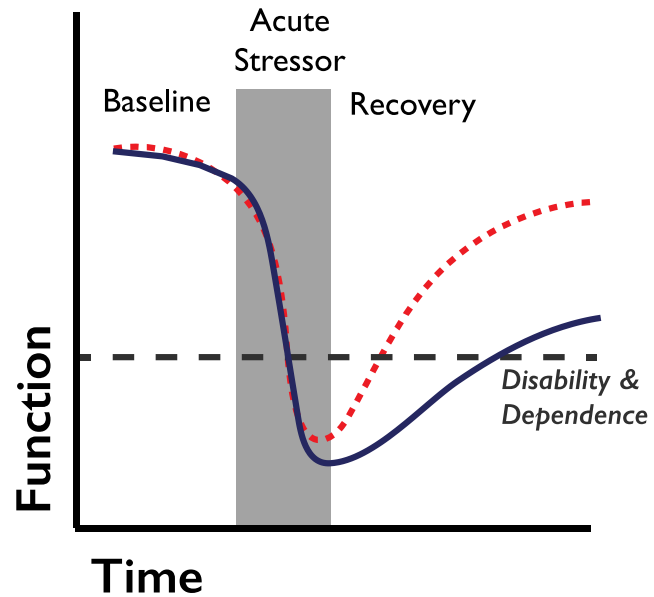


# Geroscience Targets the Biological Hallmarks of Aging

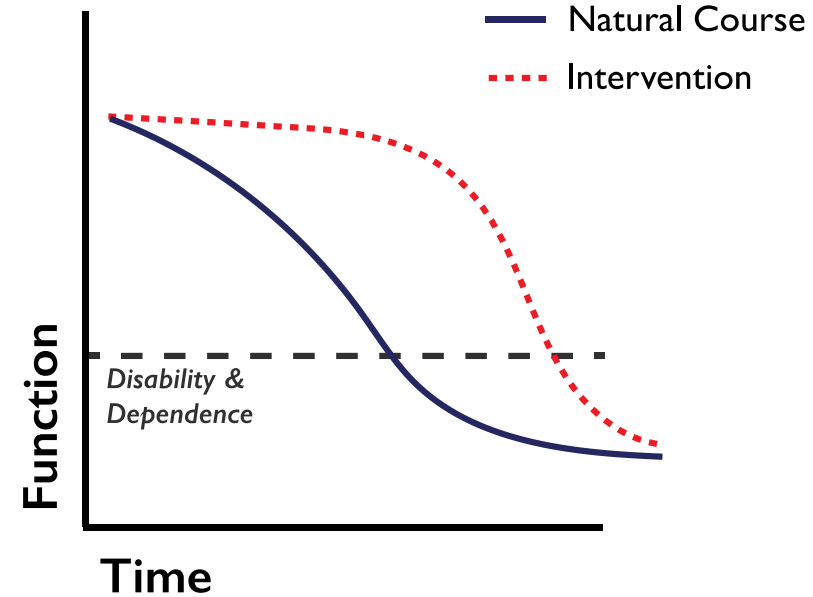


# Geroscience Approaches

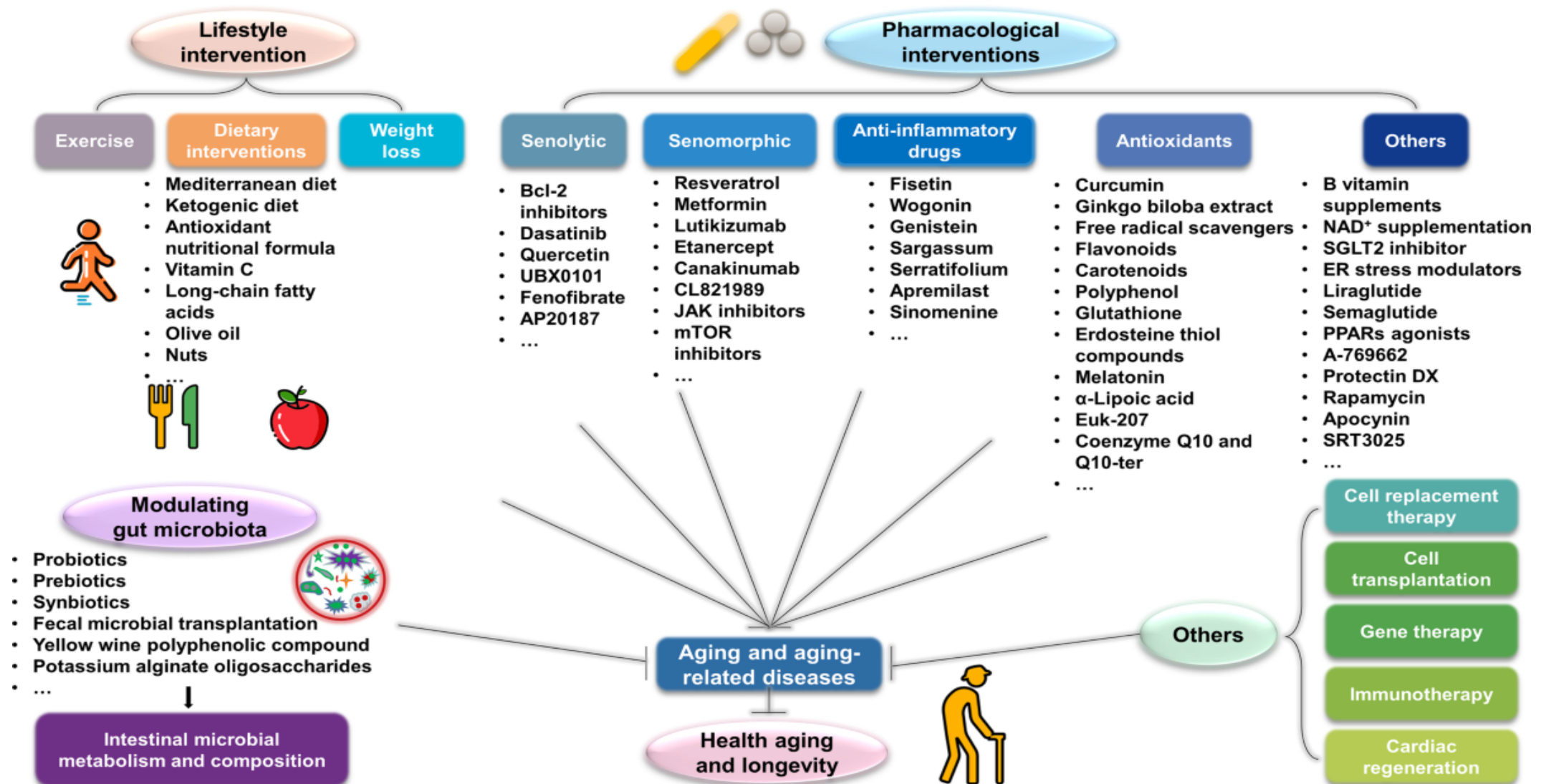
## A. Enhancing Resilience



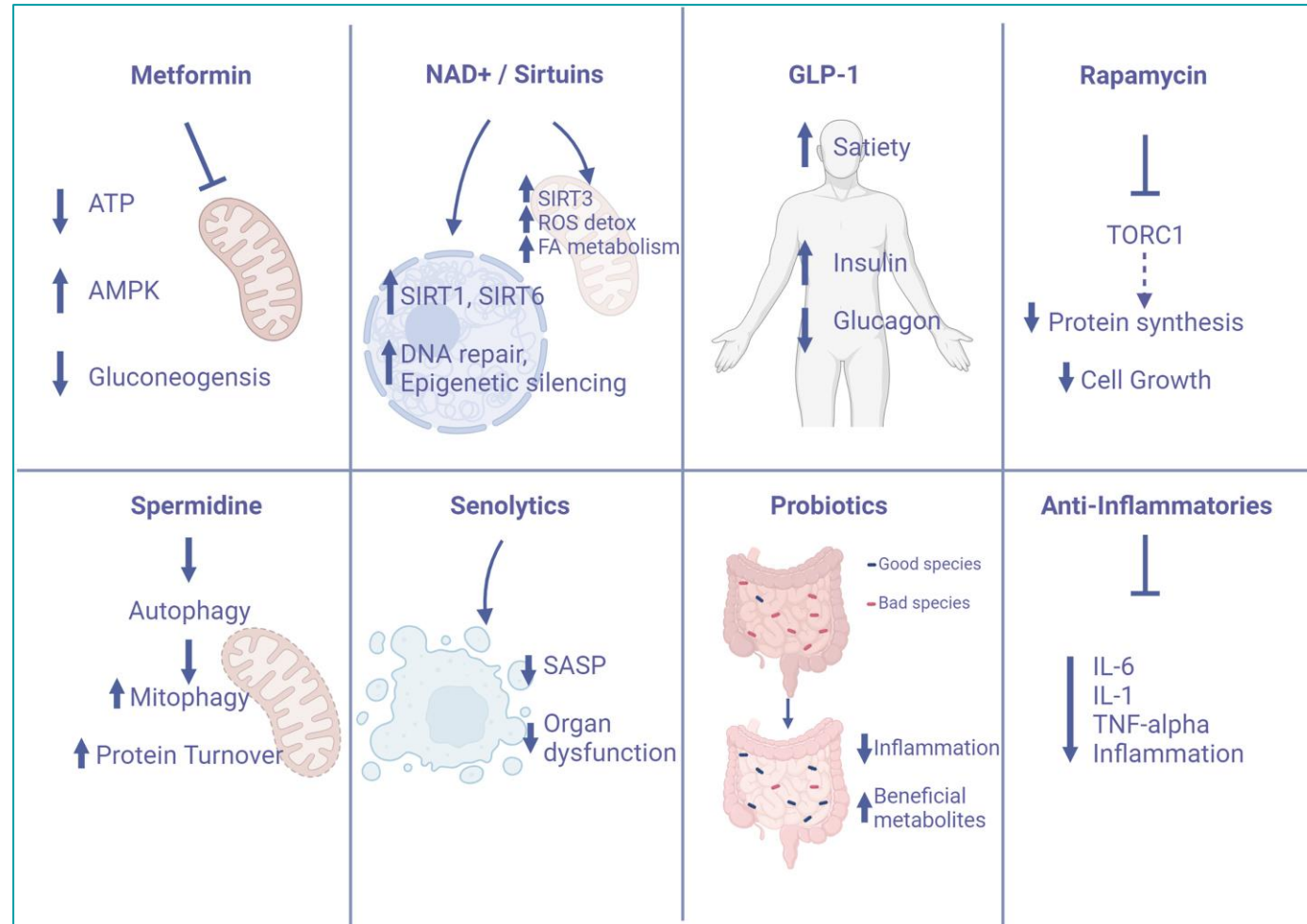
## B. Prolonging Healthspan



# Possible Interventions + Treatments v Aging-related Diseases



# No FDA-approved Treatment Strategies



# A 2026 study of attitudes about aging and health with 11k participants aged 65-99 followed for up to 12 years found:

1. Declines in cognitive function and/or walking speed in **95%** of participants
2. Declines in cognitive function and/or walking speed in **75%** of participants
3. Improvements in cognitive function and/or walking speed in **15%** of participants
4. Improvements in cognitive function and/or walking speed in **45%** of participants
5. Improvements in cognitive function and/or walking speed in **65%** of participants



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# The Longevity Bros

## The New York Times

### He Built a Wellness Empire While Adventuring With R.F.K. Jr.

Dr. Mark Hyman, a “functional medicine” proponent and longtime friend of Robert F. Kennedy Jr., is finding powerful allies in his bid to treat disease with blood tests and supplements.

David Sinclair, a Harvard geneticist and longevity researcher, co-founded **Sirtris Pharmaceuticals** in 2004, which was acquired by GlaxoSmithKline (GSK) in 2008 for approximately **\$720 million**. While the company was sold for a high valuation, the technology it was based on—specifically resveratrol-based anti-aging compounds—later faced significant scientific criticism and commercial failure. [Nature +2](#)

TECHNOLOGY

### The misleading information in one of America’s most popular podcasts

The Huberman Lab has credentials and millions of fans, but it sometimes oversteps medical fact.

by **A.W. Ohlheiser**  
May 2, 2024 at 10:05 AM PDT



Newsletters

*The Atlantic*

HEALTH

### The Longevity Influencer Who Went Into ‘Withdrawal’ Without Jeffrey Epstein

Peter Attia is all over the Epstein files.

### ‘My ultimate goal? Don’t die’: Bryan Johnson on his controversial plan to live for ever

**Joel Snape**

The tech entrepreneur is waging a one-man war against ageing. But is taking 100 pills a day, finishing your meals by 11am, giving up both alcohol and a social life, really worth it?





# The Good, the Bad, and the Ugly

Taking aging seriously

Prevention and personalization

Early intervention vs risk factors

Use of emerging tests and technologies

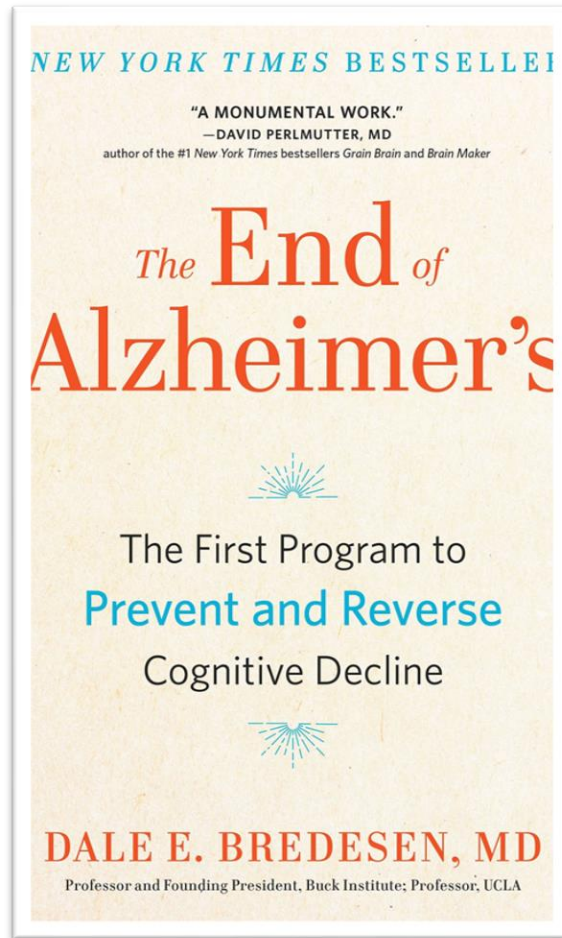
Over testing and overtreatment

Not always evidence-based

Commercialization  
Profiteering  
Worsening inequity



# Even More Controversial



A screenshot of the Apollo Health website (apollohealth.com) is shown. The website has a dark blue header with the Apollo Health logo and navigation links: Solutions, Bredesen Protocol, Dr. Bredesen, Practitioners, Coaches, News, About, and a Login button. The main content area features the heading "First to Publish Reversal of Cognitive Decline". Below this, a paragraph states that Dr. Dale Bredesen, CSO for Apollo Health, was the first neurodegenerative disease researcher to publish peer-reviewed groundbreaking studies on reversing cognitive decline in Alzheimer's disease. It notes that everyone knows a cancer survivor, but no one knows an Alzheimer's survivor, until now. Another paragraph explains that the following studies shattered preconceived notions and beliefs that Alzheimer's is unsurvivable, fostering hope for those facing cognitive decline or caring for someone who is. A list of three studies is provided: "Reversal of cognitive decline: a novel therapeutic program (Aging, 2014)", "Reversal of cognitive decline in Alzheimer's disease (Aging, 2016)", and "Reversal of Cognitive Decline: 100 Patients - (Journal of Alzheimer's Disease & Parkinsonism, 2018)". To the right of the text is a circular diagram with three green circles connected by arrows, representing the timeline of these studies. The circles are labeled with the years 2014, 2016, and 2018. The text next to each circle describes the study: "Reversal of cognitive decline: a novel therapeutic program (Aging, 2014)", "Reversal of cognitive decline in Alzheimer's disease (Aging, 2016)", and "Reversal of Cognitive Decline: 100 Patients (Journal of Alzheimer's Disease & Parkinsonism, 2018)".



# This is What Bad Science Looks Like

SCIENCE	MEND/RECODE
IRB Approval	Multiple rejections by public and private IRBs
Subject/patient consent	No mention anywhere
COPE, ICMJE, Declaration of Helsinki	0 of 3 articles meet widely accepted ethical criteria 2018 paper in predatory, open access journal
Robust, generalizable data	No patient selection criteria, info on cognitive changes, no standardized measurements, no blinding, different “subjective” changes in different patients, many blanks on data table, different evaluation and follow up, no methods sections or statistical significance tests
Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) initiative	Consistent overstatement in scientific, lay press, and for-profit company website
If benefits unclear, at least avoid harms	\$30,000 for patients 40% of monthly Medicare budget

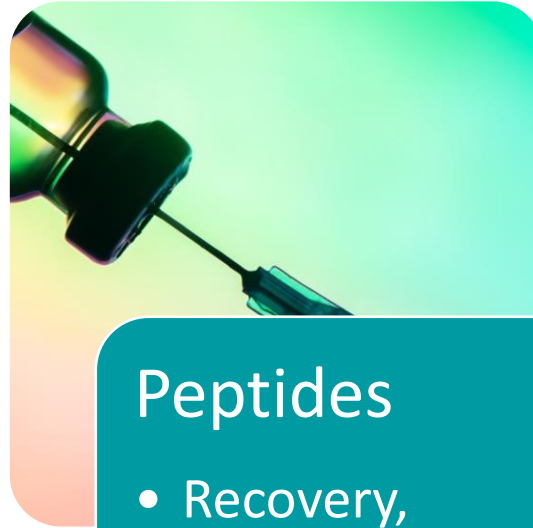


# Good for Aging, Bad for Health?



## NAD+

- Energy, skin, brain
- Cancer promotion



## Peptides

- Recovery, inflammation
- Side effects, hormone disruption



## Rapamycin

- Aging/disease prevention
- Side effects, no data

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# Promote Healthy Aging in All Patients Regardless of Age

Age	Goal	Examples of assessments and recommendations
<b>20-40</b>	Make physiological peak as high as possible	Assess tobacco, alcohol use, exercise and dietary habits Maximize peak cardiorespiratory capacity, bone density, muscle strength Develop stress management strategies Establish healthy sleep habits
<b>40-60</b>	Slow and prevent declines (even invisible ones)	Assess metabolic and cardiovascular risks Resistance training + increased protein intake to stem losses Begin balance maintenance Prioritize stress management and sleep at this high stress, low happiness stage of life
<b>60-80</b>	Maximize function and reserves	Assess bone density, cognition, grip strength, gait speed, balance Frailty and fall prevention with resistance and balance exercise Encourage social engagement and new learning Minimize polypharmacy
<b>80+</b>	Optimize quality and resilience	Assess function, frailty, cognition, social isolation, social supports, goals of life/care Focus on purpose, quality of life, accident avoidance, building resilience Continue frailty and fall prevention/management with resistance and balance exercise and without low expectations or defeatism



# Important Metrics to Add to Your New Patient Yearly Visit History:

## Loneliness and Social Isolation

### Three-Item UCLA Loneliness Scale

Lead-in and questions are read to respondent.

The next questions are about how you feel about different aspects of your life. For each one, tell me how often you feel that way.

First, how often do you feel that you lack companionship: Hardly ever (1), some of the time (2), or often (3)?

How often do you feel left out: Hardly ever (1), some of the time (2), or often (3)?

How often do you feel isolated from others: Hardly ever (1), some of the time (2), or often (3)?

#### Scoring:

Sum the total of all items. Higher scores indicate greater degrees of loneliness.

SOURCE: Hughes et al., 2004.

LSNS Item no.	Item
1	How many relatives do you see or hear from at least once a month?
2	How many relatives do you feel at ease with that you can talk about private matters?
3	How many relatives do you feel close to such that you could call on them for help?
4	How many of your friends do you see or hear from at least once a month?
5	How many friends do you feel at ease with that you can talk about private matters?
6	How many friends do you feel close to such that you could call on

The Lubben Social Network Scale (LSNS-6) items 2 .

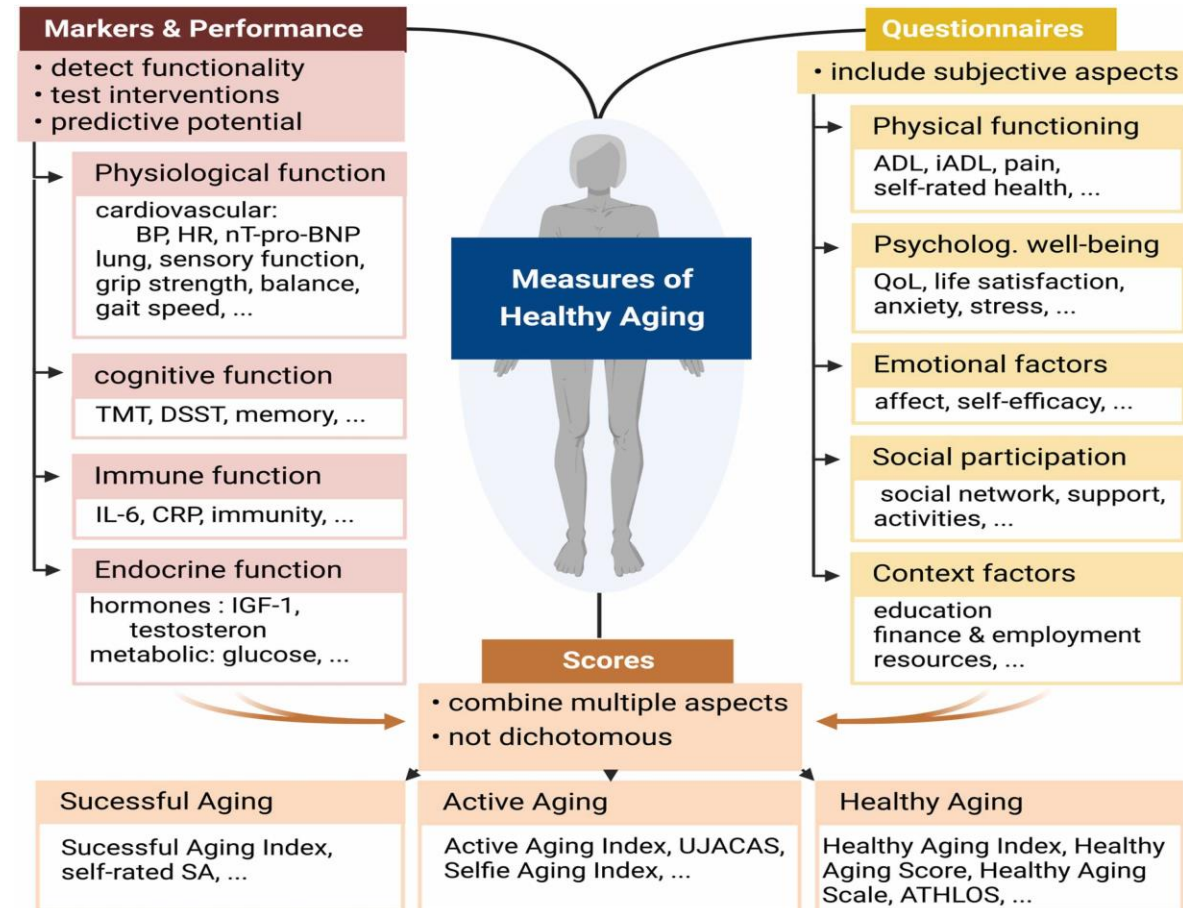




# Know Which Biomarkers You Already Assess... and consider adding 1+ in categories you currently miss

Biomarkers are measures that

- predict the rate of aging
- monitor a basic process that underlies the aging process, not the effects of disease
- can be tested repeatedly without harming the person
- work in humans and laboratory animals, such as mice





# Messaging

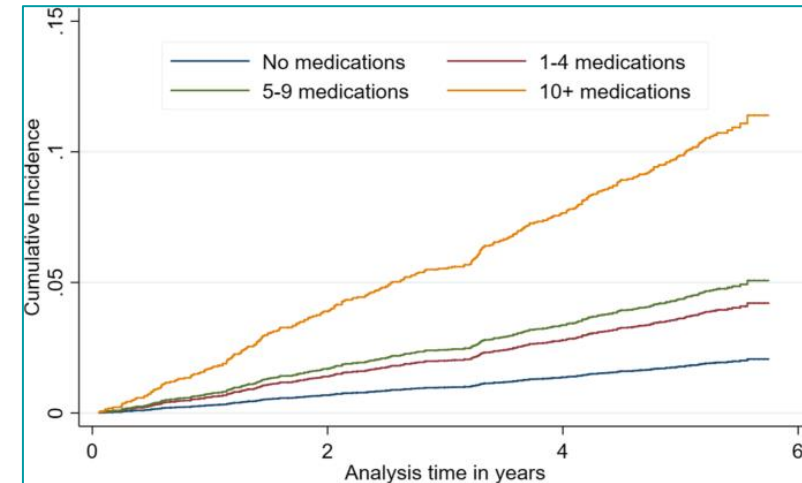
“Good news! I have already  
checked [many/most/all of]  
the [tests/biomarkers]  
\_\_\_\_\_.com uses.”



# Explain and Protect Patients from Risks of Supplements

## Supplement Advice for Patients

- Use often meets criteria for “medication”
  - Contributes to risks of med-med, med-disease, and med-person interactions
- Not regulated so manufacturing, transportation and storage matter a lot:
  - May have too much or too little of desired supplement
  - May contain other drugs
  - May have lost effect due to handling
- Look for NSF, USP, CL approval



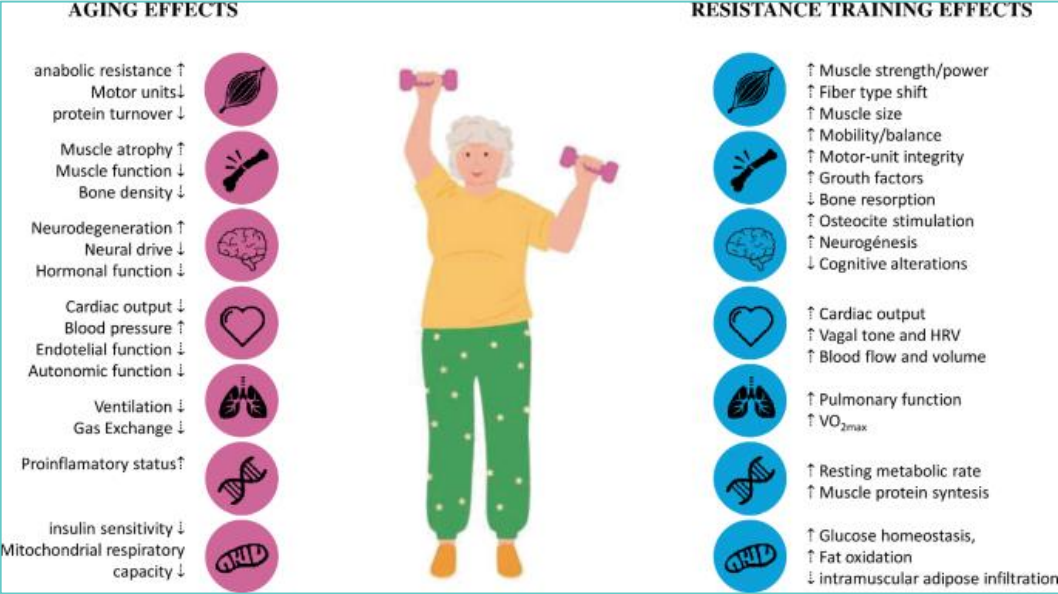
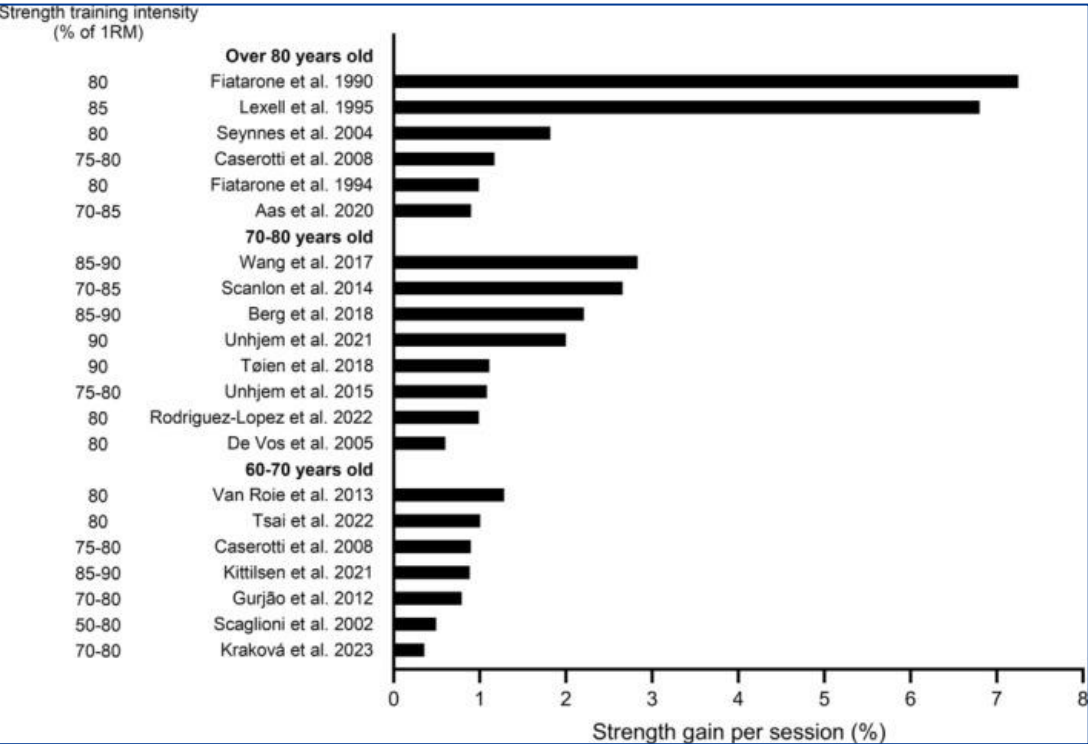
# Assess and Treat Hearing Loss Early

## Hearing aids and dementia

Observational studies suggest that using a hearing aid reduces the risk of developing dementia. This might be because untreated hearing problems contribute to cognitive decline. Another explanation is that only those who are cognitively unimpaired can cope with the challenges of wearing a hearing aid. A longitudinal study of nearly 400 000 US veterans finds that both these things are true. Incident dementia was reduced by a quarter among people who persistently used hearing aids. In contrast, more than half of those with pre-existing dementia discontinued using them (*Age Ageing* doi:[10.1093/ageing/afac266](https://doi.org/10.1093/ageing/afac266)).

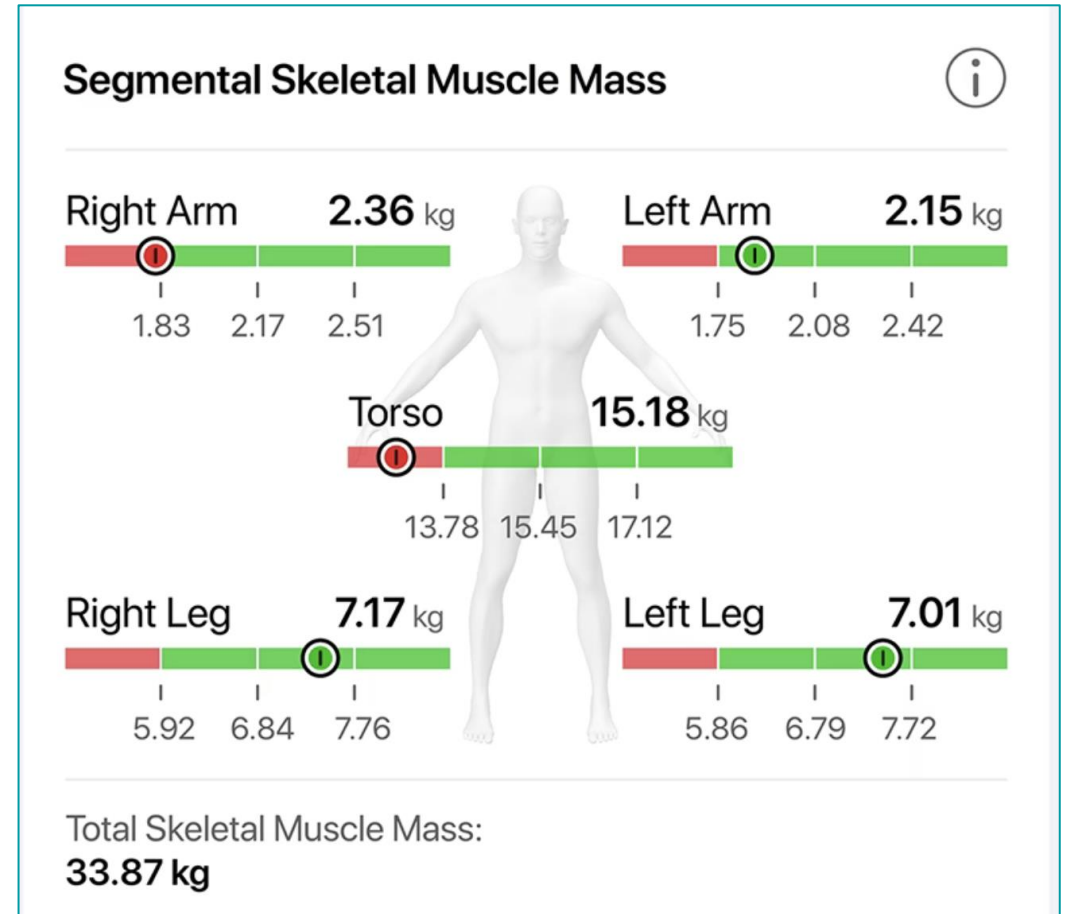
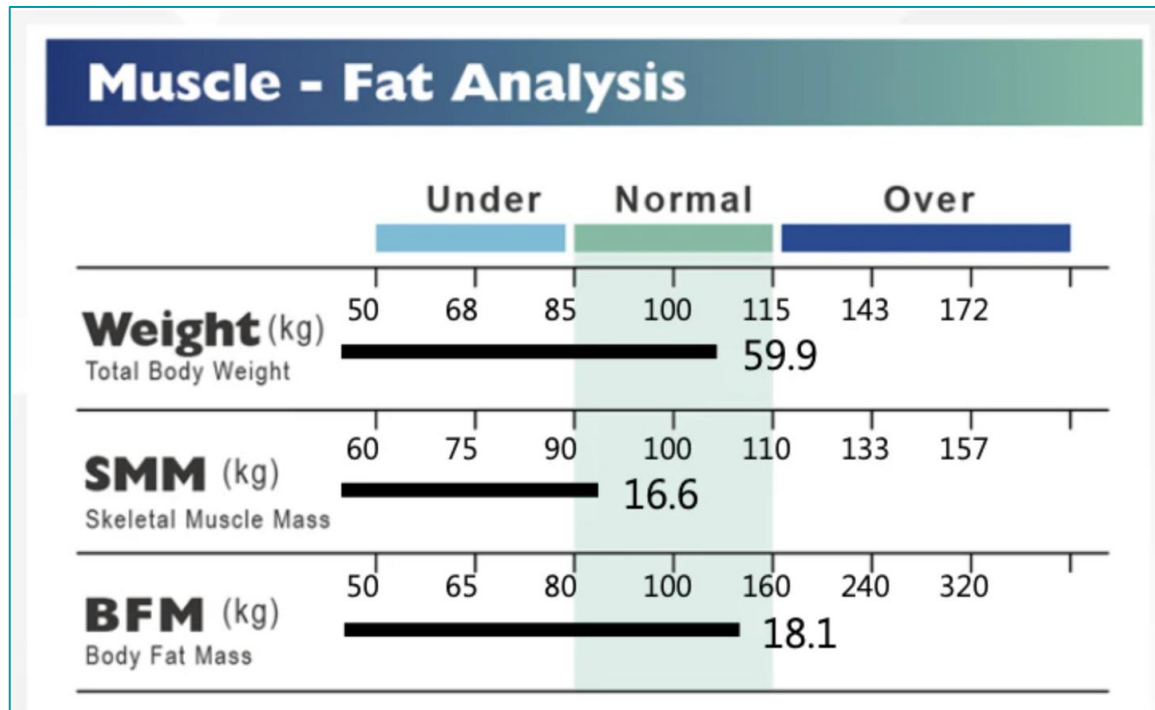


# Resistance Training



# Get an Office Scale that Provides Useful Information

(note: body composition is also available from DEXA scans)



# MOC REFLECTIVE STATEMENT (BRIEF TAKE HOME NOTES FOR REFERENCE)

In contrast to traditional medicine's focus on reactive disease treatment, healthy aging and longevity medicine prioritize preventative interventions and proactive healthspan optimization.

Medical care for healthy aging takes place across the lifespan and includes regular risk assessments (including biomarkers) not just for diagnosis but for pre-morbid decline trends, routine evaluation of physical strength and function, and more explicit prescriptions for exercise, diet, social engagement, sleep optimization and stress management.

Internists can promote healthy aging by helping young adults maximize their physiological peak, slowing and preventing declines in middle-aged adults, optimizing function and reserves in older adults, and building resilience and quality of life in elderly patients.



# REFERENCES

1. Kroemer G, Maier AB, Cuervo AM, Gladyshev VN, Ferrucci L, Gorbunova V, Kennedy BK, Rando TA, Seluanov A, Sierra F, Verdin E, López-Otín C. From geroscience to precision geromedicine: Understanding and managing aging. *Cell*. 2025 Apr 17;188(8):2043-2062.
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