

You + Me KNOWLEDGE CENTER

SIGNATURE GUIDE SERIES · 2026 EDITION

The Ultimate Guide to *Longevity* Medicine

Healthspan, biomarkers, hormones, NAD+, peptides & physician-supervised healthy aging

8 CHAPTERS | 8 FIGURES | 35–45 MIN READ

WELCOME

Welcome to the Knowledge Center

The You + Me Knowledge Center is our educational library. We want patients to have accurate, evidence-based health information, so they can make informed decisions alongside their healthcare providers.

This guide is part of our Signature Guide Series. Longevity is one of the most talked-about topics in healthcare, and one of the most misunderstood. The goal of this guide is to help you separate established science from hype, understand what can actually be measured and improved, and feel confident discussing healthy aging with a licensed provider.

EXECUTIVE SUMMARY

Adding healthy years, not just years

For most of medical history, healthcare has been reactive. We wait for disease to appear and then treat it. Longevity medicine takes a different approach. It focuses on identifying risk early, measuring the systems that influence how we age, and taking action years or decades before chronic disease develops.

The goal is not simply to live longer. It's to extend **healthspan**: the number of years you live in good health, with physical strength, mental clarity, and independence.

Most of what determines healthy aging is well understood. Cardiorespiratory fitness, muscle strength, metabolic health, sleep, nutrition, and social connection are among the strongest predictors of long-term health in medical research. Newer tools, such as advanced biomarkers, hormone therapy, and investigational therapies like NAD+ and peptides, may play a supporting role, but none of them replaces the fundamentals.

This guide was created to help you understand:

- What longevity medicine is, and what it is not.
- The biology of aging and why some people age faster than others.
- Which biomarkers and lab tests are most informative.
- Why muscle, fitness, nutrition, and sleep matter more than any supplement.
- How hormone changes affect aging in men and women.
- What the research currently shows about NAD+, peptides, and other emerging therapies.
- How physician-supervised longevity care differs from direct-to-consumer wellness products.

EDITOR'S NOTE

Real science, honest limits

Longevity is a field where the science is real but the marketing often gets ahead of the evidence. Social media is full of protocols, supplements, and "biohacks," many of which have never been tested in humans.

Three themes recur throughout this guide. First, the fundamentals have the strongest evidence: movement, strength, nutrition, sleep, and connection. Second, measurement matters. You can't improve what you don't understand, and the right biomarkers can reveal risk long before symptoms appear. Third, every patient is different. Longevity care should be personalized, supervised, and grounded in evidence.

As research evolves, so will this guide.

— The You + Me Editorial Team

HOW TO USE THIS GUIDE

Every chapter, the same rhythm

Each chapter follows the same format used across the Signature Guide Series:

- **The Science** explains how the body works in plain language.
- **Research Spotlight** summarizes what major studies and medical organizations tell us.
- **Clinical Pearl** offers short, practical, physician-style insights.
- **Myth vs. Fact** separates misconceptions from evidence.
- **Key Takeaways** recap the most important points.
- **Your Next Step** suggests the next helpful resource.

! IMPORTANT MEDICAL DISCLAIMER

This guide is for educational purposes only. It is not medical advice and should not replace consultation with a licensed healthcare provider. Some therapies discussed here are investigational, prescribed off-label, or not approved by the FDA for aging-related uses. Always discuss your personal medical history, medications, and goals with your healthcare provider before beginning, changing, or stopping any treatment. Individual results vary.

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PART 1 · FOUNDATIONS OF LONGEVITY

CHAPTER 01

What Is Longevity Medicine? Lifespan vs. Healthspan

◆ KEY TAKEAWAY

Longevity medicine is a proactive, preventive approach to healthcare that aims to extend healthspan, the years lived in good health, by measuring risk early and addressing the root drivers of chronic disease before symptoms appear.

IN THIS CHAPTER

01 Living longer vs. living better

02 From reactive care to proactive care

03 The four conditions that matter most

04 What longevity medicine is, and what it is not

Living longer vs. living better

Life expectancy rose dramatically over the last century, mostly because of vaccines, antibiotics, sanitation, and emergency medicine. Many people now spend their final decade or more living with chronic conditions such as heart disease, type 2 diabetes, dementia, frailty, and cancer.

The difference between **lifespan** (how long you live) and **healthspan** (how long you live in good health) is often called the healthspan gap. Longevity medicine aims to narrow that gap.

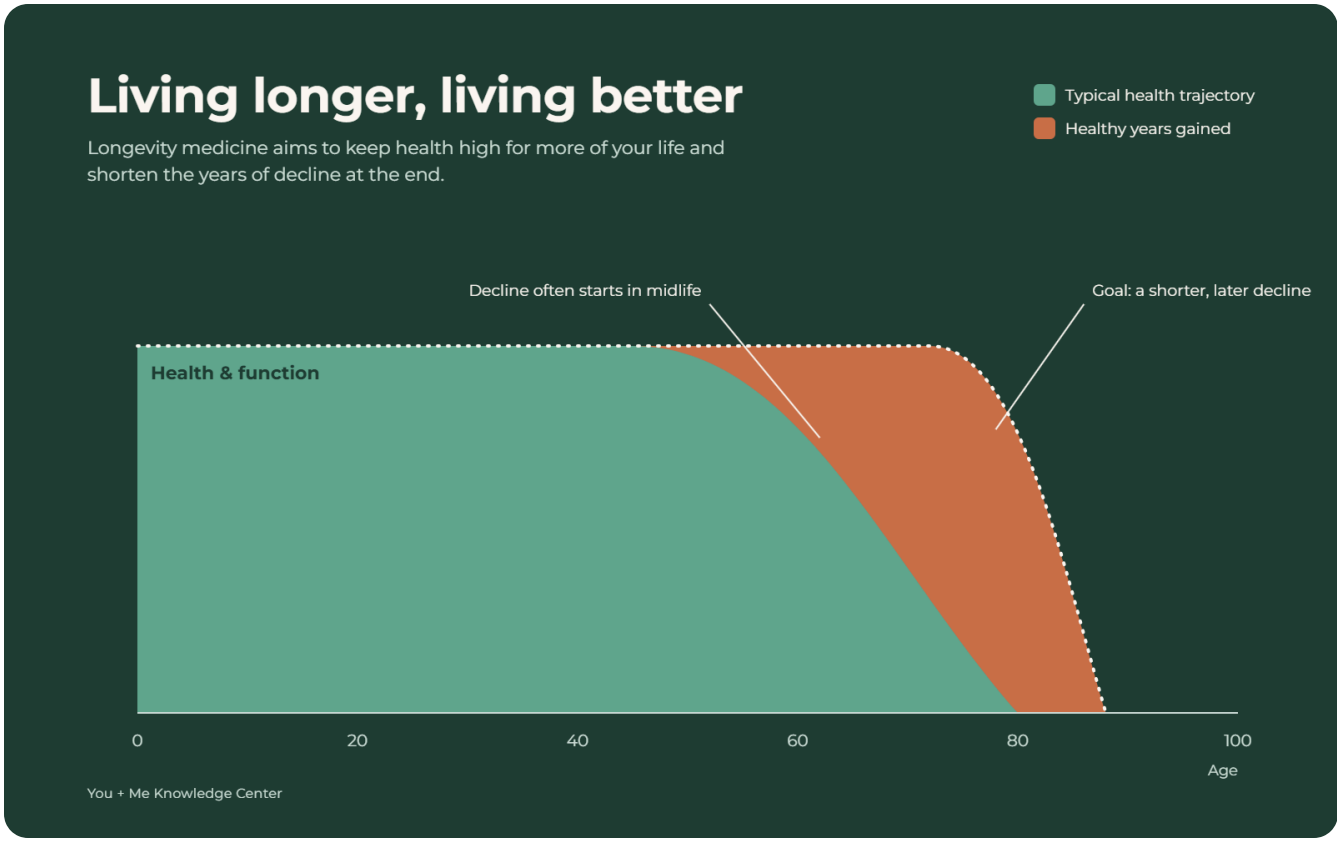

Figure 1. Lifespan vs. Healthspan Two timelines: years lived in good health, then years lived with chronic disease. The longevity goal is to compress the second segment.

From reactive care to proactive care

Traditional healthcare is very good at treating acute illness. It tends to act once a threshold is crossed, for example when blood sugar reaches the diabetic range or a blood vessel is already blocked. Yet most chronic diseases develop silently for 10 to 20 years before diagnosis.

Longevity medicine focuses on that silent window. Instead of asking "Do you have a disease?", it asks "Where are you heading, and what can we do about it now?"

The four conditions that matter most

In developed countries, most deaths in adulthood are driven by a small group of chronic conditions:

- **Cardiovascular disease**, including heart attack and stroke
- **Cancer**
- **Neurodegenerative disease**, including Alzheimer's disease and other dementias
- **Metabolic disease**, including insulin resistance, type 2 diabetes, and fatty liver disease

These conditions share many of the same underlying drivers, including chronic inflammation, insulin resistance, elevated lipoproteins, high blood pressure, physical inactivity, and poor sleep. Addressing those shared drivers can lower risk across several diseases at once.

✚ CLINICAL PEARL

Many people with "normal" lab results still carry significant long-term risk. A reference range describes the average population, and the average adult in many countries is metabolically unhealthy. Longevity care looks at trends and optimal ranges, not just the line between normal and abnormal.

What longevity medicine is, and what it is not

Longevity medicine **is** evidence-based prevention, personalized risk assessment, ongoing measurement, and physician-guided treatment when it's appropriate.

It **is not** a promise to stop or reverse aging, a supplement stack, or a replacement for primary care. No therapy has been proven to reverse human aging. Any program that claims otherwise should be viewed with caution.

◉ RESEARCH SPOTLIGHT

Large observational studies consistently show that a few modifiable factors are linked to substantially longer, healthier lives. Cardiorespiratory fitness, measured on a treadmill test, was one of the strongest predictors of long-term survival in a study of more than 120,000 adults, and the lowest-fitness group had markedly higher mortality than the highest-fitness group.[2] A meta-analysis of 148 studies found that strong social relationships were associated with a 50% greater likelihood of survival.[3]

Myth vs. Fact

× MYTH

Longevity is mostly genetic.

✓ FACT

Genetics matter, but twin studies suggest heritability accounts for a modest share of lifespan variation. Lifestyle, environment, and medical care explain much of the rest.

× MYTH

Longevity medicine is only for the wealthy or the elderly.

✓ FACT

The highest-impact interventions are low-cost, and the earlier risk is identified, the more there is to gain.

Key Takeaways

- ✓ Healthspan, the years lived in good health, is the primary goal.
- ✓ Most chronic diseases develop silently for years before they're diagnosed.
- ✓ Cardiovascular, metabolic, neurodegenerative disease and cancer share common, modifiable drivers.
- ✓ No therapy has been proven to reverse human aging.

Frequently Asked Questions

At what age should I start thinking about longevity?

The best time is before problems appear. Many risk factors, such as rising blood pressure, insulin resistance, elevated lipoproteins, and loss of muscle, begin in the 30s and 40s.

Is longevity medicine the same as anti-aging medicine?

No. Reputable longevity care focuses on evidence-based prevention and measurable risk reduction rather than cosmetic or "age-reversal" claims.

Does longevity care replace my primary care physician?

No. It's designed to complement primary care with deeper risk assessment and ongoing optimization.

How is success measured?

By improvements in measurable markers, such as fitness, strength, blood pressure, lipids, glucose regulation, and body composition, and in how you feel and function day to day.

YOUR NEXT STEP Chapter 2 explores what aging actually is at the cellular level.

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PART 1 · FOUNDATIONS OF LONGEVITY

CHAPTER 02

The Biology of Aging: Why Our Bodies Change Over Time

◆ KEY TAKEAWAY

Aging is driven by a set of interconnected biological processes known as the hallmarks of aging. Many of them are influenced by lifestyle, metabolism, and medical care, which is why people of the same age can age at very different rates.

IN THIS CHAPTER

01 Chronological age vs. biological age

02 The hallmarks of aging

03 Why the hallmarks matter to patients

04 NAD+ and cellular energy

Chronological age vs. biological age

Your chronological age is the number of years since you were born. Your biological age reflects how well your cells, tissues, and organs are functioning. Two 50-year-olds can have very different hearts, muscles, metabolisms, and brains.

The hallmarks of aging

In 2013, and again in an expanded 2023 update, researchers organized the biology of aging into a set of hallmarks, shared processes that appear across species and tissues.[1] In simple terms, they include:

- **Genomic instability:** DNA damage builds up over time.
- **Telomere attrition:** the protective caps on chromosomes shorten.
- **Epigenetic alterations:** the switches that control which genes are turned on and off drift.
- **Loss of proteostasis:** cells become less effective at maintaining and recycling proteins.
- **Disabled autophagy:** cellular "clean-up" processes slow down.
- **Deregulated nutrient sensing:** pathways like insulin/IGF-1, mTOR, and AMPK fall out of balance.
- **Mitochondrial dysfunction:** cellular energy production declines.
- **Cellular senescence:** damaged "zombie" cells stop dividing but release inflammatory signals.
- **Stem cell exhaustion:** tissues lose their ability to repair.
- **Altered intercellular communication:** signaling between cells and organs becomes disrupted.
- **Chronic inflammation ("inflammaging"):** persistent, low-grade inflammation.
- **Dysbiosis:** the gut microbiome changes.

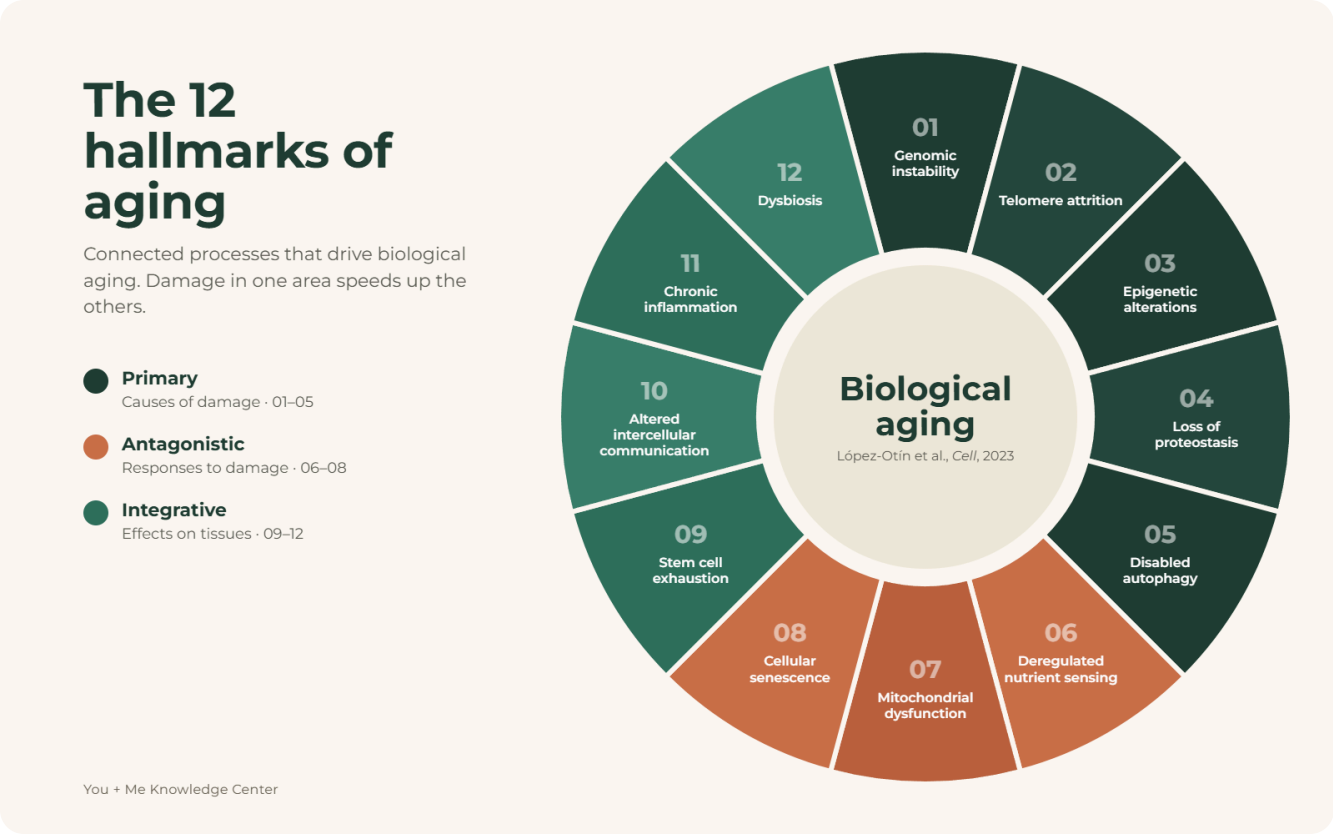

Figure 2. The Hallmarks of Aging A circular diagram of the 12 hallmarks, grouped into primary damage, the body's responses, and integrative effects.

Why the hallmarks matter to patients

The hallmarks are interconnected. Insulin resistance and excess visceral fat fuel inflammation. Inflammation accelerates damage to blood vessels and the brain. Inactivity reduces mitochondrial function and muscle mass. That is why a single habit, such as regular exercise, can influence several hallmarks at once.

NAD+ and cellular energy

Nicotinamide adenine dinucleotide (NAD+) is a molecule found in every cell. It's essential for energy metabolism and DNA repair. Research shows NAD+ levels decline with age in many tissues, which has made NAD+ an active area of longevity research.[2] Chapter 7 reviews what human studies show so far.

+ CLINICAL PEARL

Much of what we know about aging biology comes from yeast, worms, and mice. A therapy that extends lifespan in a mouse has not necessarily been shown to do the same in humans. Always ask whether the evidence comes from human trials.

RESEARCH SPOTLIGHT

The CALERIE trial tested two years of moderate calorie restriction (about 12% below baseline intake) in healthy, non-obese adults. Participants improved several cardiometabolic risk factors, including LDL cholesterol, blood pressure, and insulin sensitivity.[3] The trial shows that aging-related biology can change in humans, though it did not measure lifespan.

Myth vs. Fact

× MYTH

Aging is a fixed, unchangeable process.

✓ FACT

The rate of biological aging varies widely and is influenced by behavior, metabolism, and environment.

× MYTH

Antioxidant supplements slow aging.

✓ FACT

Large trials of antioxidant supplements have generally not shown longevity benefits, and some have shown harm at high doses.

Key Takeaways

- ✓ Biological age can differ meaningfully from chronological age.
- ✓ Aging is driven by interconnected hallmarks, many of them modifiable.
- ✓ Inflammation, insulin resistance, and mitochondrial decline are common threads.
- ✓ Animal findings don't automatically translate to humans.

Frequently Asked Questions

What is "inflammaging"?

Chronic, low-grade inflammation that tends to rise with age and is associated with heart disease, diabetes, dementia, and frailty.

What are senescent cells?

Damaged cells that stop dividing but stay in tissues, releasing inflammatory signals. Drugs that clear them (senolytics) are being studied but aren't established treatments.

Can I slow my biological aging?

Evidence suggests exercise, healthy body composition, good sleep, not smoking, and managing blood pressure, lipids, and glucose are associated with healthier aging.

Why does NAD+ decline with age?

Researchers believe it reflects both reduced production and increased consumption by enzymes involved in DNA repair and inflammation.

YOUR NEXT STEP Chapter 3 explains how biomarkers and lab testing can reveal how you're aging.

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PART 2 · MEASURING HOW YOU AGE

CHAPTER 03

Biomarkers, Lab Testing & Biological Age

◆ KEY TAKEAWAY

The right biomarkers can reveal cardiovascular, metabolic, and hormonal risk years before symptoms appear. The most useful tests are well validated, actionable, and tracked over time, not checked once.

IN THIS CHAPTER

01 What is a biomarker?

02 Cardiovascular markers

03 Metabolic markers

04 Hormone, organ, and nutrient markers

05 Functional and body composition measures

06 Biological age tests

What is a biomarker?

A biomarker is a measurable indicator of a biological state. Blood pressure, LDL cholesterol, HbA1c, and grip strength are all biomarkers. Good biomarkers predict outcomes, respond to treatment, and help guide decisions.

Cardiovascular markers

- **ApoB:** counts the atherogenic (plaque-forming) lipoprotein particles in the blood. Many experts consider it a more precise marker of cardiovascular risk than LDL cholesterol alone.
- **LDL cholesterol:** a well-established causal factor in atherosclerotic cardiovascular disease.[1]
- **Lipoprotein(a) [Lp(a)]:** a largely genetic, inherited risk factor. Current European guidance recommends measuring it at least once in every adult's lifetime.[2]
- **High-sensitivity C-reactive protein (hs-CRP):** a marker of systemic inflammation associated with cardiovascular risk.[3]
- **Blood pressure:** one of the most important and most treatable risk factors.

Metabolic markers

- **Fasting glucose and HbA1c:** reflect current and roughly three-month average blood sugar.
- **Fasting insulin:** can reveal insulin resistance before glucose rises.
- **Triglycerides and HDL:** a high triglyceride-to-HDL ratio may signal insulin resistance.
- **Liver enzymes (ALT, AST, GGT):** may point to metabolic dysfunction-associated fatty liver disease.
- **Uric acid:** associated with metabolic and cardiovascular risk.

Hormone, organ, and nutrient markers

Depending on age, sex, and symptoms, a provider may assess thyroid function (TSH, free T4), sex hormones (total and free testosterone, estradiol, SHBG), kidney function (eGFR, cystatin C), a complete blood count, vitamin D, B12, ferritin, and omega-3 index.

Functional and body composition measures

Some of the most powerful longevity biomarkers aren't blood tests:

- **VO_2 max:** a measure of cardiorespiratory fitness.
- **Grip strength:** a simple marker associated with mortality and cardiovascular risk.[4]
- **Body composition (DEXA):** lean mass, fat mass, visceral fat, and bone density.
- **Waist circumference:** a practical proxy for visceral fat.

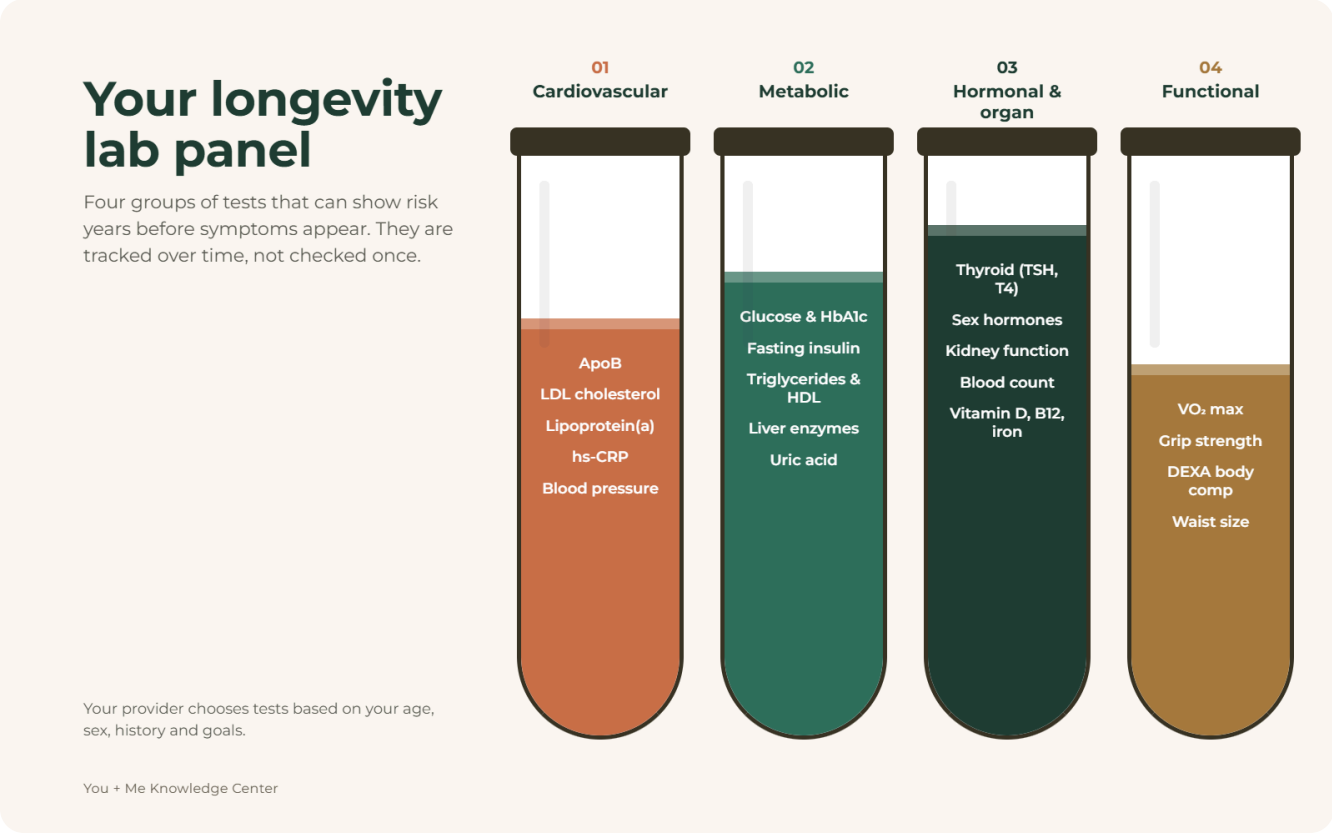

Figure 3. The Longevity Biomarker Panel Four grouped tiles: Cardiovascular, Metabolic, Hormonal & Organ, Functional, each listing its core markers.

Biological age tests

Epigenetic "clocks" estimate biological age from patterns of DNA methylation.[5] Newer versions, such as DunedinPACE, estimate the *pace* of aging.[6] These tools are scientifically interesting but still evolving. Results can vary between labs, and they aren't yet validated for guiding individual treatment decisions.

Wearables and continuous data

Wearable devices can track sleep, heart rate variability, resting heart rate, activity, and, with continuous glucose monitors, glucose patterns. They work best for spotting trends and supporting behavior change, not for diagnosing.

✚ CLINICAL PEARL

More testing isn't always better. Every test should answer a question that could change your plan. Large "everything panels" can turn up incidental findings that lead to anxiety and unnecessary follow-up.

◉ RESEARCH SPOTLIGHT

In a 30-year follow-up of more than 27,000 women in the Women's Health Study, hs-CRP, LDL cholesterol, and Lp(a) measured once at baseline each independently predicted cardiovascular events decades later. Women with all three elevated had the highest risk.[7]

Myth vs. Fact

× MYTH

If my cholesterol is "normal," my heart is fine.

✓ FACT

Standard panels can miss risk from elevated ApoB or Lp(a), and risk builds with cumulative exposure over time.

× MYTH

A biological age test tells me exactly how long I'll live.

✓ FACT

These tests estimate patterns associated with aging. They're not precise predictors for individuals.

Key Takeaways

- ✓ ApoB, Lp(a), hs-CRP, and blood pressure are core cardiovascular markers.
- ✓ Fasting insulin and triglycerides can reveal early insulin resistance.
- ✓ Fitness, strength, and body composition are powerful functional biomarkers.
- ✓ Track markers over time, and test only what can change decisions.

Frequently Asked Questions

How often should longevity labs be repeated?

Commonly every 3 to 12 months depending on the marker and treatment plan. Lp(a) is largely stable and often needs to be measured only once.

Do I need to fast?

Fasting is typically recommended for glucose, insulin, and triglycerides. Your care team will give specific instructions.

Is a DEXA scan safe?

DEXA uses a very low dose of radiation, far lower than a standard chest X-ray.

Will insurance cover these tests?

Coverage varies. Some advanced markers may not be covered, so ask about costs before testing.

YOUR NEXT STEP Chapter 4 covers the single most powerful longevity intervention: movement.

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PART 3 · THE PILLARS OF HEALTHSPAN

CHAPTER 04

Movement, Muscle & Cardiorespiratory Fitness

◆ KEY TAKEAWAY

Cardiorespiratory fitness and muscle strength are among the strongest predictors of how long, and how well, people live. No medication or supplement has shown benefits as broad as regular exercise.

IN THIS CHAPTER

01 Why fitness predicts longevity

02 Muscle: the organ of longevity

03 The four types of training

04 How much is enough?

Why fitness predicts longevity

In large studies, low cardiorespiratory fitness is associated with mortality risk comparable to, or greater than, smoking, diabetes, or high blood pressure.[1,2] Moving from the lowest fitness category to even a moderate one is linked to some of the largest risk reductions.

Muscle: the organ of longevity

Muscle is more than strength. It's a major site of glucose disposal, a metabolic reserve during illness, and essential for balance, mobility, and independence. Adults gradually lose muscle mass and strength with age, a process that can progress to **sarcopenia**.[3] Loss of strength and power raises the risk of falls, fractures, and loss of independence.

Muscle preservation is especially important during weight loss, including weight loss with GLP-1 medications, because some of the weight lost can come from lean tissue.

The four types of training

- **Zone 2 / aerobic base:** steady activity at a pace where you can still talk. It builds mitochondrial capacity and endurance.
- **High-intensity intervals:** short bursts of hard effort that improve VO_2 max.
- **Resistance training:** builds and preserves muscle and bone.
- **Stability, balance, and mobility:** protect joints and reduce fall risk.

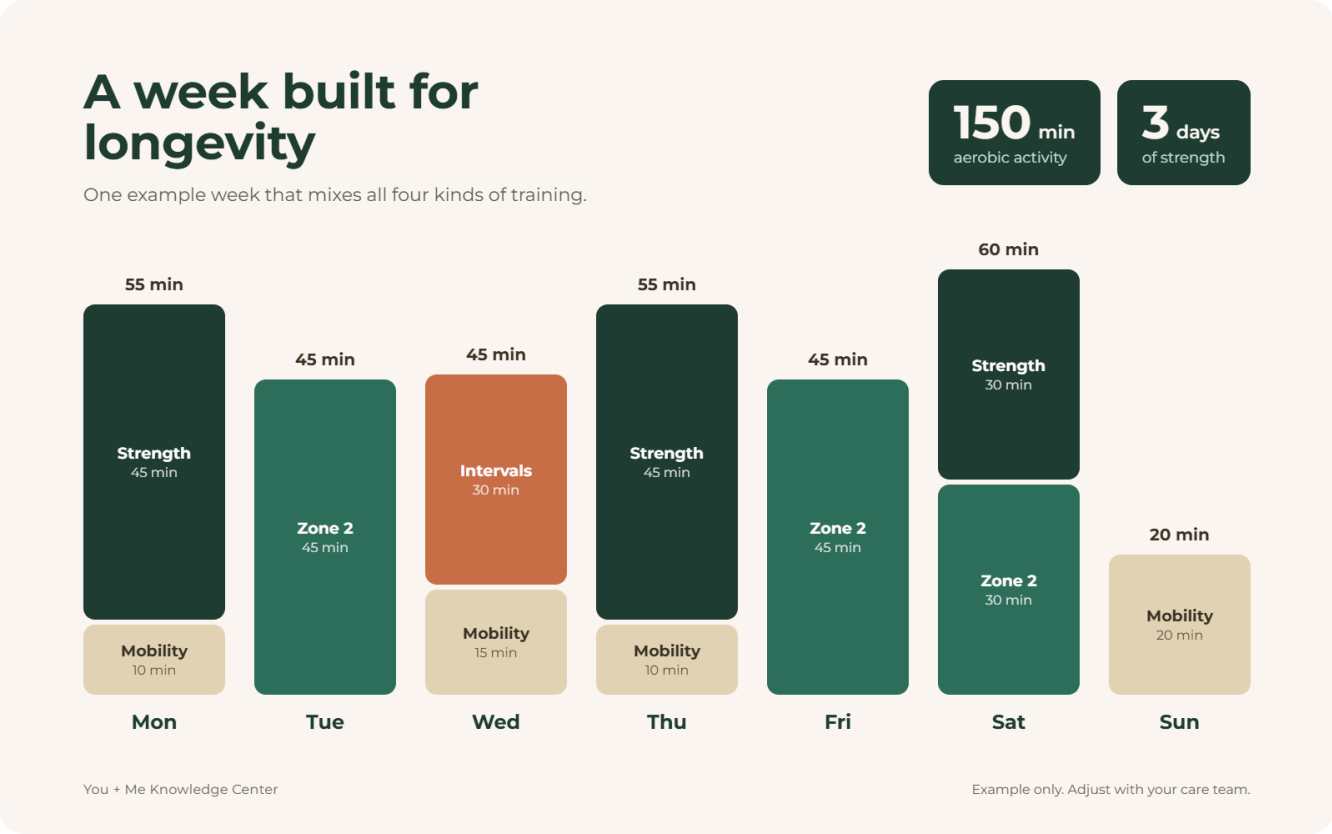

Figure 4. The Longevity Training Week A weekly grid showing aerobic, interval, strength, and mobility sessions.

How much is enough?

Public health guidelines recommend at least 150 to 300 minutes of moderate aerobic activity (or 75 to 150 minutes of vigorous activity) per week, plus muscle-strengthening activity at least two days per week. Benefits begin well below these targets. In a meta-analysis of 15 cohorts, more daily steps were associated with progressively lower mortality, with benefits leveling off around 6,000 to 8,000 steps per day for adults 60 and older, and 8,000 to 10,000 for younger adults.[4]

+ CLINICAL PEARL

Train for the life you want at 80. If you want to lift a grandchild, carry groceries up stairs, or travel independently, those goals can be trained for decades in advance.

RESEARCH SPOTLIGHT

In the PURE study of nearly 140,000 adults across 17 countries, each 5-kg reduction in grip strength was associated with a 16% higher risk of death from any cause. Grip strength was a stronger predictor of cardiovascular death than systolic blood pressure.[5]

Myth vs. Fact

× MYTH
Older adults shouldn't lift heavy weights.

✓ FACT
Properly supervised, progressive resistance training is safe and effective for most older adults.

× MYTH
Cardio alone is enough.

✓ FACT
Aerobic fitness and strength protect against different risks. Both are needed.

Key Takeaways

- ✓ Low fitness is a major, modifiable mortality risk factor.
- ✓ Muscle is a metabolic and functional reserve for aging.
- ✓ Combine aerobic, interval, strength, and mobility training.
- ✓ Any increase in activity from a low baseline brings meaningful benefit.

Frequently Asked Questions

What is Zone 2 training?
Steady aerobic exercise at an intensity where you can hold a conversation but would rather not. It's often 60 to 70% of maximum heart rate, but individual zones vary.

How do I measure VO_2 max?
Most accurately with a laboratory cardiopulmonary exercise test. Many wearables provide estimates.

Is it too late to start at 60 or 70?
No. Strength and fitness improve at any age, and the biggest gains often come to those starting from a low baseline.

How do I protect muscle on a GLP-1 medication?
Prioritize resistance training and adequate protein, and discuss body composition monitoring with your provider.

YOUR NEXT STEP Chapter 5 covers nutrition, metabolic health, and sleep.

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CHAPTER 05

Nutrition, Metabolic Health, Sleep & Recovery

◆ KEY TAKEAWAY

Metabolic health, meaning healthy blood sugar, insulin sensitivity, lipids, blood pressure, and body composition, underpins healthy aging. Nutrition, sleep, stress management, and social connection each have a measurable influence on it.

IN THIS CHAPTER

01 Metabolic health: the common denominator

02 Nutrition principles for longevity

03 Protein and aging

04 Fasting and calorie restriction

05 Sleep: the overlooked pillar

06 Stress, connection, and purpose

Metabolic health: the common denominator

Insulin resistance often develops years before type 2 diabetes is diagnosed. It's associated with cardiovascular disease, fatty liver disease, some cancers, and cognitive decline. Excess visceral fat, the fat stored around internal organs, is a key driver.

Nutrition principles for longevity

No single diet has been proven best for longevity. Dietary patterns with consistent evidence share common features:

- Mostly minimally processed foods
- Plenty of vegetables, fruits, legumes, whole grains, nuts, and olive oil
- Adequate protein, especially for older adults and those losing weight
- Limited ultra-processed foods, added sugars, and alcohol
- Calorie intake that supports a healthy body composition

Protein and aging

Older adults may need more protein than younger adults to maintain muscle. Expert groups have suggested 1.0 to 1.2 g/kg/day for healthy older adults, and more for those who are ill or very active.[1] Protein supports the gains from resistance training.[2] People with kidney disease should discuss protein targets with their provider.

Fasting and calorie restriction

Time-restricted eating and intermittent fasting are popular. In human trials, their benefits appear largely tied to reduced calorie intake and weight loss rather than unique anti-aging effects. They can be a useful tool for some people but aren't required.

Sleep: the overlooked pillar

Both short and very long habitual sleep are associated with higher mortality in large meta-analyses.[3] During sleep, the brain clears metabolic waste,[4] hormones are regulated, and memory is consolidated. Poor sleep worsens appetite regulation, insulin sensitivity, and blood pressure. Untreated sleep apnea is common and treatable.

Stress, connection, and purpose

Chronic stress affects cortisol, sleep, blood pressure, and eating behavior. Social isolation is associated with increased mortality risk,[5] and the 2024 Lancet Commission listed social isolation among 14 modifiable risk factors for dementia.[6]

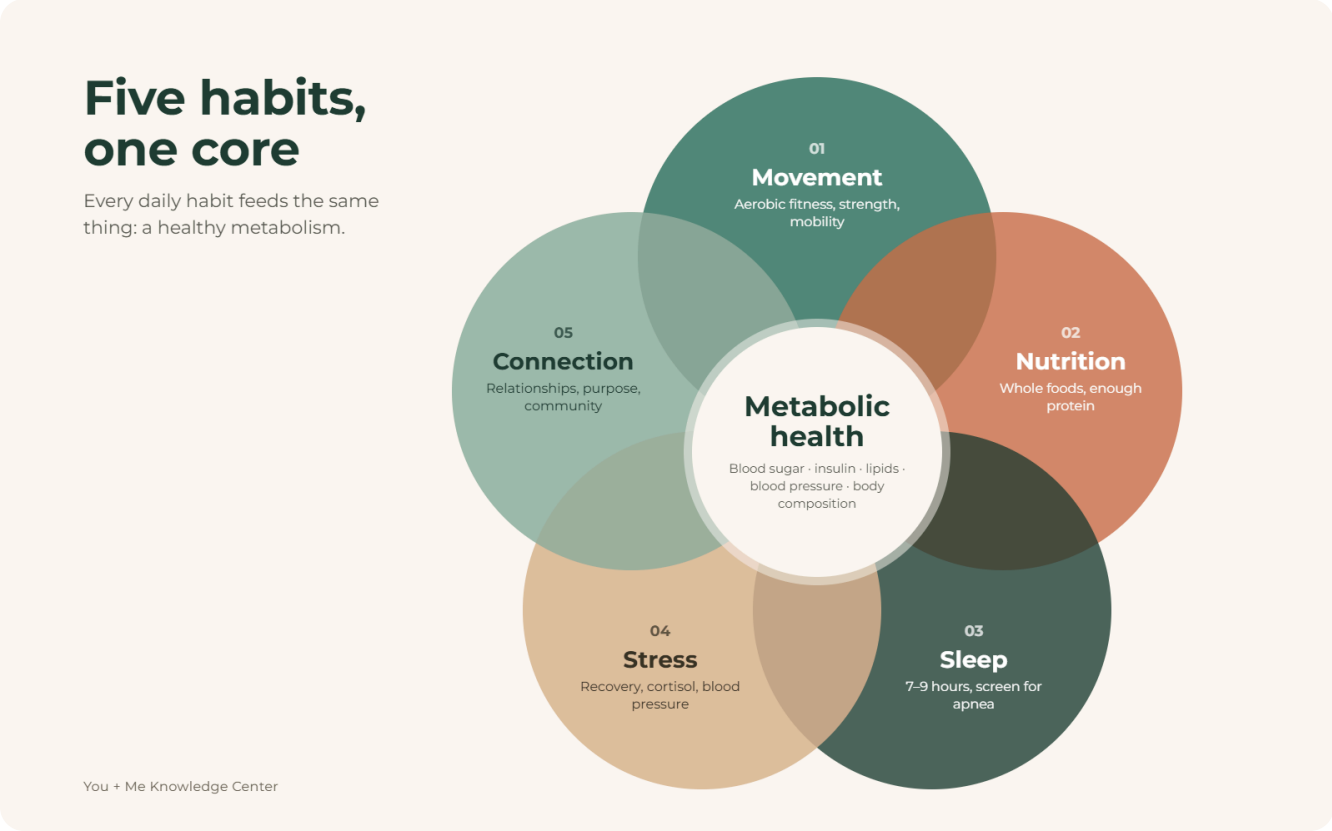

Figure 5. The Five Pillars of Healthspan Movement, Nutrition, Sleep, Stress, Connection, arranged around a central "Metabolic Health" core.

✚ CLINICAL PEARL

If you snore loudly, wake unrefreshed, or feel sleepy during the day despite enough time in bed, ask about sleep apnea testing. Treating it can improve energy, blood pressure, and metabolic health.

◉ RESEARCH SPOTLIGHT

The 2024 Lancet Commission on dementia estimated that nearly half of dementia cases worldwide could theoretically be prevented or delayed by addressing 14 modifiable risk factors across life. These include physical inactivity, high LDL cholesterol, hypertension, diabetes, obesity, hearing loss, vision loss, smoking, and social isolation.[6]

Myth vs. Fact

× MYTH
There's one perfect longevity diet.

✓ FACT
Many dietary patterns can support healthy aging. Consistency and food quality matter most.

× MYTH
Sleep is a luxury, not a health priority.

✓ FACT
Chronic sleep deprivation is linked to cardiovascular, metabolic, and cognitive risk.

Key Takeaways

- ✓ Insulin resistance and visceral fat are central longevity risks.
- ✓ Prioritize whole foods and adequate protein.
- ✓ Seven to nine hours of quality sleep supports nearly every system.
- ✓ Social connection and stress management have measurable health effects.

Frequently Asked Questions

Should I wear a continuous glucose monitor?
For some people, a short CGM trial can reveal how foods, sleep, and activity affect glucose. Results should be interpreted with your care team.

Do I need supplements?
Most people get the most benefit from diet. Supplements may help correct documented deficiencies, such as vitamin D or B12.

Is alcohol good for longevity?
Current evidence doesn't support drinking for health benefits. Lower intake is generally associated with lower risk.

How much protein do I need?
Needs vary by age, activity, kidney function, and goals. Your provider or dietitian can personalize a target.

YOUR NEXT STEP Chapter 6 explains how hormones change with age and when treatment may help.

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PART 4 · MEDICAL THERAPIES FOR HEALTHY AGING

CHAPTER 06

Hormones & Healthy Aging

◆ KEY TAKEAWAY

Hormone levels change with age in both men and women. For appropriately selected patients with a confirmed deficiency or symptoms, physician-supervised hormone therapy can improve quality of life. It requires careful evaluation and ongoing monitoring.

IN THIS CHAPTER

01 How hormones change with age

02 Menopause and hormone therapy

03 Testosterone in men

04 Testosterone in women, thyroid, and growth hormone

How hormones change with age

Hormones regulate energy, mood, sleep, muscle, bone, sexual function, and metabolism. In women, menopause brings a relatively rapid decline in estrogen and progesterone. In men, testosterone tends to decline gradually, and some men develop clinically low levels (hypogonadism). Thyroid function and growth hormone also change over time.

Menopause and hormone therapy

Menopausal symptoms can include hot flashes, night sweats, sleep disruption, mood changes, vaginal dryness, and changes in body composition. Estrogen loss also accelerates bone loss.

Current guidance from The Menopause Society states that for healthy women under 60, or within 10 years of menopause, without contraindications, the benefits of hormone therapy for bothersome symptoms and bone protection generally outweigh the risks.[1] Treatment is individualized based on personal and family history.

Testosterone in men

Symptoms of low testosterone can include low libido, fatigue, reduced muscle mass, low mood, and erectile dysfunction. Diagnosis requires consistent symptoms **and** confirmed low morning testosterone on repeat testing.[2]

In the TRAVERSE trial, testosterone therapy in middle-aged and older men with hypogonadism and elevated cardiovascular risk was not associated with an increase in major adverse cardiac events compared with placebo. Higher rates of atrial fibrillation, acute kidney injury, and pulmonary embolism were observed.[3] Treatment requires monitoring of hematocrit, PSA, and symptoms. Testosterone can suppress fertility.

Testosterone in women, thyroid, and growth hormone

Testosterone may be considered for some postmenopausal women with hypoactive sexual desire disorder under specialist guidance. Thyroid disorders are common with age and should be assessed when symptoms suggest them. Growth hormone isn't approved as an anti-aging therapy, and its use for that purpose carries risks.

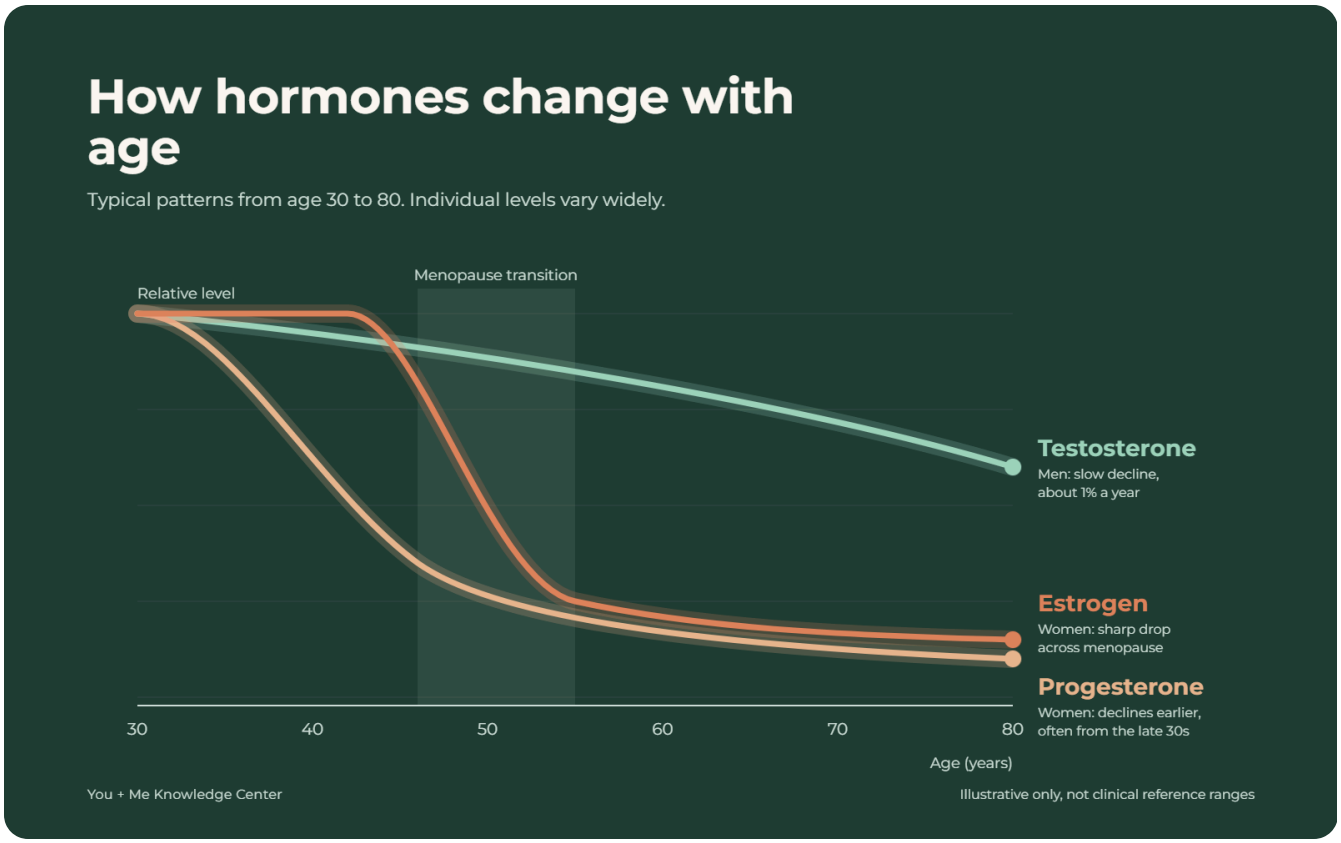

Figure 6. Hormone Changes Across the Lifespan Line chart (illustrative) of estrogen, progesterone, and testosterone trends from age 30 to 80, by sex.

✚ CLINICAL PEARL

Treat the patient, not just the number. Hormone therapy decisions are based on symptoms, confirmed lab results, medical history, and goals together, never on a single lab value alone.

◉ RESEARCH SPOTLIGHT

TRAVERSE randomized 5,246 men aged 45 to 80 with hypogonadism and pre-existing or high risk of cardiovascular disease to testosterone gel or placebo. Over a mean follow-up of about 22 months, testosterone was noninferior to placebo for major adverse cardiac events.[3]

Myth vs. Fact

× MYTH

Hormone therapy is dangerous for all women.

✓ FACT

Risk depends on age, timing, type, dose, and personal history. Many healthy women in early menopause are appropriate candidates.

× MYTH

More testosterone is always better.

✓ FACT

The goal is a physiologic range with symptom relief. Excess dosing raises risks.

Key Takeaways

- ✓ Hormone changes affect energy, mood, body composition, bone, and sexual health.
- ✓ Menopausal hormone therapy has a favorable profile for many healthy women under 60.
- ✓ Testosterone therapy requires a confirmed diagnosis and ongoing monitoring.
- ✓ Growth hormone isn't an approved anti-aging treatment.

Frequently Asked Questions

What's the difference between bioidentical and synthetic hormones?

"Bioidentical" hormones are chemically identical to those the body makes. FDA-approved bioidentical options exist. Compounded versions aren't FDA-approved and vary in quality.

When should testosterone be tested?

In the morning, when levels peak, and confirmed with repeat testing.

Will testosterone affect fertility?

Yes, it can suppress sperm production. Men planning children should discuss alternatives.

How long can I stay on hormone therapy?

Duration is individualized and should be reviewed with your provider regularly.

YOUR NEXT STEP Chapter 7 reviews NAD+, peptides, and emerging therapies.

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CHAPTER 07

NAD+, Peptides & Emerging Longevity Therapies

◆ KEY TAKEAWAY

NAD+ therapies, peptides, metformin, rapamycin, and GLP-1 medications are being studied for their potential role in healthy aging. Human evidence ranges from promising to very limited, and none is approved by the FDA to treat aging itself.

IN THIS CHAPTER

01 A framework for evaluating new therapies

02 NAD+ and NAD+ precursors

03 Peptides

04 GLP-1 medications and longevity

05 Metformin and rapamycin

A framework for evaluating new therapies

When considering any emerging therapy, ask four questions:

- Has it been tested in randomized human trials?
- Did it improve meaningful outcomes, or only lab markers?
- What are the known and unknown risks?
- What is its regulatory status, and how is it sourced?

NAD+ and NAD+ precursors

Because NAD+ declines with age, researchers are studying ways to restore it. These include oral precursors such as nicotinamide riboside (NR) and nicotinamide mononucleotide (NMN), and NAD+ given by injection or IV infusion.[1] Small human trials show these precursors can raise NAD+ levels in blood and appear generally well tolerated.[2] One small randomized trial in postmenopausal women with prediabetes found NMN improved muscle insulin sensitivity.[3] Effects on lifespan, disease prevention, or long-term function in humans haven't been established.

NAD+ injections and infusions aren't FDA-approved for anti-aging, energy, or longevity purposes. Patients may experience flushing, nausea, or discomfort during infusion. Treatment should be prescribed and supervised by a licensed provider.

Peptides

Peptides are short chains of amino acids. Some are well-established, FDA-approved medicines: insulin and GLP-1 receptor agonists are peptides. Many peptides marketed online for recovery, longevity, or performance have limited or no human trial data. The FDA has raised safety concerns about certain peptides used in compounding. Patients should avoid "research-use-only" products and use only therapies prescribed by a licensed provider and dispensed by a licensed pharmacy.

GLP-1 medications and longevity

GLP-1 medications were developed for diabetes and obesity, but they may have broader effects on aging-related disease. In the SELECT trial, semaglutide reduced major adverse cardiovascular events by 20% in adults with overweight or obesity and established cardiovascular disease, without diabetes.[4] Researchers are studying their effects on kidney, liver, and brain health.

Metformin and rapamycin

Metformin, a long-used diabetes medication, is being proposed for study in the TAME (Targeting Aging with Metformin) trial, designed to test whether it delays age-related diseases in people without diabetes.[5] **Rapamycin** (sirolimus) inhibits mTOR and extends lifespan in mice. A small human study found an mTOR inhibitor improved vaccine response in older adults.[6] Neither is approved for longevity. Both carry side effects and should only be used under medical supervision.



Figure 7. Evidence Ladder for Longevity Therapies A vertical ladder from "animal data only" to "human outcome trials," placing NAD+, peptides, metformin, rapamycin, GLP-1s, and exercise on the rungs.

✚ CLINICAL PEARL

Emerging therapies work best as additions to the fundamentals, never as substitutes. An NAD+ infusion can't offset the effects of inactivity, poor sleep, or uncontrolled blood pressure.

RESEARCH SPOTLIGHT

SELECT enrolled 17,604 adults aged 45 or older with established cardiovascular disease and a BMI of 27 or higher, without diabetes. Over a mean follow-up of about 40 months, semaglutide 2.4 mg reduced the composite of cardiovascular death, nonfatal heart attack, or nonfatal stroke by 20% compared with placebo.[4]

Myth vs. Fact

× MYTH

NAD+ therapy reverses aging.

✓ FACT

NAD+ precursors can raise NAD+ levels, but human evidence for anti-aging effects is still limited.

× MYTH

Peptides sold online are the same as prescription peptides.

✓ FACT

"Research-use" products aren't regulated for human use and may differ in purity, dose, or content.

Key Takeaways

- ✓ Judge emerging therapies by the quality of their human evidence.
- ✓ NAD+ therapies are promising but unproven for longevity outcomes.
- ✓ GLP-1 medications have strong cardiovascular outcome data in selected patients.
- ✓ Use only licensed, provider-prescribed sources.

Frequently Asked Questions

What's the difference between NAD+ injections and NMN or NR supplements?

Injections deliver NAD+ directly, while NMN and NR are oral precursors the body converts to NAD+. Comparative human data are limited.

Are NAD+ injections safe?

They appear generally well tolerated in limited studies. Common side effects include flushing, nausea, and injection-site discomfort. Long-term safety data are limited.

Can I take a GLP-1 just for longevity?

GLP-1 medications are prescribed for specific approved indications, such as obesity or type 2 diabetes. Eligibility is determined by a provider.

Are senolytics available?

Senolytic drugs are being studied in clinical trials but aren't established treatments.

YOUR NEXT STEP Chapter 8 brings it all together into a personal longevity plan.

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PART 5 · BUILDING YOUR LONGEVITY PLAN

CHAPTER 08

Physician-Supervised Longevity Care: Building Your Personal Plan

◆ KEY TAKEAWAY

Effective longevity care is a continuous cycle of assessing, prioritizing, acting, and re-measuring, guided by a licensed provider who can personalize the plan and monitor safety.

IN THIS CHAPTER

01 The longevity care cycle

02 Physician-supervised vs. direct-to-consumer

03 Age-appropriate screening

04 Questions to ask any longevity provider

05 How the You + Me app supports longevity care

The longevity care cycle

- **Assess:** medical history, family history, symptoms, labs, and functional testing.
- **Prioritize:** identify the risks with the greatest potential impact.
- **Act:** lifestyle changes first, then medical therapies where appropriate.
- **Re-measure:** track biomarkers and function over time and adjust.



Figure 8. The You + Me Longevity Care Cycle A four-step loop: Assess → Prioritize → Act → Re-measure.

Physician-supervised vs. direct-to-consumer

Many longevity products are sold directly to consumers without medical evaluation. Physician-supervised care adds:

- Evaluation of medical history, medications, and contraindications
- Interpretation of lab results in context
- Prescription therapies from licensed pharmacies
- Monitoring for side effects and dose adjustment

- Coordination with primary care and specialists

Age-appropriate screening

Longevity care should include, not replace, evidence-based preventive screening recommended by organizations such as the U.S. Preventive Services Task Force. That includes cancer screening, blood pressure checks, diabetes screening, bone density testing, and vaccinations appropriate for your age and risk.

Questions to ask any longevity provider

- Is a licensed physician or clinician reviewing my history and labs?
- What evidence supports this therapy for someone like me?
- How will we measure whether it's working?
- What are the risks, and how will they be monitored?
- Where is the medication sourced and dispensed?

How the You + Me app supports longevity care

Depending on your plan and available features, the You + Me app may help you complete your health assessment, securely message your care team, manage prescriptions and refills, review lab results, track progress over time, and access Knowledge Center education. These tools support clinical decision-making. They don't replace professional medical judgment.

+ CLINICAL PEARL

Pick two or three priorities at a time. Lasting change comes from a short list of high-impact actions done consistently, not a long protocol done briefly.

◉ RESEARCH SPOTLIGHT

Lowering LDL cholesterol and blood pressure, two of the most studied preventive targets, has been shown in large randomized trials and genetic studies to reduce cardiovascular events. The benefit grows with the size and duration of the reduction, which supports addressing risk earlier in life.[1]

Myth vs. Fact

× MYTH

A longevity plan means taking many supplements and medications.

✓ FACT

Most plans center on a few high-impact lifestyle priorities, with medications added only when indicated.

× MYTH

Once my labs improve, I'm done.

✓ FACT

Longevity care is ongoing. Markers and goals change with age.

Key Takeaways

- Longevity care is a cycle: assess, prioritize, act, re-measure.
- Physician supervision adds safety, context, and accountability.
- Standard preventive screening remains essential.
- Focus on a few priorities done consistently.

Frequently Asked Questions

What happens at a first longevity consultation?

Typically a review of history, goals, and symptoms, followed by lab and functional testing and a personalized plan.

How long until I see results?

Some markers, such as blood pressure and glucose, can improve within weeks. Fitness, strength, and body composition typically change over months.

Can longevity care be done online?

Many parts can be delivered through telehealth, combined with local lab testing. Some assessments require in-person visits.

Can I combine longevity care with medical weight loss?

Yes. Many goals overlap, including metabolic health, body composition, and cardiovascular risk.

◆ YOUR NEXT STEP

Start your free longevity assessment with You + Me, or explore the Medical Weight Loss guide to learn how metabolic health and healthy aging connect.

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A FINAL WORD

Move often. Build strength. Eat well. Sleep deeply. *Stay connected.*

The science of aging is advancing quickly, and new therapies will continue to emerge. The foundations, though, have stayed remarkably consistent: move often, build strength, eat well, sleep deeply, stay connected, and measure what matters with a care team you trust.

— *The You + Me Editorial Team*

Educational content only; not medical advice. Some therapies described are investigational, off-label, or not FDA-approved for aging-related uses. Individual results vary. All references should be verified by the medical reviewer before publication.



You + Me

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Start a free online assessment. A licensed provider reviews your history, goals and labs, and builds a plan you can measure over time.

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