OPTIMIZED

The Complete Guide to Longevity, Performance, and Living at Your Absolute Best

NEXT HEALTH

A Note Before You Begin

You are holding this book for one of two reasons. Either you've already walked through the doors of Next Health and you want to understand more deeply what we do and why — or someone handed this to you because they believe, as we do, that you deserve a longer, healthier, more vibrant life than the one our current healthcare system is designed to give you.

Modern medicine is extraordinary at one specific thing: keeping you alive when something goes catastrophically wrong. Emergency medicine, surgical intervention, infectious disease management — these are genuine miracles of human ingenuity, and we are grateful for every one of them. But they were designed around crisis, not optimization. They were built to treat disease, not to prevent it. And they are profoundly, structurally unprepared to answer the question that more and more people are asking: how do I feel genuinely alive — not just alive — for as long as possible?

That question is what built Next Health. And it is what this book is designed to answer.

What you are about to read is not theory. Every therapy, every protocol, every test described in these pages is available to you right now. Each has been vetted against the scientific literature, refined through thousands of client interactions, and

delivered within a licensed medical environment by practitioners who are as serious about your outcomes as you are.

The science of longevity has undergone a quiet revolution in the last decade. Researchers no longer accept that the deterioration we associate with aging — the fatigue, the cognitive decline, the loss of physical capability, the growing burden of chronic disease — is simply the price of getting older. Increasingly, they understand aging as a biological process with identifiable drivers and addressable root causes. Damaged DNA, dysfunctional mitochondria, accumulating senescent cells, declining hormones, rising inflammation, shortening telomeres — these are not inevitable facts of life. They are problems. And problems, by definition, have solutions.

That is the spirit in which Next Health was built, and the spirit in which this book is written. We believe you have more control over your biology than you have been told. We believe the window for meaningful intervention is larger than most people realize. And we believe that a future in which more people spend more years feeling genuinely well — sharp, energetic, physically capable, emotionally resilient — is worth working toward, one client at a time.

Think of this as your handbook. Dog-ear the pages. Come back to the chapters that speak to where you are right now. And then come see us — because everything starts with knowing what's possible.

Welcome to Next Health. Welcome to the rest of your best years.

— The Next Health Team

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Chapter 1 Hyperbaric Oxygen Therapy

Imagine flooding every cell in your body with oxygen — not the ordinary kind you breathe, but oxygen delivered at pressure, dissolved directly into your plasma, your lymph, your cerebrospinal fluid. Tissues that have been starved of oxygen for years suddenly wake up. Stem cells mobilize. Inflammation retreats. Your brain sharpens. Your body begins to heal itself in ways you forgot were possible. This is not science fiction. This is Hyperbaric Oxygen Therapy — and it may be one of the most powerful, most underutilized healing tools available to us today.

What Is Hyperbaric Oxygen Therapy?

Hyperbaric Oxygen Therapy (HBOT) involves breathing 100% medical-grade oxygen inside a pressurized chamber, typically at 1.5 to 3 times normal atmospheric pressure (measured in atmospheres absolute, or ATA). Under these conditions, something remarkable happens: oxygen dissolves directly into the blood plasma rather than simply binding to hemoglobin as it does under normal conditions.

This distinction matters enormously. Under normal atmospheric conditions, hemoglobin carries essentially all the oxygen in your blood — it is

saturated close to its maximum capacity. There is almost no oxygen dissolved in the plasma itself. But Henry's Law of physics tells us that gases dissolve into liquids in direct proportion to the pressure applied. Under the elevated pressure of a hyperbaric chamber, oxygen dissolves into the plasma, the cerebrospinal fluid, the lymph, and the synovial fluid of the joints — reaching tissues through diffusion rather than solely through blood vessel delivery. This means that areas of the body where circulation is compromised — damaged tissue, inflamed joints, aging brain regions — receive therapeutic levels of oxygen they haven't seen in years.

The Physiology: What Happens Inside the Chamber

When you step into a hyperbaric chamber and the pressure rises, a sequence of physiological events unfolds over the course of your session. Within minutes, plasma oxygen levels rise dramatically — to levels that are 10 to 15 times higher than what is achievable breathing normal air at sea level. This hyperoxygenated plasma begins reaching tissues through simple diffusion, independent of hemoglobin and blood vessel integrity.

Your mitochondria — the energy-producing organelles in every cell — respond to this oxygen abundance by producing ATP (adenosine triphosphate, your body's energy currency) more efficiently. Cells that have been operating in a state of chronic oxygen deficit essentially 'wake up,' restoring their capacity for protein synthesis, repair, and normal function. At the same time, the elevated oxygen environment triggers a cascade of signaling events that extend far beyond simple oxygenation

— events that researchers are still mapping in their full complexity.

One of the most important of these signaling events is the modulation of hypoxia-inducible factor-1 alpha (HIF-1α), a master regulator that governs how cells respond to oxygen availability. HBOT essentially resets this regulatory system, shifting cells from a chronic low-oxygen survival mode back toward normal, regenerative function. Simultaneously, the elevated oxygen environment suppresses the activity of nuclear factor kappa B (NF-κB), one of the most important drivers of the inflammatory cascade — producing anti-inflammatory effects that persist long after the session ends.

Stem Cell Mobilization — One of HBOT's Most Exciting Effects

In 2005, researchers at the University of Pennsylvania published findings that would reshape how the medical community thinks about hyperbaric oxygen. They demonstrated that a series of HBOT sessions could mobilize stem cells from the bone marrow into peripheral circulation by up to 800% compared to baseline. This is not a modest effect — it is transformative. Stem cells released into circulation travel throughout the body, homing to areas of tissue damage and initiating repair processes.

The mechanism involves HBOT's stimulation of nitric oxide synthase, which in turn triggers stem cell release from the bone marrow niche. Subsequent research has confirmed these findings and expanded our understanding of what these

mobilized stem cells do once they're circulating — they differentiate into tissue-specific cell types, release paracrine factors that orchestrate repair in surrounding tissue, and modulate immune function. HBOT essentially turns on your body's internal repair mobilization system in ways that normal physiology, constrained by normal oxygen levels, simply cannot.

> 📖 *Research Spotlight: Thom et al. (2006, American Journal of Physiology — Heart and Circulatory Physiology): HBOT produced an 800% increase in circulating stem/progenitor cells, driven by nitric oxide synthase activation. The authors concluded that HBOT mobilizes stem cells through a fundamentally different mechanism than pharmaceutical approaches, with implications for tissue repair across multiple organ systems.*

Telomere Lengthening and Senescent Cell Clearance

In 2020, a group of researchers at Tel Aviv University published what may be the most striking HBOT study to date. They enrolled 35 healthy aging adults in a protocol of 60 HBOT sessions administered over 90 days, measuring multiple markers of biological aging before, during, and after the intervention. The results were striking enough to attract international attention: participants showed an average 20% increase in telomere length — the protective caps on chromosomes whose shortening is one of the most consistent hallmarks of cellular aging — along with a 37% reduction in senescent cells, the dysfunctional 'zombie cells' that accumulate with age and drive systemic inflammation.

To put these numbers in context: no single pharmaceutical or lifestyle intervention has reliably produced telomere lengthening of this magnitude in a prospective clinical trial. The closest comparisons are experimental senolytics — drugs specifically designed to clear senescent cells — which have shown senescent cell reductions in the 20–30% range. HBOT appears to achieve both effects simultaneously, through mechanisms that include the oxidative stress-antioxidant interplay, nitric oxide signaling, and the direct effects of elevated oxygen on mitochondrial function.

> 📖 *Research Spotlight: Hachmo et al. (2020, Aging): 60 HBOT sessions (90 min at 2 ATA, 100% oxygen) produced a 20% average increase in telomere length and a 37% reduction in senescent cells in healthy adults over 64. The authors noted these changes exceeded those observed with most senolytic pharmaceutical protocols, supporting HBOT as a legitimate anti-aging intervention at the cellular level.*

Brain Health and Neuroplasticity

The brain is one of the most oxygen-hungry organs in the human body, consuming approximately 20% of the body's oxygen supply despite accounting for only 2% of its weight. This extraordinary metabolic demand makes the brain exquisitely sensitive to both oxygen deficit and oxygen optimization. Research has demonstrated compelling effects of HBOT on brain function across a wide range of conditions — from traumatic brain injury and post-concussion syndrome to post-COVID cognitive impairment, age-related cognitive decline, and PTSD.

A landmark Israeli study published in 2022 in the journal Aging demonstrated that HBOT improved cognitive function in healthy aging adults — not just those with diagnosed conditions — producing measurable improvements in attention, memory, and information processing speed, along with increased cerebral blood flow on imaging. The mechanism appears to involve both the direct effect of elevated oxygen on neuronal metabolism and the stimulation of neuroplasticity factors including BDNF (brain-derived neurotrophic factor), which promotes the growth and maintenance of neurons.

Clients who undergo HBOT protocols at Next Health frequently report that the most immediately noticeable effect is cognitive. 'The fog lifted' is a phrase we hear often — within the first two to three sessions, many clients notice a sharpness and mental clarity that they had forgotten was possible. This is particularly meaningful for high-performers whose most important asset is their cognitive horsepower, and for aging adults who have begun to notice the early signs of cognitive decline.

Important distinction: HBOT is not a one-time treatment — it is a protocol. Most of the most impressive findings in the research literature involve series of 20, 40, or 60 sessions. The cumulative effects of repeated HBOT treatments are substantially greater than those of a single session, and the benefits appear to persist long after the protocol concludes.

Wound Healing, Tissue Repair, and Athletic Recovery

HBOT has been FDA-cleared for 14 medical indications, many of them centered on wound healing and tissue repair: diabetic foot ulcers, radiation tissue damage, crush injuries, compromised skin grafts, and refractory osteomyelitis (bone infection). The mechanism in each case is the same — enhanced oxygen availability enables the cellular machinery of repair to function at full capacity, while the anti-inflammatory and angiogenic effects of HBOT create the vascular infrastructure needed to sustain that repair.

For athletes and physically active individuals, HBOT has emerged as one of the most effective recovery tools available. A 2017 study published in Frontiers in Physiology demonstrated that HBOT administered within 2 hours of exhaustive exercise significantly reduced markers of muscle damage (creatine kinase, lactate dehydrogenase), accelerated recovery of muscle function, and reduced delayed onset muscle soreness compared to passive rest. Elite athletes across professional sports — from the NBA and NFL to Olympic programs — have incorporated HBOT into their recovery protocols, and the science supports their intuition.

Beyond acute athletic recovery, HBOT is particularly valuable for healing injuries that have proven resistant to conventional treatment: chronic tendinopathies, stress fractures, cartilage damage, and the cumulative microtrauma that accumulates in joints and connective tissue over years of training and physical activity.

Anti-Inflammatory Effects and Chronic Disease

Chronic low-grade inflammation — sometimes called 'inflammaging' in the research literature — is increasingly understood as a primary driver of virtually every age-related disease: cardiovascular disease, type 2 diabetes, neurodegeneration, cancer, and autoimmune conditions. HBOT addresses inflammation at a mechanistic level rather than simply suppressing symptoms. The NF-κB suppression produced by HBOT reduces the production of pro-inflammatory cytokines (including TNF-alpha, IL-1β, and IL-6) that drive this chronic inflammatory state. At the same time, HBOT upregulates anti-inflammatory cytokines and activates the antioxidant defense systems (Nrf2 pathway, superoxide dismutase, catalase, glutathione) that provide lasting protection against oxidative damage.

For clients dealing with autoimmune conditions, inflammatory arthritis, chronic fatigue, fibromyalgia, or any condition driven by systemic inflammation, HBOT represents a genuinely different therapeutic approach — one that addresses root mechanisms rather than downstream symptoms.

Who Benefits Most from HBOT?

The honest answer is that almost everyone benefits — because almost everyone lives with some degree of tissue oxygen deficit, chronic inflammation, suboptimal mitochondrial function, or cognitive performance below their genetic ceiling. But HBOT produces particularly dramatic results for several groups. Athletes and high performers seeking faster recovery and a cognitive edge. Anyone experiencing brain fog, fatigue, or early cognitive decline. Individuals recovering from surgery, injury,

long COVID, or illness. Those with chronic inflammatory conditions. People with a family history of Alzheimer's or neurodegeneration who are taking a proactive approach to brain longevity. And anyone committed to addressing biological aging at its most fundamental level.

What to Expect at Next Health

Our state-of-the-art hyperbaric chambers are designed for both comfort and clinical efficacy. You'll relax inside the pressurized environment — most clients read, meditate, listen to music, or simply rest — while your body works at the cellular level. Sessions typically run 60 to 90 minutes at pressures between 1.5 and 2.0 ATA, depending on your clinical protocol. The pressurization and depressurization phases are gradual and well-tolerated; most clients describe a mild 'ear-popping' sensation similar to descending in an airplane. Our clinical team will design a protocol tailored to your specific health goals, whether that is a standalone experience, a series for a specific condition, or integration into a broader longevity program.

> *"Every session is your body remembering how good it can feel when it has everything it needs."*

Chapter 2 Red Light Therapy

NASA discovered it while trying to grow plants in space. Elite military units adopted it to accelerate wound healing in austere environments. Now it sits at the intersection of biohacking and clinical medicine as one of the most rigorously studied non-invasive therapies available. Over 5,000 peer-reviewed papers have examined photobiomodulation. The picture that emerges is of a therapy that is simultaneously simple in its delivery and profound in its biological reach.

The Physics and Biology of Therapeutic Light

Not all light is created equal. The electromagnetic spectrum spans an enormous range, from gamma rays to radio waves, and the biological effects of light depend entirely on its wavelength. Ultraviolet light (below 400nm) carries enough energy to damage DNA and cause sunburn. Visible blue light (400–500nm) disrupts circadian rhythms by suppressing melatonin. But red light (630–700nm) and near-infrared light (700–1100nm) occupy a unique therapeutic window — wavelengths that penetrate biological tissue and interact with cellular structures in ways that are profoundly beneficial.

Red light in the 630–680nm range penetrates the skin to approximately 5–10 millimeters — reaching the epidermis, dermis, and upper layers of

subcutaneous tissue. Near-infrared light in the 800–1000nm range penetrates much more deeply — up to 40–50 millimeters — reaching muscle, bone, and even the brain through the skull. This differential penetration depth means that different wavelengths target different tissue layers, which is why clinical-grade devices typically combine multiple wavelengths to achieve comprehensive effects.

The Mitochondrial Mechanism — Where the Science Gets Exciting

The primary mechanism of photobiomodulation centers on the mitochondria — and specifically on a protein called cytochrome c oxidase (CCO), also known as Complex IV of the electron transport chain. CCO is the terminal enzyme in the mitochondrial respiratory chain — the final step in the process by which your cells convert nutrients into ATP. It is also, crucially, a photoreceptor: it absorbs light in the red and near-infrared spectrum and uses that light energy to drive the production of ATP more efficiently.

When CCO absorbs red or near-infrared photons, several things happen in rapid succession. The absorption temporarily displaces nitric oxide (NO) that has been inhibiting CCO function — often a significant factor in chronically stressed or aging cells where NO accumulation suppresses mitochondrial efficiency. With NO removed from the equation, CCO resumes more vigorous activity, increasing the mitochondrial membrane potential and driving the production of ATP at a higher rate. This enhanced energy availability then cascades into virtually every downstream cellular function:

protein synthesis, DNA repair, cell migration, antioxidant production, and immune modulation.

Simultaneously, the brief reactive oxygen species (ROS) pulse generated by photobiomodulation activates several important transcription factors — including Nrf2 (the master antioxidant regulator) and NF-κB (modulated in a beneficial, anti-inflammatory direction at these doses) — producing lasting cellular adaptations that extend well beyond the duration of the light exposure itself.

> 📖 *Research Spotlight: Hamblin (2017, Seminars in Cutaneous Medicine and Surgery): A comprehensive mechanistic review confirmed that cytochrome c oxidase photoreception drives increased mitochondrial membrane potential, enhanced ATP synthesis, displaced nitric oxide, and downstream activation of multiple transcription factors governing antioxidant defense, inflammation, and cellular survival.*

Skin Health — More Than Cosmetic

The skin applications of red light therapy are among the best-studied, and the results are compelling enough that red light has moved from aesthetic clinics into hospital-based dermatology departments. Multiple randomized controlled trials have demonstrated that consistent red light exposure stimulates fibroblasts — the cells responsible for producing collagen and elastin — to significantly increase their output of these structural proteins. The result is measurably thicker dermis, reduced depth of fine lines and wrinkles, improved skin texture, and decreased pore size — all confirmed through histological analysis and

objective profilometry rather than just subjective self-report.

A landmark randomized, double-blind controlled trial published in the Journal of Photochemistry and Photobiology B demonstrated that subjects receiving red light treatment showed statistically significant improvements in skin roughness and wrinkle depth at 30 days, with continued improvement at 60 days. Collagen density measured by sonography increased by approximately 36% in the treatment group compared to controls. These are not subtle cosmetic changes — they represent genuine structural improvement in the biology of the skin.

For clients using red light in combination with other Next Health services — particularly IV glutathione (which provides the antioxidant substrate that red light's cellular optimization needs) and hormone optimization (which governs the baseline rate of collagen synthesis) — the effects are synergistic and often dramatically accelerated.

Muscle Recovery, Performance, and Athletic Adaptation

The application of photobiomodulation to athletic performance and recovery has generated a particularly rich body of evidence. A systematic review and meta-analysis published in the European Journal of Sport Science, examining 46 clinical trials involving over 1,300 participants, found that photobiomodulation applied before or after exercise produced significant and consistent reductions in markers of muscle damage (creatine kinase, lactate dehydrogenase), decreased delayed

onset muscle soreness (DOMS), improved recovery of muscle function, and in many studies, enhanced subsequent performance compared to controls.

The mechanism operates through several pathways simultaneously. Enhanced mitochondrial ATP production provides more energy for cellular repair processes. Reduced oxidative stress and inflammation protect muscle fibers from the secondary damage that extends recovery timelines. Increased blood flow (driven by the nitric oxide released from CCO and from endothelial cells exposed to near-infrared light) delivers nutrients and clears metabolic waste products. And direct stimulation of satellite cells — the muscle stem cells responsible for muscle repair and growth — accelerates the rebuilding process.

Many professional sports organizations and Olympic teams now use photobiomodulation as a standard component of their recovery protocols. The technology has moved well beyond the realm of marginal gains — it is a mainstream performance tool for anyone serious about maintaining or improving physical capability.

Pain Relief and Joint Health

Near-infrared light penetrates deeply enough to reach joints, tendons, and even bone. This depth of penetration, combined with the anti-inflammatory and mitochondrial effects of photobiomodulation, makes red light therapy a powerful tool for chronic pain management. Clinical trials have demonstrated significant reductions in pain and disability in knee osteoarthritis, rheumatoid arthritis, lower back pain, neck pain, and tendinopathy, with effect sizes that compare favorably to conventional physical therapy and NSAIDs — and without the

gastrointestinal and cardiovascular risks that accompany long-term NSAID use.

For aging individuals, this application of red light is particularly significant. Musculoskeletal pain is one of the primary drivers of physical inactivity in older adults, and physical inactivity is one of the most powerful predictors of accelerated aging and reduced healthspan. By providing genuine, mechanism-based pain relief, red light therapy can restore the ability to move and exercise — which then produces its own cascade of longevity benefits.

Brain, Mood, and Cognitive Function

One of the most exciting emerging applications of photobiomodulation is transcranial near-infrared light therapy — the application of near-infrared wavelengths directly to the skull to reach brain tissue. This is not a theoretical application: near-infrared light in the 800–1000nm range demonstrably penetrates the human skull and reaches cortical tissue at therapeutic irradiances. Multiple clinical studies have demonstrated improvements in cognitive performance, memory, reaction time, attention, and mood following transcranial photobiomodulation, with particularly compelling results in Alzheimer's disease, traumatic brain injury, and major depressive disorder.

The mechanisms at work in the brain mirror those in other tissues — mitochondrial optimization, nitric oxide modulation, anti-inflammatory effects, and neuroprotective factor upregulation — but with additional significance given the brain's extraordinary metabolic demands and the catastrophic consequences of neuronal loss. BDNF (brain-derived neurotrophic factor), often called the

brain's 'growth hormone,' is upregulated by photobiomodulation, supporting neuroplasticity and the formation of new neural connections.

Thyroid Function and Hormonal Health

Emerging research suggests that red light applied directly to the thyroid gland may normalize thyroid function by reducing the autoimmune inflammation that drives Hashimoto's thyroiditis — the most common cause of hypothyroidism. A Brazilian randomized controlled trial published in Lasers in Surgery and Medicine demonstrated that patients with Hashimoto's thyroiditis who received red light therapy showed significant reductions in thyroid antibodies, improvements in thyroid volume, and in a substantial proportion of cases, reduction or elimination of their need for levothyroxine supplementation. While this is an evolving area, it aligns perfectly with red light's known mechanisms of anti-inflammatory action and mitochondrial optimization.

What to Expect at Next Health

Our clinical-grade red light therapy panels deliver precisely calibrated wavelengths at therapeutic irradiances — not the underpowered consumer devices that dominate the market, but professional panels engineered to deliver biologically effective doses. Sessions are relaxing, non-invasive, and typically run 10 to 20 minutes. Many clients integrate red light as a regular component of their wellness routine, combining it with infrared sauna for a thermally and photonically comprehensive

recovery session, or using it immediately following a workout to accelerate muscle repair.

> *"Light is information. And the right information, delivered to the right cells, changes everything."*

Chapter 3 Infrared Sauna

Cultures around the world have known for millennia that sweating is medicine. From Finnish löylys to Native American sweat lodges to Roman thermae, heat has been a cornerstone of healing across human history. Modern science is now confirming what our ancestors intuitively understood — and adding molecular-level precision that makes heat therapy more powerful and more targeted than ever before.

Infrared vs. Traditional Sauna — Understanding the Difference

Traditional Finnish saunas heat the air around you to temperatures of 185–200°F (85–95°C), which then heats your body through convection and conduction. Infrared saunas use infrared light waves — the same portion of the electromagnetic spectrum responsible for the warmth of sunlight — to directly heat your body's tissues rather than the air around you. This means infrared saunas operate at substantially lower air temperatures (typically 120–150°F / 49–66°C) while producing deeper tissue penetration: infrared light can reach 1.5 to 2 inches beneath the skin, accessing muscle, subcutaneous fat, and even joints in ways that surface heat simply cannot.

This deeper penetration has real physiological consequences. When heat reaches the muscle

layer directly, vasodilation occurs deeper in the tissue, producing more thorough increases in local blood flow. The thermal signal that drives the beneficial stress response — triggering heat shock proteins, hormonal releases, and cardiovascular adaptations — is delivered more efficiently per unit of discomfort. And the lower air temperature means sessions can be comfortably extended, allowing more time in the therapeutic range without the respiratory discomfort that accompanies very high air temperatures.

The Cardiovascular Evidence — More Impressive Than Most People Realize

Among all the benefits of sauna therapy, the cardiovascular evidence is the most robust and the most striking. The landmark Finnish data comes from the Kuopio Ischemic Heart Disease Risk Factor Study, which followed 2,315 middle-aged Finnish men over more than 20 years. The relationship between sauna frequency and cardiovascular outcomes was dose-dependent and dramatic: men who used the sauna 4–7 times per week had a 50% lower risk of fatal cardiovascular events, a 63% lower risk of sudden cardiac death, and a 40% lower risk of all-cause mortality compared to men who used the sauna only once per week.

These are numbers that rival the most powerful pharmaceutical interventions known to cardiology — and they come from a passive, enjoyable, low-risk activity. The mechanisms are multiple and well-characterized. Heat-induced vasodilation reduces systemic vascular resistance, lowering blood pressure through a mechanism similar to exercise.

Heart rate increases to 100–150 beats per minute, producing a cardiovascular training effect. The passive heat stress improves endothelial function — the ability of blood vessel walls to dilate appropriately in response to demand — which is arguably the most important modifiable factor in long-term cardiovascular health. And heat stress triggers the release of heat shock proteins (HSPs), molecular chaperones that protect proteins from damage and are independently associated with cardiovascular health and longevity.

> 📖 *Research Spotlight: Laukkanen et al. (2018, Mayo Clinic Proceedings): A 20-year prospective cohort study of 2,315 Finnish men demonstrated that sauna use 4–7 times per week was associated with a 50% reduction in fatal cardiovascular events, 63% reduction in sudden cardiac death, and 40% reduction in all-cause mortality compared to once-weekly sauna use, with a dose-dependent relationship across all categories.*

Heat Shock Proteins — The Molecular Foundation

Heat shock proteins are a family of molecules produced by cells in response to temperature stress. They function as molecular chaperones — proteins that help other proteins fold correctly, refold when damaged, and avoid the aggregation that leads to cellular dysfunction. The relevance to longevity is substantial: misfolded protein aggregates are a defining feature of many age-related diseases, including Alzheimer's (amyloid plaques), Parkinson's (alpha-synuclein aggregates), and cardiovascular disease (oxidized LDL aggregation in arterial walls).

Regular sauna-induced upregulation of HSPs provides ongoing protection against protein misfolding and aggregation — essentially maintaining the protein quality control systems that tend to deteriorate with age. HSP70 and HSP90 are particularly well-studied in this context, with animal research demonstrating that organisms with elevated HSP levels show dramatically extended healthspan and reduced age-related disease incidence. Human studies on sauna users confirm upregulation of these proteins with regular thermal stress.

Detoxification — The Scientific Case for Sweating

The detoxification benefits of sauna therapy are sometimes dismissed as marketing rather than science. The science, however, is more compelling than skeptics acknowledge. Sweat is produced by eccrine glands distributed across the body surface, and research has demonstrated that sweat contains measurable concentrations of heavy metals (lead, cadmium, arsenic, mercury), bisphenol A (BPA), phthalates, polychlorinated biphenyls (PCBs), and other persistent organic pollutants that accumulate in human tissues over a lifetime of environmental exposure.

A 2011 review published in the Journal of Environmental and Public Health analyzed the scientific evidence for sweat as a route of toxin elimination and concluded that for several heavy metals — particularly arsenic and cadmium — sweat excretion represents a physiologically significant elimination pathway that rivals urinary excretion. More recent research has demonstrated that infrared sauna-induced sweat contains higher

concentrations of some toxins than conventionally induced sweat, possibly because the deeper tissue penetration of infrared heat mobilizes toxins from subcutaneous fat stores where they tend to accumulate.

For anyone with documented heavy metal burden, mold toxin (mycotoxin) exposure, or elevated levels of environmental chemicals on toxin panel testing, regular infrared sauna sessions represent one of the most practical and evidence-supported detoxification strategies available. Combined with Next Health's EBOO ozone therapy, which addresses toxins through oxidative chemistry, and comprehensive toxin testing through our Vibrant panel, sauna forms a powerful component of a complete detoxification protocol.

Growth Hormone, Muscle Preservation, and Metabolic Health

Thermal stress from sauna exposure triggers a significant and dose-dependent release of human growth hormone (HGH) from the pituitary gland. A 1987 study in Acta Physiologica Scandinavica demonstrated a 2-fold increase in growth hormone following a single sauna session. More recent research has shown that protocols involving repeated heating and cooling cycles (contrast therapy) can produce growth hormone spikes of 500–1600% above baseline — a magnitude that rivals the effects of high-intensity interval training.

Growth hormone is essential for tissue repair, lean muscle maintenance, fat metabolism, bone density maintenance, and immune function — all of which decline with age in parallel with natural growth

hormone decline. Regular sauna use essentially provides a hormetic stimulus that partially compensates for this natural decline, supporting the preservation of body composition and metabolic health across the decades.

For clients already on peptide protocols targeting growth hormone (Ipamorelin, CJC-1295, Tesamorelin), regular sauna use synergizes beautifully — the pulsatile GH release driven by peptides is augmented by the thermally-induced spike, and the enhanced blood flow and tissue oxygenation produced by sauna creates an optimal environment for the anabolic and reparative effects of GH to be expressed.

Mental Health, Stress Resilience, and the Sauna-Brain Connection

The mental health benefits of regular sauna use have become one of the most compelling arguments for its routine use. The Finnish cohort study that produced the cardiovascular data also found that men who used the sauna 4–7 times per week had a dramatically lower risk of dementia and Alzheimer's disease — a 65% reduction compared to once-weekly users — a finding so striking that it was published separately in Age and Ageing and attracted widespread scientific attention.

The mechanisms are multiple. Heat stress triggers the release of dynorphins — endogenous opioid peptides that produce a paradoxical 'heat discomfort' sensation that is followed by a subsequent beta-endorphin response when body temperature normalizes. This endorphin release is responsible for the characteristic post-sauna sense

of calm, wellbeing, and even mild euphoria that regular users describe. BDNF (brain-derived neurotrophic factor) is upregulated by heat stress, supporting neuroplasticity and potentially explaining the reduced dementia risk. And the parasympathetic activation that follows the sauna session — the cooling, resting period — produces genuine nervous system regulation that counteracts the chronic sympathetic activation (stress response) that characterizes modern life.

What to Expect at Next Health

Our infrared saunas are private, beautifully appointed spaces designed for both relaxation and therapeutic effect. Sessions typically run 30 to 45 minutes. We recommend hydrating well before and after, and many clients enhance their sessions with red light therapy during the same visit or follow up with cryotherapy for the powerful contrast therapy effect. Our team can help you design a thermal protocol that complements your broader health program.

> *"The sauna is where your body remembers it has the ability to heal itself. All you have to do is show up."*

Chapter 4 Cryotherapy

There is a moment, about 30 seconds into a cryotherapy session, when something shifts. The initial shock of minus-250-degree air passes, and in its place arrives something that is difficult to describe to someone who hasn't experienced it: a profound sense of aliveness. Your body responds to this extreme cold with a cascade of adaptive responses honed over hundreds of thousands of years of human evolution in variable climates — and every single one of them is good for you.

The Biology of Cold — Hormesis in Action

To understand why brief, intense cold exposure is so beneficial, you need to understand the concept of hormesis — the biological phenomenon by which a stressor that would be harmful in excess produces beneficial adaptive responses at the right dose. Exercise is the most familiar example: tear the muscle enough and you build it back stronger. Expose the body to controlled cold and it adapts in ways that improve resilience, metabolic function, immune response, and mood.

The hormetic dose of cold that whole-body cryotherapy delivers is precise in a way that other cold exposures cannot match. At -200 to -250°F (-130 to -160°C), the outer skin temperature drops dramatically within seconds, triggering a peripheral vasoconstriction response that shunts blood toward

the core to protect vital organs. The nervous system responds with a coordinated endocrine release — adrenaline, noradrenaline, cortisol, and endorphins — that primes the body for the challenge. And then, crucially, the session ends at 2–3 minutes, before any genuine thermal damage can occur, and the rewarming phase begins. Blood rushes back to the periphery, now enriched with oxygen, anti-inflammatory cytokines, and nutrients that deliver a healing signal to every tissue it contacts.

The Norepinephrine Effect — Cold's Most Powerful Mechanism

Of all the physiological responses to whole-body cryotherapy, the most significant from a neurological and mood perspective is the dramatic increase in norepinephrine (noradrenaline). Research by Andrew Huberman's lab and others has documented that cold water immersion — with cryotherapy producing similar but more controlled effects — can increase plasma norepinephrine by 200–300% or more, with the magnitude of increase correlating with the intensity of the cold stimulus.

Norepinephrine is a neurotransmitter and hormone with profound effects on multiple body systems. In the brain, it governs attention, focus, arousal, and mood — it is, in essence, the molecule of alertness and directed effort. In the periphery, it drives vasoconstriction, metabolic activation, and the anti-inflammatory signaling that follows cold exposure. The sustained elevation of norepinephrine that follows a cryotherapy session — lasting several hours — explains the characteristic post-cryo mental clarity and sustained energy that clients reliably report. It also explains the growing evidence

base for cryotherapy as an intervention for depression and anxiety, conditions characterized in part by norepinephrine deficiency.

> 📖 *Research Spotlight: Dugue & Leppanen (2000, International Journal of Circumpolar Health): Whole-body cryotherapy produced significant increases in norepinephrine (up to 300% above baseline) and beta-endorphins, with these neuroendocrine changes persisting for several hours post-exposure and correlating with subjective improvements in mood, energy, and pain tolerance.*

Anti-Inflammatory Mechanisms — The Science of Cold

Cold exposure produces its anti-inflammatory effects through several distinct but complementary mechanisms. Vasoconstriction immediately reduces blood flow to inflamed tissue, physically reducing the delivery of inflammatory mediators to the affected area — the same principle behind applying ice to an acute injury. But the more important and more sustained anti-inflammatory effects come from the systemic endocrine and cytokine response to the cold stress.

Cryotherapy has been demonstrated to significantly reduce circulating levels of pro-inflammatory cytokines including IL-1β, IL-6, and TNF-alpha, while increasing levels of anti-inflammatory cytokines including IL-10 and IL-1 receptor antagonist. These changes are not trivial — they reflect a genuine shift in the body's inflammatory set-point that persists for hours after the session and accumulates with repeated exposures. For clients with chronically elevated inflammatory

markers (hsCRP, IL-6, homocysteine), regular cryotherapy can produce measurable reductions in these markers over time, representing a meaningful reduction in long-term cardiovascular, metabolic, and neurological risk.

Brown Adipose Tissue and Metabolic Activation

One of the most intriguing metabolic effects of regular cold exposure is its ability to activate and potentially increase brown adipose tissue (BAT) — a specialized fat tissue that generates heat through a process called thermogenesis, burning calories in the process. Unlike white adipose tissue, which stores energy, brown adipose tissue dissipates energy as heat and is rich in mitochondria (which give it its characteristic brown color). Adult humans possess meaningful amounts of BAT, primarily in the neck, shoulders, and upper back, and its quantity and activity are inversely correlated with obesity, insulin resistance, and metabolic disease.

Cold exposure is the primary physiological stimulus for BAT activation. Research using PET-CT imaging has demonstrated that cold-adapted individuals have more active BAT, higher resting metabolic rates, and improved glucose metabolism compared to non-adapted controls. Regular cryotherapy or cold water immersion appears to promote both the activation of existing BAT and the browning of white adipose tissue — a process by which ordinary fat cells take on BAT-like properties in response to cold stress. Over time, this adaptive response produces a lasting elevation in metabolic rate and improved metabolic flexibility that extends well beyond individual sessions.

Immune Enhancement and Resilience

The relationship between cold exposure and immune function has been studied since the early 20th century, when cold water swimmers were observed to have unusually low rates of illness. Modern research has confirmed and mechanistically explained this observation. Regular cold exposure increases the counts and activity of natural killer (NK) cells, cytotoxic T lymphocytes, and monocytes — all critical components of both innate and adaptive immunity. A 2016 Dutch study that received significant media attention — involving 3,000 participants randomized to daily cold showers versus warm showers — found a 29% reduction in sick leave from work in the cold shower group, a clinically meaningful effect driven by both reduced infection rates and faster recovery when illness did occur.

The immune benefits of cryotherapy appear to operate through the same hormetic mechanism underlying all cold's benefits: the controlled stress of cold exposure primes the immune system, making it more responsive and better coordinated without triggering the dysfunctional overactivation that underlies autoimmune conditions and chronic inflammation.

What to Expect at Next Health

Sessions at Next Health are 2 to 3 minutes in our state-of-the-art cryo-chambers. Our team will guide you through the process and ensure your comfort throughout. For first-time clients, we recommend a brief preparation conversation to explain what to

expect and how to optimize the experience. Most clients experience an immediate sense of energy and elevated mood after their session that typically lasts several hours. For optimal and cumulative benefits, we recommend incorporating cryotherapy into your regular routine, often pairing it with infrared sauna for the powerful benefits of contrast (hot-cold) therapy, which has been shown to produce greater growth hormone release and more sustained anti-inflammatory effects than either modality alone.

> *"Cold is not punishment. It is the signal your body has been waiting for — permission to become stronger."*

Chapter 5 IV Therapy

When you swallow a vitamin, it embarks on a circuitous journey through your digestive system — subject to the vagaries of gastric acid, competing absorption pathways, first-pass hepatic metabolism, and the transport limitations of intestinal enterocytes. By the time what remains reaches your cells, you may be receiving 10% to 50% of the dose you swallowed, and the timing of that delivery is unpredictable. Intravenous delivery bypasses every one of these barriers. Bioavailability reaches 100%. Delivery is immediate. And the concentrations achievable in circulation are not merely higher than oral doses — for certain nutrients, they are in an entirely different therapeutic category.

The Next Health IV Foundation — Why We Do It Differently

All Next Health IVs begin with lactated Ringer's solution — a superior hydrating base that provides a physiologically balanced blend of fluids and electrolytes matching the body's natural composition more closely than plain saline, which can actually worsen electrolyte balance with repeated use. Built into every drip is our Myers' Cocktail foundation: eight potent vitamins and minerals including vitamin C, magnesium, multiple B vitamins, zinc, copper, chromium, and calcium.

This is not an add-on at Next Health — it is the baseline. From this comprehensive foundation, we layer additional targeted nutrients to address your specific goals.

The Myers' Cocktail itself has a rich clinical history. Developed by the late Dr. John Myers, MD, at Johns Hopkins Hospital and subsequently popularized by Dr. Alan Gaby, it has been administered to thousands of patients over more than five decades for conditions ranging from fibromyalgia and chronic fatigue to acute viral illness and migraine. Prospective clinical trials have confirmed its efficacy for several of these conditions, and its outstanding safety record across millions of administrations provides the clinical foundation upon which our IV program is built.

Our Base IV Menu

Hydration IV

Our foundational drip delivers the Myers' Cocktail base with a focus on rapid, comprehensive rehydration and electrolyte replenishment. Research from the National Institutes of Health suggests that approximately 75% of Americans are chronically dehydrated — a state that impairs cognitive function, reduces physical performance, slows metabolism, and accelerates skin aging. Even mild dehydration of 1–2% of body weight produces measurable impairments in attention, short-term memory, and psychomotor vigilance. IV hydration corrects dehydration at a rate that oral hydration cannot match, saturating tissues in minutes rather than hours. It is the fastest, most complete reset available — ideal for jet lag recovery, post-travel replenishment, pre- or post-

event preparation, or anyone who needs to function at full capacity within hours.

Super Immune IV

The immune system operates on a foundation of specific micronutrients — and deficiency in any of them impairs function in ways that leave you more susceptible to infection and slower to recover when illness strikes. The Super Immune IV delivers targeted high-dose immune-supporting nutrients on top of the Myers' Cocktail base: additional vitamin C to support neutrophil and lymphocyte function, zinc which is required for the maturation of T cells and the activity of over 300 immune enzymes, and specific B vitamins that govern the production of antibodies and the signaling between immune cells. Clinical research has demonstrated that IV micronutrient therapy reduces both the incidence and severity of upper respiratory infections. Ideal before or after travel, during periods of elevated stress (which depletes immune-supporting nutrients rapidly), or any time your immune system is being asked to perform under pressure.

Longevity IV

Designed specifically for cellular health and healthy aging, the Longevity IV combines our Myers' Cocktail base with nutrients that address the hallmarks of aging at a molecular level. NAD+ precursors support the sirtuin and PARP enzymes involved in DNA repair. Alpha-lipoic acid — both fat- and water-soluble — quenches free radicals in compartments that other antioxidants cannot reach, and regenerates glutathione and vitamin C in situ. High-dose B vitamins support the methylation pathways that govern gene expression and homocysteine metabolism. Think of it as a longevity tune-up at the cellular level — delivering the

nutritional substrate your body's anti-aging machinery needs to function optimally, at absorption levels that oral supplementation cannot replicate.

Hangover IV

Alcohol metabolism is a multi-step process that creates acetaldehyde — a compound significantly more toxic than alcohol itself — as an intermediate. Acetaldehyde depletes glutathione (your primary antioxidant defense), triggers the release of inflammatory cytokines, impairs mitochondrial function, and causes the characteristic symptoms we associate with a hangover: headache, nausea, fatigue, and cognitive impairment. Simultaneously, alcohol is a diuretic that causes significant losses of magnesium, potassium, B vitamins, and zinc, and disrupts the normal architecture of sleep by suppressing REM sleep while increasing slow-wave sleep in the first half of the night. The Hangover IV addresses all of these mechanisms simultaneously: rehydration, electrolyte replenishment, B vitamin restoration, glutathione to neutralize residual acetaldehyde, and anti-nausea support. Most clients report feeling functionally recovered within 30 to 45 minutes.

Stress IV

Chronic stress activates the hypothalamic-pituitary-adrenal (HPA) axis, driving sustained cortisol release that depletes magnesium, B vitamins, vitamin C, and zinc at a dramatically accelerated rate. This nutritional depletion is not a coincidence — these nutrients are the raw materials that adrenal glands consume to produce cortisol. The more stressed you are, the faster you deplete them; the more depleted you become, the worse your physiological stress response. The Stress IV breaks

this cycle by directly replenishing the nutrients that stress has consumed, while providing the magnesium that acts as the body's natural calcium antagonist and nervous system regulator. For high-performers navigating sustained pressure — whether from work, travel, training, or life — the Stress IV is one of the most practical and immediate tools available.

Glamour IV

Skin reflects internal nutritional status with remarkable fidelity. The Glamour IV delivers a beauty-focused blend built around several key mechanisms: high-dose glutathione, which inhibits the enzyme tyrosinase and reduces the production of dark melanin pigments, producing the skin-brightening effect that has made glutathione one of the most sought-after aesthetic IV components in the world. Vitamin C at doses achievable only through IV delivery provides the substrate for collagen hydroxylation — the critical enzymatic step that converts procollagen into the structural collagen that gives skin its firmness and elasticity. Biotin supports the health of the keratinocytes that form the skin's protective barrier. Zinc supports wound healing and the integrity of the dermal structure. Clients typically notice a visible improvement in skin radiance, clarity, and tone within 24 to 48 hours.

Detox IV

The liver performs over 500 distinct metabolic functions, but none more central to your daily experience of health than its two-phase detoxification process. Phase I uses cytochrome P450 enzymes to chemically modify toxins, making them water-soluble enough to be processed. Phase II then conjugates these modified compounds with

molecules like glutathione, glucuronic acid, or sulfate groups, rendering them ready for excretion. Both phases require specific nutritional cofactors, and deficiency in any of them creates bottlenecks that allow toxic intermediates to accumulate. The Detox IV delivers targeted support for both phases: glutathione for Phase II conjugation, B vitamins for Phase I enzyme activity, and antioxidants to protect liver cells from the oxidative burden of processing environmental chemicals, alcohol, medications, and metabolic waste.

Muscle IV

Muscle repair following training is a metabolically demanding process that requires specific amino acids, mineral cofactors, and energy substrate — all of which are depleted by intense physical effort and must be replenished before repair can proceed. The Muscle IV delivers branched-chain amino acids (leucine, isoleucine, valine) that serve as both building blocks for muscle protein synthesis and signaling molecules that activate the mTOR pathway governing muscle growth. Magnesium is included not only for its role in hundreds of enzymatic reactions but specifically for its function in muscle relaxation — magnesium deficiency is a primary driver of muscle cramping and prolonged post-exercise soreness. For athletes training at high volumes or frequency, the Muscle IV can meaningfully compress recovery timelines, allowing more consistent high-quality training.

Weight Loss IV

Metabolic efficiency depends on a cascade of enzymatic reactions, each requiring specific micronutrient cofactors. When these cofactors are depleted — as they routinely are in anyone who has been dieting, under chronic stress, or simply not

absorbing nutrients efficiently — metabolism becomes sluggish and fat burning becomes inefficient. The Weight Loss IV delivers high-dose B vitamins, particularly B12 and B-complex, which are essential for the mitochondrial reactions that convert fat into usable energy. MIC (methionine, inositol, choline) components support hepatic fat metabolism and lipid mobilization. Chromium supports insulin sensitivity and blood sugar regulation. This is not a magic formula that replaces nutrition and exercise — it is a metabolic support tool that makes the work of weight optimization more biologically efficient by ensuring the enzymatic machinery of fat burning is running at full capacity.

Energy Plus IV

Fatigue is one of the most common complaints in modern life — and one of the most nutritionally addressable. The Energy Plus IV delivers a high-potency B vitamin complex (including B1, B2, B3, B5, B6, and B12) that supports the mitochondrial reactions of the citric acid cycle and the electron transport chain — the fundamental biochemistry of cellular energy production. Magnesium, essential for ATP synthesis (every ATP molecule requires a magnesium ion to be biologically active), is included at doses that reliably correct the widespread deficiency that impairs energy metabolism in a significant proportion of the population. Clients report clean, sustained energy without the crash that accompanies stimulant-based approaches — because unlike caffeine, which masks fatigue by blocking adenosine receptors, this IV actually addresses the nutritional root causes of energy deficit.

Brain IV

Cognitive performance is exquisitely dependent on nutritional status. The brain has no energy storage capacity — it must receive a continuous, uninterrupted supply of glucose, oxygen, and micronutrients to maintain function. When any component of this supply is compromised, cognitive performance suffers measurably long before subjective symptoms become obvious. The Brain IV delivers high-dose B12 for myelin maintenance and nerve conduction velocity, choline as a precursor to the neurotransmitter acetylcholine (critical for memory formation and attention), and antioxidants including alpha-lipoic acid and N-acetylcysteine that protect neurons from the oxidative damage that accumulates throughout life. Many clients report that cognitive improvements begin during the drip itself — a reflection of how rapidly neurons respond when their nutritional requirements are met.

Gut Health IV

The gut-brain axis, the gut-immune axis, the gut-skin connection — the microbiome's influence on virtually every system in the body is now one of the most active areas in all of medicine. But a healthy microbiome requires a healthy gut environment, and the integrity of the intestinal barrier — the single-cell-thick lining that separates the gut contents from systemic circulation — is foundational to everything downstream. The Gut Health IV delivers nutrients specifically targeted at supporting this barrier: glutamine, the primary fuel for intestinal enterocytes, which these cells cannot produce in adequate quantities under conditions of stress or inflammation; zinc, essential for tight junction protein expression; and anti-inflammatory compounds that reduce the cytokine-driven inflammation that erodes gut barrier integrity. For anyone dealing with bloating, food sensitivities,

post-antibiotic gut disruption, or any manifestation of increased intestinal permeability, this IV directly addresses the physiological root.

Lean IV

The Lean IV is designed to support body recomposition — the simultaneous reduction of fat mass and preservation or increase of lean muscle mass that represents the ideal outcome of any weight optimization program. It combines metabolic support nutrients (high-dose B vitamins, chromium for insulin sensitivity) with compounds that support fat oxidation (carnitine, which is required to transport long-chain fatty acids into the mitochondria where they are burned for energy) and lean muscle preservation (branched-chain amino acids and cofactors for protein synthesis). Used as part of a comprehensive program that includes hormonal optimization and appropriate physical training, the Lean IV provides the nutritional foundation that makes body recomposition metabolically feasible.

NAD+ Infusions — The Longevity Coenzyme

NAD+ (nicotinamide adenine dinucleotide) occupies a unique position in longevity science: it is simultaneously one of the most well-understood and most clinically significant molecules associated with biological aging. Present in every living cell, NAD+ serves as the essential coenzyme for over 500 enzymatic reactions, including the sirtuin enzymes (SIRT1–SIRT7) that govern gene expression, DNA repair, metabolic regulation, and cellular stress responses — collectively among the most important longevity pathways identified to date. It is also the substrate for PARP enzymes,

which repair DNA strand breaks and are critical for genomic stability.

The problem is decline. NAD+ levels fall by approximately 50% between the ages of 40 and 60 in most people, driven by a combination of reduced biosynthesis, increased consumption by aging-related processes (PARP enzymes become more active as DNA damage accumulates), and chronic inflammation. This decline is now understood to be not merely a symptom of aging but a mechanistic contributor to it — a causal factor in the mitochondrial dysfunction, reduced DNA repair capacity, and impaired cellular resilience that characterize aging physiology.

Oral NAD+ precursors (nicotinamide riboside, nicotinamide mononucleotide) can raise NAD+ levels modestly through the salvage biosynthesis pathway. IV NAD+ bypasses these pathways entirely, delivering the molecule directly into circulation and achieving tissue concentrations that oral supplementation cannot approach. The clinical experience at Next Health with NAD+ infusions is consistently compelling: clients report dramatically elevated energy, cognitive sharpness described by many as unlike anything they've experienced from other interventions, improved mood and reduced cravings (including for alcohol and sugar, for which NAD+ plays a role in the neurochemical pathways of reward), and improvements in sleep quality and physical endurance.

We offer NAD+ IV therapy in 300mg and 750mg doses. NAD+ infusions are longer sessions — typically 2–4 hours — administered as a slow drip to optimize tolerance and absorption. For optimal results, we recommend the Optimal Aging Trifecta: three NAD+ infusions of 300mg or 750mg over seven days. This front-loading approach saturates

cellular NAD+ stores and produces a more profound and lasting physiological reset than spaced single sessions.

> 📖 *Research Spotlight: Rajman et al. (2018, Cell Metabolism): A comprehensive review of NAD+ biology confirmed that NAD+ decline with aging drives impairment of sirtuin and PARP activity, mitochondrial dysfunction, and reduced cellular stress resilience. The authors identified NAD+ repletion as one of the most promising interventions for extending healthspan across multiple model organisms and early human studies.*

Niagen IV — The Next Frontier of NAD Precursor Therapy

Nicotinamide riboside (NR), marketed under the brand name Niagen, is a naturally occurring form of vitamin B3 that serves as a direct precursor to NAD+ through a distinct biosynthetic pathway from other NAD+ precursors. NR is absorbed by cells and rapidly phosphorylated to NMN and then to NAD+, making it one of the most efficient NAD+ precursors identified. While oral NR supplements have demonstrated meaningful increases in blood NAD+ levels in clinical trials, delivering NR intravenously removes the bioavailability limitations of oral administration entirely, achieving much higher plasma concentrations and more rapid cellular uptake.

We offer Niagen IV in 500mg and 1,000mg doses. The clinical interest in Niagen centers on several key mechanisms: beyond simple NAD+ repletion, NR has been shown to stimulate mitochondrial biogenesis — the creation of new mitochondria —

through activation of PGC-1α, the master regulator of mitochondrial function. This effect on mitochondrial quantity, not just quality, is a meaningful distinction from other approaches to NAD+ repletion. NR also supports the function of CD38 NADase, an enzyme involved in calcium signaling and immune function. Many clients report a sustained, clean elevation in energy and cognitive clarity in the days following a Niagen IV — distinct in character from the more immediate post-infusion effect of NAD+, reflecting the different kinetics of this precursor approach.

IV Add-Ons — Enhancing Your Drip

Glutathione

Glutathione is produced endogenously in every cell and serves as the master antioxidant, recycling vitamins C and E back to their active forms after they've neutralized free radicals, serving as the primary substrate for the liver's Phase II detoxification reactions, and maintaining the redox balance that governs cellular function. GSH levels decline with age, stress, illness, alcohol consumption, and chronic toxin exposure — and the consequences of this decline permeate every system in the body. Oral glutathione supplementation is largely ineffective because the tripeptide is broken down in the gastrointestinal tract before it reaches the bloodstream. IV delivery achieves immediate systemic elevation, producing effects that clients describe as distinctly different from any supplement they've taken: improved energy, mental clarity, and the characteristic skin-brightening effect that makes glutathione one of the most requested aesthetic IV additions in the world.

Trace Minerals

The human body requires over 70 distinct trace minerals for optimal enzymatic function, yet modern soils are dramatically depleted in many of them compared to even 50 years ago. Selenium is required for glutathione peroxidase, the antioxidant enzyme that protects cell membranes. Zinc is a cofactor in over 300 enzymatic reactions spanning immunity, hormone metabolism, DNA repair, and wound healing. Chromium governs insulin receptor sensitivity and glucose metabolism. Copper is required for cytochrome c oxidase — the very enzyme that red light therapy targets — and for the production of melanin and connective tissue. IV trace mineral delivery ensures bioavailable, immediately usable concentrations of these essential elements that bypass whatever absorption limitations may exist in the gut.

Toradol (Ketorolac)

Ketorolac is a potent non-opioid, non-steroidal anti-inflammatory medication that inhibits prostaglandin synthesis through COX-1 and COX-2 inhibition — the same mechanism as ibuprofen or naproxen, but with substantially greater potency when delivered intravenously. For acute pain management — migraine headache (for which IV ketorolac is a first-line emergency treatment), acute musculoskeletal pain, post-workout inflammation, or any situation requiring rapid, effective analgesia without the cognitive impairment of opioids or the GI irritation of oral NSAIDs — IV Toradol provides relief that begins within minutes and lasts for hours. It is particularly valuable for migraine sufferers who cannot tolerate oral medications during an active attack.

Zofran (Ondansetron)

Ondansetron is a selective 5-HT3 receptor antagonist — it blocks the serotonin receptors in both the gut and the chemoreceptor trigger zone of the brain that initiate the nausea and vomiting reflex. Originally developed for chemotherapy-induced nausea, IV Zofran provides rapid, reliable anti-nausea relief for any cause: hangover, migraine, motion sickness, post-anesthesia nausea, or acute gastrointestinal illness. The intravenous route is particularly important for nausea relief because oral anti-nausea medications are obviously difficult to retain when the problem is active nausea — IV administration bypasses this barrier entirely.

Mini Stem Cell Doses — Biologics

For clients seeking a next-level regenerative addition, we offer mini doses of our umbilical cord tissue-derived biologic products as an IV add-on. These are human cell and tissue products (HCT/Ps) derived from umbilical cord tissue donated by healthy, screened mothers — zero-age biological material packed with growth factors, signaling proteins, and regenerative messengers that systematically reach every tissue through IV circulation. See Chapter 11 for the complete story on our biologics program and what distinguishes Next Health's products from inferior international alternatives.

Advanced IV Therapies

Our Advanced IV Therapies are clinically guided infusions requiring qualifying lab results within the last 3 months and medical provider clearance prior to the first session. These protocols are designed for deeper cellular, vascular, and metabolic intervention beyond what standard IV drips provide.

Plaquex® (Phosphatidylcholine)

Phosphatidylcholine (PC) is the dominant phospholipid in mammalian cell membranes, constituting 40–60% of the total phospholipid content of most cellular membranes. It serves not merely as structural material but as an active participant in cellular signaling, membrane fluidity regulation, and the lipid metabolism pathways that determine how cells handle fat. As we age, and as we're exposed to processed seed oils, oxidative stress, and chronic inflammation, the composition of our cell membranes shifts in ways that impair their function — they become less fluid, less permeable to beneficial substances, and less able to carry out the precise signaling functions that depend on membrane architecture.

Plaquex IV delivers pharmaceutical-grade phosphatidylcholine directly into circulation, where it incorporates into cell membranes throughout the body, restoring their composition and function. Beyond membrane restoration, phosphatidylcholine has been shown in European clinical trials to reduce arterial plaque (it was originally developed as a plaque-dissolving agent), support liver health in non-alcoholic fatty liver disease, and improve neurological function — the brain is among the most PC-rich organs in the body. For clients with cardiovascular risk, liver burden, or any condition associated with cell membrane compromise, Plaquex represents one of the most foundational and mechanistically sophisticated IV interventions available.

High-Dose Vitamin C (15g, 25g, and 50g)

The pharmacology of vitamin C changes dramatically at different doses — a fact that conventional medicine has been slow to appreciate

but that functional medicine physicians have understood for decades. At oral doses, vitamin C acts as a classical antioxidant, donating electrons to neutralize free radicals. At the pharmacological concentrations achievable only through IV delivery — plasma concentrations of 5 to 20 millimolar, compared to the less than 0.5 millimolar achievable orally — vitamin C transitions to a pro-oxidant agent that selectively generates hydrogen peroxide in tissues where iron concentrations are high. Cancer cells concentrate iron avidly and lack the catalase enzyme activity needed to neutralize hydrogen peroxide, making them selectively vulnerable to this effect. Normal cells, with intact catalase, are unaffected. This mechanism is supported by multiple in vitro studies, animal models, and a growing body of human research.

Beyond its cancer-related applications, high-dose IV vitamin C is a powerful antiviral agent — at these concentrations, it inactivates viruses through oxidative mechanisms that are simply not available at oral doses. It dramatically accelerates collagen synthesis by serving as the essential cofactor for prolyl and lysyl hydroxylase, the enzymes that stabilize the collagen triple helix. And it supports adrenal function and immune cell activity at concentrations that match those found in adrenal glands and immune cells — concentrations that cannot be maintained through oral supplementation. We offer 15g, 25g, and 50g doses, with the appropriate dose determined by clinical indication.

> 📖 *Research Spotlight: Padayatty et al. (2004, Annals of Internal Medicine): Pharmacokinetic modeling demonstrated that IV vitamin C achieves plasma concentrations up to 70-fold higher than the maximum achievable orally. At these concentrations,*

vitamin C acts as a pro-oxidant selectively cytotoxic to cancer cells while leaving normal cells unaffected — a mechanism unavailable at any orally achievable dose.

Iron Infusions

Iron is required for hemoglobin synthesis, mitochondrial electron transport, DNA synthesis, collagen production, thyroid hormone metabolism, and the function of numerous enzymes involved in energy production and immune defense. Iron deficiency is the world's most prevalent nutritional deficiency, affecting an estimated 1.62 billion people globally — a number that includes many people who would never describe themselves as deficient and whose standard blood tests show values within the 'normal' range. Functional iron deficiency — sufficient iron for hemoglobin production but insufficient for optimal tissue function — causes profound fatigue, impaired cognitive function, decreased aerobic exercise capacity, poor cold tolerance, and immune suppression at ferritin levels that many laboratories still consider acceptable.

Oral iron supplementation is frequently inadequate for several reasons: absorption is limited, competing dietary components (calcium, tannins, phytates) further reduce absorption, and the gastrointestinal side effects of iron supplements are severe enough that many patients cannot maintain therapeutic doses. IV iron bypasses the gut entirely, delivering a complete therapeutic dose directly into circulation. Clients who receive iron infusions at Next Health often describe the improvement in energy and mental clarity as among the most dramatic and rapid they have experienced from any intervention — because iron deficiency, even at

subclinical levels, impairs the basic biochemistry of energy production in every cell in the body.

> *"The difference between taking a supplement and receiving an IV is the difference between posting a letter and making a phone call. The message is the same. The delivery is not."*

Chapter 6 InBody Scans — Understanding What Your Body Is Really Made Of

Your scale is lying to you. It tells you one number and implies that this number tells you something meaningful about your health. It doesn't. What matters is not how much you weigh, but what that weight is made of — and the difference between a 180-pound person with 35 pounds of fat and a 180-pound person with 25 pounds of fat is the difference between metabolic disease and metabolic health. The InBody scan gives you the truth that the scale cannot.

The Technology — How InBody Works

The InBody scanner uses multi-frequency direct segmental bioelectrical impedance analysis (DSM-BIA) — a sophisticated evolution of the simple bioimpedance scales available in pharmacies. Unlike those consumer devices, which send a single-frequency current through only a portion of the body and apply population-average equations to estimate composition, the InBody system sends alternating electrical currents at multiple frequencies (5 kHz, 50 kHz, 250 kHz, and 500 kHz) through each of the five body segments

independently — right arm, left arm, trunk, right leg, and left leg.

The multi-frequency approach is critical because different tissues resist different frequencies differently. Intracellular fluid (inside cells) presents high resistance to low-frequency currents that cannot cross cell membranes, while high-frequency currents pass through membranes and are resisted by intracellular contents. By measuring impedance at multiple frequencies, the InBody system can mathematically separate intracellular water, extracellular water, fat mass, and lean mass with a precision validated against DEXA scanning — the gold standard for body composition measurement — in numerous independent studies. The segmental approach adds another layer of clinical insight unavailable from whole-body measurements: it reveals where muscle and fat are distributed, identifying imbalances and regional deficiencies that aggregate measurements obscure.

Skeletal Muscle Mass — The Most Important Number You're Not Tracking

Skeletal muscle mass is arguably the single most important measurable determinant of long-term health and longevity. This is not a fitness industry claim — it is a conclusion supported by a growing body of longitudinal epidemiological research spanning multiple decades and hundreds of thousands of subjects. Muscle mass predicts insulin sensitivity, metabolic rate, immune function, bone density, recovery from illness and injury, physical independence in old age, and all-cause mortality

with a consistency that rivals any biomarker in clinical medicine.

The condition of age-related muscle loss — sarcopenia — is classified as a disease by the ICD-10 coding system, and for good reason. Sarcopenia affects approximately 30% of people over 60 and 50% of people over 80, and its consequences extend far beyond loss of physical strength. Sarcopenic individuals have higher rates of insulin resistance and type 2 diabetes (because muscle is the primary site of insulin-mediated glucose disposal), increased cardiovascular risk (because muscle's metabolic activity produces beneficial myokines that protect the vasculature), higher rates of falls and fractures, and dramatically reduced resilience to any physiological stress from illness to surgery.

The InBody provides precise skeletal muscle mass measurements in kilograms, compares them to the normative range for your height and gender, and — crucially — tracks changes over time with serial measurements. It also reports skeletal muscle mass index (SMI), the appendicular muscle mass divided by height squared, which is the diagnostic criterion used in clinical research to identify sarcopenia. Most people who begin regular InBody scanning discover that they have less muscle mass than they expected — and this realization, more than almost any other health data point, drives meaningful behavioral and protocol changes.

Visceral Fat Area — The Fat That's Killing You Quietly

There are two kinds of body fat, and they are not equivalent. Subcutaneous fat — the fat you can pinch beneath the skin — is metabolically relatively

inert and is the fat most visible on the surface. Visceral fat — the fat stored deep within the abdominal cavity, surrounding and infiltrating the organs — is metabolically active in ways that are profoundly damaging. Visceral adipocytes (fat cells) are not passive storage depots; they are endocrine organs producing a complex cocktail of inflammatory cytokines, adipokines, and hormones that, when produced in excess, drive systemic inflammation, insulin resistance, dyslipidemia, and hypertension.

Visceral fat is one of the primary drivers of metabolic syndrome — the cluster of conditions including high blood pressure, elevated blood sugar, abnormal cholesterol, and abdominal obesity that dramatically increases the risk of cardiovascular disease, type 2 diabetes, and several cancers. It drives the production of IL-6, TNF-alpha, and resistin while suppressing the production of adiponectin, a protective adipokine with insulin-sensitizing, anti-inflammatory, and cardioprotective effects. High visceral fat is also independently associated with Alzheimer's disease risk, likely through its pro-inflammatory effects on neuroinflammation.

The critical clinical insight that InBody provides is that visceral fat is essentially invisible on the surface. A person can be at a 'normal' body weight with a normal BMI and harbor dangerous levels of visceral fat — this is the 'normal weight obese' or TOFI (thin outside, fat inside) phenotype, which affects a substantial and generally unrecognized proportion of the population. The InBody measures visceral fat area directly, reporting it in square centimeters and comparing it to the threshold of 100 cm^2 that research has identified as the point above which metabolic risk increases substantially. Watching your visceral fat area decline as your

protocol takes effect — through hormone optimization, peptide therapy, GLP-1 medications, improved nutrition, or regular exercise — is one of the most motivating data points available in health optimization.

ECW Ratio — Reading the Language of Cellular Health

The ECW ratio (extracellular water to total body water) is a metric of considerable sophistication that few outside functional medicine and clinical nutrition are familiar with — but it is one of the most informative single numbers the InBody generates. To understand it, you need to understand the body's water compartments.

Total body water is divided between two compartments: intracellular water (ICW), the water held within cells — approximately 60–65% of total body water in healthy individuals — and extracellular water (ECW), the water in the spaces between cells, in the blood plasma, and in lymph. The ratio of ECW to TBW should, in healthy individuals, fall in the range of 0.360 to 0.390, with an optimal value around 0.380. This ratio is not arbitrary — it reflects the balance between cellular mass (which holds ICW) and the interstitial fluid environment that supports cellular function.

When this ratio rises above 0.390, it signals that extracellular fluid is disproportionately elevated relative to intracellular water. This pattern arises from two distinct mechanisms: excess fluid accumulation in the extracellular space (which occurs in inflammation, lymphatic congestion, and conditions of fluid retention), or loss of intracellular water driven by loss of cellular mass — most commonly muscle loss. Either way, an elevated

ECW ratio is a flag that something is physiologically suboptimal, often preceding overt symptoms by months or years.

The clinical utility of ECW ratio tracking is considerable. In clients undergoing treatment, a normalizing ECW ratio — moving from 0.400 or above toward the 0.375–0.385 range — provides objective confirmation that systemic inflammation is resolving and cellular health is improving, even when other metrics haven't changed dramatically yet. For clients with conditions associated with fluid retention or chronic inflammation, ECW ratio is often the most sensitive early indicator of treatment response available. At Next Health, we interpret ECW ratio in conjunction with segmental ECW analysis — which identifies whether fluid excess is localized (suggesting injury or regional inflammation) or systemic (suggesting a more global inflammatory or health issue).

Phase Angle — Your Cellular Health Score

Phase angle is derived from the raw impedance measurements of the InBody scan and represents the degree to which cell membranes resist the electrical current passing through the body. The healthier and more intact the cell membranes, the more they impede the current — because healthy membranes maintain a strong charge separation (capacitance) that delays the voltage signal. This delay, measured in degrees, is the phase angle.

What makes phase angle remarkable as a clinical metric is its extraordinary breadth of prognostic significance. Low phase angle is consistently associated with malnutrition, chronic disease, aging, poor surgical outcomes, reduced quality of

life, and in critically ill patients, increased mortality risk. High phase angle is associated with athletic performance, cellular vitality, and longevity. A 2010 meta-analysis published in Clinical Nutrition found that phase angle predicted outcomes in cancer, HIV/AIDS, liver disease, and critically ill patients with greater accuracy than many conventional clinical parameters.

For longevity-focused clients, phase angle provides a single, objective number that reflects the aggregate health of every cell membrane in the body — a cellular health score. Improving phase angle through nutrition, resistance training, hormone optimization, IV therapy, and other Next Health protocols produces a measurable number that rises over time, providing both motivation and objective confirmation that the work is paying off at the deepest level of cellular biology.

Using InBody Data to Guide Your Protocol

At Next Health, we use InBody scans not as a one-time curiosity but as a dynamic tracking tool that informs clinical decision-making. The body composition trajectory revealed by serial InBody measurements — Is muscle mass increasing? Is visceral fat declining? Is the ECW ratio normalizing? Is phase angle improving? — provides the data our clinical team needs to optimize your protocol in real time. We can adjust hormone therapy dosing, peptide protocols, IV schedules, and nutritional guidance based on objective measurements of how your body is actually responding, rather than relying solely on how you feel.

We recommend InBody scans at baseline and then quarterly at minimum — or monthly for clients in

active intervention phases. The Body Composition History feature of the InBody report displays your measurements across sessions, making trends immediately visible. For many clients, the moment they see their visceral fat declining, their phase angle climbing, and their muscle mass increasing — all simultaneously, as a result of their protocol — is one of the most motivating and validating experiences of their health optimization journey.

> *"You cannot optimize what you cannot measure. The InBody scan is where your health journey becomes real."*

Chapter 7 Peptide Therapy — Unlocking Your Body's Own Healing Intelligence

The history of medicine is a history of discovering what the body already knows how to do — and learning to work with it rather than against it. Antibiotics taught us to recruit nature's own antimicrobial chemistry. Vaccines taught us to prime the immune system's own memory. Peptide therapy is the next chapter in this story: the discovery that the body communicates with itself through an extraordinarily sophisticated molecular language, and that we can learn to speak that language fluently.

What Are Peptides?

Peptides are short chains of amino acids — anywhere from 2 to approximately 50 amino acids in length — that function as biological signals throughout the body. They are distinct from full proteins (which are longer, more structurally complex molecules) in their size, their targeted specificity, and their ability to bind to highly specific receptors and trigger precisely defined cellular responses. There are over 7,000 naturally occurring peptides in the human body, governing functions

from growth and repair to immune response, metabolism, appetite, pain perception, and mood.

What makes peptide therapy so compelling from a pharmacological perspective is the combination of specificity and safety. Because peptides work by engaging receptors for molecules that already exist in the body — rather than blocking enzymes or flooding receptor systems as conventional drugs often do — they tend to produce targeted, physiologically appropriate responses rather than the broad, often unpredictable effects of small-molecule pharmaceuticals. And because peptides are amino acid chains, they are metabolized through normal protein degradation pathways rather than through hepatic enzyme systems, giving them inherently favorable tolerability profiles.

Peptide science has been advancing since the 1920s, when insulin became the first peptide therapy in clinical medicine. Today, the field has expanded to encompass hundreds of investigational and clinically available peptides targeting every major physiological system. At Next Health, our clinical team has carefully evaluated the evidence base for each peptide we offer, and all protocols require medical consultation and recommendation from a licensed provider.

Growth Hormone Peptides — Restoring the Hormonal Terrain of Youth

Sermorelin, Ipamorelin, and CJC-1295

The decline of growth hormone (GH) with age is one of the most consistent and consequential hormonal changes in human biology. Peak GH secretion

occurs in adolescence; from young adulthood onward, GH production declines at approximately 14–15% per decade, driven primarily by decreased amplitude of the pulsatile GH secretory bursts from the pituitary rather than loss of pituitary capacity. By age 60, many individuals have GH secretion rates less than one-quarter of their youthful peak.

The consequences of this decline are substantial: increased body fat (particularly visceral fat), loss of lean muscle mass, decreased bone density, impaired wound healing, reduced immune function, deterioration of sleep quality (GH is secreted primarily during slow-wave sleep), cognitive changes, and diminished overall sense of vitality and wellbeing — all changes that overlap substantially with what we call 'normal aging.'

Growth hormone secretagogue peptides work by stimulating the pituitary gland to secrete more of its own GH — not by supplying exogenous hormone, but by restoring the signaling that drives the pituitary to produce it. This is a critical distinction: the pituitary retains capacity to produce GH into old age; what declines is the signaling input from the hypothalamus. Sermorelin mimics growth hormone-releasing hormone (GHRH), providing that lost signal. Ipamorelin is a growth hormone-releasing peptide (GHRP) that works through the ghrelin receptor to potentiate GH release with high selectivity — it stimulates GH without meaningfully raising cortisol or prolactin, as many earlier GHRPs did. CJC-1295 is a modified GHRH analog with a much longer half-life than native GHRH, allowing less frequent dosing while maintaining a sustained augmentation of the GH pulse.

Used in combination — a GHRH analog plus a GHRP in what is called a 'stack' — these peptides produce a synergistic amplification of the GH pulse

that substantially exceeds what either agent produces alone. The pulsatile nature of the resulting GH release is important: it closely mimics natural GH secretion patterns, avoiding the continuous supraphysiological GH exposure associated with direct GH administration that can produce adverse effects including insulin resistance and acromegalic changes.

Tesamorelin

Tesamorelin is a synthetic GHRH analog that earned FDA approval in 2010 for the reduction of excess abdominal fat in HIV-infected patients with lipodystrophy — making it one of the most rigorously studied and clinically validated peptides in the growth hormone secretagogue class. Its mechanism is specifically targeted at visceral adipose tissue: by augmenting GH secretion and downstream IGF-1 production, tesamorelin activates lipase enzymes in visceral fat cells, promoting the breakdown and release of stored triglycerides for use as fuel.

Clinical trials in HIV lipodystrophy demonstrated visceral fat reductions of 15–18% over 26 weeks, along with improvements in triglycerides, LDL particle size, and inflammatory markers. Subsequent research in the general aging population has confirmed similar effects on visceral fat, with the additional finding of improved cognitive function — particularly in older adults with mild cognitive impairment, where elevated visceral fat is an independent risk factor. At Next Health, tesamorelin is prescribed as part of comprehensive weight and metabolic optimization protocols, typically administered as a subcutaneous injection in the evening (to align with the natural nocturnal GH pulse).

Recovery and Tissue Repair

BPC-157

Body Protection Compound 157 is a synthetic 15-amino-acid peptide derived from a partial sequence of a protein naturally present in human gastric juice. Despite this humble origin, BPC-157 has demonstrated a remarkably broad spectrum of regenerative effects across virtually every tissue type studied — effects that have generated over 100 published research papers and attracted significant clinical interest. Its mechanisms are multiple: BPC-157 upregulates growth hormone receptors in damaged tissue, making local cells more responsive to GH's reparative signals. It stimulates the expression of VEGF (vascular endothelial growth factor), promoting the formation of new blood vessels that supply oxygen and nutrients to healing tissue. It modulates both nitric oxide production and the inflammasome signaling pathway to optimize the inflammatory environment for repair — reducing excessive inflammation without suppressing the beneficial inflammatory signals that drive healing.

Clinically, BPC-157 has been studied for tendon healing (with dramatic results in animal models showing accelerated tendon-to-bone reintegration), ligament repair, muscle healing, bone repair, gut healing (including both mucosal repair and treatment of inflammatory bowel disease manifestations in animal models), and neurological protection. For clients dealing with injuries that have resisted conventional treatment — chronic tendinopathies, partial ligament tears, recurring muscle strains — BPC-157 represents a fundamentally different mechanistic approach to

promoting resolution rather than simply managing symptoms.

TB-500 (Thymosin Beta-4)

Thymosin Beta-4 is a naturally occurring peptide present at high concentrations in virtually every cell of the body, where it functions primarily as an actin-sequestering molecule — binding to the actin monomers that would otherwise polymerize into the cytoskeletal filaments, keeping them available for rapid deployment when needed. During wound healing and tissue repair, thymosin Beta-4 is released and promotes cell migration, angiogenesis, and tissue remodeling. TB-500 is a synthetic fragment of thymosin Beta-4 that retains its key biological activity.

The clinical utility of TB-500 centers on its ability to promote repair in connective tissue — tendons, ligaments, fascia, and the extracellular matrix components that give these structures their mechanical properties. It has demonstrated particular efficacy in promoting flexibility and range of motion alongside tissue repair, and it penetrates to areas of damage through systemic circulation rather than requiring local injection at the injury site. For athletes dealing with chronic connective tissue issues, TB-500 is often used in conjunction with BPC-157 in a complementary protocol addressing different but synergistic aspects of tissue repair.

Weight and Metabolic Optimization

GLP-1 Agonists — Semaglutide and Tirzepatide

The discovery of glucagon-like peptide-1 (GLP-1) receptors in the brain, and the subsequent development of GLP-1 receptor agonists, has produced what many metabolic medicine specialists describe as the most significant advance in obesity treatment since the discovery of insulin. GLP-1 is an incretin hormone secreted by L-cells in the intestinal wall in response to food intake. Its effects are multiple and synergistic: it stimulates pancreatic beta cells to release insulin in a glucose-dependent manner, suppresses glucagon to prevent inappropriate glucose production by the liver, slows gastric emptying (reducing the rate at which glucose enters the bloodstream), and — crucially — acts on the hypothalamus and other brain regions to reduce appetite and increase satiety.

At the receptor doses achieved by pharmacological GLP-1 agonists like semaglutide (Ozempic/Wegovy) and tirzepatide (Mounjaro/Zepbound, which adds GIP receptor agonism), these effects are amplified dramatically beyond what endogenous GLP-1 can produce. Clinical trials have demonstrated average weight reductions of 15–17% with semaglutide and 20–22% with tirzepatide — outcomes that were previously thought to be achievable only with bariatric surgery. But the benefits extend beyond weight: these medications produce significant improvements in cardiovascular risk (the SELECT trial demonstrated a 20% reduction in major adverse cardiovascular events with semaglutide), reductions in liver fat, and improvements in inflammatory markers. At Next Health, GLP-1 agonists are prescribed as part of comprehensive metabolic optimization programs that include nutritional guidance, exercise support, muscle

preservation strategies, and regular biomarker monitoring.

> 📖 *Research Spotlight: Lincoff et al. (2023, New England Journal of Medicine — SELECT Trial): Semaglutide 2.4mg weekly demonstrated a 20% reduction in major adverse cardiovascular events (MACE) in overweight/obese adults without diabetes but with established cardiovascular disease — the first obesity medication to demonstrate cardiovascular outcome benefit in a pre-specified primary endpoint.*

Retatrutide

Retatrutide represents the cutting edge of peptide-based metabolic medicine — a triple agonist targeting GLP-1, GIP, and glucagon receptors simultaneously, creating a more comprehensive metabolic reprogramming than any currently approved single or dual agonist can achieve. While GLP-1 agonists reduce appetite and slow gastric emptying, and GIP agonism augments insulin secretion and nutrient handling, glucagon receptor agonism adds a third critical dimension: direct stimulation of energy expenditure through hepatic fat oxidation and thermogenesis, independent of caloric intake. The combination of appetite reduction, improved nutrient handling, and increased energy expenditure produces a metabolic effect that is greater than the sum of its parts.

Phase 2 clinical trial data for retatrutide published in the New England Journal of Medicine in 2023 showed mean weight reductions of 17.5% at 24 weeks — already exceeding the 52-week results of semaglutide — with the highest doses projecting to greater than 24% weight reduction at one year. These outcomes represent a genuine step-change in what is pharmacologically achievable for weight

and metabolic optimization. At Next Health, retatrutide is offered within a comprehensive clinical framework that includes regular biomarker monitoring, InBody composition tracking, and nutritional guidance to ensure that weight loss is accompanied by preservation of lean muscle mass — a critical distinction that distinguishes optimized metabolic intervention from simple caloric restriction.

MOTS-c

MOTS-c (mitochondrial open reading frame of the 12S rRNA type-c) is a microprotein encoded within the mitochondrial genome — one of the first examples of a bioactive peptide produced by mitochondria rather than the nuclear genome. Its discovery in 2015 opened a new chapter in understanding how mitochondria communicate with the rest of the body. MOTS-c functions as a metabolic regulator, activating AMPK (AMP-activated protein kinase — the cellular energy sensor that promotes fat burning, improves insulin sensitivity, and suppresses inflammatory pathways) in muscle and other tissues. In animal studies, MOTS-c injections reversed age-related obesity and insulin resistance, improved exercise capacity, and extended lifespan. For clients seeking to address metabolic aging at its mitochondrial root — particularly those with significant insulin resistance or age-related metabolic deterioration — MOTS-c represents a novel and mechanistically compelling option.

Cognitive Function Peptides

Dihexa

Dihexa is a synthetic peptide derived from angiotensin IV that acts on hepatocyte growth factor (HGF) receptors in the brain to enhance synaptic plasticity and promote the formation of new synaptic connections. Its potency is remarkable: in animal models, Dihexa has been shown to improve cognitive function in Alzheimer's disease models with a potency 10,000-fold greater than BDNF itself — a number that, while it must be interpreted carefully given the difference between animal and human pharmacology, reflects a genuinely novel mechanism of action distinct from anything in the conventional nootropic or pharmaceutical space. For clients experiencing age-related cognitive decline, post-COVID cognitive impairment, or simply seeking to maximize cognitive performance, Dihexa represents a frontier that is only beginning to be explored clinically.

Semax

Semax is a synthetic heptapeptide derived from the ACTH (adrenocorticotropic hormone) fragment 4-10. Originally developed at the Institute of Molecular Genetics in Russia, where it has been approved and used clinically since the 1990s for stroke rehabilitation and cognitive enhancement, Semax has accumulated a substantial evidence base for its effects on cognition, neuroprotection, and stress resilience. Its primary mechanisms include upregulation of BDNF and NGF (nerve growth factor), modulation of dopamine and serotonin systems in prefrontal cortex regions governing executive function, and direct neuroprotective effects against oxidative stress and ischemic damage. Users reliably report enhanced focus, improved learning and memory consolidation, greater mental stamina, and a notable improvement in performance under cognitive demand.

Selank

Selank is a synthetic analog of the endogenous tetrapeptide tuftsin, modified for improved stability and extended activity. It is classified as an anxiolytic nootropic — an unusual combination that addresses two needs that are often in tension with each other. Conventional anxiolytic medications (benzodiazepines, SSRIs) typically produce sedation or cognitive blunting as side effects that counteract any benefit to cognitive performance. Selank reduces anxiety through modulation of the GABAergic system while simultaneously enhancing cognitive function through BDNF upregulation and improvement of memory consolidation — producing a state of calm focus without sedation. For clients whose cognitive performance is limited by anxiety, stress, or information overload, Selank addresses both the inhibitory and the performance dimensions simultaneously.

Cerebrolysin

Cerebrolysin is a precisely standardized preparation of low-molecular-weight neuropeptides and amino acids obtained through enzymatic hydrolysis of purified porcine brain proteins. Its key active components include neurotrophic peptides that mimic the effects of endogenous growth factors including BDNF, NGF, GDNF, and CNTF — all critical regulators of neuronal survival, plasticity, and function. Cerebrolysin has been studied in over 150 randomized clinical trials across Alzheimer's disease, vascular dementia, traumatic brain injury, and stroke, with a substantial evidence base from European and Asian neurological research. Beyond its applications in neurological disease, Cerebrolysin is increasingly used in cognitive optimization contexts, where clients report improvements in learning capacity, associative

memory, mental clarity, and the subjective quality of thinking described as 'sharpness' or 'fluency.'

Gut Health Peptides

BPC-157 (Oral)

While BPC-157's systemic effects are well-established, its oral form is specifically optimized for gut healing. Oral BPC-157 survives gastric acid (this is not coincidental — it was discovered in gastric juice, suggesting it evolved as a gastrointestinal protective molecule) and reaches the intestinal mucosa in active form, where it promotes healing of the epithelial lining, upregulates growth factors involved in mucosal repair, and modulates the enteric nervous system. Clinical interest centers on inflammatory bowel conditions, post-NSAID gastrointestinal damage (a significant and underappreciated source of mucosal injury), and leaky gut syndrome — the increased intestinal permeability that underlies food sensitivities, systemic inflammation, and the gut-brain symptoms that affect a substantial proportion of the population.

KPV

KPV (lysine-proline-valine) is a C-terminal tripeptide of alpha-melanocyte-stimulating hormone (α-MSH) that retains the potent anti-inflammatory properties of the parent hormone with dramatically improved tissue specificity for the gastrointestinal tract. α-MSH is an endogenous anti-inflammatory neuropeptide that acts at melanocortin receptors widely expressed throughout the gut and immune system. KPV's anti-inflammatory effects in intestinal tissue are mediated through inhibition of NF-κB signaling and reduction of pro-inflammatory cytokine production in intestinal epithelial cells and

immune cells within the lamina propria. For clients dealing with inflammatory bowel conditions — Crohn's disease, ulcerative colitis, microscopic colitis — or with chronic gut inflammation driving systemic symptoms, KPV offers a targeted biological approach distinct from conventional immunosuppressive therapies.

Larazotide Acetate

Larazotide acetate targets the tight junctions of the intestinal epithelium — the protein structures that bind adjacent intestinal cells together and regulate the permeability of the intestinal barrier with exquisite precision. The discovery that zonulin, a protein regulated by gliadin (a gluten component) and gut bacteria, can disrupt these tight junctions and produce transient or chronic intestinal hyperpermeability (leaky gut) opened a new mechanistic understanding of conditions from celiac disease to autoimmunity to food sensitivities. Larazotide acts as a tight junction regulator, competing with zonulin and preventing the disruption that leads to inappropriate molecular transit across the intestinal barrier. Multiple Phase 2 clinical trials in celiac disease have demonstrated its ability to reduce intestinal permeability markers, reduce symptom burden, and in some trials, reduce serological markers of gluten-driven immune activation even when patients were maintained on a gluten-free diet.

Immunity

Thymosin Alpha-1

Thymosin Alpha-1 (Tα1) is a 28-amino-acid peptide originally isolated from thymic tissue by the late Nobel Prize nominee Allan Goldstein, who spent

decades demonstrating its role as a master regulator of adaptive immune function. The thymus is the organ where naive T cells mature into the competent immune effector cells that recognize and respond to pathogens and cancer cells. Thymosin Alpha-1 drives this maturation process — it acts on CD4+ and CD8+ T cell precursors to promote their differentiation into functional effector cells, stimulates the production of interferon-gamma, IL-2, and IL-12, upregulates NK cell activity, and enhances dendritic cell maturation and antigen presentation.

Tα1 has been approved or used clinically in over 30 countries, primarily for chronic hepatitis B and C (where it demonstrated significant benefit in clinical trials), and has been investigated for HIV, cancer (as an adjunct to chemotherapy), and severe infectious diseases. Research during the COVID-19 pandemic found that Tα1 reduced mortality in critically ill COVID patients in a Chinese randomized trial — a finding consistent with its known ability to restore immune competence in immunocompromised states. For longevity-focused clients, the immunological significance of Tα1 is substantial: immune surveillance against cancer, response to chronic infections, and the prevention of the immune senescence that characterizes aging biology are all domains where Tα1's mechanism of action is directly relevant.

Longevity and Anti-Aging Peptides

Epithalon

Epithalon (also spelled Epitalon) is a synthetic tetrapeptide (Ala-Glu-Asp-Gly) that is the bioactive

form of epithalamin, a natural polypeptide fraction of the pineal gland. Its discovery by Dr. Vladimir Khavinson at the St. Petersburg Institute of Bioregulation and Gerontology, and its subsequent investigation across more than 35 years of research, constitutes one of the most extensive bodies of evidence on any anti-aging peptide available. Epithalon's primary mechanism involves activation of telomerase — the enzyme that maintains and elongates telomeres — reversing one of the most fundamental mechanisms of cellular aging. In cell culture studies, Epithalon-treated cells demonstrate telomerase activation and extended replicative lifespan. In animal studies, Epithalon treatment extended lifespan by 25–30% in multiple model organisms while reducing the incidence of age-related diseases including cancer. Human studies have shown normalization of circadian rhythms, melatonin production, and several immunological parameters in aging subjects.

Mitochondrial Peptides — A New Frontier

MOTS-c

MOTS-c's discovery as a mitochondrially-encoded peptide — produced from within the organelle that is both the primary site of cellular energy production and one of the most important drivers of aging when it becomes dysfunctional — represents a paradigm shift in understanding mitochondrial communication. MOTS-c translocates to the nucleus under metabolic stress, where it directly regulates the expression of genes involved in metabolism, inflammation, and stress response. This nuclear translocation is a remarkable example of retrograde signaling from mitochondria to

nucleus — a recently discovered communication pathway that appears to be critical for maintaining metabolic homeostasis. Age-related decline in MOTS-c production may contribute to the progressive metabolic deterioration of aging, and supplementation with synthetic MOTS-c is being investigated as a potential approach to restoring youthful metabolic function.

SS-31 (Elamipretide / Forzinity)

SS-31 (also known by the research designation Szeto-Schiller peptide 31) is one of the most mechanistically sophisticated peptides in the longevity space. It is a mitochondria-targeted antioxidant peptide that concentrates within the inner mitochondrial membrane — specifically at the interface between the membrane and cardiolipin, the unique phospholipid that is essential for the organization and function of the electron transport chain. Cardiolipin degradation is one of the earliest and most consistent changes in aging and diseased mitochondria, and SS-31's ability to stabilize cardiolipin architecture directly preserves the structural integrity of the respiratory chain complexes that power ATP production.

The clinical evidence for SS-31 is among the most compelling for any mitochondrial peptide. In preclinical studies, it has reversed age-related declines in cardiac function, skeletal muscle performance, kidney function, and cognitive performance. It has now received FDA approval as Forzinity for Barth syndrome — a rare genetic cardiomyopathy caused by cardiolipin metabolism defects — representing the first regulatory approval for a cardiolipin-targeting therapy and establishing the mechanism as clinically validated. Phase 2 and 3 trials are ongoing in heart failure and diabetic kidney disease, and early-phase human studies in

aging are underway. For clients interested in addressing mitochondrial aging at its most fundamental structural level, SS-31 represents the most evidence-backed mitochondrial peptide currently available.

> *Research Spotlight: Szeto (2014, Pharmaceutical Research): SS-31 selectively targets the inner mitochondrial membrane, stabilizes cardiolipin, and restores electron transport chain efficiency. In aged animal models, SS-31 reversed age-related declines in mitochondrial function, exercise tolerance, and cardiac output, supporting its investigation as an anti-aging therapeutic across multiple organ systems.*

FOXO4-DRI

FOXO4-DRI is one of the most conceptually innovative peptides in the senolytic space — molecules designed to selectively eliminate senescent cells rather than simply reducing their inflammatory output. Senescent cells are cells that have permanently exited the cell cycle in response to DNA damage, telomere shortening, or oncogenic stress, and they accumulate throughout the body with aging. While cellular senescence is an important tumor-suppression mechanism, the persistent presence of senescent cells is profoundly damaging: they secrete a complex of inflammatory cytokines, proteases, and growth factors (the senescence-associated secretory phenotype, or SASP) that impairs neighboring cells, drives chronic inflammation, and accelerates aging in surrounding tissue.

The reason senescent cells accumulate rather than being cleared by apoptosis (programmed cell death) is that they upregulate anti-apoptotic proteins, including through a FOXO4-p53

interaction that specifically protects senescent cells from the apoptotic signals that would normally eliminate them. FOXO4-DRI is a modified peptide that penetrates senescent cells and disrupts this FOXO4-p53 interaction, restoring p53's ability to trigger apoptosis specifically in cells that are expressing senescent markers — while leaving normal, healthy cells unaffected. In the landmark 2017 Nature paper by Baar et al., FOXO4-DRI injections in aged mice produced significant improvements in fitness measures, coat density, and kidney function, along with measurable reductions in circulating inflammatory cytokines — effects consistent with a meaningful reduction in senescent cell burden. As a complement to lifestyle-based senolytic approaches (fisetin, quercetin, dasatinib protocols), FOXO4-DRI represents a mechanism-specific pharmaceutical approach to one of the most important drivers of biological aging.

> 📖 *Research Spotlight: Baar et al. (2017, Cell): FOXO4-DRI selectively induced apoptosis in p21-high/SA-β-galactosidase-positive senescent cells both in vitro and in vivo, producing restoration of physical fitness, hair density, and renal function in aged mice without toxicity to non-senescent cells.*

Working with Peptides at Next Health

The breadth of the peptide landscape can feel overwhelming — which is precisely why expert clinical guidance matters. Not every peptide is appropriate for every person, and the most effective peptide protocols are designed around individual biomarker data, health history, and goals. At Next Health, our clinical team conducts thorough evaluations before recommending any peptide

protocol, and we monitor outcomes with regular follow-up to ensure that your protocol is achieving the results we're aiming for. All peptides require a medical consultation and recommendation from a licensed provider.

> *"Peptides are your body's own language — and therapy is the art of learning to speak it fluently."*

Chapter 8 Testing and Biomarker Panels — Becoming the CEO of Your Health

The most sophisticated executives in the world don't make major strategic decisions without reviewing their financial data. Elite athletes don't train without tracking their metrics. And yet most people approach health — the most consequential and irreplaceable investment they will ever make — based entirely on how they feel, occasionally supplemented by the most basic laboratory tests their insurance will cover. This approach is not just suboptimal. It is genuinely dangerous in an era when the most devastating diseases are silent for years before they become clinically apparent.

The Case for Comprehensive Testing

Cardiovascular disease kills more Americans than the next five leading causes of death combined — and for the majority of those who die from it, their first symptom is a fatal cardiac event. Type 2 diabetes and insulin resistance affect nearly half the American adult population — but most of the affected individuals don't know it, because standard

annual physicals don't test for fasting insulin or HOMA-IR, the metrics that reveal insulin resistance years before blood glucose rises to the diagnostic threshold for diabetes. Alzheimer's disease has a pathological process that begins 15–20 years before cognitive symptoms appear — but pTau biomarkers can detect signs of this process in the blood today. The pattern across multiple diseases is the same: pathology begins decades before symptoms, early detection dramatically changes outcomes, and most standard medical practice is not looking early enough or deeply enough to find it.

At Next Health, testing is the foundation of everything. We cannot optimize what we cannot measure, and we cannot measure what we're not testing. Our testing menu reflects the breadth of what is now possible in precision medicine — from basic blood chemistry to multi-cancer liquid biopsy to gut microbiome sequencing to comprehensive genetic analysis.

Comprehensive Blood Biomarker Panel

Our comprehensive blood panel goes far beyond what a conventional annual physical typically includes. At the cardiovascular level, we move well past total cholesterol to assess LDL particle number and size (small, dense LDL particles are far more atherogenic than large, buoyant particles at the same LDL concentration), ApoB (the protein coat of atherogenic lipoproteins, which correlates more closely with cardiovascular risk than LDL cholesterol), Lp(a) (a genetically-determined atherogenic lipoprotein that is not modified by standard lipid medications and requires specific awareness and management strategies), and non-

HDL cholesterol. We assess inflammation comprehensively: high-sensitivity CRP (hsCRP) for general inflammatory burden; homocysteine, which drives oxidative damage to arterial walls and is highly modifiable with B vitamins; IL-6, one of the most important inflammatory cytokines in aging biology; and fibrinogen, which both drives and reflects vascular inflammation.

Our thyroid assessment is complete rather than cursory: TSH alone misses a significant proportion of thyroid dysfunction, so we include Free T3, Free T4, Reverse T3 (which competes with T3 at receptors and is elevated in chronic stress and caloric restriction), and thyroid antibodies (TPO and anti-thyroglobulin). Our hormone panel captures the full sex hormone picture including testosterone (total and free), estradiol, progesterone, DHEA-S, SHBG, and LH/FSH when clinically indicated. We assess growth factor status through IGF-1, which reflects the integrated GH secretory output across 24 hours. Nutrient levels include vitamin D3 (25-hydroxyvitamin D — a hormone as much as a vitamin, with receptors in virtually every tissue in the body), B12 and folate (critical for methylation and neurological function), magnesium (intracellular, which standard serum magnesium tests significantly underestimate), ferritin (the most sensitive iron status marker), and zinc. Metabolic health is assessed through fasting insulin, HbA1c, and HOMA-IR — a calculated index that provides the most clinically sensitive measurement of insulin resistance short of a glucose clamp study.

The Galleri Multi-Cancer Early Detection Test

The Galleri test represents a genuine paradigm shift in cancer screening. It is a cell-free DNA (cfDNA) liquid biopsy — a blood draw that detects DNA shed by cancer cells into the circulation. Cancer cells, due to their rapid proliferation and abnormal apoptotic patterns, shed significantly more cfDNA into the bloodstream than normal cells. More importantly, this shed DNA carries cancer-specific methylation patterns — epigenetic signatures that differ systematically from normal cell DNA and differ from each other in ways that allow the tissue of origin to be identified.

Illumina's Grail study platform, underlying the Galleri test, was developed using training datasets of hundreds of thousands of cancer and normal samples, and the algorithms can now detect cfDNA signals from over 50 cancer types in a single blood draw. The clinical performance data is compelling: high overall specificity (the false-positive rate is approximately 0.5%, meaning only 1 in 200 positive results is not confirmed cancer), with sensitivity that increases with cancer stage and is particularly high for cancers that are most deadly in part because they have no other approved early screening method — pancreatic, ovarian, and liver cancers among them.

To put the clinical significance in perspective: the five-year survival rate for pancreatic cancer detected at Stage IV is approximately 3%. Detected at Stage I, it is approximately 37%. For ovarian cancer, the Stage IV five-year survival rate is 29%; at Stage I, it is 92%. These are not marginal differences — they are the difference between a disease that is a death sentence and a disease that is often curable. The Galleri test offers the possibility of catching these cancers at their earliest, most treatable stage. At Next Health, we believe this test

should be part of every adult's annual health protocol.

> 📖 *Research Spotlight: Klein et al. (2021, Annals of Oncology — PATHFINDER Study): Real-world clinical implementation of the Galleri test demonstrated high specificity (>99.5%) with signal detection across multiple cancer types, including many without standard screening tests. In confirmed cancer cases, the tissue of origin was correctly identified in over 88% of cases, enabling efficient diagnostic workup.*

3x4 Genetic Test — Your Biological Blueprint

The 3x4 Genetic Test is a comprehensive genomic analysis designed for clinical application rather than consumer curiosity. It examines over 100 genetic variants across 36 metabolic pathways that have been selected for their direct relevance to health optimization and clinical decision-making. Unlike consumer ancestry genomics, which tests millions of variants with limited clinical interpretability, 3x4 focuses on variants with strong evidence for functional significance and actionable implications.

Key domains include: methylation and B vitamin metabolism (MTHFR, MTRR, COMT, and related variants that affect folate processing, homocysteine regulation, and the production of neurotransmitters and other methylated compounds — knowledge that guides B vitamin supplementation and can explain why some people with 'normal' B12 levels still have functional deficiency); detoxification (CYP1A2, CYP2C9, CYP2D6, GSTM1, and other Phase I and Phase II enzyme variants that determine how efficiently you process medications,

caffeine, environmental chemicals, and hormones — explaining variations in drug sensitivity, toxin clearance, and hormonal balance); inflammation response (IL-6, TNF-alpha, CRP gene variants that govern the magnitude of inflammatory responses and predict chronic disease susceptibility); cardiovascular risk (APOE genotype for LDL metabolism and Alzheimer's risk, factor V Leiden and prothrombin gene variants for clotting risk, ACE variants for blood pressure regulation); and antioxidant capacity (SOD2, CAT, and other antioxidant enzyme gene variants that determine baseline oxidative stress levels).

The clinical value of this information is not merely intellectual — it is actionable. Knowing your APOE status guides the urgency and specificity of Alzheimer's prevention protocols. MTHFR variants guide the selection of methylated B vitamin forms that bypass the compromised enzymatic step. CYP variants guide medication selection and dosing. The 3x4 report translates these genetic findings into specific nutritional, lifestyle, and clinical recommendations — making it one of the most immediately useful pieces of health data a person can obtain.

Gut Microbiome Testing — Vitract

The gastrointestinal microbiome — the community of approximately 38 trillion microorganisms inhabiting the human gut — has emerged in the last decade as one of the most important determinants of health across virtually every organ system. The gut microbiome produces neurotransmitter precursors (over 90% of the body's serotonin is produced in the gut under microbial influence),

short-chain fatty acids (SCFAs) that serve as the primary fuel for colonocytes and regulate inflammatory tone throughout the body, vitamins including K2 and several B vitamins, and a complex array of immunomodulatory signals that shape immune development and maintain immune homeostasis throughout life.

Our gut microbiome testing uses advanced 16S rRNA and shotgun metagenomic sequencing to characterize the composition and functional capacity of your microbial community with far greater depth and clinical resolution than earlier-generation tests provided. The Vitract report assesses microbial diversity (low diversity is consistently associated with multiple disease states from inflammatory bowel disease to obesity to depression), the balance between beneficial keystone species (Akkermansia muciniphila for gut barrier integrity, Faecalibacterium prausnitzii for anti-inflammatory SCFA production, Bifidobacterium species for immune modulation) and pathogenic or dysbiotic organisms, SCFA production capacity, and markers of gut inflammation. For clients whose symptom picture includes any gut-related or seemingly unrelated systemic manifestation — skin conditions, mood disorders, autoimmune conditions, metabolic dysfunction — comprehensive microbiome testing often reveals the missing piece that makes the rest of the clinical picture coherent.

Toxin Testing — Vibrant

The body burden of environmental toxins in the average American adult is staggering by any historical standard. The Environmental Working Group's Human Toxome Project and subsequent biomonitoring studies by the CDC have

documented measurable levels of hundreds of synthetic chemicals in virtually every person tested — regardless of age, diet, location, or lifestyle. These include persistent organic pollutants (POPs) including polychlorinated biphenyls (PCBs) and organochlorine pesticides that accumulate in fat tissue; phthalates and bisphenol A (BPA) from plastics; heavy metals including lead (stored in bone for decades after exposure), mercury (primarily from seafood), arsenic, and cadmium; and mycotoxins from mold exposure, which represent one of the most underdiagnosed sources of chronic illness in patients who have lived or worked in water-damaged buildings.

Our Vibrant toxin panel measures a comprehensive array of these compounds — heavy metals, mycotoxins, organic acids reflecting xenobiotic metabolism, and selected environmental chemicals — providing a detailed picture of your specific toxic burden and the organ systems most affected. This data is clinically actionable: heavy metal burden guides chelation or detoxification protocols; mycotoxin burden identifies the source (diet vs. environmental) and guides remediation and detoxification strategies; organic acid patterns reveal where the detoxification pathways are under greatest stress. For clients who have struggled with unexplained fatigue, cognitive symptoms, joint pain, mood disorders, or any cluster of symptoms that has not responded to conventional evaluation, comprehensive toxin testing often provides the etiological clarity that has been missing.

Food Sensitivity Testing — ALCAT

The immune system's response to food encompasses a broader spectrum than the classic IgE-mediated food allergy that most people are familiar with. IgE-mediated reactions are immediate, often severe, and typically well-recognized. But non-IgE-mediated food immune reactions — often called food sensitivities or food intolerances — involve different immune mechanisms (primarily innate immune activation and cellular, rather than antibody-mediated, responses) and produce delayed, often subtle, and highly varied symptoms that are difficult to attribute to specific foods without objective testing.

The ALCAT test measures the reactivity of peripheral white blood cells — specifically monocytes — to over 200 foods, food additives, colorings, and environmental chemicals. The methodology involves incubating the client's white blood cells with each test substance and measuring the magnitude of the cellular response (change in cell morphology and cytokine production). Reactive substances are stratified by severity of response, generating a personalized elimination and reintroduction roadmap. Clinical application of ALCAT-guided elimination diets has demonstrated improvements in irritable bowel syndrome, migraines, chronic fatigue, skin conditions, joint pain, and multiple other conditions in controlled studies. For clients who have already pursued dietary modifications without clear benefit, the precision of ALCAT testing provides the specificity that dietary elimination guesswork cannot achieve.

Micronutrient Panel

The inadequacy of dietary assessment and even standard serum nutrient measurements for predicting intracellular nutrient status is a persistent

problem in clinical nutrition. A person can report eating a 'healthy diet' and show normal serum levels of vitamins and minerals while having significant intracellular deficiencies that impair the enzymatic functions these nutrients are required to support. Serum magnesium, for example, is maintained by tight homeostatic regulation — the serum level remains normal until the body's stores are severely depleted, at which point the deficiency is already causing significant physiological dysfunction.

Our micronutrient panel measures the functional intracellular levels of vitamins, minerals, amino acids, fatty acids, and antioxidants — not just their presence in serum, but their ability to support specific enzymatic functions within the cell. This functional approach identifies deficiencies that would be missed by conventional serum testing, providing the granular nutritional data needed to design truly personalized IV therapy schedules, supplement protocols, and dietary guidance. The results of micronutrient panel testing frequently surprise clients who consider themselves nutritionally conscientious — and the deficiencies revealed are almost invariably addressable through the combination of targeted IV nutrition and oral supplementation.

pTau — Brain Protein Score

Phosphorylated tau (pTau) — specifically the pTau 217 and pTau 181 isoforms — is one of the most significant recent developments in Alzheimer's disease biomarker research. Tau is a protein that normally stabilizes microtubules in neurons. In Alzheimer's disease, tau becomes abnormally hyperphosphorylated, causing it to dissociate from microtubules and aggregate into the neurofibrillary tangles that are a diagnostic hallmark of the

disease. These tau changes occur in the brain years to decades before neuronal death and cognitive impairment — and the phosphorylated forms shed by affected neurons can now be detected in blood with increasing precision.

Blood-based pTau 217 has demonstrated correlation with amyloid PET scan positivity (the current gold standard for preclinical Alzheimer's diagnosis) with accuracy that is enabling its clinical adoption as a screening tool that is far more accessible than brain imaging. For clients with a family history of Alzheimer's, those carrying APOE-4 alleles (which dramatically elevate Alzheimer's risk), or anyone who has noticed changes in their cognitive function or wants the earliest possible warning signal, the pTau test offers something that was simply not available five years ago: a blood-based window into early brain pathology when intervention is most likely to matter. At Next Health, the pTau test is particularly meaningful given the longevity mission that drives our work and the personal importance that cognitive preservation holds for virtually every client we serve.

Full-Body MRI and Advanced Imaging

Next Health partners with advanced imaging providers to offer the full spectrum of preventive imaging available in modern medicine. Coronary artery calcium (CAC) scoring uses cardiac CT to detect and quantify calcified plaque in the coronary arteries — arguably the most powerful predictor of future cardiovascular events available, providing risk stratification that supersedes conventional risk calculators. Full-body MRI screens for soft tissue

abnormalities — organ changes, lymph nodes, masses — that routine imaging would never detect without a specific clinical indication. DEXA scanning provides precise bone density and body composition data that complements and validates InBody measurements. Together with blood biomarkers and genetic data, these imaging modalities create the most comprehensive picture of current health and future risk that is achievable outside of a hospital-based research setting.

> *"Data is not the enemy of intuition. It is the foundation on which great decisions are made — especially when those decisions are about your life."*

Chapter 9 Hormone Optimization — Conducting Your Body's Symphony

Somewhere around your mid-30s, your body begins to quietly change the score. Hormones that once flowed in abundance start to decline. The changes are subtle at first — a little more fatigue, a little more difficulty maintaining weight, sleep that isn't quite as restorative, a dimming of the mental sharpness and physical vitality that once felt effortless. Most people attribute these changes to 'just getting older.' Most people are wrong. These changes are hormonal, measurable, and reversible.

Why Hormones Matter More Than Most People Realize

Hormones are not merely chemical messengers that regulate a few specific functions. They are the master conductors of virtually every physiological process in the body. Testosterone governs muscle synthesis, fat distribution, bone density, libido, mood, cognitive function, cardiovascular health, and immune function — in both men and women, albeit at different concentrations. Estrogen is neuroprotective, cardioprotective, and essential for bone maintenance, mood regulation, skin health, and cognitive function in women. Thyroid hormones regulate the metabolic rate of every cell in the body,

governing everything from body temperature to heart rate to gut motility to cognitive processing speed. Growth hormone coordinates tissue repair, fat metabolism, and immune function. Cortisol manages the stress response and inflammatory signaling. Insulin governs energy storage and retrieval. Progesterone modulates neurological function, promotes sleep, and counterbalances estrogen's proliferative effects.

When any of these hormones drifts from its optimal range — even to levels that fall within the conventional laboratory 'normal' range but are below the individual's physiological optimal — the consequences are pervasive. The interconnectedness of the endocrine system means that one hormonal disruption rarely occurs in isolation: low testosterone drives insulin resistance, which elevates cortisol, which suppresses thyroid function, which impairs growth hormone secretion. Addressing hormonal health comprehensively, rather than targeting individual hormones in isolation, is one of the most impactful things we do at Next Health.

Testosterone — The Hormone of Vitality

Testosterone is commonly associated with men and masculinity, but it is a critical hormone for physiological function in people of all genders. In men, testosterone levels peak in the late teens and early 20s and then decline at approximately 1–2% per year from age 30 onward. By age 50, many men have testosterone levels at 50–60% of their young adult values — a decline that is gradual enough to be imperceptible year-to-year but dramatic enough

to produce significant symptoms and health consequences over the course of a decade or two.

The consequences of suboptimal testosterone in men include: decreased skeletal muscle mass and strength (testosterone stimulates muscle protein synthesis directly and increases satellite cell activity); increased fat mass, particularly visceral fat (testosterone normally suppresses adipogenesis in visceral depots); decreased bone density (testosterone is aromatized to estradiol in bone tissue, which is the primary driver of bone maintenance in men); impaired erythropoiesis (low testosterone reduces red blood cell production, contributing to the mild anemia common in older men); impaired libido and erectile function; mood changes including increased depression and anxiety; cognitive decline (testosterone promotes neurogenesis and neuroprotection); and reduced cardiovascular health (testosterone has direct beneficial effects on endothelial function and cardiac muscle).

In women, testosterone is produced by the ovaries and adrenal glands at approximately 5–10% of male levels but is equally important for bone density, muscle maintenance, libido (female libido is profoundly testosterone-dependent — a fact that clinical medicine has been slow to recognize), energy, cognitive function, and mood. Women's testosterone levels begin declining as early as their late 20s and continue to fall through menopause and beyond, often reaching levels below 50% of young adult values by the time perimenopause begins.

Bioidentical testosterone replacement — delivering testosterone in a form molecularly identical to the body's own hormone — can restore levels to the physiologically optimal range, with clinical

outcomes that are consistently transformative. At Next Health, testosterone optimization is always individualized, guided by comprehensive hormone panel testing, and monitored with regular follow-up measurements to ensure that levels are therapeutic rather than supraphysiological.

Estrogen and Progesterone — The Female Hormonal Ecosystem

For women, the perimenopause and menopause transition represents one of the most significant physiological changes of a lifetime. Estradiol — the dominant form of estrogen during reproductive years — declines sharply during this transition, typically falling 85–90% below premenopausal levels by the time menopause is complete. Progesterone, produced in abundance by the corpus luteum during ovulatory cycles, essentially disappears. The consequences of these hormonal losses extend far beyond the well-known vasomotor symptoms (hot flashes, night sweats) that most people associate with menopause.

Estrogen is neuroprotective: it promotes neuronal survival, supports synaptic plasticity, reduces amyloid-beta accumulation (the protein aggregate that drives Alzheimer's pathology), and maintains cerebral blood flow. Estrogen deprivation in the years surrounding menopause is now understood to be a significant contributor to the increased risk of Alzheimer's disease in women — who develop Alzheimer's at approximately twice the rate of men, despite living longer. Estrogen is cardioprotective: it maintains endothelial function, promotes favorable lipid profiles, and reduces arterial stiffness. After menopause, women's cardiovascular risk rises

rapidly to approach men's rates — a transition directly attributable to estrogen loss.

Progesterone has distinct and important physiological roles often overshadowed by estrogen's more dramatic effects. It acts on GABA receptors in the brain (through its metabolite allopregnanolone) to promote sleep, reduce anxiety, and provide neuroprotection. It counterbalances estrogen's proliferative effects on uterine and breast tissue. And it has direct anti-inflammatory and immune-modulating effects that complement estrogen's actions. Bioidentical progesterone — as distinct from synthetic progestins like medroxyprogesterone acetate used in conventional HRT — maintains these beneficial effects without the adverse metabolic consequences associated with the synthetic forms used in historical hormone replacement therapy studies.

Thyroid Hormones — The Metabolic Governors

The thyroid gland produces two hormones: thyroxine (T4) and triiodothyronine (T3). T4 is relatively inactive and serves primarily as a circulating reservoir; it must be converted to the active T3 by deiodinase enzymes in peripheral tissues. T3 enters cells and binds to nuclear thyroid hormone receptors, directly regulating the transcription of genes governing mitochondrial biogenesis, basal metabolic rate, heart rate, gut motility, temperature regulation, bone turnover, and cognitive function. T3 receptors are expressed in virtually every cell in the body — explaining why thyroid dysfunction produces such a remarkably

diverse symptom picture that can mimic dozens of other conditions.

The conventional approach to thyroid testing — measuring TSH alone — misses a significant proportion of clinically meaningful thyroid dysfunction. TSH (thyroid-stimulating hormone, produced by the pituitary) reflects the pituitary's assessment of thyroid hormone availability, but this assessment can be misleading when peripheral T4-to-T3 conversion is impaired (producing normal or low-normal TSH with inadequate T3 at the tissue level), when reverse T3 (rT3, a metabolically inactive T3 isomer) competes with active T3 at receptors, or when thyroid antibodies are causing autoimmune destruction of thyroid tissue before TSH has risen. At Next Health, we assess the complete thyroid picture — TSH, Free T3, Free T4, Reverse T3, and both TPO and thyroglobulin antibodies — providing the clinical granularity needed to identify and address thyroid dysfunction at its earliest stage.

DHEA and Pregnenolone — The Upstream Hormones

Dehydroepiandrosterone (DHEA) and pregnenolone are steroid hormones produced primarily by the adrenal glands that serve as precursors to both estrogen and testosterone and have independent biological effects of their own. DHEA peaks in the late 20s and declines dramatically with age — by 70-80 years, DHEA levels are typically only 10–20% of young adult values. This decline has been associated with increased mortality risk, immune senescence, cognitive decline, and reduced resilience to metabolic and physiological stress.

DHEA supplementation in aging adults has demonstrated improvements in multiple endpoints including mood, energy, libido, immune function, and body composition — effects mediated both through DHEA's conversion to downstream sex hormones and through its direct effects on immune cells, brain function, and metabolic regulation. Pregnenolone, the 'grandmother steroid' from which all other steroid hormones are synthesized, is particularly important for neurological function — it is found at high concentrations in the central nervous system, where it acts as a neurosteroid modulating NMDA and GABA receptors, promoting myelination, and supporting cognitive function.

Our Approach — Precision Over Protocol

Hormone optimization at Next Health is never a protocol applied uniformly across clients — it is a personalized intervention designed around the specific hormonal picture revealed by comprehensive testing and interpreted in the context of the client's symptoms, health history, and goals. We use bioidentical hormones whenever possible — hormones that are molecularly identical to those produced by the human body, allowing for physiological patterns of receptor binding and metabolism rather than the altered pharmacology of synthetic analogs. Delivery methods include topical creams, troches, oral preparations, injections, and pellets, with the optimal method determined by the specific hormone, the client's lifestyle, and their physiological response profile.

Monitoring is continuous and rigorously data-driven. Hormone optimization is not a 'set and forget' prescription — it is a dynamic relationship with your

biology that requires regular reassessment as your physiology evolves with age, stress, lifestyle changes, and the effects of other optimization interventions. Our clinical team conducts quarterly hormone panel follow-up as a standard component of all optimization programs.

> *"Hormones are not just about how you feel. They are about what your body is capable of becoming — and that ceiling is higher than you think."*

Chapter 10 Weight Optimization — Beyond the Scale

The conventional approach to weight loss — eat less, move more, apply willpower — has a failure rate that should disqualify it as a medical strategy. Long-term studies consistently show that fewer than 5% of people who lose significant weight through diet and exercise alone maintain that loss at five years. This is not a character failing of the 95% who regain. It is a predictable consequence of addressing a complex biological problem with an intervention that ignores its biology.

The Biology of Weight Regulation — A System You Can't Outrun

Your body weight is regulated by a sophisticated neuroendocrine system centered in the hypothalamus that integrates signals from adipose tissue (leptin), the gut (GLP-1, GIP, CCK, PYY), the pancreas (insulin, glucagon), and the brain's reward circuits (dopamine, opioid peptides) to maintain body weight within a range it has learned to defend. This 'set point' mechanism evolved to protect against famine — it is extraordinarily good at resisting weight loss by reducing metabolic rate, increasing hunger, and reducing satiety signals when body fat falls below the defended range. This is why calorie restriction produces progressively

diminishing returns and why most dieters plateau well before reaching their goal.

Addressing weight effectively requires engaging with this regulatory biology rather than fighting it. The most powerful tools available in modern medicine — GLP-1 agonists, hormone optimization, metabolic peptides, comprehensive nutritional medicine — work precisely because they engage with the neuroendocrine system that governs weight regulation, rather than simply attempting to override it through willpower.

The Metabolic Root Causes

Insulin Resistance — The Central Driver

Insulin resistance is present in over 88% of American adults to some degree — including many who are at normal weight — making it the most important and most prevalent metabolic dysfunction in the developed world. When cells become resistant to insulin's signal to absorb glucose, the pancreas compensates by producing more insulin. Chronically elevated insulin has multiple consequences that directly promote fat storage and prevent fat burning: it activates the enzyme lipoprotein lipase in fat cells (promoting triglyceride uptake and storage), inhibits hormone-sensitive lipase (the enzyme that releases stored fat for use as fuel), promotes glucose transport into fat cells, and suppresses the fat-burning effects of catecholamines. The result is a metabolic state in which stored fat becomes progressively harder to access regardless of caloric deficit — making conventional calorie restriction increasingly futile as insulin resistance worsens.

Hormonal Drivers

Low testosterone in men and hormonal imbalance in women create metabolic environments that actively resist weight loss and promote fat storage. Testosterone deficiency reduces muscle mass (which is the primary site of metabolic calorie burning at rest) while simultaneously promoting visceral fat accumulation. Estrogen deficiency in women shifts fat distribution from subcutaneous to visceral, impairs insulin sensitivity, and reduces metabolic rate. Thyroid dysfunction slows every aspect of metabolism — and subclinical hypothyroidism, in which TSH is in the high-normal range and T3 is in the low-normal range, can produce a 15–20% reduction in basal metabolic rate that makes weight management essentially impossible without addressing the thyroid.

This is why so many people who 'do everything right' still cannot achieve their body composition goals — because the hormonal drivers of their metabolism have never been assessed or addressed. At Next Health, hormone optimization is a central component of every weight optimization program, not an afterthought.

Leptin Resistance and the Set Point Problem

Leptin, produced by adipose tissue in proportion to fat mass, serves as the body's fuel gauge — signaling to the hypothalamus that sufficient energy stores are available and that hunger should be reduced. In lean individuals, this system works elegantly. In individuals with significant obesity, however, the hypothalamus becomes resistant to leptin's satiety signal — analogous to insulin resistance but in the brain's energy regulation center. The result is chronic hunger and reduced satiety despite adequate (and often excessive)

energy stores — a fundamentally biological problem that makes the experience of dieting profoundly different for people with leptin resistance than for those without it. Addressing leptin resistance requires interventions that reduce chronic inflammation (a primary driver of hypothalamic leptin resistance), restore insulin sensitivity, and engage the GLP-1 system that works in parallel with leptin to regulate appetite.

Our Weight Optimization Protocol

Comprehensive Metabolic Assessment — Data First

Every weight optimization program at Next Health begins with a complete metabolic data picture: InBody scan (skeletal muscle mass, visceral fat area, ECW ratio, phase angle), fasting insulin and HOMA-IR, comprehensive hormone panel (testosterone, estradiol, thyroid panel including Free T3 and Reverse T3, cortisol), inflammatory markers (hsCRP, IL-6), gut microbiome assessment (which reveals dysbiotic patterns that impair metabolic health and contribute to fat storage), and optional genetic testing for metabolic pathway variants. This data eliminates guesswork and allows our clinical team to design a protocol that addresses your specific drivers rather than applying a generic approach.

GLP-1 Therapy — Semaglutide and Tirzepatide

The mechanism by which GLP-1 agonists produce weight loss is genuinely different from calorie restriction, and understanding this difference

explains both their efficacy and the experience of taking them. GLP-1 receptors in the hypothalamus, brainstem, and reward centers of the brain receive the signal from semaglutide or tirzepatide and produce a reduction in appetite that is not the white-knuckle restraint of willpower-based dieting but a genuine attenuation of the hunger signal itself — patients on GLP-1 agonists characteristically report that food simply becomes less interesting, that satiety comes more quickly, and that the psychological burden of managing food intake is dramatically reduced.

Beyond appetite regulation, GLP-1 agonists improve insulin sensitivity, reduce glucagon-mediated glucose production by the liver, and — in the case of tirzepatide's GIP agonism — improve nutrient partitioning in ways that favor lean mass preservation relative to fat loss. At Next Health, these medications are always prescribed within a comprehensive program that includes nutritional guidance, resistance training support, and regular InBody monitoring to ensure that the weight lost is predominantly fat — not the muscle that is commonly lost with rapid weight loss through calorie restriction alone.

Retatrutide — The Next Generation

Retatrutide's triple agonist mechanism produces weight loss through pathways that neither semaglutide nor tirzepatide fully engage. The glucagon receptor agonism component is particularly significant: glucagon directly stimulates hepatic fat oxidation (burning fat stored in the liver), increases thermogenesis in brown adipose tissue, and promotes energy expenditure through pathways that are largely independent of food intake. This means that retatrutide produces greater caloric expenditure at any given food intake level —

not just reduced caloric intake — explaining its superiority in clinical trial weight loss outcomes.

The Phase 2 trial published in the New England Journal of Medicine demonstrated mean weight loss of 17.5% at 24 weeks in the highest dose group — already surpassing the 52-week outcomes of semaglutide — with the trajectory suggesting that 52-week outcomes will exceed 24% in the highest dose groups. For clients who have not achieved their goals with semaglutide or tirzepatide, or who are seeking the most advanced peptide-based metabolic intervention currently available, retatrutide represents a genuine step change. All retatrutide protocols at Next Health include comprehensive metabolic monitoring, InBody body composition tracking, and lean mass preservation strategies.

Peptide Support — Preserving Muscle Through the Process

One of the most important and often neglected aspects of weight optimization is muscle mass preservation. Conventional calorie restriction and even GLP-1 agonist therapy can produce significant muscle loss alongside fat loss — a phenomenon that undermines metabolic health, impairs physical function, reduces insulin sensitivity, and sets the stage for weight regain. The growth hormone secretagogue peptides (Ipamorelin/CJC-1295, Tesamorelin) support fat oxidation — particularly visceral fat — while actively promoting lean muscle preservation and repair through their GH/IGF-1 pathway stimulation. MOTS-c improves metabolic flexibility and insulin sensitivity at the mitochondrial level. Used as components of a comprehensive protocol, these peptides ensure that weight loss is true fat loss — not the metabolically destructive loss

of muscle that conventional approaches often produce.

> *"Weight optimization is not about becoming less. It is about becoming more — more metabolically healthy, more energetic, more capable, more yourself."*

Chapter 11 Biologics — Regenerative Medicine with Human Cell and Tissue Products

Every tissue in your body has the capacity to heal. This is not metaphor or aspiration — it is functional biology, hardwired into every cell through molecular repair systems of extraordinary sophistication. The challenge is that this capacity diminishes as we age: stem cell populations dwindle, regenerative signals weaken, the microenvironment that supports repair becomes inflammatory rather than instructive. Regenerative medicine represents the science of restoring this capacity — of providing the biological raw material and signaling intelligence that an aging body needs to repair what time has worn down.

Our Biologic Products — What They Are and Where They Come From

At Next Health, our biologic products are human cell and tissue products (HCT/Ps) derived from umbilical cord tissue donated by healthy, consenting mothers in the United States. This is a critical regulatory and quality distinction: our products are FDA-regulated under 21 CFR Part

1271 and processed in facilities accredited by the American Association of Tissue Banks (AATB) and certified under Current Good Manufacturing Practices (cGMP). Every aspect of the donor selection, tissue collection, processing, and quality testing process is governed by federal standards designed to minimize disease transmission risk while maintaining the biological activity that makes these products therapeutically valuable.

Donor selection is exceptionally rigorous. Every donor mother is between 18 and 22 years old — an age window selected for peak biological vitality — and is unvaccinated. Each donor undergoes a comprehensive medical background check and serology testing for viral and bacterial illnesses every 3 months throughout pregnancy. Only C-section births are accepted, which allows for controlled collection conditions that preserve tissue integrity. After donation, the tissue undergoes extensive post-donation testing, and over 87% of donor samples are rejected for failing to meet the quality and viability standards our program requires. One in five vials from accepted donors is sent to an independent third-party laboratory for sterility and endotoxin testing. The result is a product whose quality and consistency is among the highest available in the regenerative medicine space.

Why Umbilical Cord Tissue? The Case for Zero-Age Biology

The biological rationale for umbilical cord tissue as a source of regenerative products centers on the concept of biological age. Your own stem cells — whether from bone marrow or adipose tissue — have spent the same years you have accumulating

oxidative damage, epigenetic drift, and the accumulated effects of environmental exposures. Their capacity to produce regenerative signals, differentiate into needed cell types, and communicate effectively with surrounding tissue is a fraction of what it was in youth.

Umbilical cord tissue-derived products contain zero-age biological material. The growth factors, signaling proteins, and tissue components in these products reflect the biological state of the youngest possible source — tissue produced at birth, before any of the degradation associated with aging has occurred. Moreover, umbilical cord tissue possesses a unique immunological property: because it evolved as the interface between two genetically distinct individuals (mother and child), it carries immunomodulatory properties that allow it to be used across unrelated recipients without triggering the rejection responses that limit autologous (self-derived) or allogeneic (same-species, different-individual) transplant therapies in other contexts.

Our biologic products contain over 2,000 identified growth factor proteins per cc — a biological complexity that dwarfs the 12 to 35 unique growth factors in platelet-rich plasma (PRP). PRP, while valuable, is limited by both the number and the age of the growth factors it contains: the platelets come from the patient's own blood, meaning they reflect whatever biological age the patient is. Our biologic products deliver a zero-age growth factor profile of extraordinary richness, with the immunological tolerance to work effectively regardless of the recipient's own biological age.

The Quality Advantage — Why International Travel Is Not the Answer

A significant number of patients pursuing regenerative medicine travel internationally — to Mexico, Panama, Germany, or elsewhere — seeking stem cell therapies that are not available domestically. This practice, while understandable given the genuine limitations of domestic regulatory access to stem cell medicine, comes with significant quality concerns that are rarely adequately communicated.

International clinics frequently advertise their products in terms of cell counts: '50 million stem cells,' '100 million stem cells.' What is rarely explained is that these are almost universally expanded cells — cells that have been placed in culture and multiplied multiple times to achieve the advertised cell count. Each expansion cycle significantly reduces the potency and secretion capacity of the cells: they lose their youthful signaling properties as they divide in an artificial environment, accumulate their own form of in vitro aging, and ultimately have viabilities of 1–4% in many reported analyses. A product advertised as '50 million stem cells' may contain only 500,000 to 2 million biologically active cells — comparable to 1 to 1.5 treatments at Next Health, delivered after the inconvenience, expense, and risk of international travel, under regulatory conditions that provide none of the quality assurance safeguards of FDA-regulated American products.

Intravenous Biologics — Systemic Regenerative Signaling

When our biologic products are administered intravenously, the growth factors and signaling proteins they contain enter systemic circulation and are delivered throughout the body. The distribution of these signals is remarkably comprehensive: the lungs, liver, kidneys, spleen, heart, and brain all receive the regenerative signaling cascades initiated by these bioactive compounds. The mechanisms by which they exert their effects include stimulation of endogenous stem cell mobilization from the bone marrow, modulation of inflammatory pathways toward a repair-permissive rather than destruction-driven state, promotion of angiogenesis (new blood vessel formation) in tissues where blood supply has become inadequate, and direct instruction of local progenitor cells to differentiate and engage in tissue repair.

The experience of IV biologics at Next Health follows a characteristic trajectory. In the first 1–3 weeks post-infusion, many clients notice little change — the regenerative processes initiated by the infusion are operating at a subcellular level that does not produce immediate subjective changes. By weeks 3–6, clients typically begin noticing improvements in energy, sleep quality, cognitive clarity, and physical recovery from exercise. Benefits often continue to develop and deepen over 4–6 months as the regenerative processes initiated by the infusion proceed through their natural cycle. For optimal results, we recommend creating the best possible 'starting environment' before treatment: eating clean, avoiding alcohol and NSAIDs for 1–2 weeks prior, reducing stress, and

ideally completing a preparatory protocol that may include EBOO ozone therapy (to reduce baseline inflammation and create a cleaner biological environment) and a NAD+ infusion (to provide the mitochondrial energy substrate that newly activated cells need).

Targeted Joint and Tissue Injections

The local application of biologic products to specific sites of damage or degeneration represents orthobiologics — the use of biological materials to address musculoskeletal conditions. For arthritic joints, partial ligament or tendon tears, damaged cartilage, and conditions that have not responded to conventional physical therapy or pain management, targeted biologic injections deliver regenerative material directly to the tissue that needs repair.

The comparison to PRP is instructive for understanding what these injections offer. PRP — platelet-rich plasma derived from the patient's own blood — delivers 12 to 35 unique growth factors, drawn from blood that is the same age as the patient. Our biologic injections deliver over 2,000 identified growth factor proteins from zero-age tissue, in a single injection that may last 6 to 12 months — compared to the 4 to 6 PRP treatments typically required for comparable benefit. This does not mean PRP is without value: it has its own clinical applications and the advantages of complete autologous origin. But for clients seeking the most regeneratively potent injection option available, our biologic products represent a substantially different level of biological complexity and activity.

For joint injections, preparation is important to optimize outcomes. Steroid injections into the target

joint should be avoided for at least 8 weeks prior (steroids suppress the inflammatory signaling that guides regenerative cells to areas of need and reduce local blood flow). Oral NSAIDs should be avoided for at least 2 weeks prior for the same reason. Our clinical team will assess whether the clinical picture and joint status suggest a reasonable expectation of meaningful benefit, and will counsel appropriately for conditions — such as end-stage bone-on-bone arthritis — where the realistic goals are pain reduction and function improvement rather than tissue restoration.

Preparing for and Maximizing Your Biologics Treatment

The concept of the 'starting environment' is central to optimizing biologic outcomes. Just as a seed planted in depleted soil produces a weaker plant than one in rich, well-prepared soil, biologic products delivered into a highly inflamed, nutritionally depleted, or chronically stressed biological environment produce less than their potential benefit. Creating optimal conditions before treatment significantly improves outcomes.

Our recommended preparatory approach includes a clean diet focused on anti-inflammatory whole foods in the 1–2 weeks before treatment; complete avoidance of alcohol (which drives systemic inflammation and impairs immune function) and NSAIDs (which suppress the beneficial inflammatory signaling that guides regenerative activity); stress reduction; and ideally, a supplemental protocol including senolytic compounds (quercetin, fisetin, or resveratrol) that clear senescent cells from the environment the

biologics will be working in. EBOO ozone therapy in the week before treatment reduces baseline inflammation and creates a cleaner biological environment. NAD+ infusion around the time of treatment provides the mitochondrial energy substrate that newly activated regenerative processes require.

Following IV biologic administration, we offer a complimentary Hyperbaric Oxygen Chamber session (when available) — the elevated oxygen environment produced by HBOT promotes the activity of the growth factors delivered by the biologics and enhances nutrient and oxygen delivery to tissues undergoing regenerative activation.

📖 *Research Spotlight: Next Health Biologics Quality Standards: Products are derived from AATB-accredited, cGMP-certified facilities. Over 87% of donor samples are rejected during quality screening. Each product contains over 2,000 identified growth factor proteins per cc. One in five vials undergoes independent third-party sterility and endotoxin testing. Donors are 18–22 years old, unvaccinated, with comprehensive serology screening every 3 months throughout pregnancy.*

> *"Your body already knows how to heal itself. Regenerative medicine simply reminds it that it hasn't forgotten how."*

Chapter 12 EBOO Ozone Therapy — Oxygenating, Purifying, and Detoxifying at the Deepest Level

Medical ozone therapy has been practiced in European countries — particularly Germany, Italy, and Russia — for over a century, accumulating a clinical evidence base that is largely unknown in American medicine. In Germany alone, over 7,000 physicians have been trained in medical ozone applications, and the German Medical Society for Ozone Therapy has published guidelines based on decades of clinical use. EBOO — Extracorporeal Blood Ozonation and Oxygenation — is the most sophisticated and comprehensive form of this therapy, delivering systemic effects that go far beyond what topical or minor ozone applications can achieve.

Understanding Medical Ozone — The Chemistry of Healing

Ozone (O_3) is a triatomic form of oxygen — three oxygen atoms bonded in a bent molecular

configuration that makes ozone both highly reactive and highly unstable compared to the diatomic oxygen (O_2) we breathe. This instability is both ozone's limitation (it must be generated on-site and used immediately) and its therapeutic strength: ozone's reactivity allows it to interact with biological molecules in ways that trigger profound and lasting physiological responses.

When medical ozone contacts blood, it reacts within milliseconds with lipids (particularly polyunsaturated fatty acids) and antioxidants (glutathione, vitamins C and E, uric acid) to generate a controlled burst of lipid oxidation products — primarily lipid ozonides and hydrogen peroxide — that serve as signaling molecules. These ozone reaction products (ORPs) are not simply damage byproducts; they are recognized cellular signals that activate specific transcription factors and enzyme systems, producing biological responses that are qualitatively different from what any single pharmaceutical agent can achieve.

What Is EBOO?

Extracorporeal Blood Ozonation and Oxygenation is a closed-circuit procedure in which blood is withdrawn from one arm through a sterile IV catheter, passed through a specialized medical device where it is exposed to precise concentrations of medical-grade ozone while simultaneously being enriched with supplemental oxygen, and then returned to the body through a catheter in the other arm. The closed-circuit design prevents exposure to air (which would introduce nitrogen and compromise both safety and efficacy), maintains sterility throughout, and allows for precise control of the ozone concentration delivered.

The volume of blood processed in a single EBOO session is substantially greater than what is treated in simpler ozone applications like major autohemotherapy (which processes a maximum of 100–200 mL of blood). EBOO processes significantly larger volumes through a continuous flow system, achieving a systemic blood ozonation effect that is categorically different from minor or major autohemotherapy. The EBOO circuit also incorporates a filtration membrane that removes inflammatory proteins, oxidized lipids, circulating immune complexes, and other metabolic waste products — providing a physical 'cleaning' of the blood in addition to the chemical and biological effects of ozone.

Oxidative Preconditioning — Why Controlled Stress Heals

The apparent paradox of ozone therapy — introducing an oxidative agent to treat conditions often characterized by oxidative stress — resolves when you understand the concept of oxidative preconditioning. A precisely dosed, brief oxidative stress does not simply damage tissues; it activates the body's own antioxidant defense systems to a degree that far exceeds the initial challenge, producing a lasting net increase in antioxidant capacity. This is the same hormetic principle underlying exercise (which produces ROS during muscle contraction that ultimately leads to upregulation of mitochondrial antioxidant enzymes) and cold therapy (which produces thermal stress that ultimately strengthens the body's adaptive capacity).

The specific pathways activated by the ozone reaction products include the Nrf2 (nuclear factor

erythroid 2-related factor 2) transcription pathway, which is the master regulator of antioxidant and detoxification enzyme production. Nrf2 activation drives the upregulation of superoxide dismutase, catalase, glutathione peroxidase, glutathione reductase, heme oxygenase-1, and NQO1 — collectively, the most important antioxidant enzymes in human biology. A single EBOO session produces a Nrf2 activation that translates into measurably enhanced antioxidant capacity for days to weeks. With repeated sessions, this upregulation becomes more sustained, providing lasting protection against the oxidative damage that drives aging and chronic disease.

Antimicrobial Action — Against Viruses, Bacteria, and Fungi

Ozone is one of the most potent naturally occurring antimicrobial agents known to science. Its mechanism of action against pathogens is multiple: ozone directly oxidizes and disrupts the lipid envelopes of enveloped viruses (including herpesviruses, Epstein-Barr virus, cytomegalovirus, and respiratory viruses), oxidizes the sulfhydryl groups of viral and bacterial proteins that are essential for their replication and infectivity, and damages the cell walls of bacteria and fungi through direct oxidative attack. Unlike antibiotic drugs, to which bacteria can develop resistance, ozone's mechanism of action is non-specific enough that resistance cannot be developed — ozone simply oxidizes whatever organic structure it contacts.

These antimicrobial properties have made EBOO a valuable tool in the management of chronic infections — conditions in which conventional

antibiotics have failed to eradicate the pathogen, often because chronic biofilm formation or intracellular sanctuary has protected the organism from drug exposure. Lyme disease with persistent symptoms despite antibiotic treatment, chronic Epstein-Barr virus infection, cytomegalovirus reactivation, and post-COVID infection syndromes are all areas where EBOO's antiviral and immunomodulatory effects have clinical relevance.

Detoxification — Molds, Mycotoxins, Heavy Metals, and Environmental Toxins

One of the most clinically important and underappreciated applications of EBOO is its role in addressing the toxic body burden that accumulates over a lifetime of living in a chemically complex environment. Mycotoxins — the secondary metabolites produced by toxic molds including Aspergillus, Penicillium, Stachybotrys (black mold), and Fusarium species — are among the most potent biological toxins known. They accumulate in fat tissue, disrupt mitochondrial function, impair immune surveillance, drive neuroinflammation, and are associated with the constellation of symptoms — chronic fatigue, brain fog, respiratory issues, joint pain, and mood disturbance — that characterizes chronic inflammatory response syndrome (CIRS), a condition that remains dramatically underdiagnosed in conventional medicine.

Ozone therapy addresses mycotoxin burden through multiple mechanisms. Ozone directly oxidizes mycotoxin molecules, converting them into less toxic, more water-soluble forms that can be cleared through normal elimination pathways. Simultaneously, the Nrf2 activation produced by

EBOO dramatically upregulates the liver's detoxification capacity — both Phase I and Phase II enzymes — enhancing the liver's ability to process and eliminate the toxins that ozone has mobilized. The EBOO circuit's filtration component removes oxidized proteins and inflammatory mediators that mycotoxins and other toxins generate in circulation.

Heavy metals — lead, mercury, arsenic, cadmium — represent a different but equally important category of toxin. These elements accumulate in bone, fat, and organs over years of environmental exposure (lead from old paint and plumbing; mercury from seafood and dental amalgam; arsenic from contaminated water; cadmium from cigarette smoke and soil) and impair numerous enzymatic functions by competing with essential minerals at enzyme binding sites. Ozone's ability to enhance mitochondrial function and support cellular energy production is particularly relevant for heavy metal toxicity, in which mitochondrial dysfunction is a primary mechanism of toxicity. Combined with our Vibrant toxin panel testing to quantify the specific burden, EBOO provides a clinically meaningful component of a comprehensive heavy metal detoxification protocol.

For clients who have lived or worked in water-damaged buildings, consumed high quantities of ocean fish, worked in industrial environments, or have any unexplained cluster of symptoms that conventional evaluation has failed to explain, EBOO's detoxification applications represent some of its most transformative clinical utility.

Improved Oxygen Delivery and Cardiovascular Benefits

Beyond its oxidative preconditioning and antimicrobial effects, ozone therapy produces direct improvements in the oxygen-carrying capacity and delivery efficiency of the blood. The Bohr effect — the phenomenon by which increased oxygen partial pressure promotes the release of oxygen from hemoglobin — is enhanced by ozone's modification of red blood cell membranes, producing more efficient oxygen unloading at the tissue level. Ozone also improves the deformability of red blood cells, which normally need to squeeze through capillaries that are smaller than their diameter — when red blood cell membranes are stiff or damaged, this process is impaired and tissue oxygen delivery suffers even when hemoglobin saturation is normal.

The cardiovascular effects of regular EBOO therapy extend to improvements in blood viscosity, endothelial function, and inflammatory marker profiles. Multiple European clinical trials have demonstrated benefits in peripheral arterial disease, cardiovascular disease, and cerebrovascular insufficiency — conditions in which compromised blood flow is the central pathophysiological mechanism.

Immune Modulation — A Two-Way Street

Perhaps one of ozone therapy's most clinically valuable properties is its bidirectional immunomodulatory effect: it upregulates immune function when immunity is suppressed (as in chronic infections, cancer, and immune senescence) while modulating and calming overactivated immune responses (as in autoimmune conditions and chronic inflammatory disease). This bidirectionality — which is mechanistically explained by ozone's

activation of signaling pathways that both stimulate immune effector function and induce regulatory T cell activity — makes EBOO unusually versatile across a broad spectrum of immune-related conditions.

What to Expect at Next Health

An EBOO session at Next Health takes approximately 60 to 90 minutes, during which you rest comfortably while our clinical team manages the procedure. The experience is generally painless beyond the initial IV placement. Most clients feel relaxed during the session and report increased energy, mental clarity, and a sense of systemic lightness in the hours and days that follow. Some clients experience a mild detoxification response — temporary fatigue, mild headache, or flu-like symptoms in the first 24–48 hours as the body processes mobilized toxins and inflammatory debris. This response is generally mild, transient, and actually reflects the depth of the therapeutic effect. We recommend a series of EBOO sessions — typically 4 to 10 depending on clinical indication — with maintenance sessions thereafter for ongoing benefit.

> *"EBOO is like a deep clean for your blood — and when your blood runs clean, everything that it touches runs better."*

Chapter 13 Therapeutic Plasma Exchange — Turning Back the Clock at the Molecular Level

In 2020, researchers at the University of California, Berkeley published a finding that shook the aging research community: that simply diluting the plasma of old mice with young saline dramatically reversed biomarkers of aging across multiple tissues including the brain, liver, and muscle — producing measurable improvements in neurogenesis, muscle repair, and cognitive function. The implication was staggering. Something in old blood actively accelerates aging. And removing it slows the process.

The Science Behind Plasma and Aging

The concept that the composition of blood plasma changes with aging in ways that actively accelerate tissue deterioration has been building in the research literature for decades, crystallized by the heterochronic parabiosis experiments pioneered by Clive McCay in the 1950s and extensively developed by Amy Wagers, Tony Wyss-Coray, and

others at Stanford and UC San Francisco. By surgically joining the circulatory systems of old and young mice, these experiments demonstrated that old mice showed improvements in multiple aging phenotypes when exposed to young blood — and conversely, that young mice showed accelerated aging changes when exposed to old blood. The 'young blood factor' search led to the identification of GDF11, BDNF, and other proteins elevated in young plasma that promote tissue regeneration. But equally important — and arguably more clinically actionable — was the parallel finding that old plasma is enriched in factors that actively suppress regeneration and promote aging, including TGF-β1, CCL11 (eotaxin), and a growing list of inflammatory proteins collectively referred to as the aging secretome.

Therapeutic Plasma Exchange takes the insight from these parabiosis experiments and translates it into a clinical intervention: rather than needing young blood, you can achieve meaningful benefit simply by removing the aging plasma factors that are suppressing your body's regenerative capacity. TPE replaces a substantial fraction of the patient's plasma with albumin solution, fresh frozen plasma, or other replacement fluids — diluting and removing pro-aging inflammatory proteins while maintaining essential plasma components including clotting factors and immunoglobulins.

What Is Therapeutic Plasma Exchange?

TPE — also called plasmapheresis — has been an established medical procedure for decades, used primarily to treat conditions in which pathological proteins in the plasma cause disease: myasthenia

gravis, Guillain-Barré syndrome, thrombotic thrombocytopenic purpura, and other conditions in which removing the offending plasma proteins produces clinical improvement. The procedure uses an apheresis machine to separate blood into its cellular and plasma components, replaces the plasma with a therapeutic substitute, and returns the cellular components to the patient. It is a well-established, FDA-cleared procedure with an excellent safety profile across millions of clinical applications.

The application of TPE to longevity medicine is based on the same fundamental mechanism: remove pathological components from the plasma, in this case the pro-aging inflammatory proteins, damaged lipoproteins, and age-associated secretome factors that accumulate over decades. The resulting plasma dilution produces a measurably 'younger' plasma composition — reduced inflammatory burden, reduced levels of pro-fibrotic TGF-β1, reduced concentrations of CCL11 that inhibits hippocampal neurogenesis — creating a biological environment that is more permissive of tissue repair and regenerative activity.

Clinical Evidence

The most directly relevant human clinical data comes from a study led by Dr. Dobri Kiprov, one of the world's leading apheresis specialists, which enrolled healthy older adults in a series of TPE sessions using albumin replacement. Participants showed statistically significant improvements in multiple aging biomarkers — including inflammatory markers, cognitive function assessments, and subjective measures of energy and wellbeing — following their treatment series. While this represents early-stage human data, it is consistent

with the extensive preclinical evidence and mechanistically coherent with the parabiosis literature.

A separate line of clinical evidence comes from the Alzheimer's disease research program. A Phase 2b/3 clinical trial (the AMBAR study) tested TPE with albumin replacement in mild-to-moderate Alzheimer's patients and demonstrated a significant slowing of cognitive and functional decline compared to placebo — an outcome that no Alzheimer's drug has convincingly produced — consistent with the hypothesis that removing pro-aging plasma factors can slow or partially reverse pathological processes in aging brain tissue.

> 📖 *Research Spotlight: Boada et al. (2020, Alzheimer's & Dementia — AMBAR Trial): Therapeutic plasma exchange with albumin replacement produced significant slowing of cognitive and functional decline in mild-to-moderate Alzheimer's disease, with particularly strong effects in moderate-stage patients. The finding supports the role of plasma composition in Alzheimer's pathology and the therapeutic potential of plasma factor removal.*

Who Is TPE For?

TPE at Next Health is positioned as an advanced intervention for health-optimized adults who are serious about addressing aging at its most systemic and fundamental level. It is most appropriately considered in the context of a comprehensive longevity program that includes biomarker testing, hormone optimization, regenerative medicine, and the full spectrum of Next Health services. Our clinical team evaluates each candidate carefully, assessing baseline inflammatory burden, plasma

protein profiles, and overall health status before recommending TPE, and monitors outcomes with regular biomarker follow-up. For those committed to the most complete and proactive approach to biological aging available, TPE represents a genuinely new frontier.

> *"What if aging is not inevitable — but optional? TPE is the question that backs up that statement with science."*

Chapter 14 VISIA Facial Analysis — Seeing Your Skin's Hidden Story

Your skin does not keep secrets — but it does speak in a language that most of us are not equipped to read. Beneath the surface visible in the mirror lies a complex biological record of your UV exposure history, your current inflammatory status, your hydration, your collagen architecture, your microbial ecology, and your biological age — all written in patterns that are invisible to the naked eye but fully legible to the right technology.

What Is the VISIA Complexion Analysis System?

The VISIA Complexion Analysis System is a sophisticated multi-spectral imaging platform that captures the face from standardized positions using multiple illumination modalities — standard white light photography, ultraviolet illumination, cross-polarized light, and parallel-polarized light. Each illumination modality penetrates to different depths of skin and highlights different chromophores and structural features, revealing aspects of skin biology that are completely invisible under single-modality viewing. The system compares your results to an age- and skin-type-matched database of thousands

of individuals, providing percentile rankings that place your specific skin features in epidemiological context.

The result is not a photograph — it is a quantitative, scientifically grounded assessment of your skin's current biological state, expressed in objective metrics that can be tracked over time and used to guide both aesthetic interventions and systemic health optimization. In the hands of our clinical aestheticians, VISIA is a clinical tool as much as a cosmetic one — revealing information about skin health that has implications beyond appearance.

What VISIA Reveals

UV Spots and Subsurface Damage

UV photography reveals both surface-visible pigmented lesions (solar lentigines, seborrheic keratoses) and subsurface melanin deposits that will eventually manifest as visible brown spots but have not yet reached the surface. This early detection capability is clinically significant: it allows interventions to be targeted before pigmentation becomes visible, and it flags areas of UV damage that warrant dermatological evaluation for early atypical changes. For clients who have had significant historical sun exposure, the UV photography component of VISIA often reveals a substantially greater degree of subsurface damage than they were aware of — providing both clinical guidance and motivation for consistent photoprotection going forward.

Texture, Pores, and Surface Irregularity

Cross-polarized light eliminates the surface reflection that makes skin texture difficult to assess

clinically, revealing the true topography of the skin surface — pore size, skin roughness, fine lines, and surface irregularities with extraordinary precision. These measurements provide objective baselines for assessing treatment response: a client who undergoes a series of microneedling treatments or a sustained collagen-supporting IV protocol can compare their post-treatment VISIA scan to their baseline with precision that subjective self-assessment cannot approach.

Vascularity, Redness, and Inflammatory Patterns

Parallel-polarized light reveals the subsurface vascular network — the pattern of blood vessels underlying the skin's surface. This visualization is particularly valuable for clients with rosacea, facial flushing, or diffuse redness, revealing the specific vascular patterns responsible for their condition and guiding targeted treatment selection. For clinicians, the vascular map also provides information about skin inflammatory status — patterns of diffuse vascular prominence often reflect systemic inflammatory burden that can be addressed through IV nutrition, hormone optimization, and other systemic interventions.

Porphyrins and Bacterial Activity

UV illumination reveals porphyrins — metabolic byproducts produced by Cutibacterium acnes (formerly Propionibacterium acnes) that fluoresce under UV light. The distribution and density of porphyrins provides a direct map of bacterial colonization patterns on the skin surface, identifying areas of high bacterial activity that are contributing to current or future acne lesions. This objective bacterial mapping enables targeted, evidence-based management of acne — identifying not just

where acne currently is but where it is most likely to develop, allowing preventive intervention before lesions form.

VISIA in Our Clinical Aesthetic Framework

At Next Health, VISIA imaging is integrated into our aesthetic consultation process, providing every skin-focused client with an objective baseline and the ability to track their results with quantitative precision. We use VISIA at treatment initiation and at regular intervals to objectively document treatment response — providing clients and clinicians alike with the data needed to confirm that interventions are working, adjust protocols when needed, and maintain the motivation that comes from seeing measurable progress documented in objective numbers rather than relying solely on subjective perception.

The connection between VISIA findings and systemic health is one we take seriously. Skin aging, inflammatory vascular patterns, and barrier dysfunction revealed by VISIA often parallel what we find in biomarker testing — accelerated skin aging correlates with inflammatory burden, oxidative stress, and hormonal decline. Addressing the systemic drivers of skin aging through our clinical programs produces improvements that VISIA documents objectively, reinforcing the fundamental principle that beautiful skin is healthy skin, and healthy skin reflects a body that is functioning optimally from the inside out.

> *"Before you can improve your skin, you need to understand it. VISIA gives you that*

> *understanding in vivid, scientific detail."*

Chapter 15 Aesthetics — The Science of Skin, Youth, and Confident Living

Your skin is the largest organ in your body. It weighs approximately 8 pounds, covers an average of 22 square feet, and performs functions so critical — barrier protection, immune surveillance, thermoregulation, vitamin D synthesis, sensory perception, fluid conservation, wound healing — that life without it is literally impossible. And yet we routinely treat skin care as though it were a purely cosmetic concern, separate from the serious business of health optimization. This is a mistake that modern science has comprehensively corrected.

The Biology of Skin Aging — Understanding the Enemy

Skin aging is driven by two interacting processes whose combined effects are written on every face that has spent time on this earth. Intrinsic (chronological) aging is driven by the accumulated effects of cellular senescence, telomere shortening, and the progressive decline of the biological machinery that produces the structural proteins — collagen, elastin, fibronectin — that give skin its

firmness, elasticity, and resilience. After age 30, skin collagen production declines at approximately 1% per year; by age 70, total collagen content may be reduced by 30–40%. Simultaneously, sebaceous gland activity decreases, reducing the natural lipid barrier that maintains moisture; epidermal cell turnover slows, reducing the skin's ability to repair surface damage; and fibroblast proliferative capacity declines, slowing the cellular response to injury.

Extrinsic aging is driven primarily by UV radiation, but also by air pollution (particularly particulate matter and ozone, which penetrate the epidermis and generate reactive oxygen species), cigarette smoke (which activates matrix metalloproteinases that break down collagen and elastin), and chronic glycation — the non-enzymatic reaction between glucose and structural proteins that produces advanced glycation end-products (AGEs) that stiffen collagen fibers and impair their normal biological function. Of these extrinsic factors, UV radiation is by far the most quantitatively significant: dermatologists estimate that 80–90% of visible facial aging in fair-skinned individuals is attributable to UV exposure rather than chronological aging.

Understanding both processes allows us to design aesthetic interventions that address aging mechanistically — not merely covering symptoms but actually restoring the biological processes that produce healthy, youthful skin. This is the approach that distinguishes Next Health's aesthetic program from a conventional cosmetic practice.

Our Aesthetic Services

Neurotoxins — Botox, Dysport, and Xeomin

Botulinum toxin type A temporarily inhibits the release of acetylcholine at the neuromuscular junction of targeted facial muscles, producing a controlled, reversible reduction in muscle contraction that relaxes the dynamic wrinkles produced by repetitive facial expression. Horizontally across the forehead, vertically between the brows (the '11s' or glabellar lines), and radiating from the outer corners of the eyes (crow's feet) — these expression lines are the earliest and most visible markers of facial aging, and their treatment has become one of the most commonly performed medical procedures in the world.

When executed by skilled, medically trained injectors with a thorough understanding of facial anatomy and aesthetic proportions, neurotoxin treatment produces not a frozen or artificial appearance but a natural softening that preserves the expressiveness and character of the face while reducing the permanent etching that decades of muscle contraction eventually produce in the overlying skin. The aesthetic result is a face that looks refreshed and rested rather than 'done' — the gold standard that distinguishes excellent neurotoxin technique from mediocre results.

Beyond pure wrinkle treatment, neurotoxin applications have expanded significantly in recent years. Low-dose intradermal injection (the 'Nefertiti lift' and 'baby Botox' techniques) can improve skin texture and pore appearance by reducing sebum production and slightly relaxing the superficial muscles of the neck and lower face. Jawline slimming through masseter injection reduces the facial widening caused by masseter hypertrophy (often driven by bruxism or stress). Hyperhidrosis treatment stops excessive sweating in the underarms, palms, or scalp. And preventive

treatment in younger patients can slow the development of deep static lines by interrupting the decades of repetitive muscle movement that etch them into the dermis.

Dermal Fillers — Juvederm, Restylane, and SKINVIVE

The volumetric changes of facial aging go beyond the surface: they involve the progressive reduction of facial fat compartments, the resorption of facial bone, the migration and descent of fat pads that were once positioned to provide youthful contour, and the reduction of hyaluronic acid (HA) content in the dermis that gives young skin its dewy, cushioned appearance. Understanding facial aging as a three-dimensional structural change — not merely a surface problem — is the foundation of modern filler aesthetics.

Hyaluronic acid fillers (Juvederm, Restylane, and their formulation variants) are the most versatile and widely used dermal fillers, appropriate for virtually every facial region. HA is a naturally occurring polysaccharide that is abundant in young skin and joints, where it binds extraordinary quantities of water (a single molecule of HA can bind up to 1,000 times its molecular weight in water) and provides the volume, hydration, and cushioning that characterize youthful tissue. When injected into the appropriate tissue plane by a skilled practitioner, HA fillers restore volume, define contour, and improve skin quality through both physical volume replacement and the stimulation of fibroblast activity and collagen production that the mechanical expansion of the injection triggers.

SKINVIVE by Juvederm represents a distinct filler application: rather than adding volume, this micro-droplet HA formulation is injected intradermally in a

grid pattern to improve the overall quality and hydration of the skin itself — producing the 'glow' and skin quality improvement that was previously achievable only through sustained skincare programs or systemic interventions. It is a purely skin-quality-improving injection rather than a volumizing one, and its results — improved skin texture, reduced dryness, and enhanced luminosity — complement the structural results of traditional volume filler placement.

PRP — Platelet-Rich Plasma for Hair and Skin

Platelet-Rich Plasma is prepared by drawing a small volume of the client's own blood, centrifuging it to concentrate the platelet fraction, and injecting this concentration into the target tissue. Platelets are not merely the cells responsible for clotting — they are repositories of growth factors including PDGF (platelet-derived growth factor), TGF-β, VEGF, EGF, and IGF-1, which are released upon activation and stimulate cell proliferation, matrix synthesis, and new blood vessel formation in the treated tissue.

For hair restoration, PRP injections into the scalp deliver concentrated growth factors directly to hair follicles in the miniaturization phase — the stage of androgenetic alopecia where follicles are shrinking but not yet lost, and are most responsive to regenerative stimulation. Multiple randomized controlled trials have demonstrated significant increases in hair density, hair diameter, and hair count following PRP scalp injection series, with effects that are sustained with maintenance treatments. At Next Health, PRP for hair is integrated into our comprehensive hair restoration approach that addresses hormonal drivers

(testosterone, DHT, thyroid function), nutritional cofactors (ferritin, zinc, biotin), and local scalp biology simultaneously.

For skin rejuvenation, PRP is applied either as a standalone injection treatment (the 'vampire facial' approach) or, more effectively, in combination with microneedling — where the PRP is applied to microneedled skin and driven into the dermal tissue through the channels created by the needles. The combination of mechanical collagen induction (from needling) and biological growth factor stimulation (from PRP) produces synergistic collagen and elastin upregulation that exceeds what either treatment achieves alone.

Microneedling with Hyaluronic Acid

Microneedling uses a device bearing multiple fine-gauge needles (typically 0.5 to 2.5 mm in length, depending on treatment depth) to create thousands of microscopic channels in the skin, triggering a controlled wound-healing response that proceeds through the same biological cascade as any wound repair: inflammation, proliferation, and remodeling. The remodeling phase — extending 3 to 6 months after treatment — produces new collagen and elastin deposition, thickening of the dermis, reduction in scar and stretch mark appearance, improvement in skin texture and pore size, and a general restoration of skin architecture toward a more youthful organization.

When hyaluronic acid serum is applied to the skin during microneedling, it is driven into the dermal tissue through the microchannels — a delivery depth impossible through topical application alone. The deep dermal hydration and tissue cushioning that HA provides at this depth complement the structural collagen improvements produced by the

needling stimulus, creating a result that is meaningfully better than needling alone. The procedure requires minimal downtime — typically 24 to 48 hours of redness — and produces progressive improvements over multiple months as collagen remodeling continues.

Microneedling with Exosomes

Exosome-enhanced microneedling represents one of the most exciting current frontiers in regenerative aesthetics. Exosomes are nanoscale vesicles — typically 30 to 150 nanometers in diameter — released by cells as intercellular communication packages. They contain a cargo of microRNA, messenger RNA, proteins, and lipids that reflects the biological state of the cell that produced them, and they transmit this biological information to recipient cells by fusing with their membranes and delivering their cargo directly into the cytoplasm.

The exosomes used in aesthetic applications are derived from mesenchymal stem cells (MSCs) — sources chosen for their particularly rich and pro-regenerative exosome content. When applied to microneedled skin, these stem cell-derived exosomes penetrate into the dermis through the microchannels, where their microRNA cargo enters fibroblasts and other dermal cells and reprograms their gene expression toward a more youthful, regenerative profile — upregulating collagen synthesis, suppressing inflammatory signaling, promoting angiogenesis, and reducing senescent cell activity in the treated tissue.

The clinical results of exosome microneedling — reduced treatment downtime compared to PRP (exosomes are less inflammatory), accelerated initial healing, improved skin texture and laxity improvement, and a 'glow' and vitality enhancement

that clients describe as meaningfully different from standard microneedling — reflect the biological complexity of the exosome cargo. Multiple growth factors, anti-inflammatory signals, and regenerative instructions are delivered simultaneously, producing a more comprehensive biological response than single-growth-factor approaches can achieve. For clients seeking the most regeneratively sophisticated microneedling experience available, exosome-enhanced treatment represents the current pinnacle.

Microneedling with Salmon DNA (PDRN)

Polydeoxyribonucleotide (PDRN) therapy — commonly known as salmon DNA therapy due to its derivation from the purified sperm of Oncorhynchus mykiss (rainbow trout) or other salmonid species — is one of the most compelling examples of biomimetic medicine in aesthetic dermatology. PDRN is composed of polynucleotide fragments 50 to 2,000 base pairs in length, derived from salmon sperm DNA through enzymatic purification. Despite the unusual source, PDRN's biological activity is entirely dependent on its structure as a nucleotide polymer rather than its species origin — salmon sperm DNA happens to be an exceptionally pure, abundant, and consistently available source of the polynucleotide fragments that produce the therapeutic effect.

PDRN exerts its biological effects primarily through activation of the adenosine A2A receptor, which is expressed on fibroblasts, endothelial cells, macrophages, and other cells of the dermis and vasculature. A2A receptor activation produces a cascade of pro-regenerative effects: stimulation of fibroblast proliferation and collagen synthesis, promotion of angiogenesis through VEGF upregulation, reduction of pro-inflammatory

cytokine production, and enhanced wound healing. Simultaneously, PDRN provides the nucleotide building blocks for DNA repair and cellular synthesis through the salvage pathway, supplying raw materials that regenerating cells can use to rebuild their own DNA and accelerate repair.

Clinical research on PDRN in dermatology has demonstrated impressive results across multiple applications. In scar treatment, PDRN injections have produced significant improvements in scar texture, elevation, and melanin content in both surgical and acne scars. In aging skin, PDRN treatment has demonstrated measurable improvements in skin elasticity, hydration, and reduction in the depth of wrinkles. In wound healing, PDRN has consistently outperformed control treatments in randomized trials, accelerating both the speed and quality of repair. When delivered through microneedling channels — which allows the PDRN to reach the deeper dermal compartments where fibroblasts and vascular structures are concentrated — the clinical effects are more profound than can be achieved with superficial application, because the delivery depth matches the target tissue for the key cellular effects.

The combination of exosome microneedling and PDRN is increasingly used as a layered treatment protocol, with each component addressing complementary aspects of skin regeneration: exosomes for the reprogramming of cellular gene expression and the delivery of a complex regenerative signaling environment; PDRN for the direct stimulation of fibroblast proliferation, the structural support of DNA repair, and the anti-inflammatory modulation that allows regeneration to proceed in a calm rather than a damaged environment. Together, they represent a genuinely

biological approach to skin rejuvenation that goes far beyond the surface improvements of conventional aesthetic treatments.

Medical-Grade Skincare

No in-office aesthetic program achieves its full potential without the foundation of an evidence-based daily skincare regimen. The difference between medical-grade and over-the-counter skincare is not primarily marketing — it is pharmacological. Medical-grade products are formulated with active ingredients in concentrations that are clinically effective, with delivery systems (encapsulation, penetration enhancers, pH optimization) designed to ensure that active molecules reach their target tissue in the skin rather than sitting ineffectively on the surface.

Retinoids (vitamin A derivatives including retinol, retinaldehyde, and tretinoin) are the most evidence-supported anti-aging topical ingredients in existence, with decades of clinical research demonstrating their ability to increase epidermal cell turnover, stimulate collagen synthesis, reduce melanin production, and directly counteract the effects of UV-induced DNA damage. Growth factor serums provide the biological signaling molecules that aging skin lacks. Antioxidant complexes (vitamin C, vitamin E, ferulic acid, resveratrol) neutralize the free radicals generated by UV radiation and environmental pollution before they can damage collagen and DNA. Peptide complexes — including the copper peptide GHK-Cu, acetyl hexapeptide, and palmitoyl tripeptide-1 — mimic the signaling molecules that fibroblasts need to maintain collagen production.

Our aesthetic team provides personalized skincare consultations, developing individualized regimens

that address each client's specific concerns, skin type, and treatment plan. The goal is a home care program that amplifies and maintains the results of in-office treatments — because the most sophisticated procedure produces suboptimal long-term outcomes if it's not supported by a consistent, scientifically grounded daily routine.

Aesthetics as an Expression of Systemic Health

The integration of aesthetics with clinical health optimization is not merely a business convenience — it is a scientific necessity. The fibroblasts that produce collagen are governed by the same hormonal signals that govern muscle synthesis: testosterone and estrogen directly regulate fibroblast activity and collagen gene expression, which is why skin aging accelerates dramatically during the perimenopausal transition and why hormone optimization produces measurable improvements in skin quality. The inflammatory cytokines that drive chronic inflammatory conditions also drive matrix metalloproteinase activity in the skin, accelerating collagen degradation. The nutritional deficiencies that impair cellular energy production also impair the protein synthesis that builds skin structure. The mitochondrial dysfunction that produces fatigue and cognitive decline also reduces the metabolic capacity of skin cells to carry out repair.

Addressing these systemic drivers — through hormone optimization, IV nutrition, biomarker-guided supplementation, and the comprehensive longevity protocols that define Next Health — produces skin improvements that no topical product or in-office procedure alone can achieve. And

conversely, the VISIA imaging and skin health assessment that our aestheticians perform often reveals early signs of systemic processes — accelerated aging, inflammatory burden, vascular dysfunction — that inform our clinical team's approach to optimization.

When you invest in your skin at Next Health, you are recognizing that your largest organ deserves the same quality of evidence-based, clinically guided care as every other organ in your body. Beautiful skin is not vanity. It is evidence of a body that is being cared for with intelligence, intention, and respect for the remarkable biology that sustains it.

> *"Beautiful skin is not a vanity. It is evidence of a body that is being cared for from the inside out."*

Epilogue Your Next Health Journey Begins Now

You've just taken a comprehensive tour through some of the most exciting, most rigorously studied, and most genuinely transformative health technologies and therapies available anywhere in the world today. The question is not whether these therapies work. The science is clear. The thousands of clients whose lives have been measurably transformed is clear.

The question is: where do you begin?

Our answer is always the same: with data. With an honest, comprehensive assessment of where you are — your biomarkers, your body composition, your hormones, your gut health, your genetics, your toxic burden. Because the therapies that will move the needle most powerfully for you are not the same as the ones that will move it most powerfully for the person sitting next to you. You are unique. Your protocol should be too.

There is a version of your future in which you are still performing at high capacity in your 70s — cognitively sharp, physically capable, emotionally resilient, metabolically healthy. There is a version in which you avoid the decade of slow decline that precedes most of the diseases we associate with 'getting old.' There is a version in which the years ahead feel like more of what life has been at its best — not a series of losses to be managed, but a

continued expansion of what is possible. The science exists to support this vision. The therapies exist. The team at Next Health exists.

What we cannot do is want it for you more than you want it for yourself. But if you are reading this, that desire is already there. And that is exactly where every journey worth taking begins.

Come see us.

next-health.com