aervita | HYPERBARICS

A FIELD GUIDE
VOLUME 02

A field guide to hyperbaric oxygen —

Dive to *Thrive*.

Why hyperbaric oxygen belongs in modern medicine — and what it can really do for your brain, body, and recovery.

An invitation —

Oxygen is the only substance the FDA classifies as both a ***drug*** and an ***element of life***.

The average adult takes roughly 22,000 breaths a day. 8 million breaths a year. 600 million breaths in a lifetime. Every cell in your body except mature red blood cells depends on it. Pull oxygen out of the picture for just 4–6 minutes, and brain cells begin to die.

This guide is what happens when we treat oxygen as the medicine it already is.

Contents.

A field guide in seven chapters and five appendices.

THE GUIDE

APPENDICES

— 01 —

WELCOME

A letter *from Aervita*.

You picked up this guide because something inside told you there had to be more. Whatever brought you here, we wrote it for you.

Maybe a provider told you *"this is just how it's going to be."* Maybe a loved one is fading slowly and the prescriptions aren't holding the line. Maybe you're an athlete chasing one more good year, or a high-performer who can feel the wheels coming off. Maybe you're just curious — because you've heard whispers that something called hyperbaric oxygen is helping people recover from chronic conditions where conventional approaches have plateaued.

We wrote this guide because hyperbaric oxygen therapy (HBOT) is one of the most underutilized therapies in medicine — and most patients never hear about it from the people who could be telling them.

We wrote it because the FDA-approved list of indications for HBOT is barely more than a dozen conditions. The list of conditions where peer-reviewed research has shown benefit is **well over a hundred** — and growing every year.

We also wrote it because oxygen, despite being one of the most ubiquitous and absolutely essential substances on Earth, is classified as a **drug** by the U.S. medical system. That single decision means HBOT lives inside a tight regulatory framework that has slowed its adoption, narrowed its insurance footprint, and kept it out of conversations where it absolutely belongs.

WHY THIS GUIDE EXISTS

This guide is built to do three things: equip patients to make informed decisions about whether HBOT is worth their time and money; equip referral partners — chiropractors, dentists, naturopaths, surgeons, therapists, coaches — to speak the language of HBOT with confidence; and lay out the best-practices framework so anyone considering hyperbaric therapy can run a legitimate trial of it the right way.

There's a tremendous amount of information out there. Patients are asked to navigate an exhausting menu of options for almost every health concern. We wrote this guide with one question top of mind: **what's the best return on your time and money?** HBOT is often very worth it. There's also a time, a place, and a *best way* to apply it.

To your healing,

— The Aervita Team

— 02 —

FOUNDATIONS

HBOT explained, its *history*, & *types* of chambers.

The mechanical definition. The 350-year arc from a 1662 English clergyman's pressure chamber to today's FDA-cleared machines. And why, at 2.0 ATA on 100% oxygen, plasma carries roughly *13× the dissolved oxygen* of ordinary breathing.

Hyperbaric oxygen therapy is the medical use of *oxygen at greater-than-atmospheric pressure*. You sit or lie inside a sealed chamber, the pressure inside is increased above the pressure of the air outside, and you breathe a high concentration of oxygen for a defined period of time.

That's the entire mechanical definition. Everything else — the dose, the protocol, the type of chamber, the supporting therapies — is execution.

The principle is best understood by going underwater. Every 33 feet of seawater adds one atmosphere of pressure to your body. At sea level, you experience 1.0 ATA (atmospheres absolute). At 33 feet down, you're at 2.0 ATA. At 66 feet, 3.0 ATA. An HBOT chamber is essentially a controlled, dry "dive" — you don't get wet, but the physics are the same.

Pressure does the work that ordinary breathing can't

Under normal conditions, the oxygen you breathe is carried almost entirely on hemoglobin in red blood cells. Hemoglobin maxes out around 97–99% saturation; you can't push it much further by simply breathing harder or breathing pure oxygen at sea-level pressure.

What you *can* do is dissolve more oxygen directly into the plasma — the watery part of your blood, plus your lymph, cerebrospinal fluid, and interstitial fluid. **Henry's Law** says the amount of gas dissolved in a liquid is proportional to the partial pressure of that gas above the liquid. Increase the pressure, and you dissolve far more oxygen into every fluid in the body.

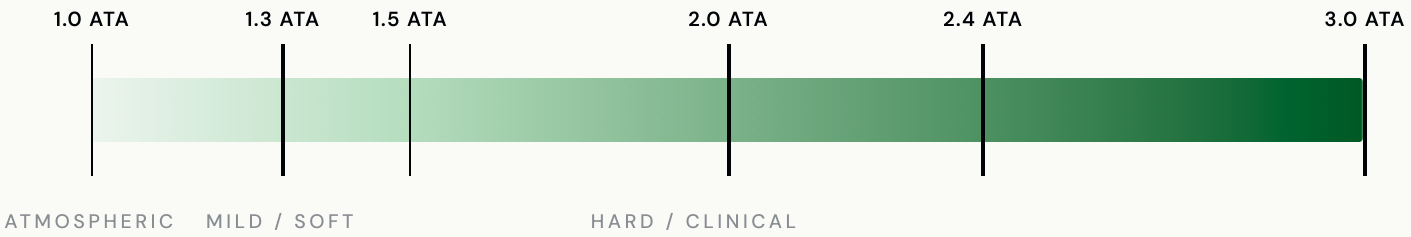
THE HEADLINE NUMBER

Up to 1,200% more oxygen delivered to tissue

- Hemoglobin alone: ~97% saturation, fixed ceiling
- HBOT at 2.0 ATA on 100% O_2: 10–13× more dissolved oxygen in plasma
- Result: oxygen reaches tissue that blood cells can't always reach

The pressure spectrum, at a glance

HBOT isn't one thing — it's a range of pressures and oxygen concentrations. Where you sit on this spectrum changes what HBOT actually does in your body.



WHAT CHANGES ACROSS THE SPECTRUM

Below 1.3 ATA — Marketing aside, this is essentially room air. Pressure is too low to dissolve meaningful additional oxygen into plasma. Useful for altitude acclimatization, not therapeutic HBOT.

1.3 ATA, ambient air or 95–96% O_2 — The "mild HBOT" zone. Soft chambers, often used at home or in wellness clinics. Real benefit for fatigue, recovery, mild concussion, and general wellness — but it's a different dose curve than clinical HBOT.

1.3–2.0 ATA — The bridging band. Useful for performance recovery, post-surgical support, and patients ramping toward higher pressures. Many integrative protocols live here when the goal is consistent, gentle stimulus rather than maximum dose.

2.0–2.4 ATA, 100% O_2 — The clinical sweet spot. This is where most peer-reviewed research lives. Sufficient pressure to drive dissolved-oxygen levels 10–13× normal, drive stem-cell mobilization, and trigger the gene-expression cascades HBOT is famous for.

2.4–3.0 ATA — Reserved for specific FDA-approved indications: decompression sickness, gas embolism, carbon monoxide poisoning, and some severe wound and infection protocols. Higher dose, tighter monitoring.

A USEFUL MENTAL MODEL

Think of HBOT like a prescription. Same molecule — oxygen — but the **dose, duration, and route of delivery** *change everything about what it does. A 60-minute session at 2.0 ATA is a different medicine than 90 minutes at 1.3 ATA, the same way 5mg of a drug is a different medicine than 50mg.*

A short *history* of HBOT

1662. A British clergyman-physician named Henshaw builds the first known pressurized chamber — a sealed wooden room he calls the "domicilium." He has no idea why it works, but patients who spend time inside it seem to recover faster. The mechanism would not be understood for another two centuries.

The science catches up in the 1770s, when Scheele and Priestley independently isolate oxygen, and again in the early 1800s when William Henry publishes the gas law that bears his name — the same law that explains why pressurized oxygen dissolves so deeply into the body's fluids. Through the 1800s, "pneumatic institutes" pop up across Europe and America, offering pressurized treatments for everything from tuberculosis to nervous conditions. Without a systematic understanding of dose or mechanism, the field is part medicine, part theater.

The *industrial* turning point

The next chapter is written underwater. As Europe industrializes in the late 1800s, workers digging caissons — the pressurized underwater chambers used to build bridge foundations — start dying of a mysterious illness. The condition is named "the bends." The treatment, eventually, is the same physical principle Henshaw had stumbled onto: re-pressurize the patient, then bring them back to surface pressure slowly. **HBOT becomes formal medicine the moment it has a problem only it can solve.**

A USEFUL COINCIDENCE

The Navy adopts HBOT, and everything changes.

- 1900s — U.S. Navy formalizes recompression tables for divers
- 1937 — Behnke uses HBOT for decompression sickness
- 1950s — Boerema (Netherlands) pioneers HBOT for cardiac surgery and gas gangrene
- 1960s — first hospital-based hyperbaric units open in the U.S. and Europe

From the Navy to the *operating room*

By the 1960s, hospitals are using HBOT for gas gangrene, carbon monoxide poisoning, and crush injuries. The Undersea and Hyperbaric Medical Society (UHMS) is founded, and the first formal "approved indications" list is established. With modest expansion, that list still defines what U.S. insurance will cover today — about 14 conditions, most of them acute. The 1980s and '90s bring a parallel track: NASA studies HBOT for astronaut recovery, the Russian and Chinese militaries publish hundreds of post-stroke studies, and Israeli researchers at the Sagol Center begin a program of randomized trials in fibromyalgia, post-concussion syndrome, and TBI that continues to lead the field.

The mild-chamber *boom*

In the 2000s, a lower-pressure category emerges: the soft-sided "mild HBOT" chamber. Mild chambers operate at 1.3 ATA — gentler than clinical HBOT, but accessible at a fraction of the cost. The result is a two-tier landscape: hospital-based hard chambers for FDA-approved indications, and a growing field of wellness clinics running mild HBOT for off-label benefits.

WHY MOST PATIENTS HAVE NEVER HEARD OF HBOT

FDA approval requires expensive randomized controlled trials. Oxygen can't be patented, so no pharmaceutical company will fund those trials. The result: a therapy with hundreds of peer-reviewed indications has only a dozen FDA-approved uses — and most American physicians were never trained to prescribe it for anything else.

Today, HBOT is used in over 60 countries. China alone operates more than 5,000 chambers; the U.S. has roughly 1,300. Every year, new peer-reviewed studies expand the documented use cases — and every year, the gap between what the research supports and what U.S. insurance covers gets a little wider. The challenge now is making sure patients and providers have the framework to use HBOT **well**.

There are essentially *two categories* of hyperbaric chamber in use today. Both deliver real benefit. They aren't interchangeable. **At Aervita, we offer both** — mild (soft) and hard (clinical) — and match the chamber to the indication.

CATEGORY ONE

Mild HBOT (*soft*)

1.3 ATA · ambient or oxygen-enriched air

Pressure: 1.3 ATA (about 4 psi above sea level)

Oxygen: ambient air or 95–96% via concentrator

Build: soft-sided, fabric, zip seal

Cost / footprint: low; can live in a home or small clinic

Best for: recovery, fatigue, mild TBI, wellness, daily use

Session length: 60 or 90 minutes

Safety profile: very gentle; minimal contraindications

CATEGORY TWO

Hard *HBOT* (clinical)

1.5–2.4 ATA · high-concentration oxygen

Pressure: 1.5–2.4 ATA, sometimes 3.0 ATA

Oxygen: high-concentration O_2 (~92–96%) via mask or hood

Build: rigid acrylic or steel; clinical-grade

Cost / footprint: high; requires dedicated facility

Best for: stroke, TBI, wounds, infections, cancer-adjunct

Session length: 60 or 90 minutes, often with air breaks

Safety profile: robust; requires medical screening

TWO STYLES, SIDE BY SIDE

Mild (soft) chamber · 1.3 ATA

Hard (clinical) chamber · 1.5–2.4 ATA

When mild is the right tool

Mild HBOT shines for the *large middle ground* of human health: people who feel "off" but aren't sick, athletes recovering from training loads, knowledge workers fighting brain fog, post-illness convalescence, mild concussion histories, and anyone seeking a daily-use longevity protocol. The pressure is low enough that frequency can be very high — daily, even twice daily — without significant risk.

Mild also makes sense as a *maintenance modality* after a hard-HBOT protocol concludes. Many patients run a 40-session hard-chamber protocol and then continue with mild HBOT one to three times per week to hold their gains.

When hard is the right tool

Hard HBOT is what the serious indications require. Stroke recovery, traumatic brain injury, persistent post-concussion syndrome, Long COVID with significant cognitive or physiologic dysfunction, non-healing wounds, radiation injury, severe Lyme, autoimmune flares, fibromyalgia — these have all been studied at clinical pressures, and the dose response is real. Trying to substitute a mild chamber for a clinical one in these cases is like trying to substitute a multivitamin for an antibiotic. They share a category, not a mechanism.

When *both* is the right answer

The most sophisticated programs use both — and at Aervita we offer both under one roof. Patients often begin with hard HBOT for the heavy lifting (typically 40 sessions at 1.5–2.4 ATA) and then transition to mild HBOT for ongoing maintenance and reinforcement. This combination captures the gene-expression and stem-cell benefits of clinical pressure while keeping the long-term cost and time burden manageable.

THE PRACTICAL QUESTION TO ASK

Whenever you read or hear about HBOT, ask: **at what pressure?** *If the answer is 1.3 ATA, you're in mild-chamber territory — real but gentler. If the answer is 1.5 ATA or higher with 100% oxygen, you're in clinical-HBOT territory, and the bigger published outcomes apply.*

— *03* —

MECHANISMS · EFFECTS

Two *clocks*. Two *payoffs*.

Every session of HBOT works on two timescales at once. A *fast* mechanism that produces what you'll feel today — and a *slow*, compounding mechanism that produces what you'll keep for years. Knowing the difference protects you from quitting too early.

The *fast* clock starts the moment the chamber pressurizes. One mechanism does the heavy lifting — and a cascade of effects follows within hours.

The mechanism: *hyperoxygenation of plasma*

At normal pressure, oxygen rides almost exclusively on hemoglobin. Under pressure, Henry's Law takes over: oxygen dissolves directly into **plasma, lymph, cerebrospinal fluid, and synovial fluid**. Tissues that couldn't get enough from red blood cells alone — diabetic feet, post-stroke brain, hypoxic wound beds, inflamed joints — finally get oxygen delivered *independently of circulation*. That single shift is what every short-term effect downstream depends on.

WITHIN HOURS OF A SESSION

What you'll *feel*

- **Mental clarity** — fog lifts, focus sharpens within 30–60 min
- **Pain relief** — chronic pain often dampened post-session
- **Reduced inflammation** — joint stiffness eases the same day
- **Mood lift** — calmer, less reactive, more present
- **Better sleep** — many patients sleep deeper that night
- **Improved energy** — afternoon-crash relief is common
- **Faster recovery** — soreness clears noticeably faster
- **Antimicrobial activity** — bacteriostatic against many pathogens; potentiates antibiotics

WHY THESE SHOW UP SO QUICKLY

The same-day *cascade*

Saturated plasma drives an immediate **anti-inflammatory cascade** — pro-inflammatory cytokines (TNF-α, IL-1, IL-6) drop, and the immune system shifts toward a regulatory profile. Oxygenated tissue is hostile to many pathogens, which is why HBOT is bacteriostatic and amplifies many antibiotics. And the brain — the body's most oxygen-hungry organ — gets fed first, which is why clarity and mood lift arrive before anything structural has changed.

These are the effects you can feel. They are real — and they are not the most important thing HBOT does.

The *slow* clock is where structural change lives. The body reads repeated pressure-and-oxygen cycles as a signal to *rebuild* — and across 20–40 sessions, it does.

The mechanism: *the hyperoxic-hypoxic paradox*

When pressure drops back to normal at session's end, tissues briefly experience a relative drop in oxygen — tricking the body into thinking it has been at altitude. Stem-cell genes, growth factors, and angiogenesis pathways activate as if adapting to thin air. Repeat 20, 30, 40 times and the adaptations *compound*.

01

Angiogenesis — new capillary growth

VEGF and other vascular growth factors upregulate; the body builds new microvasculature where blood supply was compromised. **This effect is permanent** — once new capillaries form, they remain.

02

Stem-cell mobilization

Circulating stem cells increase up to **8× over baseline**. They home to sites of injury and inflammation and accelerate repair in tissues that ordinarily heal slowly.

03

Mitochondrial biogenesis

The number, density, and efficiency of mitochondria increase. Patients describe this as "the lights coming back on" — the mechanism behind much of HBOT's effect on chronic fatigue.

04

Neuroplasticity & dormant-cell reactivation

In post-stroke and TBI imaging, HBOT reactivates "stunned" brain tissue at the edges of old injuries. Function returns to areas conventional medicine had written off.

05

Telomere lengthening & cellular-aging markers

In a rigorously designed Israeli trial, 60 daily sessions — 90 minutes at 2.0 ATA, five days a week over three months — produced measurable **telomere lengthening (>20%)** and a drop in **senescent cells (up to ~37%)**: biological-aging markers almost nothing else moves. Results like these track with serious dosing, which is why more significant cases are often prescribed **80–120 sessions** within a defined window.

THE PATTERN MOST PATIENTS DESCRIBE

*Sessions **1–3**: noticeable clarity, calm, or pain relief. Around **10–15**: the feeling often dips — real repair has a metabolic cost. By **20–30**: gains stabilize and start to feel structural. By **40**: imaging and lab changes are typically locked in. Quitting at session 12 looks like "it stopped working." It hadn't started yet.*

A chamber by itself is just a chamber. *How* we use it is what turns sessions into transformation.

Most clinics treat HBOT as a standalone modality: book a chamber, sit for 90 minutes, leave. That works for some indications and leaves a lot on the table for almost everyone else. At Aervita, HBOT is the centerpiece of an integrative protocol — not the entire protocol. The goal is to put the body in the best possible condition *around* each session, so dissolved oxygen has somewhere productive to go.

What we add *around* the chamber

FUNCTIONAL MEDICINE WORKUP

Before a serious protocol begins, we look at the foundations: nutrient status, gut health, inflammatory markers, hormones, sleep architecture. HBOT works far better when biology isn't fighting it.

TARGETED NUTRITION & SUPPLEMENT SUPPORT

HBOT generates a transient burst of reactive oxygen species — part of the signaling mechanism. We support antioxidant capacity (glutathione, NAC, CoQ10, vitamin C) and mitochondrial cofactors (B-complex, magnesium, ALA).

MOVEMENT, LIGHT, AND RECOVERY

Red light therapy potentiates the mitochondrial work. Lymphatic drainage clears metabolic waste faster. Sleep optimization protects the consolidation phase between sessions.

PROVIDER-LED PROTOCOL DESIGN — ASSESS · BUILD · ADJUST

Pressure, frequency, duration, and total session count are all **prescription decisions**. We assess at intake, build a written protocol with milestones, and re-evaluate at defined checkpoints — adjusting as needed.

THE FRAMING — AND WHAT WE WON'T DO

Hyperbaric oxygen, used well, is one of the most powerful therapies in modern medicine. Used in isolation, it's still useful — it just isn't the medicine it could be. We won't sell open-ended packages, promise outcomes we can't support, or position HBOT as a replacement for conventional care.

— 04 —

WHAT HBOT REACHES

Across *every* system.

Oxygen reaches every organ system. Here is what the published research suggests it does, system by system — and where the strongest evidence currently lives.

The *brain* & nervous system

This is where HBOT's most striking results show up. The brain consumes about 20% of the body's total oxygen budget despite being only 2% of body weight; when blood flow is compromised — by stroke, head trauma, post-concussion syndrome, Long COVID, or the slow drift of vascular aging — neurons in the penumbra around any insult become metabolically dormant. They aren't dead. They are starved. HBOT delivers oxygen to those zones at pressure, and SPECT and fMRI imaging studies show measurable functional reactivation, sometimes years after the original injury.

For traumatic brain injury, the Israeli randomized trials are the strongest published work. For post-stroke recovery beyond the conventional six-month window, HBOT is one of the few interventions with peer-reviewed evidence of late functional recovery. For post-concussion syndrome, persistent post-COVID cognitive symptoms, and chemo-fog, the response rates in published cohorts are clinically meaningful.

Mood, anxiety, and the regulatory *brain*

HBOT's effects on mood are partly downstream of inflammation reduction. Many depressive and anxious presentations have a measurable inflammatory component, and the cytokine modulation that HBOT produces appears to lift mood symptoms in a meaningful subset of patients. PTSD is an emerging research focus — the Sagol Center has published encouraging work on combat veterans with treatment-resistant PTSD.

A USEFUL REFRAME

"Permanent" damage isn't always permanent.

- Stunned tissue at the edge of an injury can be reactivated
- The window appears to extend years past the original event
- Imaging confirms the changes; they aren't just symptomatic

The *cardiovascular* system

HBOT improves microvascular function, increases capillary density in tissues, and supports the endothelium — the inner lining of blood vessels — in ways that compound over a protocol. For patients recovering from cardiac events, peripheral vascular disease, or the slow vascular aging that drives cognitive decline, the angiogenic effect is meaningful.

The *immune* & inflammatory axis

The cytokine-modulating effect is the headline. HBOT reduces TNF-α, IL-1, IL-6 and other pro-inflammatory signals, while supporting regulatory T-cell populations. This is the mechanism behind the response in autoimmune flares, chronic Lyme, post-viral syndromes, mast-cell activation, and persistent inflammation that conventional anti-inflammatories don't fully resolve.

The *musculoskeletal* system

Soft-tissue injury, tendinopathy, bone healing, post-surgical recovery, and the recurring strain patterns of high-volume athletes all respond to HBOT. The dissolved oxygen reaches hypoxic injury beds; the angiogenic response builds capillary support around the repair; the anti-inflammatory effect quiets the chronic component that holds healing back.

The *gut* & microbiome

Inflammatory bowel disease, including Crohn's and ulcerative colitis, has a published HBOT literature. The mechanism is partly anti-inflammatory and partly direct — many gut-pathology contributors are anaerobic, and high tissue oxygen is hostile to them. Patients with chronic gut symptoms layered on top of post-infection or post-antibiotic dysbiosis often respond well.

The *endocrine* & metabolic axis

HBOT improves insulin sensitivity in some cohorts, supports thyroid function indirectly through reduced inflammation, and appears to modulate cortisol regulation in chronically stressed patients. It is not a primary treatment for endocrine disease, but it often raises the floor on which conventional endocrine treatment works.

The *skin* & wound healing

The original FDA-approved indications. Diabetic foot ulcers, radiation injury, compromised flaps and grafts, and severe burns all have decades of clinical evidence behind HBOT. The angiogenic and antimicrobial effects do most of the work. For aesthetic medicine and post-procedure recovery, the same mechanisms apply on a smaller scale.

Performance & *longevity*

The Israeli aging studies — including telomere lengthening and senescent-cell reduction in healthy older adults — are some of the most provocative work in the field. HBOT for performance enhancement and longevity isn't a primary indication, but for patients investing in healthspan, the mechanism stack is well aligned.

Where the *strongest* evidence lives today

Not every indication is supported equally. Some have decades of randomized trials behind them; others have promising case series and emerging mechanism studies. The honest answer for any given condition is somewhere on a spectrum from "very strong" to "plausible and worth a structured trial."

The conditions with the strongest published support — beyond the FDA-approved list — are post-concussion syndrome and TBI, fibromyalgia, post-stroke recovery, post-radiation tissue injury, certain non-healing wounds, and a growing body of work on Long COVID, chronic Lyme, and inflammatory bowel disease.

— oxygen delivery —

10–13×

MORE DISSOLVED OXYGEN REACHES TISSUE AT CLINICAL HBOT PRESSURES THAN AT SEA-LEVEL BREATHING. THAT SINGLE FACT IS THE THROUGHLINE BEHIND EVERY SYSTEM-LEVEL EFFECT ON THIS TOUR.

— 05 —

THE INDICATION MAP

A documented *map*.

A categorized look at the conditions HBOT has been studied for and where the published evidence currently sits. Some indications are FDA-approved. Many more are well-supported by international research. All are framed as conditions commonly seen — not promises.

The categories below summarize where peer-reviewed research has explored HBOT. The first category lists FDA-cleared indications. All others are framed as *conditions commonly seen*, where some research suggests HBOT may support recovery alongside conventional care.

FDA-Cleared Indications

- Decompression sickness
- Air or gas embolism
- Carbon monoxide poisoning
- Severe anemia
- Crush injury & compartment syndrome
- Compromised skin grafts & flaps
- Diabetic foot ulcers (Wagner ≥ 3)
- Necrotizing soft-tissue infections
- Refractory osteomyelitis
- Radiation tissue injury
- Thermal burns
- Sudden sensorineural hearing loss
- Central retinal artery occlusion
- Intracranial abscess

Brain & Neurological

- Traumatic brain injury (TBI)
- Post-concussion syndrome
- Stroke (acute & late recovery)
- Cerebral palsy (supportive)
- Multiple sclerosis flares
- Migraine & cluster headache
- Cognitive decline & early dementia
- Peripheral neuropathy

Mental Health

- PTSD (combat & complex trauma)
- Treatment-resistant depression
- Generalized anxiety
- Chemo-fog & post-treatment cognitive impairment
- Burnout & HPA-axis dysregulation

Post-Infectious Syndromes

- Long COVID
- Chronic Lyme & co-infections
- Post-viral fatigue (ME/CFS-spectrum)
- Mold-related illness (CIRS-spectrum)
- Mast cell activation patterns

Autoimmune & Inflammatory

- Rheumatoid arthritis flares
- Hashimoto's & autoimmune thyroid
- Inflammatory bowel disease (Crohn's, UC)
- Psoriasis & psoriatic arthritis
- Fibromyalgia
- Chronic regional pain syndrome

Cardiovascular

- Post-cardiac-event recovery
- Peripheral vascular disease
- Microvascular dysfunction
- Endothelial repair support

— continued from the previous page —

Wound, Bone & Soft-Tissue

- Chronic & non-healing wounds
- Tendinopathy & ligament injury
- Bone fracture support
- Post-surgical recovery
- Avascular necrosis

Performance & Recovery

- Athletic recovery from training load
- Concussion & TBI in athletes
- Jet lag & altitude recovery
- Sleep quality optimization
- Cognitive performance support

Aesthetic & Skin

- Post-procedure recovery (surgical & non-surgical)
- Wound & scar remodeling
- Skin quality & collagen support
- Hair restoration support

Oncology Support

Adjunctive — provider consult required

- Radiation-related tissue injury
- Chemotherapy-related fatigue (supportive)
- Post-treatment cognitive impairment

Longevity & Healthy Aging

- Telomere & cellular-aging markers
- Mitochondrial function support
- Microvascular & cognitive resilience
- General energy & recovery in healthy adults

Other / Emerging

- Erectile dysfunction (vascular)
- Endometriosis pain (early research)
- Tinnitus (subset response)
- Macular degeneration support
- Post-anesthesia cognitive recovery
- Pre-surgical optimization

A NOTE ON THIS LIST

An indication appearing on this list is not a guarantee of benefit. It is a statement that peer-reviewed research has explored HBOT for that condition with sufficient signal to merit a structured trial. Outcomes vary by patient, dose, and execution.

— 06 —

PRESCRIPTION, NOT SUGGESTION

Dose *matters*.

The single most common reason a patient concludes "HBOT didn't work for me" is that the protocol was wrong from the start. Pressure, frequency, and total session count are prescription decisions — not preferences.

A pharmacist would never let you fill the same prescription for two different conditions. *Take 5mg for everything* isn't medicine — it's marketing. The same logic applies to HBOT. Pressure, frequency, total session count, and supporting therapies all need to match the indication.

The four dosing variables

1. PRESSURE

The single biggest lever. Mild HBOT runs at 1.3 ATA. Clinical HBOT runs from roughly 1.75 to 2.4 ATA — most often 2.0, with 1.75 and 2.2 ATA also available to fine-tune the dose to the indication and the patient. The mechanisms — and therefore the outcomes — change at each step on this scale.

2. FREQUENCY

For most clinical protocols, 5 sessions per week is standard. For mild-HBOT maintenance, 1–3 per week. Less than 3 sessions per week is rarely enough to drive the cumulative gene-expression effects HBOT relies on.

3. TOTAL SESSION COUNT

The biggest source of confused expectations. Most TBI, post-stroke, and Long COVID protocols run 40 to 60 sessions. Wound-healing protocols often need 30 to 40. Quitting at session 8 because "you're not feeling much" is like quitting an antibiotic course halfway through.

4. SUPPORTING THERAPIES

Nutrition, supplementation, movement, sleep, and adjunct modalities shape what the body does with all that oxygen. They aren't optional — they're part of the dose.

A COMMON MISTAKE

Underdosing is more common than overdosing.

- 5 sessions, twice a week, at 1.3 ATA → not a TBI protocol
- 10 sessions at 2.0 ATA → not enough for stroke recovery — far too little time under pressure to drive new blood-vessel growth (angiogenesis)
- 40 sessions, 5×/week, at 2.0 ATA → the published baseline

Dose is also *about you*

Pressure and session count aren't decided by indication alone. The right dose also depends on how significant and chronic the condition is, your overall resilience, and your environment, diet, sleep, and stress. The more complex the situation, the more extensive the protocol. See **Appendix C** for representative ranges.

— and so —

Ready to *begin*?

If something in this guide rang true — for you, for someone you love, or for a patient you're trying to help — we'd be glad to talk. The first step is always a conversation, not a chamber.

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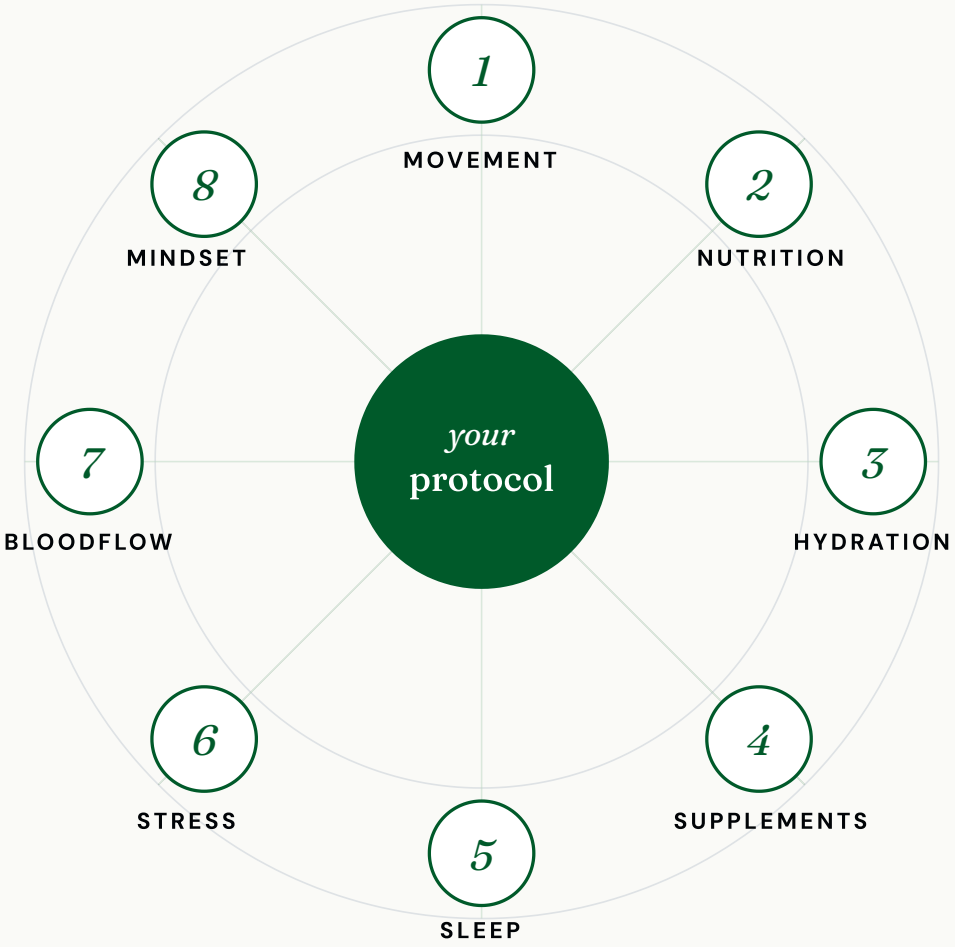
— Appendix A —

MAXIMIZING RESULTS

Eight ways to *get more* out of every session.

HBOT works because it gives the body what it needs. These eight habits make sure the body can actually use it.

— Eight overlapping levers. Pull all of them and your protocol gets noticeably better. Skip them and you leave gains on the table. —



1. *Movement*

Walk 20–30 minutes after each session. Light strength training 2–3×/week is ideal during a protocol. Avoid heavy maximal lifting in the first 24 hours after a session.

2. *Nutrition*

Anti-inflammatory whole-food diet. Skip processed sugar and seed oils. Prioritize protein (0.8–1g/lb for active patients), colorful vegetables, and clean fats. Mediterranean template works.

3. *Hydration*

Oxygen dissolves into water; tissue water content matters. Half your bodyweight in ounces per day, with electrolytes if you sweat or eat low-carb. Hydrate well in the 60 minutes before each session.

4. *Supplements*

Targeted, not random. Antioxidants (glutathione, NAC, vitamin C). Mitochondrial cofactors (B-complex, magnesium, CoQ10, alpha-lipoic acid). Omega-3s. Vitamin D + K2. **Exogenous ketones** (BHB salts/esters) give the brain an alternative fuel and help neural tissue handle the transient oxidative stress of HBOT — useful in TBI, cognitive, and longevity protocols.

5. *Sleep*

Repair work consolidates during deep sleep. 7–9 hours per night, consistent timing. Cool, dark, screen-free. If you snore or wake frequently, ask about a sleep study — undiagnosed apnea can blunt outcomes.

6. *Stress regulation*

Chronic sympathetic activation works against everything HBOT is trying to do. Daily nervous-system practice — breathwork, walks in nature, time off your phone. Ten minutes of slow nasal breathing before bed is high-yield.

7. *Bloodflow*

HBOT works on the vasculature — stack interventions that keep blood moving. **PEMF** drives microcirculation and pairs well with HBOT for soft-tissue and bone work. **PBM / red-light** stimulates mitochondrial function from a different angle.

8. *Mindset & continuity*

Treat the protocol like a season — not a series of appointments. Show up consistently. Resist the urge to evaluate the whole course at session 5. Gains arrive in clusters once a threshold is crossed.

THINK OF IT LIKE A FIRE

These eight are basic — but genuinely powerful — supportive steps. Picture your condition, and the inflammation under it, as a **fire in the body**. *HBOT is a strong extinguisher; but if you keep pouring on* **accelerants** *— poor diet, inactivity, a toxic environment, alcohol, poor sleep — you make it far harder to put out. There are other extinguishers, too: targeted nutrition, smart supplementation, and complementary health technologies. To map the full set for your situation, work with a holistic, functional-medicine–minded practitioner — Dr. Jaron and the Aervita team would love to help.*

— Appendix B —

FREQUENTLY ASKED

The questions *everyone* actually asks.

A practical Q&A — the things patients ask in consults, and the answers we give them when nobody is in a hurry.

Is HBOT *safe*?

For most patients, yes. HBOT has an excellent safety profile in qualified hands. The main contraindication is untreated pneumothorax, and a handful of conditions require specific screening (certain ear and sinus pathologies, severe COPD, pregnancy in some cases). At Aervita, every patient is screened before their first session, and we'll be candid if HBOT isn't appropriate for you right now.

Will I feel *claustrophobic*?

Most patients don't, but it varies. Our chambers are clear-sided and well-lit, and you can see and communicate with the operator throughout the session. Patients read, listen to audiobooks, watch a screen, or sleep. If claustrophobia is a real concern, we can do a short orientation session before committing to a protocol.

Will my *ears* hurt?

Pressure equalization is the most common new-patient question. The sensation is exactly what you feel on takeoff and landing in an airplane. We coach equalization techniques (yawning, swallowing, the Valsalva maneuver) and pressurize slowly. Patients with sinus congestion may need a short course of decongestant before sessions.

Is this *covered* by insurance?

Most U.S. insurance plans cover HBOT only for the FDA-approved indications (decompression sickness, certain wounds, radiation injury, etc.) and typically only at hospital-based programs. Off-label indications — TBI, Long COVID, Lyme, fibromyalgia, performance, longevity — are almost always self-pay. We'll discuss cost candidly during your consult and, where possible, structure protocols to fit your budget.

How *long* until I feel something?

Most patients notice something within 1–3 sessions: clarity, calmer mood, less pain, deeper sleep. The structural gains compound over the full course. If you've seen no change at all by session 10, we re-evaluate the protocol — that's a signal, not a failure.

Are there *side effects*?

Generally mild. The most common are temporary ear pressure, transient near-vision changes (which resolve within weeks of completing a protocol), and occasional fatigue after sessions early in a course. Serious adverse events are rare in screened patients at clinical pressures.

Can I do this at *home*?

Mild HBOT chambers can be rented or purchased for home use, and Aervita offers an at-home mHBOT rental program for patients who need high-frequency dosing or live too far for in-clinic sessions. It isn't equivalent to a 2.0 ATA hard-chamber protocol — we help patients pick the right option.

Can I do HBOT while *on medication*?

Almost always, yes. A handful of medications interact with HBOT directly (certain chemotherapies, some supplements at very high doses), and we screen for these. We coordinate with prescribing providers when needed.

What about *pregnancy*?

Routine elective HBOT is generally avoided during pregnancy. There are specific obstetric indications where HBOT is used (carbon monoxide exposure, for example), but those are decisions made with an OB.

Can my *kids* do HBOT?

Pediatric HBOT is an active research area, particularly for cerebral palsy, autism spectrum support, and post-concussion in athletes. We take pediatric cases on a case-by-case basis with parental and provider consultation.

How do you handle *cancer* patients?

Carefully and only with the oncologist's involvement. Some applications (radiation tissue injury, post-treatment cognitive recovery) are well-supported. Active treatment is more nuanced, and we operate within published guidelines and the oncologist's plan.

What does a *session* actually look like?

You arrive, change, and we screen vitals. You enter the chamber with a book or audio. Pressurization takes 10–15 minutes. You spend 60–90 minutes at pressure. Decompression takes another 10–15 minutes. Many patients fall asleep.

— Appendix C —

FOR PROVIDERS

A condition-by-condition *quick-reference.*

A clinical reference for providers and informed patients. These are starting points described in the published literature — actual prescriptions are individualized after intake and consult.

Pressures and session counts below reflect typical published protocols. This is a clinical reference, not a self-prescribing guide.

CONDITION	PRESSURE	FREQUENCY	SESSIONS
TBI / chronic post-concussion	1.3–2.0 ATA	5–7×/wk	40–60
Mild concussion (recent, isolated)	1.3–1.5 ATA	5×/wk	10
Stroke (late recovery)	1.3–2.0 ATA	5–7×/wk	40–60
Long COVID	2.0 ATA	5×/wk	40
Chronic Lyme & co-infections	2.0–2.4 ATA	5×/wk	40+
Fibromyalgia	2.0 ATA	5×/wk	40
PTSD (combat / complex)	2.0 ATA	5×/wk	40–60
Treatment-resistant depression	2.0 ATA	5×/wk	30–40
MS flares	1.75–2.0 ATA	5×/wk init	20+
Migraine / cluster headache	1.5–2.0 ATA	3–5×/wk	20–30
Inflammatory bowel disease	2.0 ATA	5×/wk	30–40
Autoimmune flares (general)	2.0 ATA	3–5×/wk	20–40
Mast cell activation	1.5–2.0 ATA	3×/wk	20–30
Mold-related illness (CIRS)	1.75–2.0 ATA	3–5×/wk	30–40
Chronic regional pain syndrome	2.0 ATA	5×/wk	30–40
Diabetic foot ulcer (Wagner ≥ 3)	2.0–2.4 ATA	5×/wk	30–40
Radiation tissue injury	2.0–2.4 ATA	5×/wk	30–60
Non-healing surgical wound	2.0–2.4 ATA	5×/wk	20–40
Avascular necrosis	2.0–2.4 ATA	5×/wk	30–40
Sudden sensorineural hearing loss	2.0–2.4 ATA	5×/wk	10–20
Tinnitus (subset)	2.0 ATA	5×/wk	20–40

CONDITION	PRESSURE	FREQUENCY	SESSIONS
Post-cardiac event recovery	1.5–2.0 ATA	3–5×/wk	20–40
Peripheral vascular disease	2.0 ATA	5×/wk	30–40
Athletic recovery	1.5–2.0 ATA	2–3×/wk	20
Athletic concussion (in-season)	1.3–2.0 ATA	5×/wk	10–40
Tendinopathy / soft-tissue injury	1.5–2.0 ATA	3–5×/wk	20–30
Bone fracture (non-union)	2.0–2.4 ATA	5×/wk	20–40
Pre-surgical optimization	1.5–2.0 ATA	3–5×/wk	10–20
Post-surgical recovery	1.5–2.0 ATA	3–5×/wk	10–20
Aesthetic / post-procedure	1.5 ATA	3–5×/wk	5–15
Hair restoration support	1.5–2.0 ATA	2–3×/wk	20–40
Cognitive decline (early)	1.3–2.0 ATA	5×/wk	40–60
Erectile dysfunction (vasculogenic)	2.0 ATA	5×/wk	40–60
Burnout / HPA dysregulation	1.5–2.0 ATA	2–3×/wk	20–30
Performance / longevity	1.5–2.0 ATA	2×/wk	20 + maint.
Chemo-related cognitive impairment	2.0 ATA	5×/wk	40
Wellness / general resilience	1.3–1.5 ATA	1–2×/wk	Ongoing
Jet lag / altitude recovery	1.3–1.5 ATA	1–3 sessions	As needed

A REMINDER FOR REFERRING PROVIDERS

Aervita welcomes co-management. We provide updates to referring providers, defer scope-of-care decisions to the patient's physician where appropriate, and frame HBOT as supportive wellness therapy that complements — not replaces — conventional care.

— Appendix D —

STUDIES WORTH READING

The *research*.

A curated reading list of peer-reviewed studies behind the claims in this guide. Organized by indication for providers who want to dig in.

BRAIN & TBI

[1] **Efrati S, et al.** Hyperbaric oxygen induces late neuroplasticity in post-stroke patients — randomized, prospective trial. *PLoS ONE*, 2013.

[2] **Tal S, et al.** Hyperbaric oxygen therapy for prolonged post-concussion syndrome: a randomized controlled trial. *Restorative Neurology & Neuroscience*, 2015.

[3] **Boussi-Gross R, et al.** Hyperbaric oxygen therapy can improve post-concussion syndrome years after mild TBI. *PLoS ONE*, 2013.

[4] **Harch PG, et al.** A phase I study of low-pressure HBOT for blast-induced post-concussion syndrome and PTSD. *Journal of Neurotrauma*, 2012.

[5] **Hadanny A, et al.** Hyperbaric oxygen for post-stroke patients beyond the chronic stage: a controlled study. *Frontiers in Neurology*, 2019.

LONG COVID & POST-VIRAL

[1] **Zilberman-Itskovich S, et al.** Hyperbaric oxygen therapy improves neurocognitive function and symptoms of post-COVID condition: randomized controlled trial. *Scientific Reports*, 2022.

[2] **Robbins T, et al.** Hyperbaric oxygen therapy for the treatment of long COVID: early case series. *Clinical Medicine*, 2021.

[3] **Bhaiyat AM, et al.** Hyperbaric oxygen treatment for long-lasting post-COVID-19 fatigue. *Journal of Translational Medicine*, 2022.

FIBROMYALGIA & PAIN

[1] **Efrati S, et al.** Hyperbaric oxygen therapy can diminish fibromyalgia syndrome — prospective clinical trial. *PLoS ONE*, 2015.

[2] **Ablin JN, et al.** Hyperbaric oxygen in fibromyalgia: targeting central nervous system mechanisms. *Rheumatology*, 2018.

[3] **Yildiz S, et al.** A new treatment modality for CRPS: HBOT. *Pain Research & Management*, 2004.

MENTAL HEALTH & PTSD

[1] **Doenyas-Barak K, et al.** Hyperbaric oxygen therapy improves symptoms, brain perfusion, and brain microstructure in veterans with treatment-resistant PTSD. *PLoS ONE*, 2022.

[2] **Harch PG, et al.** Hyperbaric oxygen for blast-induced TBI and PTSD: a case series. *Medical Gas Research*, 2017.

WOUND HEALING & DIABETIC

[1] **Löndahl M, et al.** Hyperbaric oxygen therapy facilitates healing of chronic foot ulcers in patients with diabetes. *Diabetes Care*, 2010.

[2] **Kranke P, et al.** Hyperbaric oxygen therapy for chronic wounds. *Cochrane Database of Systematic Reviews*, 2015.

[3] **Thom SR.** Hyperbaric oxygen — its mechanisms and efficacy. *Plastic & Reconstructive Surgery*, 2011.

INFLAMMATORY BOWEL DISEASE

[1] **Dulai PS, et al.** Systematic review: hyperbaric oxygen therapy for inflammatory bowel disease. *Alimentary Pharmacology & Therapeutics*, 2014.

[2] **Bekheit M, et al.** Hyperbaric oxygen therapy stimulates colonic stem cells and induces mucosal healing in IBD. *BMJ Open Gastroenterology*, 2016.

AUTOIMMUNE & INFLAMMATORY

[1] **Chen Y, et al.** Mechanisms of hyperbaric oxygen and neuro-immune-endocrine modulation. *Neural Regeneration Research*, 2014.

[2] **Thom SR, et al.** Stem cell mobilization by HBOT. *American Journal of Physiology*, 2006.

AGING & LONGEVITY

[1] **Hachmo Y, et al.** Hyperbaric oxygen therapy increases telomere length and decreases immunosenescence in isolated blood cells. *Aging*, 2020.

[2] **Hadanny A, Efrati S.** The hyperoxic-hypoxic paradox. *Biomolecules*, 2020.

[3] **Leitman M, et al.** Hyperbaric oxygen therapy improves cardiac function in healthy older adults. *European Heart Journal*, 2020.

[4] **Hachmo Y, et al.** The effect of hyperbaric oxygen therapy on the pathophysiology of skin aging: a prospective clinical trial. *Aging*, 2021.

POST-COVID, HEARING & VASCULAR

[1] **Zilberman-Itskovich S, et al.** Hyperbaric oxygen therapy improves neurocognitive functions of post-COVID-19 condition: a randomized controlled trial. *Scientific Reports*, 2022.

[2] **Rhee TM, et al.** Hyperbaric oxygen therapy for sudden sensorineural hearing loss: a meta-analysis. *Otology & Neurotology*, 2018.

[3] **Hadanny A, et al.** Hyperbaric oxygen therapy can induce angiogenesis and improve erectile function. *International Journal of Impotence Research*, 2018.

MECHANISM & FOUNDATIONAL

[1] **Calvert JW, et al.** Hyperbaric oxygenation prevented BBB breakdown and inflammation. *Journal of Cerebral Blood Flow & Metabolism*, 2007.

[2] **Sanchez EC.** Mechanisms of action of HBOT in CNS. *Pediatric Anesthesia*, 2013.

[3] **Feldmeier J, et al.** UHMS Indications Committee Reports. *Undersea & Hyperbaric Medical Society*, ongoing series.

REVIEWS & SOCIETY STATEMENTS

[1] **UHMS Hyperbaric Oxygen Therapy Indications**, 14th Edition. Undersea & Hyperbaric Medical Society.

[2] **Mathieu D, et al.** Tenth European Consensus Conference on Hyperbaric Medicine: recommendations. *Diving and Hyperbaric Medicine*, 2017.

— Appendix E —

FOR REFERRING PROVIDERS

How to write a *proper* HBOT referral.

A practical primer for any provider who wants to coordinate care with Aervita. Hyperbaric sessions are offered as a supportive, adjunctive modality — not a prescription — so a brief coordination letter, or our ready-made *Referral & Coordination Form*, is all it takes. We're glad to supply blank forms, or drop a booklet of them at your office.

A clear referral helps Aervita coordinate supportive care around your treatment plan, supports continuity across providers, and gives the patient a clean paper trail. Hyperbaric sessions here are a *supportive, adjunctive modality* — a coordination letter, not a prescription. Patients may also self-refer.

A note on scope: coordination letters from chiropractors, naturopaths, PTs, and coaches are welcome as care-coordination and patient education; sessions are supportive, may be rendered on dates separate from your own visits, and each provider keeps independent clinical judgment within their scope.

What a strong referral includes

1. INDICATION & CLINICAL CONTEXT

The working diagnosis or clinical concern, relevant history (onset, prior interventions tried), and the goal of the referral.

2. SUGGESTED DOSE — PRESSURE, FREQUENCY, SESSIONS

Pressure (1.3, 1.5, 1.75, 2.0, 2.2, or 2.4 ATA), sessions per week (typically 5×/week for serious indications), and a target total — or simply write "per Aervita protocol." Under-dosing is the most common reason patients conclude HBOT didn't help.

3. OXYGEN DELIVERY

Just note one of two options: **supplemental oxygen (~100%)** via mask or hood, or **no supplemental oxygen** (ambient air, 21%). If you're unsure which fits, leave it to us and we'll set it per protocol.

4. CO-MANAGEMENT & REASSESSMENT

The reassessment cadence you'd like (often sessions 10 and 20), any markers to track, and how you'd like progress notes delivered.

A USEFUL SHORTCUT

If you only have one line, write: "Supportive HBOT for [indication], 2.0 ATA, 5×/week × 40 sessions, reassess at 20." Aervita will build the rest of the protocol around it. Unsure on dose? Write "per Aervita protocol for indication" and we'll set it from the published literature.

— for you —

Take the next *step*.

Whether you want to keep reading or you're ready to begin, here are two easy ways forward — just scan.

TAKE THE GUIDE HOME

A free digital copy to read on your phone — or share with a friend, family member, or another provider.

aervita.com/hbot-guide

READY TO BEGIN?

Skip ahead and book an **Initial Health Assessment** with one of our providers — the fastest way to get started.

Book your assessment

Share this guide freely. The more people who understand what oxygen can do, the more people we can help.

aervita | HYPERBARICS

— and one last thing —

Dive in. *Thrive out.*

Whatever brought you to this guide — a question, a struggle, a curiosity, or a patient you're trying to help — there's a real conversation waiting on the other end of the phone. The first step is always the smallest one.

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