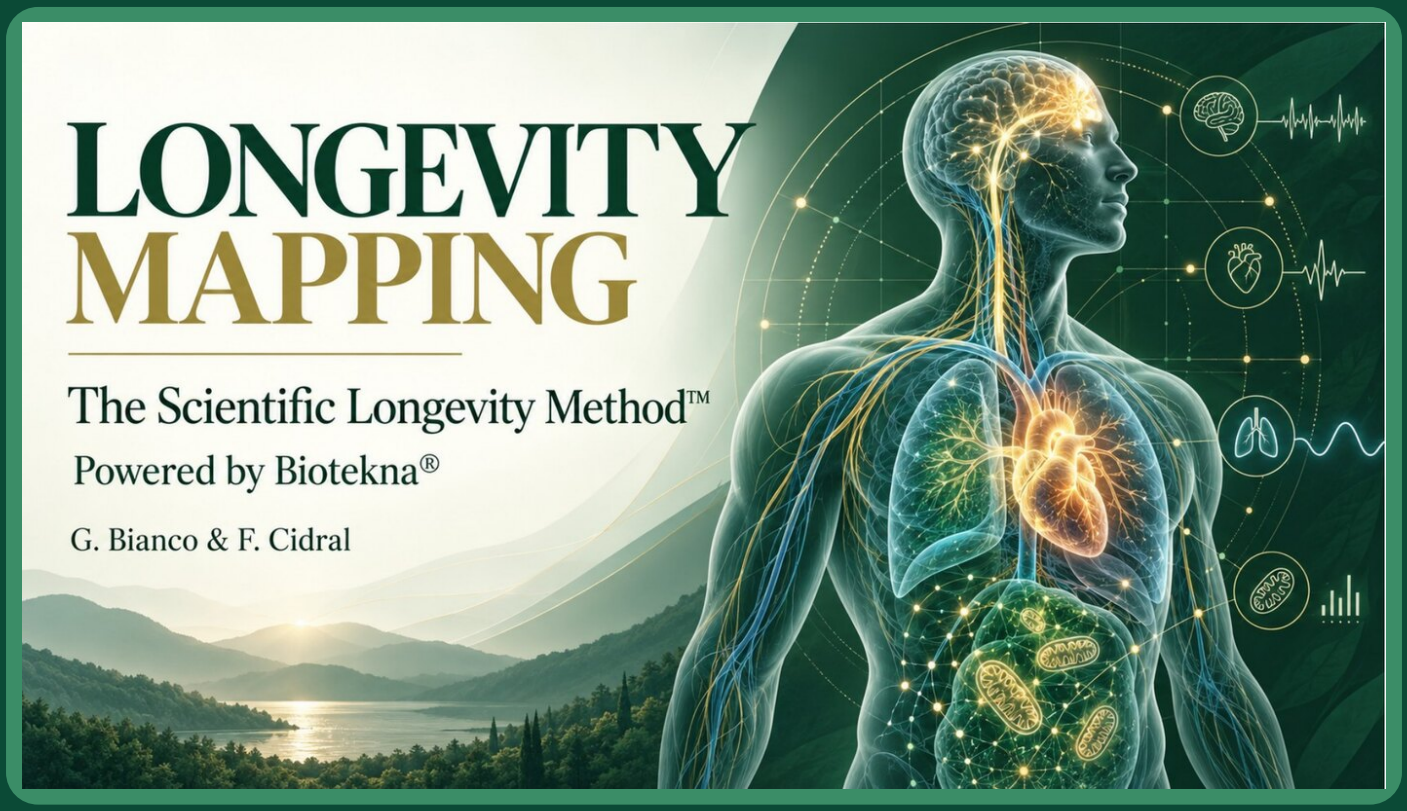
THE SCIENTIFIC LONGEVITY METHOD™

LONGEVITY MAPPING

A measurable pathway to adaptability, recovery and resilience



Longevity Mapping is the first clinical step of the Scientific Longevity Method. The central idea is simple: longevity becomes clinically useful when we stop treating it as an abstract promise and start measuring the systems that regulate adaptation, recovery, and resilience. Our focus is not merely the absence of disease. We want to understand how efficiently the organism responds to a challenge, restores balance, and maintains function over time. The framework moves from physiology to practical application: autonomic regulation, cardiorespiratory coherence, HRV analysis, vascular function, home biofeedback, and targeted nutritional support. Longevity Mapping is designed to translate these signals into a personalized and repeatable clinical pathway.

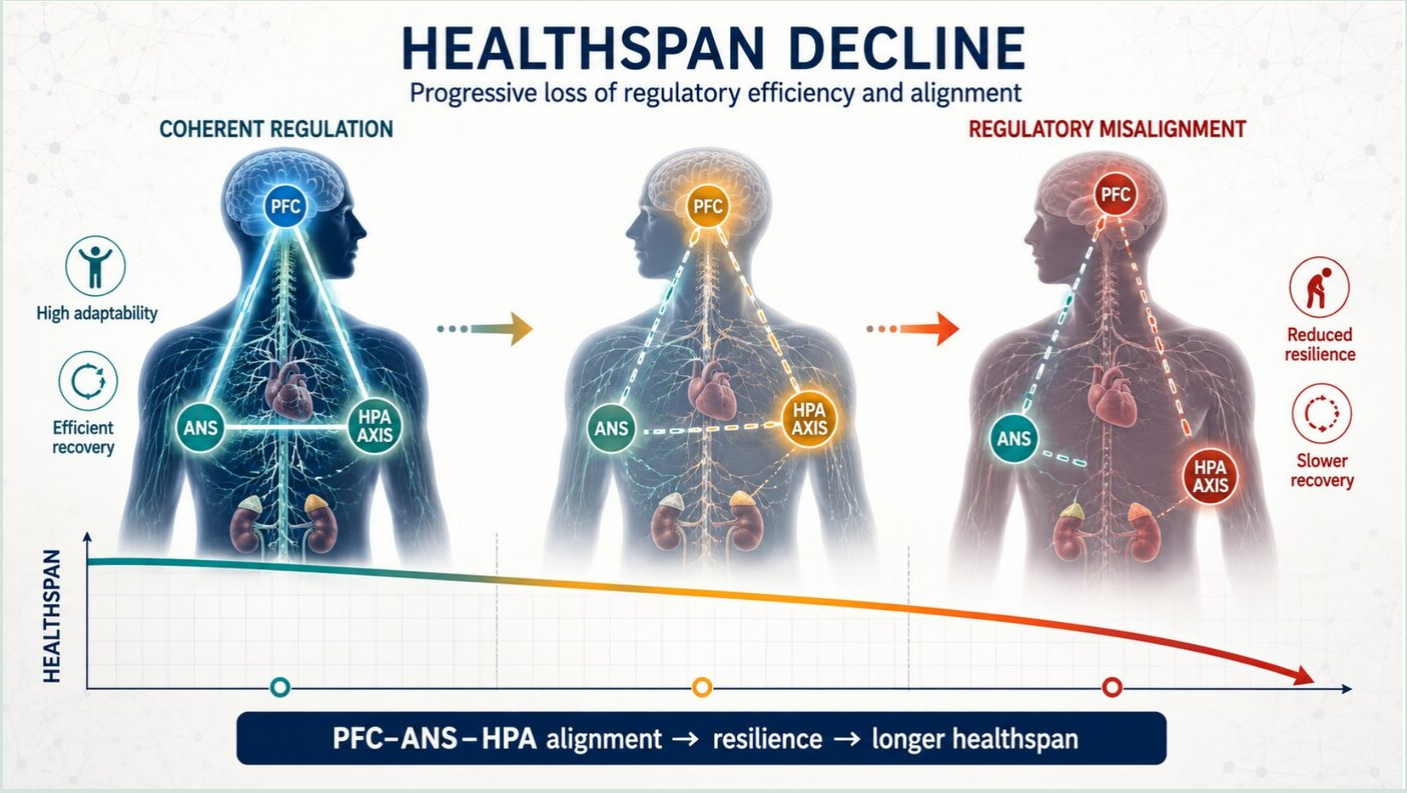
ASSESS - RESTORE - MONITOR - REASSESS

Physiology translated into a personalized and repeatable clinical pathway.

G. Bianco & F. Cidral

Powered by Biotekna®

Healthspan Decline



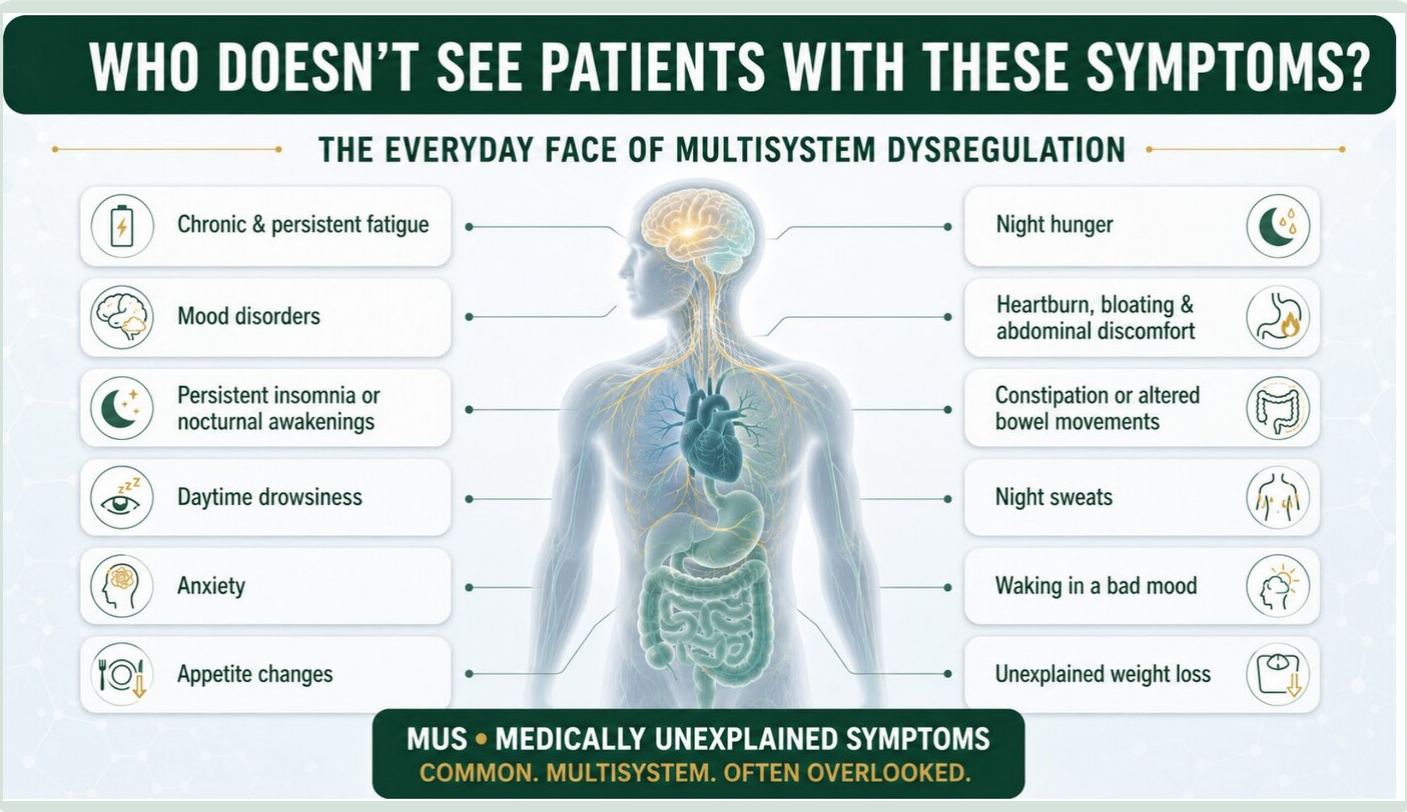
OVERVIEW

Healthspan decline is not simply the passage of time. It is often accompanied by a progressive loss of regulatory efficiency and alignment. On the left, the prefrontal cortex, autonomic nervous system, and HPA axis operate as a coordinated network. This alignment supports adaptability, efficient recovery, and physiological resilience. As regulation becomes less coherent, the system needs more effort to achieve the same result. Recovery slows, responses become less flexible, and resilience gradually declines. The graph summarizes this concept: healthspan is influenced by how well these regulatory systems remain connected and responsive across time. This is why our clinical target is not to suppress activation. It is to preserve the capacity to activate appropriately, modulate the response, and return efficiently to baseline.

KEY MESSAGE

Healthspan depends on the efficiency and alignment of the systems that regulate stress and recovery.

Who Doesn't See Patients With These Symptoms?



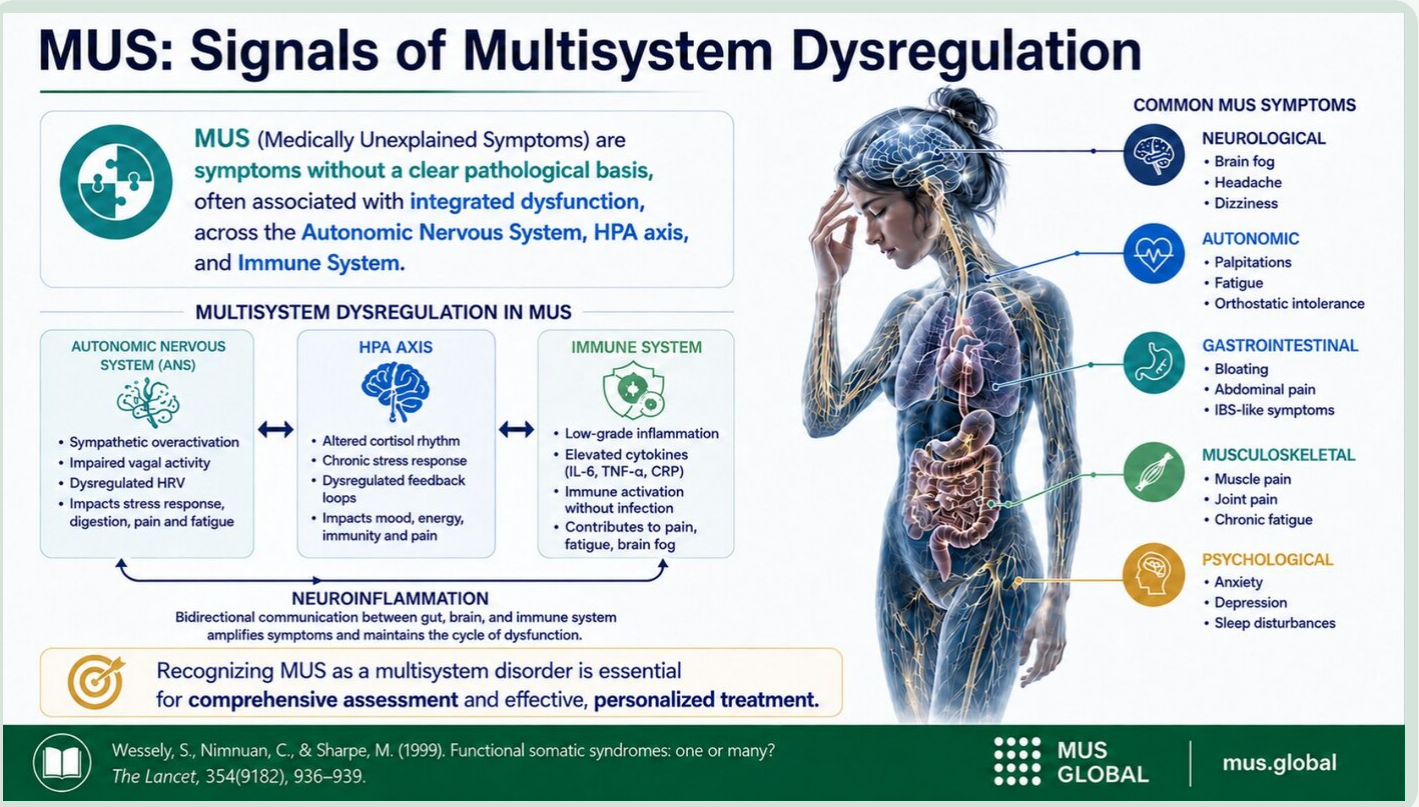
OVERVIEW

Most clinicians see these symptoms every day: persistent fatigue, poor sleep, daytime drowsiness, anxiety, appetite changes, night hunger, digestive complaints, altered bowel function, night sweats, low mood, and unexplained changes in weight. Individually, each symptom may appear nonspecific. Together, however, they can form a recognizable pattern of multisystem dysregulation. The important question is not only, 'Which symptom should I treat?' It is also, 'Which regulatory systems are failing to coordinate?' This perspective helps us move beyond isolated complaints and look for a shared physiological background involving stress regulation, autonomic balance, sleep-wake rhythms, immune signaling, and recovery capacity. The purpose of mapping is to make that background more visible and clinically actionable.

KEY MESSAGE

Persistent, nonspecific symptoms can reveal a shared pattern of multisystem dysregulation.

MUS: Signals of Multisystem Dysregulation



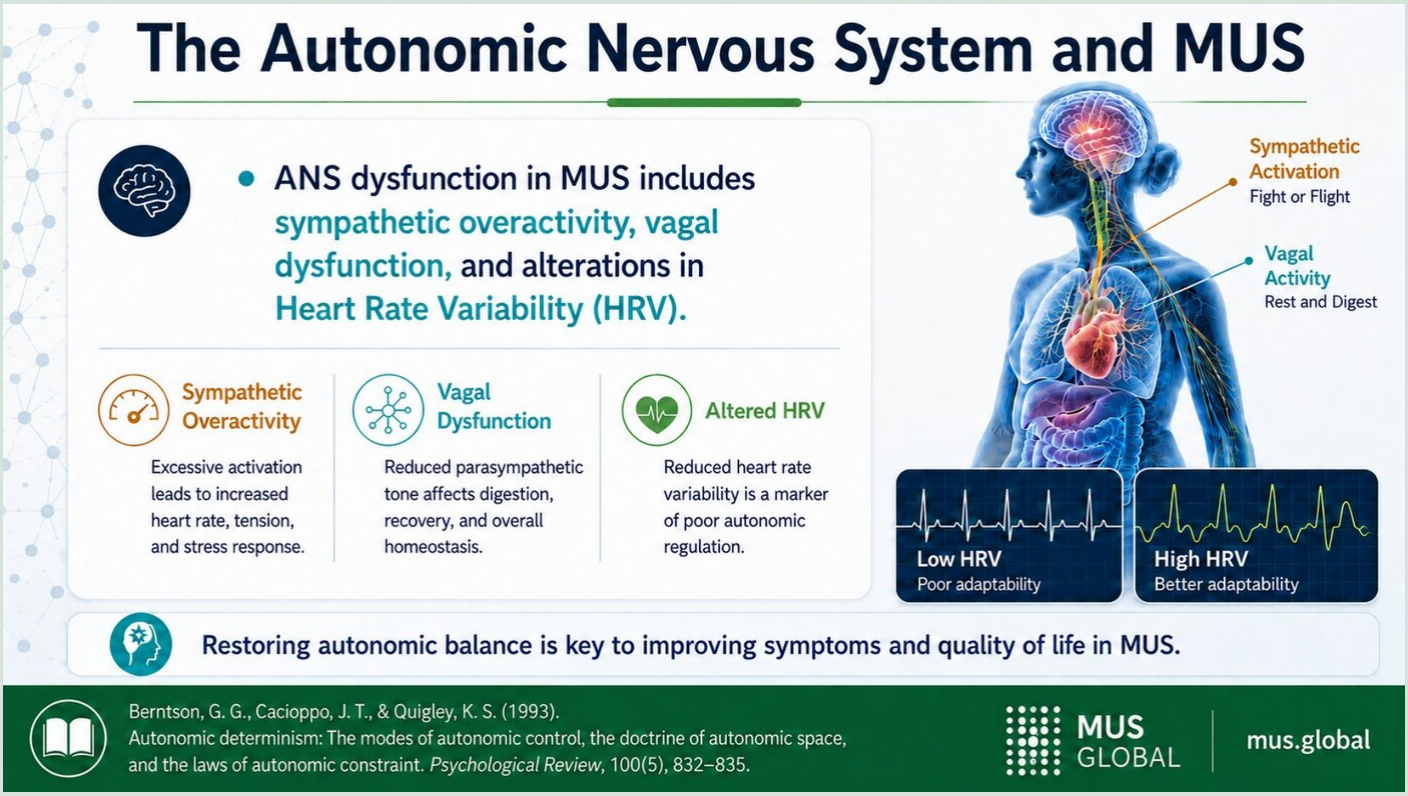
OVERVIEW

MUS refers to symptoms that remain insufficiently explained by a single clear pathological finding. This does not mean that the symptoms are imaginary, and it never replaces appropriate medical investigation. Instead, it suggests that dysfunction may be distributed across interacting systems. The slide highlights three major components: the autonomic nervous system, the HPA axis, and the immune system. Sympathetic overactivation, impaired vagal activity, altered cortisol rhythms, and low-grade inflammatory signaling can reinforce one another. Neuroinflammation and bidirectional communication between the gut, brain, and immune system may further maintain fatigue, pain, brain fog, sleep disturbance, and gastrointestinal symptoms. Recognizing this multisystem pattern creates a rationale for a comprehensive assessment and a personalized plan rather than a symptom-by-symptom approach.

KEY MESSAGE

A multisystem perspective complements appropriate medical investigation and supports personalization.

The Autonomic Nervous System and MUS



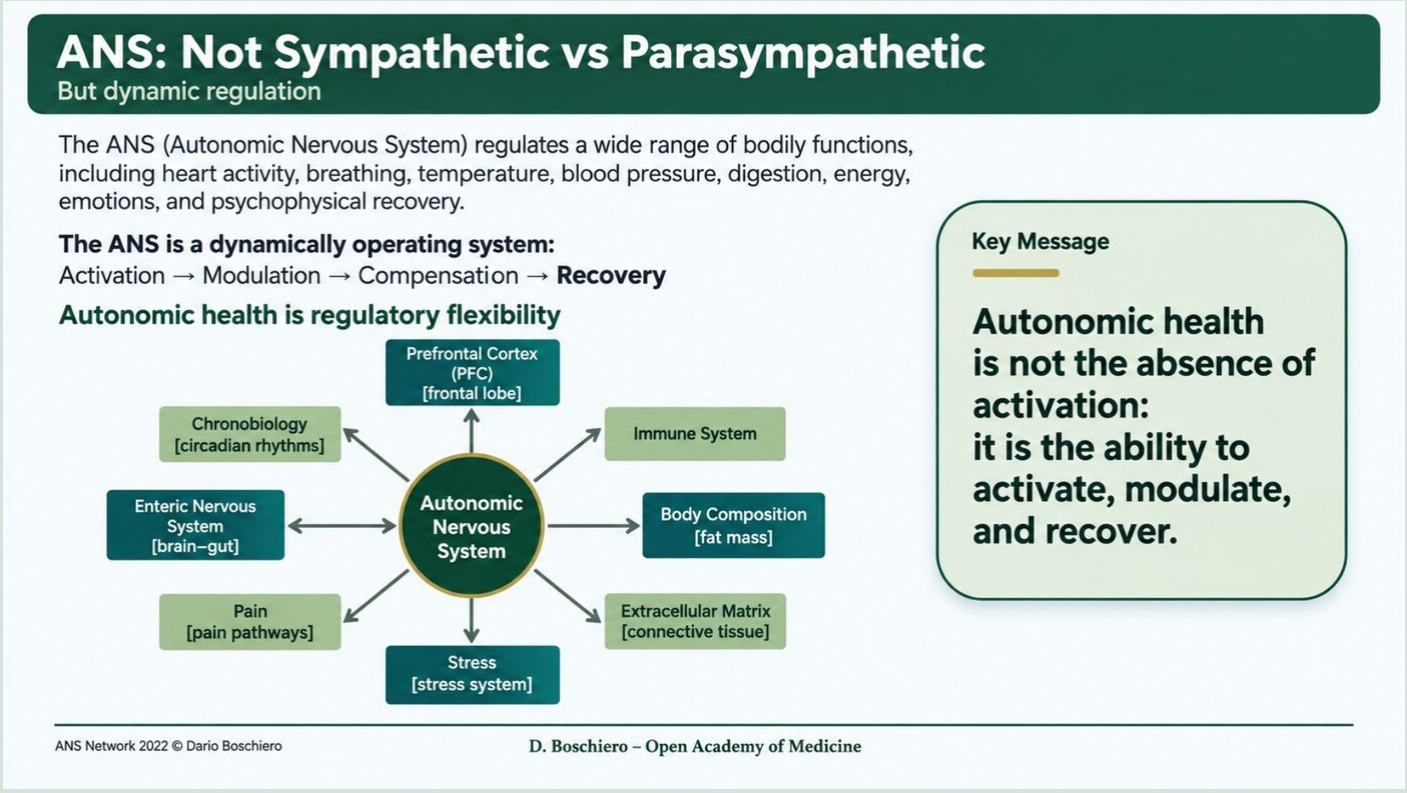
OVERVIEW

Autonomic dysfunction in MUS commonly includes three related features: excessive sympathetic activation, reduced vagal modulation, and altered heart rate variability. A sympathetic response is not inherently negative; it is necessary for action and adaptation. The problem arises when activation is excessive, prolonged, or poorly followed by recovery. Reduced vagal activity can affect digestion, restoration, pain regulation, and overall homeostasis. HRV gives us a noninvasive marker of how flexibly the heart responds to autonomic inputs. Lower or disorganized variability may indicate reduced adaptability, whereas well-structured variability is generally associated with better regulatory capacity. We should interpret HRV within the clinical context and alongside symptoms, medications, breathing, and measurement conditions. It is a functional signal, not a stand-alone diagnosis.

KEY MESSAGE

HRV provides a noninvasive functional window into autonomic adaptability.

ANS: Not Sympathetic vs Parasympathetic



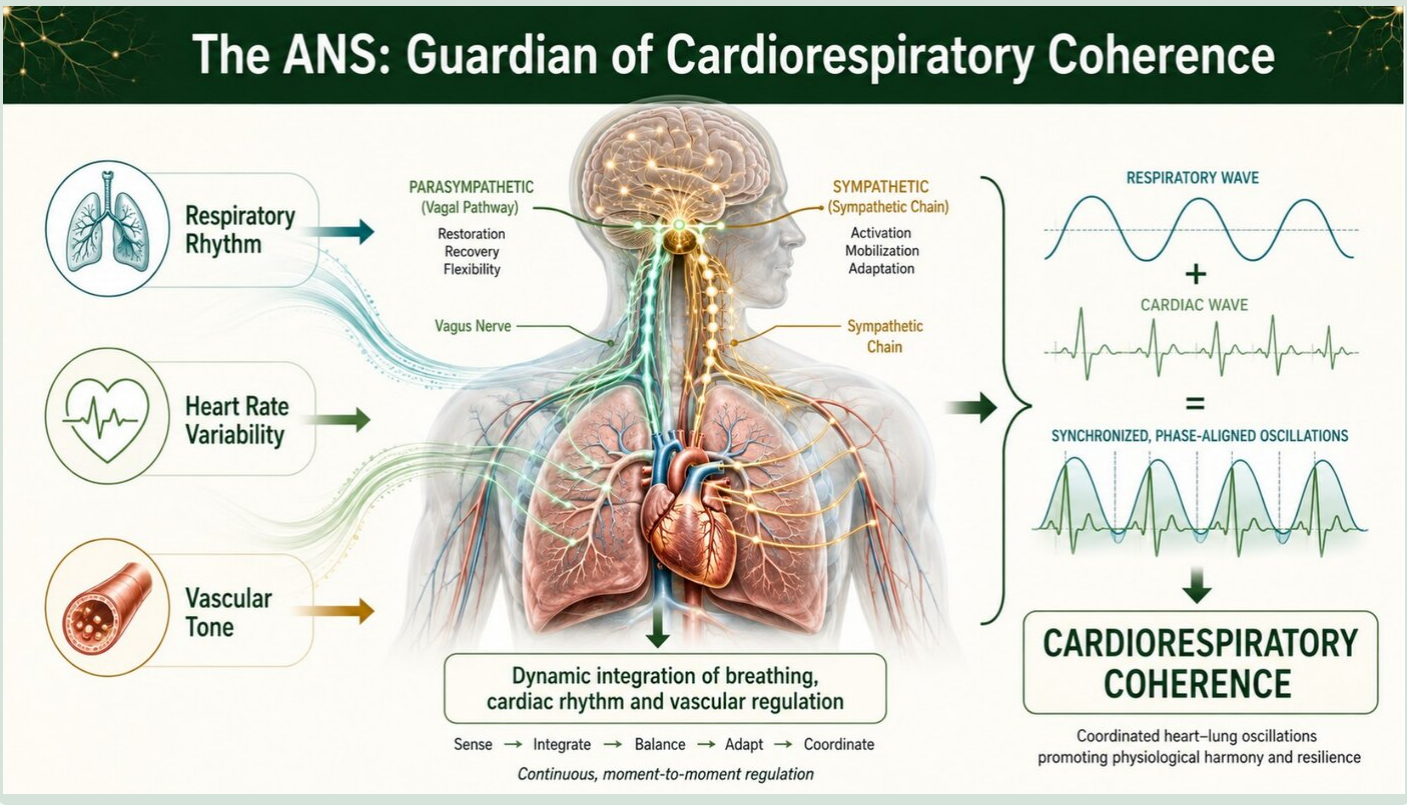
OVERVIEW

The autonomic nervous system should not be reduced to 'sympathetic bad, parasympathetic good.' Healthy regulation is dynamic. The system must activate when a challenge appears, modulate the intensity of the response, compensate when necessary, and then recover. This regulatory flexibility links the ANS with the prefrontal cortex, immune function, the enteric nervous system, chronobiology, pain pathways, stress responses, body composition, and the extracellular matrix. Therefore, autonomic health is not the absence of activation. It is the ability to activate, modulate, and recover in a context-appropriate way. This is the framework we use throughout Longevity Mapping: we do not measure a static state only; we observe how the system behaves across phases.

KEY MESSAGE

Autonomic health is the flexibility to activate, modulate, compensate and recover.

The ANS: Guardian of Cardiorespiratory Coherence



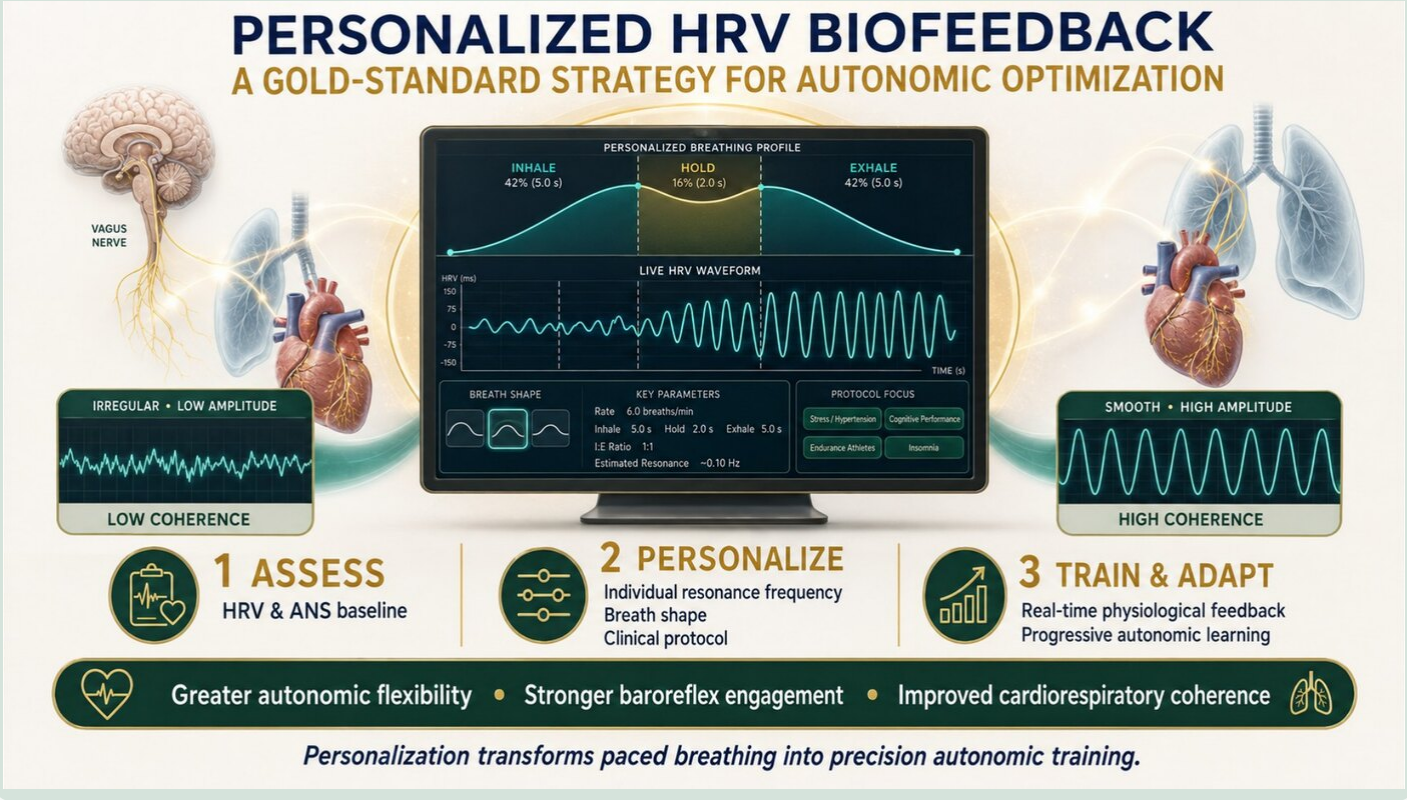
OVERVIEW

The ANS coordinates three continuously changing signals: respiratory rhythm, heart rate variability, and vascular tone. Breathing modifies vagal input and changes the timing of cardiac intervals. The heart responds beat by beat, while the vascular system adjusts pressure and flow. When these oscillations become synchronized and appropriately phase-aligned, we describe a state of cardiorespiratory coherence. This is not simply slow breathing. It is the dynamic integration of breathing, cardiac rhythm, and vascular regulation. The sequence is: sense the internal state, integrate the information, balance the response, adapt to the demand, and coordinate the whole system. The clinical value is that coherence can be measured, trained, and reassessed, offering a direct bridge between physiology and intervention.

KEY MESSAGE

Cardiorespiratory coherence integrates breathing, cardiac timing and vascular regulation.

Personalized HRV Biofeedback



OVERVIEW

Personalized HRV biofeedback begins with assessment rather than a generic breathing prescription. We first measure the HRV and ANS baseline, then identify the breathing pattern and resonance frequency that produce the most coherent physiological response. The objective is to transform an irregular, low-amplitude pattern into a smoother, higher-amplitude oscillation while maintaining comfort and safety. The protocol is individualized through inspiratory time, expiratory time, optional pauses, and respiratory rate. Real-time visual and auditory feedback allows the patient to see how breathing changes cardiac dynamics. Repeated training strengthens autonomic learning and baroreflex engagement. In this context, personalization is the gold- standard strategy: assess, personalize, train, adapt, and verify the response over time.

KEY MESSAGE

Personalization turns HRV biofeedback into a precise, measurable and repeatable training strategy.

PPG Stress Flow: Three Tools in One



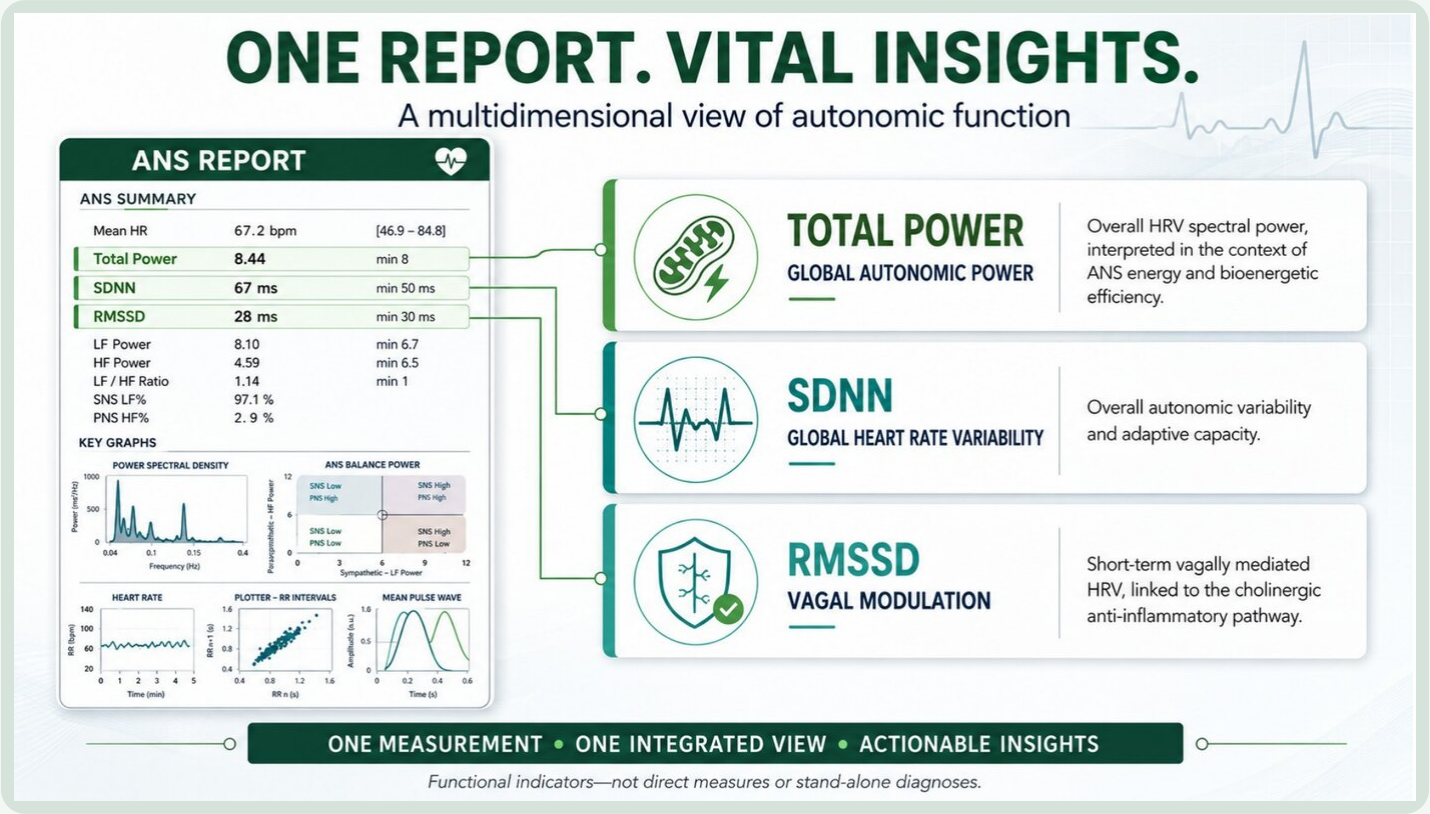
OVERVIEW

PPG Stress Flow brings three clinical functions into one device. First, it provides HRV and autonomic nervous system assessment and monitoring. Second, it generates a Vascular Health Map based on peripheral perfusion and pulse transit time. Third, it supports a complete biofeedback system for guided cardiorespiratory training. This integration is important because assessment and intervention remain connected. We can measure the baseline, identify a regulatory target, apply a personalized protocol, and then document the physiological response. The practical sequence is measure, recover, and optimize over time. Rather than relying only on subjective impressions, the clinician can combine the patient's experience with objective trends and repeatable measurements.

KEY MESSAGE

One platform connects autonomic assessment, vascular mapping and biofeedback training.

One Report. Vital Insights.



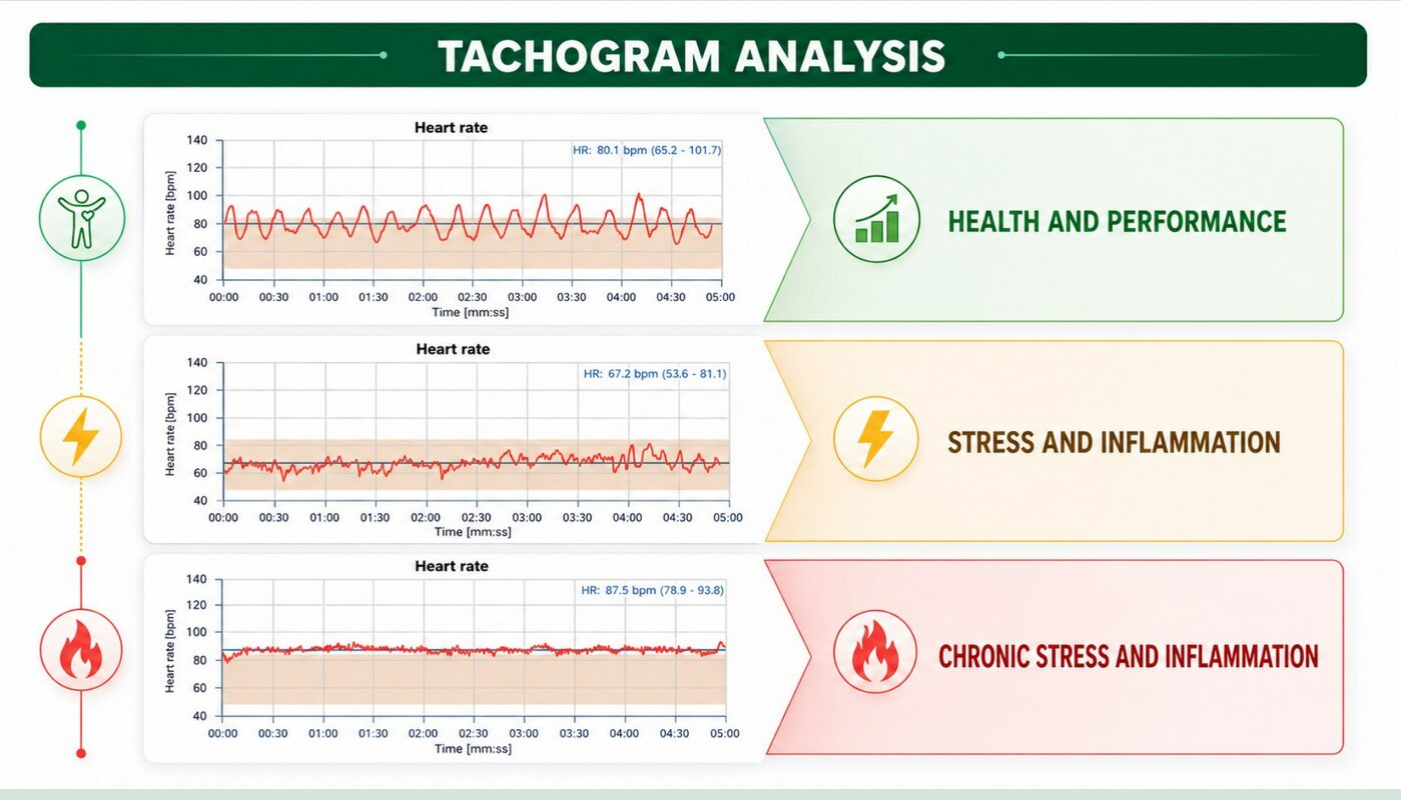
OVERVIEW

A single ANS report provides a multidimensional view of autonomic function. Total Power summarizes overall HRV spectral power and offers a view of global autonomic activity. It can be interpreted within a broader bioenergetic and brainstem-regulation context, but it is not a direct mitochondrial test. SDNN reflects overall heart-rate variability and adaptive capacity across the recording. RMSSD emphasizes short-term, vagally mediated variability and is linked to parasympathetic regulation and the cholinergic anti-inflammatory pathway. The report also includes heart-rate behavior, spectral distribution, scatter analysis, bilateral flow, oxygen saturation and pulse-wave morphology. No single number should be read in isolation. These are functional indicators, not stand-alone diagnoses. Their strength lies in integration: one measurement, one coherent view and actionable targets for follow-up.

KEY MESSAGE

Multiple physiological signals become more useful when interpreted together, not in isolation.

Tachogram Analysis



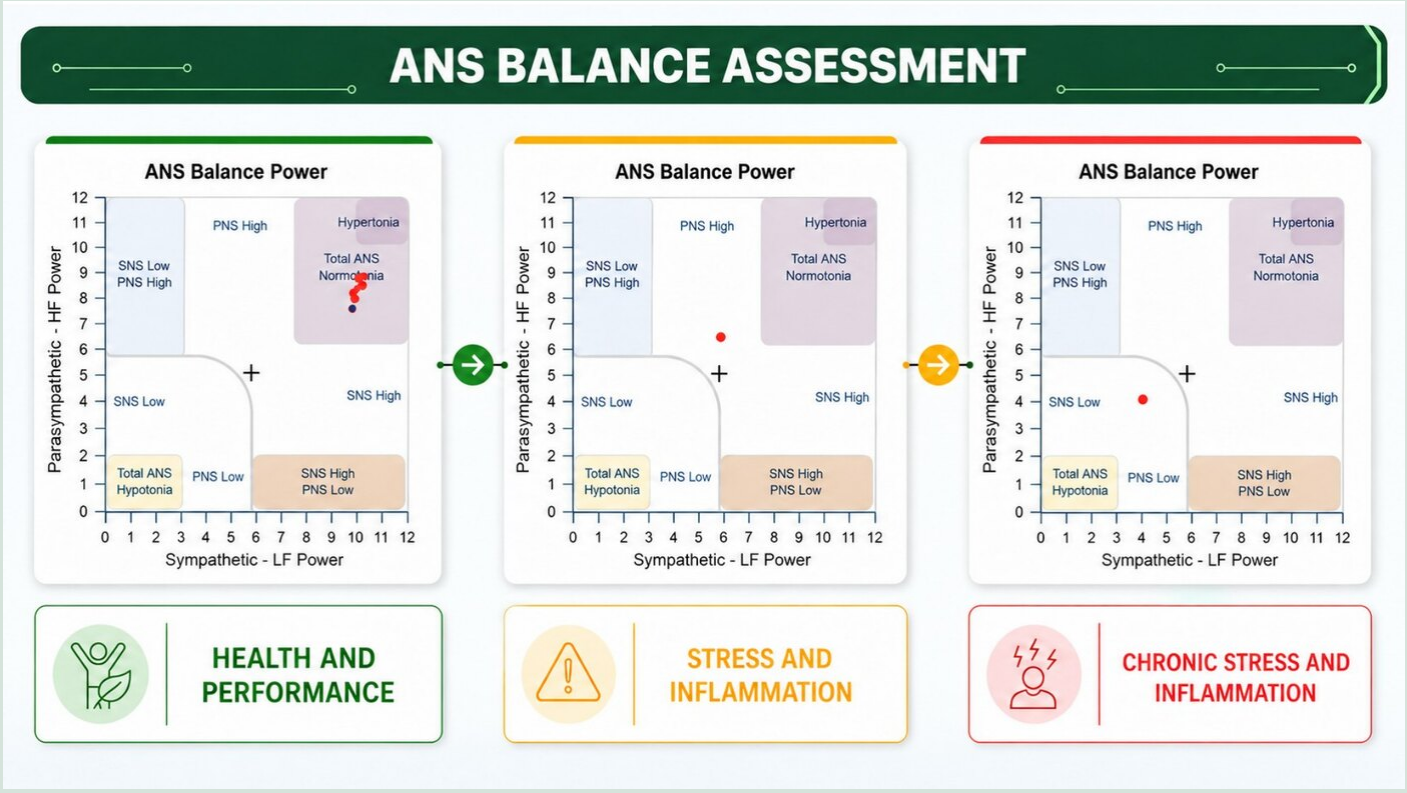
OVERVIEW

The tachogram shows how heart rate changes over time. The first example displays broad, organized oscillations, compatible with good adaptability and a health-and-performance profile. The second pattern shows reduced amplitude and less flexible variation, which may be observed in states of stress and inflammatory load. The third pattern is flatter and more rigid, suggesting reduced regulatory flexibility in chronic stress or chronic inflammatory conditions. The key is not the average heart rate alone. Two patients may have a similar mean heart rate but very different temporal organization. We therefore look at amplitude, rhythm, regularity, response to breathing, and the clinical context. The tachogram helps us see whether the system is dynamically adapting or simply maintaining a narrow operating range.

KEY MESSAGE

The temporal pattern of heart-rate change can reveal more than the average heart rate alone.

ANS Balance Assessment



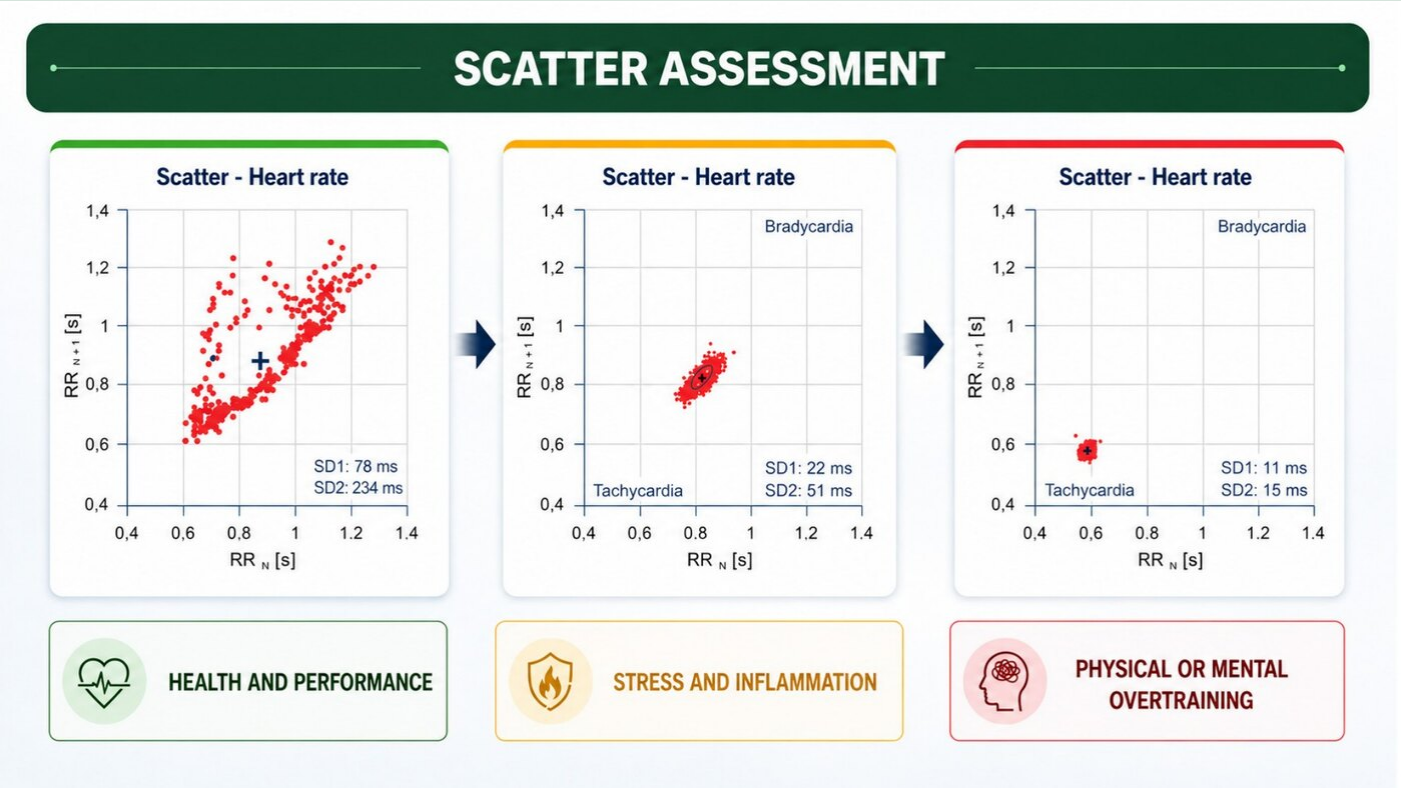
OVERVIEW

The ANS balance map places sympathetic-related LF power on the horizontal axis and parasympathetic-related HF power on the vertical axis. The position of the marker helps visualize whether the patient is closer to a balanced normotonic profile, a low-power state, sympathetic predominance, parasympathetic predominance, or generalized hypertonia or hypotonia. The three examples illustrate a progression from a health-and- performance pattern to stress and inflammation, and then to a more dysregulated chronic stress profile. This map should not be read as a binary score or a diagnosis. Its value is in pattern recognition and longitudinal comparison. Movement across repeated assessments can show whether an intervention is improving balance, increasing total regulatory power, or merely shifting dominance from one branch to the other.

KEY MESSAGE

Repeated balance mapping shows the direction and quality of physiological change.

Scatter Assessment



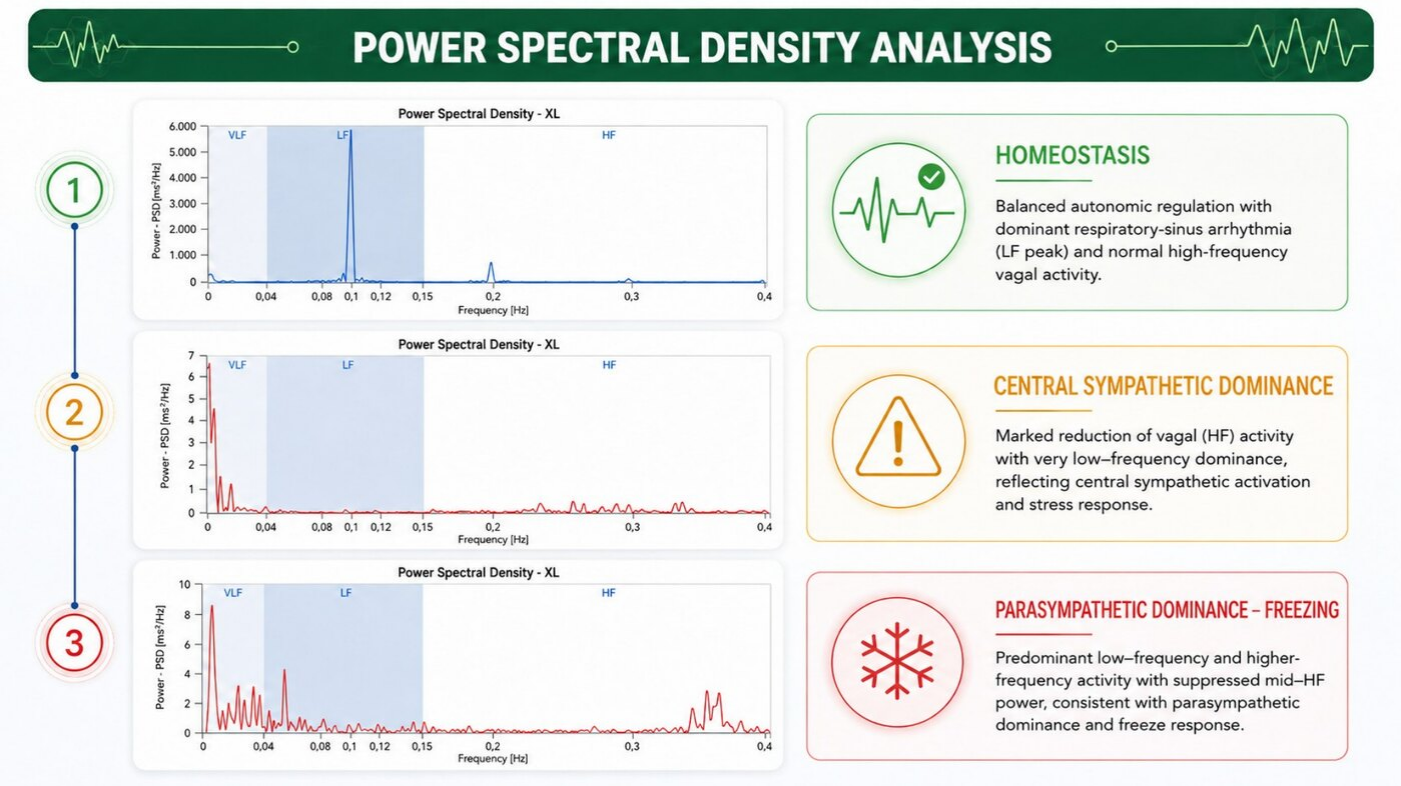
OVERVIEW

The scatter plot displays each cardiac interval in relation to the preceding interval. Its shape gives an immediate visual impression of variability. In the first example, the wide, structured cloud reflects greater beat-to-beat flexibility. SD1 represents short-term variability, while SD2 reflects longer-term dispersion. In the second example, the cloud becomes narrower, indicating reduced flexibility in a stress-and-inflammation pattern. In the third, the points are highly concentrated, which may be seen with physical or mental overtraining and reduced adaptive reserve. Again, the objective is not to label the patient from one graph. We combine the scatter pattern with heart rate, spectral analysis, symptoms, breathing, and measurement quality. The plot is especially useful for explaining autonomic flexibility visually to patients.

KEY MESSAGE

The geometry of consecutive cardiac intervals makes autonomic flexibility visible.

Power Spectral Density Analysis



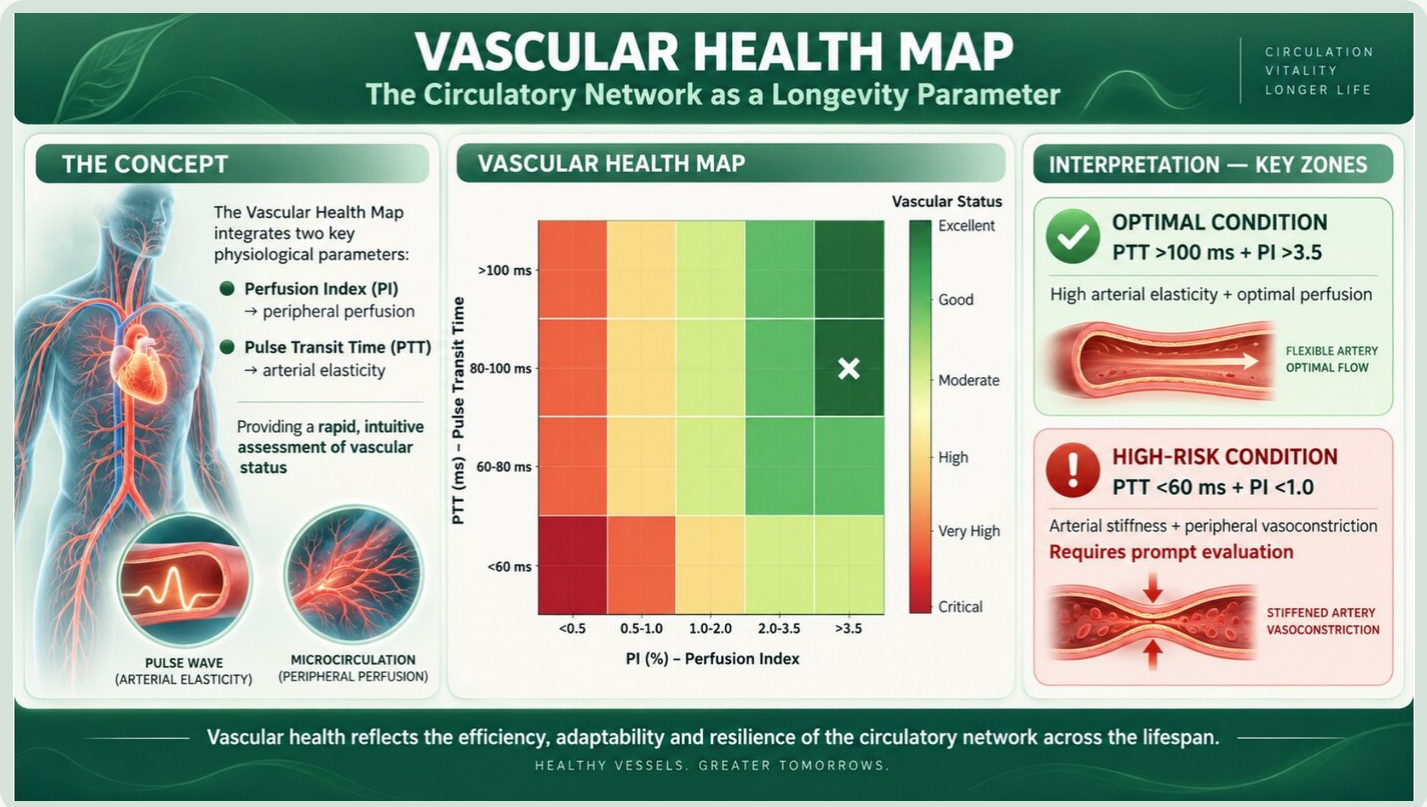
OVERVIEW

Power spectral density analysis separates HRV into frequency components and shows how autonomic oscillations are distributed. The first profile shows a prominent low-frequency peak associated with respiratory sinus arrhythmia near resonance, together with preserved high-frequency vagal activity. This is compatible with coordinated homeostatic regulation. The second profile shows a marked reduction in HF activity and dominance of very-low-frequency power, a pattern that may reflect central sympathetic activation and stress response. The third profile shows a different form of dysregulation: parasympathetic dominance with a freezing pattern rather than efficient recovery. This distinction matters because high parasympathetic activity is not automatically synonymous with health. We must interpret the whole spectral architecture, the respiratory frequency, and the patient's clinical state.

KEY MESSAGE

Spectral architecture helps distinguish different regulatory patterns that may look similar clinically.

Vascular Health Map



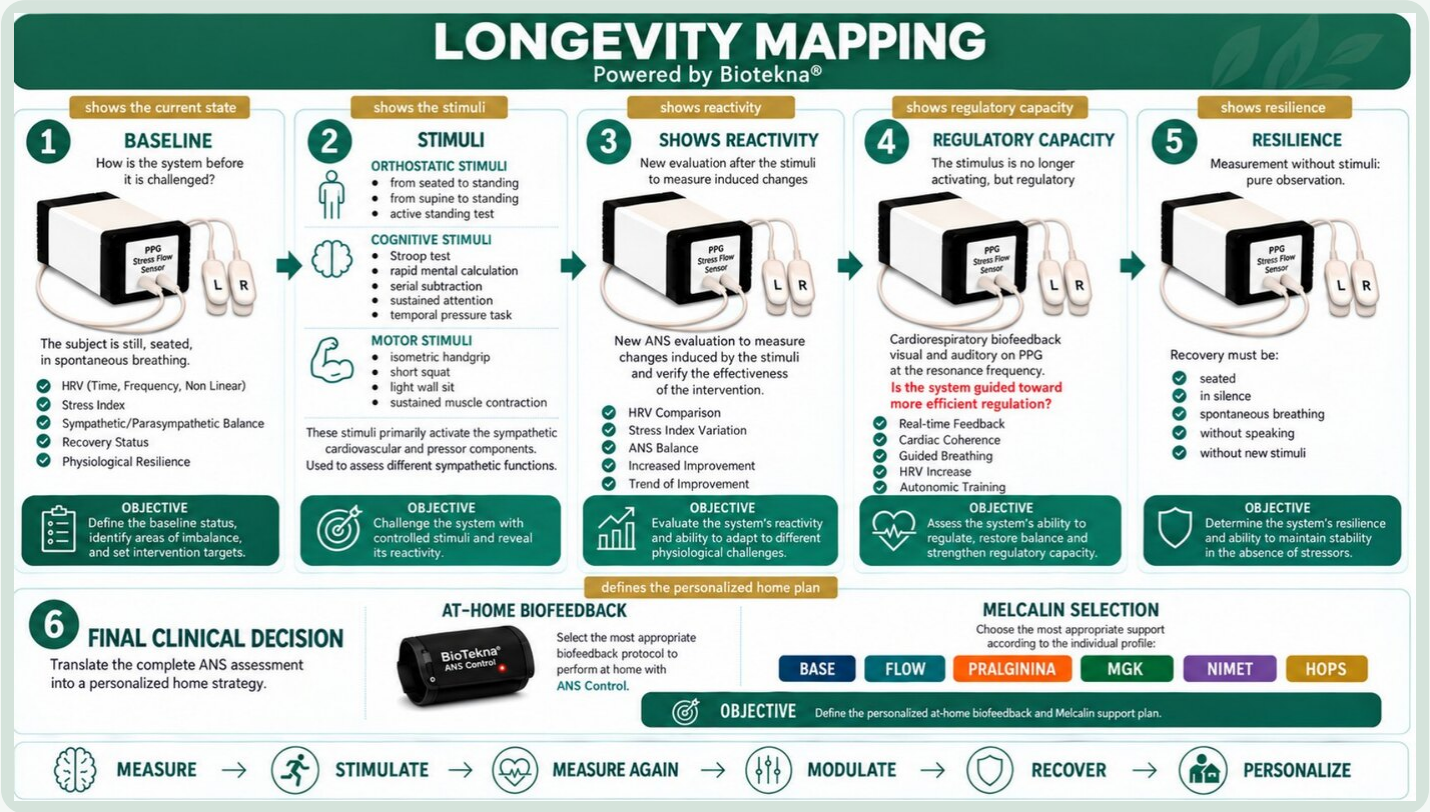
OVERVIEW

The Vascular Health Map integrates two physiological parameters. The Perfusion Index, or PI, reflects peripheral perfusion. Pulse Transit Time, or PTT, provides information related to arterial elasticity. The matrix combines these values into an intuitive visual map, ranging from critical or very-high-risk zones toward good and excellent vascular status. An optimal pattern combines a PTT above 100 milliseconds with a PI above 3.5, suggesting high arterial elasticity and optimal peripheral perfusion. At the opposite extreme, a PTT below 60 milliseconds with a PI below 1.0 suggests arterial stiffness and peripheral vasoconstriction and requires prompt clinical evaluation. The map is a functional screening and monitoring framework, not a substitute for vascular diagnosis. Its longevity value is that it reflects the efficiency, adaptability, and resilience of the circulatory network over time.

KEY MESSAGE

The efficiency, adaptability and resilience of the circulatory network are central longevity parameters.

Longevity Mapping Workflow



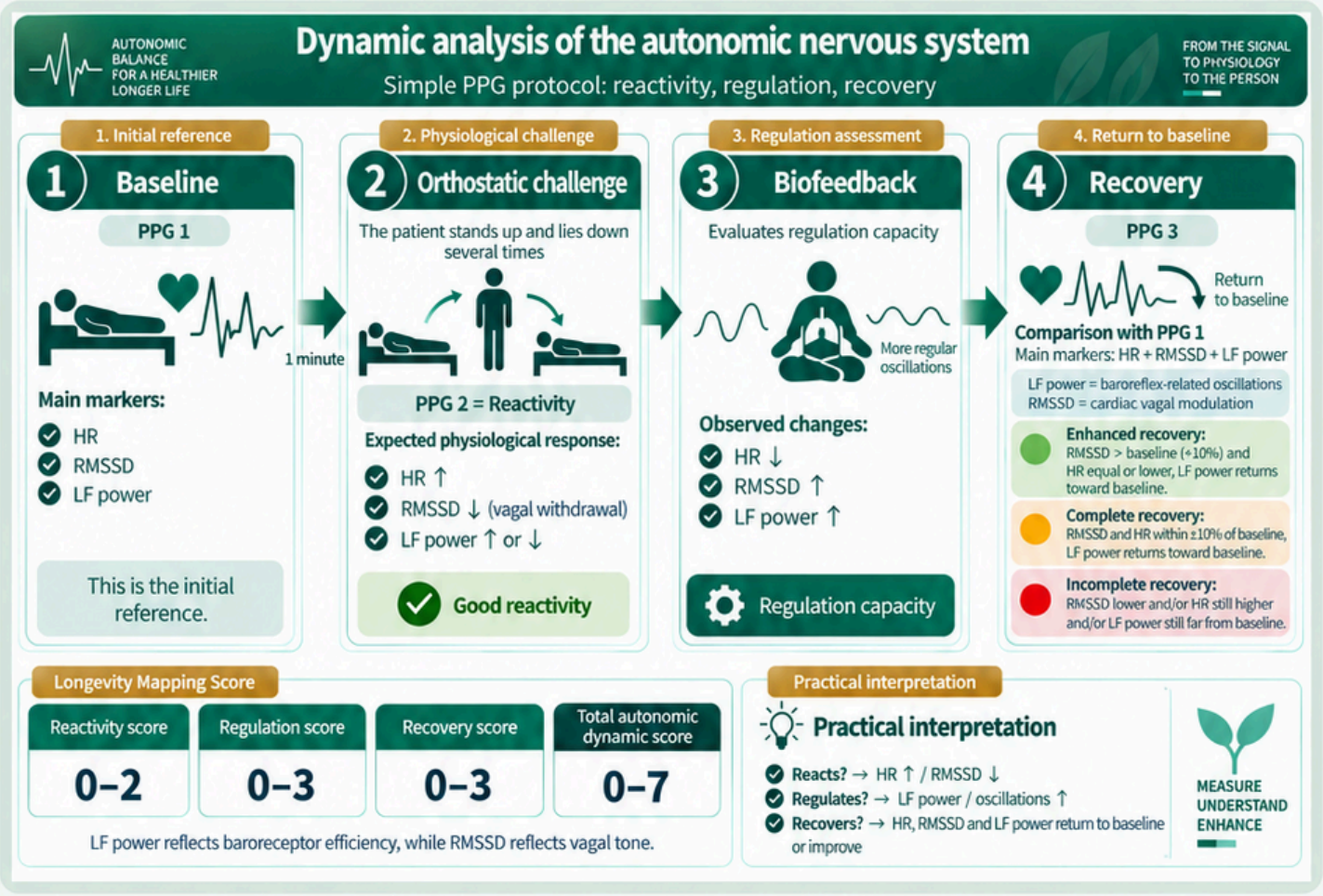
OVERVIEW

Longevity Mapping is organized as a sequence rather than a single resting measurement. First, the clinician establishes the baseline under standardized conditions. Second, a controlled orthostatic, cognitive or motor stimulus is applied. Third, the assessment measures reactivity and quantifies the change induced by the challenge. Fourth, the protocol uses cardiorespiratory biofeedback to evaluate regulatory capacity: can the system respond to guidance, increase coherence, and restore balance? Fifth, the clinician observes resilience after the stimulus has ended, without new inputs. These five phases answer different questions: current state, reactivity, regulation, recovery, and stability. The final clinical decision translates the complete assessment into a personalized home strategy, selecting the appropriate ANS Control biofeedback protocol and Melcalin support. The pathway is measure, stimulate, measure again, modulate, recover, and personalize.

KEY MESSAGE

Measure, stimulate, measure again, modulate, recover and personalize.

Dynamic Analysis of the Autonomic Nervous System



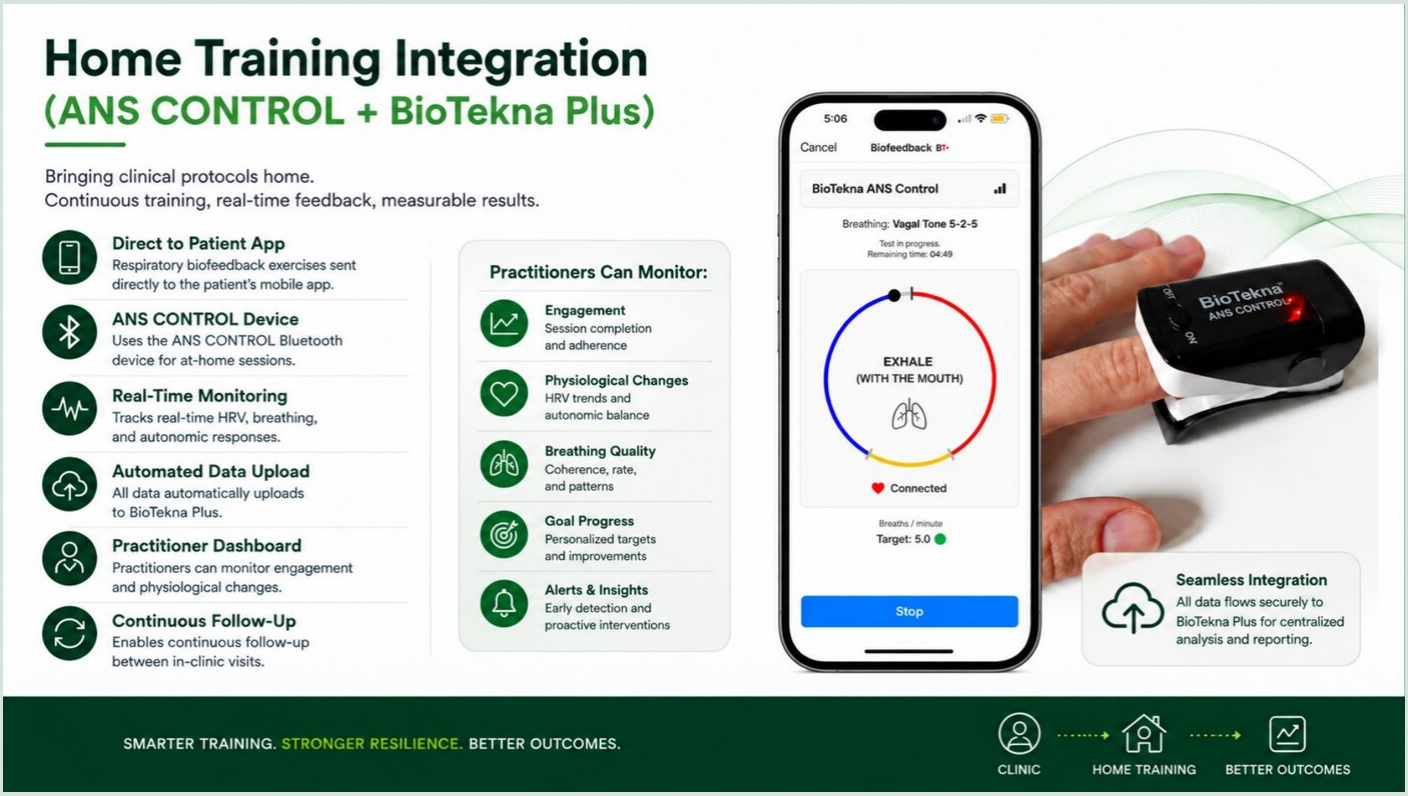
OVERVIEW

Dynamic autonomic analysis complements Longevity Mapping by moving beyond a single resting observation. First, a baseline PPG establishes the initial reference using HR, RMSSD and LF power. Second, an orthostatic challenge evaluates reactivity, revealing how the autonomic system responds to a physiological stressor. Third, biofeedback evaluates regulation capacity, showing whether guided breathing and resonance training can improve autonomic organization and coherence. Finally, a recovery measurement verifies whether HR, RMSSD and LF power return toward baseline or improve after the stimulus. In this framework, LF power reflects baroreceptor efficiency, while RMSSD reflects vagal tone. Together, reactivity, regulation and recovery provide a practical dynamic picture of autonomic function.

KEY MESSAGE

A dynamic ANS assessment reveals how the system reacts, regulates and recovers, not only how it appears at rest.

Home Training Integration



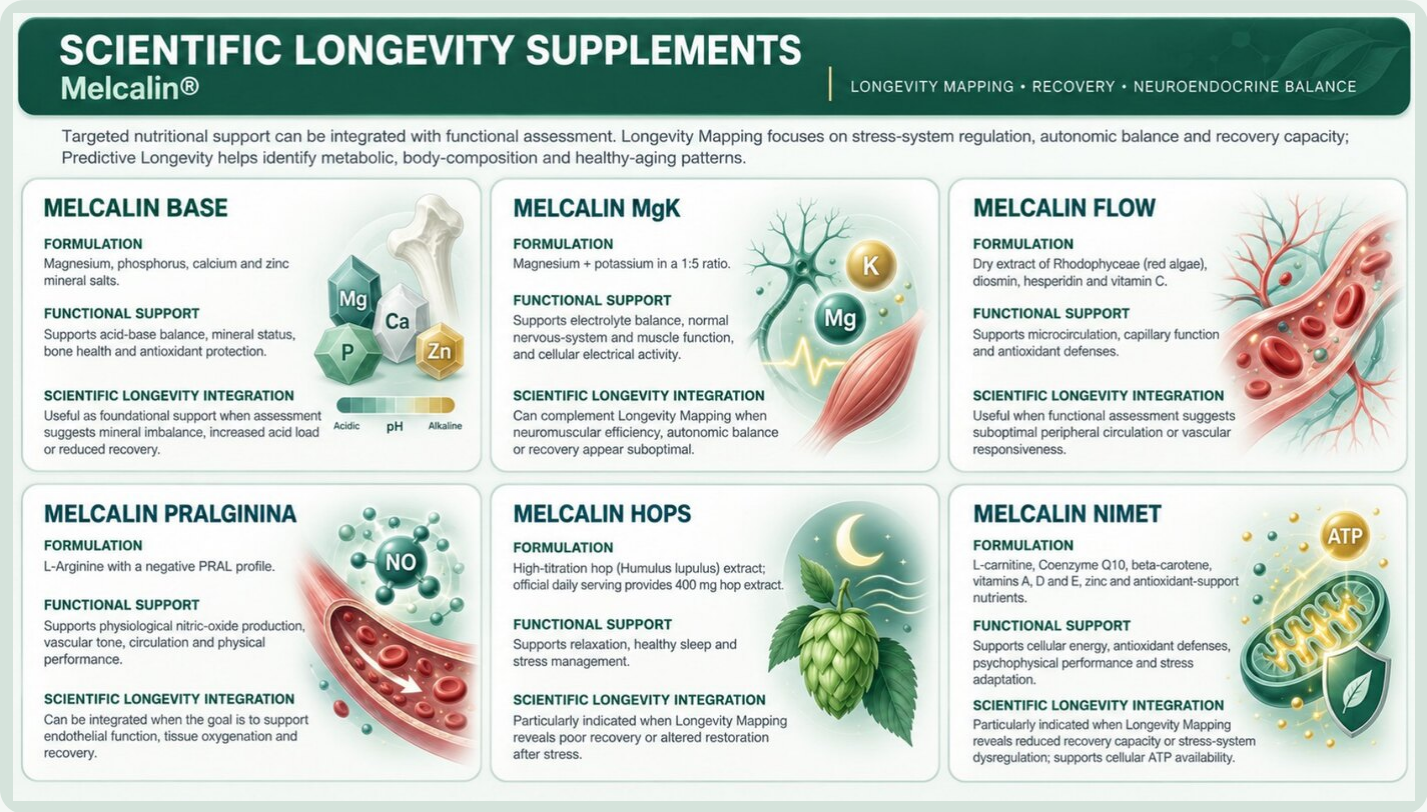
OVERVIEW

Home Training Integration brings the clinical protocol into the patient's daily environment. Personalized respiratory biofeedback exercises are delivered through the mobile app and performed with the ANS Control Bluetooth device. During each session, the system tracks breathing, HRV, and autonomic responses in real time. Data are uploaded to Biotekna Plus, allowing the practitioner to monitor adherence, physiological changes, breathing quality, progress toward personalized targets, and relevant alerts. This creates continuity between in-clinic assessments. The clinician can verify whether the patient is completing the sessions, whether the physiology is changing in the intended direction, and whether the protocol needs adjustment. The model is therefore not simply remote exercise. It is a closed feedback loop connecting clinic, home training, monitoring, and measurable outcomes.

KEY MESSAGE

A closed feedback loop connects clinic, home training, monitoring and measurable outcomes.

Scientific Longevity Supplements



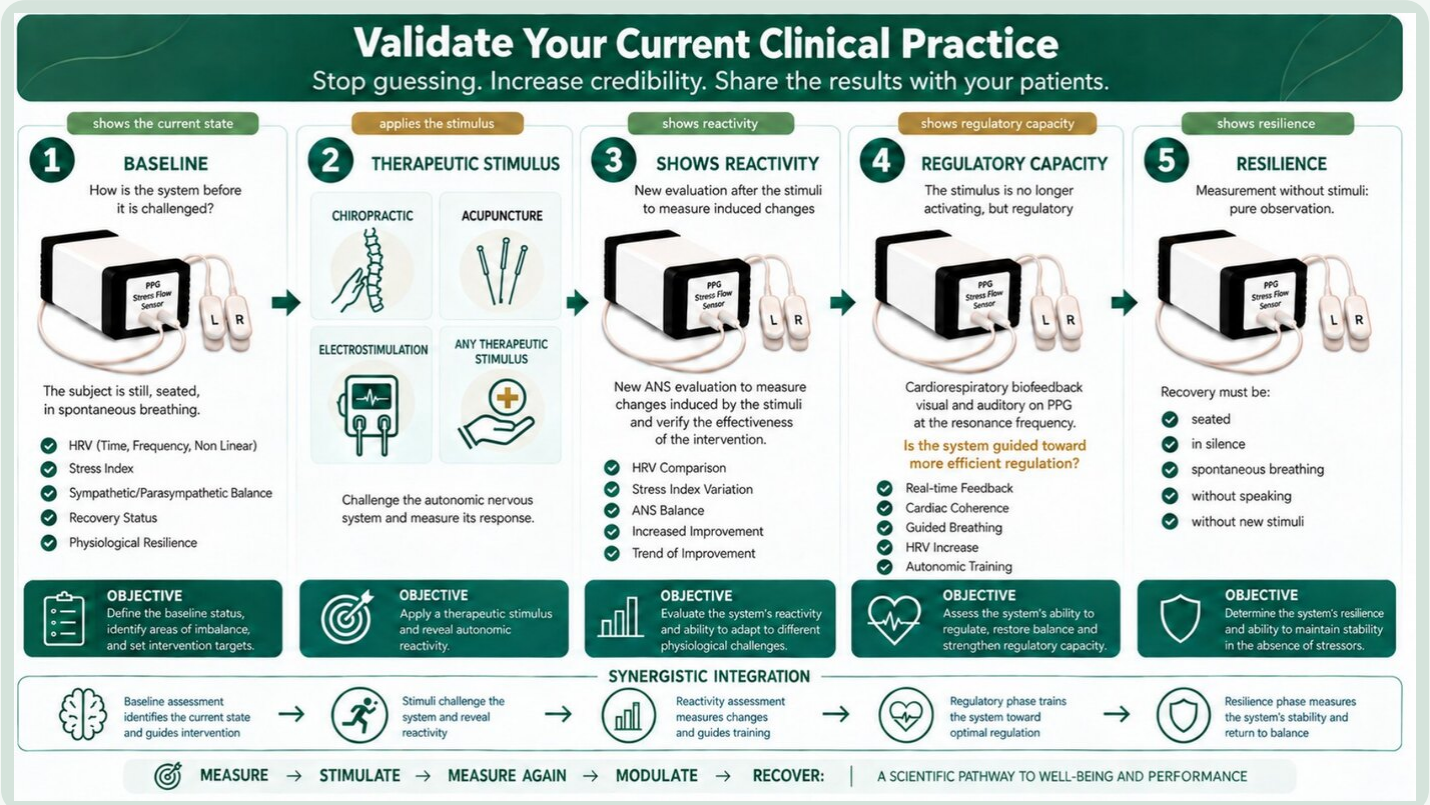
OVERVIEW

Targeted nutritional support is integrated only after the functional assessment identifies a relevant need. Melcalin Base supports mineral and acid-base balance. MgK supports electrolytes, neuromuscular function, and cellular electrical activity. Flow focuses on microcirculation and capillary function. Pralginina supports nitric-oxide production, vascular tone and tissue oxygenation. Hops is directed toward relaxation, sleep, and restoration after stress. Nimet supports cellular energy, antioxidant defenses, stress adaptation, and ATP availability. The key message is personalization. These products are not presented as a universal combination and do not replace medical treatment, nutrition, or lifestyle intervention. Selection follows the measured pattern, the patient's clinical history, contraindications, and the specific target identified through Longevity Mapping. The supplement strategy is then monitored and reassessed together with the biofeedback plan.

KEY MESSAGE

Nutritional support is selected from the measured pattern, clinical history and individual target.

Validate Your Current Clinical Practice



OVERVIEW

Longevity Mapping does not require the clinician to abandon an existing therapeutic approach. It provides a method to integrate and validate it. We begin with a standardized baseline, apply the therapeutic stimulus, and then measure reactivity, regulatory capacity, and resilience. The stimulus may be chiropractic care, acupuncture, electrostimulation, or any other appropriate therapeutic intervention. The question is no longer only, 'Did the patient feel better?' We can also ask: Did autonomic balance change? Did variability improve? Did the system respond to regulation? Did the effect persist after the intervention? This approach reduces guesswork, increases professional credibility, and makes the results easier to communicate to patients. It also supports clinical refinement: if the expected physiological response is absent, the protocol can be reconsidered and personalized.

KEY MESSAGE

Objective reassessment can validate and refine the therapeutic strategies already used in practice.

Assess. Restore. Monitor. Reassess.



OVERVIEW

The Scientific Longevity Method can be summarized in four actions: assess it, restore it, monitor it, and reassess it. Assessment gives us a physiological baseline. Restoration applies a personalized intervention. Monitoring shows whether the patient is engaging and whether the system is changing. Reassessment verifies the result and guides the next decision. This is not a generic wellness promise. It is a repeatable physiological process built around measurement, regulation, and clinical follow-up. Our goal is to make longevity practical: to identify loss of adaptability before it becomes fixed, to strengthen recovery, and to document the response over time. The result is a repeatable cycle that turns physiology into a practical, personalized clinical pathway.

For informational and professional education purposes. Functional measurements support clinical reasoning but do not replace medical diagnosis, appropriate investigation or individualized care. Product selection must consider history, contraindications and applicable regulations.

KEY MESSAGE

Assess it. Restore it. Monitor it. Reassess it. That's physiology.