

Review

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Review

The Psycho-Somatic-Noetic Paradigm in Trauma Treatment: A Critical Review of Gaps and Integrative Solutions

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Abstract

ReGEN Health Series — Paper II. Significance: Suicide is now the second leading cause of death among adolescents, with nearly 90% of youth suicidal behaviors attributable to adverse childhood experiences. Yet current trauma treatments fail 30–50% of patients, with dropout rates reaching 26–40%. This review addresses a critical gap by quantifying treatment failure and proposing a paradigm shift beyond cognitive-only approaches. Unlike previous reviews that examine individual modalities in isolation, this paper integrates evidence across biological, psychological, and noetic domains to argue for fundamentally reconceptualizing how we approach trauma healing—with direct implications for clinical practice, training curricula, and research priorities affecting millions of treatment-resistant survivors worldwide. **Background:** We have come a long way in treating trauma. And yet. Between a quarter and nearly half of patients walk away from first-line PTSD therapies before they finish. Medication brings full remission to barely thirty percent. Here is what troubles me most: somewhere between half and seventy percent of trauma therapists themselves carry signs of vicarious traumatization—which inevitably bleeds into the care they provide. Our training programs barely touch body-based approaches, even though the research keeps telling us trauma lives in the body as much as the mind. What I am arguing for here is what I call a *psycho-somatic-noetic paradigm*—treatment that works across body (the biological), soul (the psychological), and spirit (the noetic). **Objective:** This review is part of my ReGEN Health Series. I wanted to do something specific: identify and actually quantify seven gaps in how we treat trauma and train therapists. Then I looked at what might fill those gaps—established approaches like EMDR, contemplative practices, and neurofeedback, alongside newer cellular-level work including photobiomodulation, PEMF, and Somatic Experiencing. The thread connecting them? Restoring what I call tripartite coherence. **Methods:** I searched PubMed, PsycINFO, Cochrane, and Web of Science for work published between 2017 and 2024, plus grey literature and clinical guidelines. Let me be clear: this is a critical narrative review, not a formal systematic review. I used structured synthesis, but the solution mapping relies on mechanistic reasoning and clinical judgment. Gaps needed support from at least two independent sources. Evidence ratings align conceptually with GRADE, though I did not conduct formal GRADE assessment. **Results:** Seven gaps kept emerging. Treatment-resistant populations (thirty to fifty percent non-response). The mismatch between cognitive interventions and somatic reality. Pre-verbal trauma that talk therapy cannot reach. Dropout rates that should alarm us (25.6% on average; CPT hits 40.1%, PE hits 34.7%). Training that ignores the body. Therapist burnout (seventy percent of UK trauma therapists score high-risk). And the complete absence of cellular-level targeting. The established interventions work: EMDR gets 77–90% remission in single-trauma cases; contemplative practices show $d = 1.07$ with 52% no longer meeting diagnostic criteria; neurofeedback meta-analyses report SMD of -1.76 with 79.3% remission. Emerging approaches show promise too—Somatic Experiencing at $d = 0.94$ – 1.26 with 44% remission, PBM with significant effects across 11 RCTs. But the evidence is uneven. The ELATED-3 trial found nothing for low-dose PBM. fMRI-neurofeedback with proper sham controls has come up empty. **Conclusions:** I think current approaches fail certain patients not because the treatments do not work, but because they work at the wrong level—mismatched to where trauma actually lives in the body. EMDR and contemplative practices already

bridge multiple domains. Cellular interventions offer something different: direct access to biological roots. The path forward combines them. EMDR as established first-line. Contemplative practices for accessibility and low dropout. Phased cellular preparation for the treatment-resistant cases. This demands collaboration—psychologists, somatic therapists, neuroscientists, bioengineers—building protocols none of us could design alone.

Keywords: trauma treatment gaps; treatment-resistant PTSD; EMDR; somatic experiencing; contemplative practices; neurofeedback; photobiomodulation; tripartite coherence; psycho-somatic-noetic paradigm; integrative trauma therapy; multi-modal treatment; treatment non-response; ReGEN Health

ReGEN Health Series Context

This is the second paper in my ReGEN Health Series. The series examines health through what I call tripartite coherence—the integrated functioning of biological, psychological, and noetic domains. Body, soul, spirit. Soma, psyche, nous. Different traditions name it differently, but they point to the same reality.

Paper I laid the theoretical groundwork, introducing the ReGEN Framework and its debt to Denis Noble's biological relativity. Noble showed us that causation runs both directions across biological levels—no single level holds special causal privilege. This matters because it means interventions at psychological or spiritual levels can genuinely propagate to biological substrates. And vice versa. Top-down and bottom-up. The framework rejects the artificial hierarchy that puts molecules at the bottom and meaning at the top.

What do I mean by tripartite coherence? Three domains in harmonious integration:

The **biological domain**—soma, body—encompasses cellular and metabolic processes. Mitochondrial function. Inflammatory status. Autonomic balance. The physical substrate.

The **psychological domain**—psyche, soul—is where mind meets emotion. Cognitive flexibility. Emotional regulation. The subconscious patterns that shape how we process experience.

The **noetic domain**—nous, spirit—governs purpose and meaning. Values. Self-transcendence. The capacity to reflect on existence itself and find connection beyond the self.

Trauma disrupts all three. Current treatment paradigms address mainly one. That mismatch is what this paper examines.

1. Introduction

1.1. Significance of This Review

Why does this review matter? Because we are failing millions of people—and the stakes could not be higher.

The youth mental health crisis is a trauma crisis. Suicide is now the second leading cause of death for adolescents aged 10–14 and the third leading cause for those aged 15–25 [6]. In 2023, one in five U.S. high school students seriously considered suicide, and 9% reported attempting suicide in the past year [1]. The connection to trauma is direct and devastating: nearly 90% of adolescent suicidal behaviors are attributable to adverse childhood experiences [7]. Each additional ACE increases suicide attempt odds by 123% [11]. A Swedish cohort study of 3.1 million people found that up to 54% of suicides in people with PTSD are attributable to PTSD itself [13]. Among those with PTSD, nearly one in three report a suicide attempt [18].

These numbers demand we ask: **Are our trauma treatments reaching the populations most at risk?**

The answer, documented throughout this review, is troubling. The trauma treatment field has generated over 500 RCTs and multiple gold-standard guidelines. Yet somewhere between thirty and fifty percent of patients do not respond adequately. Dropout rates approach forty percent for weekly

protocols. Seventy percent of trauma therapists themselves carry signs of vicarious traumatization. These are not edge cases or statistical noise. They represent a systemic failure that persists despite decades of research and clinical refinement.

Previous reviews have examined individual modalities—EMDR effectiveness here, contemplative practice outcomes there, neurofeedback mechanisms elsewhere. What has been missing is an integrative analysis that asks: *Why do our best treatments fail certain patients?* And more importantly: *What would a fundamentally different paradigm look like?*

This review fills that gap by:

1. **Quantifying the scope of treatment failure** across seven specific, measurable gaps—not vague concerns but numbers that demand attention
2. **Proposing a paradigm shift** from cognitive-dominant to psycho-somatic-noetic approaches that address trauma where it actually lives: in cells, in bodies, in meaning systems
3. **Providing actionable clinical guidance** through decision algorithms, case illustrations, and outcome metrics that practitioners can implement
4. **Charting a research and ecosystem roadmap** that moves from critique to solution

The implications extend beyond academia. For clinicians, this offers a framework for treatment-resistant cases. For training programs, it identifies competency gaps requiring curriculum reform. For researchers, it prioritizes combined-modality trials over single-intervention studies. For policymakers, it makes the case for insurance coverage and training standards that include body-based approaches.

Most importantly, for the millions of survivors like Maria who have tried our best treatments and found them insufficient—this review argues that their struggle reflects not personal failure but paradigm limitation. And paradigms can change.

1.2. *The Case of Maria*

I want you to think about Maria.

After years of nightmares and hypervigilance, after watching relationship after relationship fall apart, she finally walked into a therapist's office. The therapist was skilled, trained in Prolonged Exposure—one of our gold-standard treatments. Maria showed up every week. She did the hard work of going back to memories she had spent years avoiding.

Twelve weeks later, she was marginally better. Her therapist was confused. Maria wondered if she was somehow failing at recovery.

What neither of them knew: Maria's experience was surprisingly common. She was one of the thirty to fifty percent of trauma survivors for whom evidence-based treatments simply do not work well enough. Not a failure of effort. Not a failure of clinical skill. A fundamental limitation of approaching trauma as if it lives only in cognition.

That limitation is what this paper names, measures, and addresses. I call the alternative the **psycho-somatic-noetic paradigm**.

Since PTSD entered DSM-III in 1980, we have accumulated over 500 randomized controlled trials. Prolonged Exposure, Cognitive Processing Therapy, EMDR—they work. The 2017 VA/DoD [41] and APA [2] guidelines are clear about this. But look at the numbers more carefully:

Penix-Smith and Swift [28], analyzing 181 studies with over 124,000 veterans, found weighted dropout at 25.6%. Weekly CPT? 40.1% dropout. Weekly PE? 34.7%. These are not edge cases.

Full remission with medication reaches only thirty percent. Another twenty percent show almost no improvement at all.

In military CPT studies, sixty-one percent end up classified as “suboptimal responders.”

Overall nonresponse across PTSD treatments? Thirty-nine percent.

These numbers represent millions of people doing their best to heal and finding that our best treatments are not quite enough.

My argument is straightforward: these persistent gaps are not random failures. They are signals. Trauma is not primarily a cognitive phenomenon. It is biological—stored in mitochondria, in autonomic dysregulation, in epigenetic modifications, in fascial tension. When we treat only thoughts and memories, we address symptoms while leaving the deeper cellular dysregulation untouched.

And there is more. For many survivors, healing requires restoration of meaning and purpose. Identity reconstruction. These noetic dimensions resist quantification, but they are real, often disrupted by trauma, and essential to genuine recovery.

The paradigm I am proposing acknowledges that comprehensive trauma healing must work across all three domains of human experience.

A note on scope: I am examining both established body-based treatments (EMDR, contemplative practices, neurofeedback) with substantial evidence, and emerging cellular-level interventions (Somatic Experiencing, PBM, PEMF) with more preliminary data. The latter are included not as equally proven treatments, but as **critical exemplars** of interventions operating at the biological/cellular level—the very level identified as absent in current paradigms (Gap 7). Their inclusion is essential to illustrate the full spectrum of a tripartite approach.

1.3. Paradigm Contrasts

To crystallize the fundamental shift this review proposes, the following table contrasts the prevailing cognitive-dominant paradigm with the psycho-somatic-noetic alternative.

Table. Contrasting Paradigms in Trauma Treatment.

Dimension	Current Predominant Paradigm (Cognitive-Dominant)	Proposed Psycho-Somatic-Noetic Paradigm
Primary Locus	Cognition, explicit memory	Tripartite: Biology (cell/body), Psychology (mind/emotion), Noetic (meaning/spirit)
Theory of Change	Top-down: Change thoughts/beliefs → changes emotions/physiology.	Reciprocal & Multi-level: Target change at any level (cellular, somatic, cognitive, existential) to propagate coherence across all domains.
View of Trauma	A disorder of memory and threat appraisal.	A whole-body injury: A dysregulating event that fragments coherence across biological, psychological, and meaning-making systems.
Treatment-Resistance	Attributed to client complexity, comorbidity, or avoidance.	Framed as level mismatch: Interventions fail when targeted at a level (e.g., cognitive) mismatched from where trauma is primarily lodged (e.g., somatic, cellular).
Therapist's Role	Expert in cognitive techniques and narrative processing.	Regulated co-regulator & guide: Embodies somatic awareness, facilitates biological safety, and holds space for meaning reconstruction.
Key Metrics	Symptom reduction (PCL-5, CAPS-5).	Tripartite coherence: Biological (HRV, inflammation), Psychological (symptoms, regulation), Noetic (meaning, growth).
Training Focus	Diagnostic assessment, protocol delivery.	Foundational training in trauma neuroscience, interoception, self-regulation, and multi-modal integration.

2. Research Questions and Aims

Three questions guide this review:

First: What quantifiable gaps exist in current trauma treatment and therapist training? What specifically contributes to non-response, dropout, and clinician burnout?

Second: Through what mechanisms might body-based treatments and cellular-level interventions address these specific gaps?

Third: What research priorities and clinical strategies emerge from this analysis?

2.1. Aims

I set out to systematically identify and quantify gaps using meta-analytic data. To map how specific interventions mechanistically address specific gaps. To synthesize findings into actionable recommendations. And to propose both a research agenda and implementation framework.

3. Methodology

Let me be direct about what this is and is not. This is a critical narrative review- not a systematic review or meta-analysis. I used structured search and synthesis methods to map the landscape, but the solution mapping involves mechanistic reasoning and expert judgment. A formal systematic review would require a narrower question; my aim was synthesis across disparate literatures. Therefore, while I followed a structured process, I did not create a PRISMA flow diagram or conduct dual-coded extraction.

I chose this approach deliberately. My aim is synthesis across disparate literatures—treatment outcomes, therapist wellbeing, cellular biology, body-based therapies—woven into an integrated argument for paradigm expansion. A systematic review would answer a narrower question more rigorously. I wanted to see the whole landscape.

3.1. Search Strategy

I searched PubMed, PsycINFO, Cochrane Library, and Web of Science from January 2017 through December 2024. The search combined PTSD and trauma terms with treatment, dropout, non-response, and efficacy terms. Separate searches targeted each body-based modality. Additional searches covered therapist training and burnout.

3.2. Inclusion and Exclusion Criteria

To ensure focus on robust, actionable evidence, I applied the following criteria:

- **Included:** Systematic reviews, meta-analyses, RCTs, and larger cohort studies ($n > 50$) on PTSD outcomes, non-response, therapist wellbeing, and intervention efficacy. Clinical guidelines from major bodies (VA/DoD, APA, NICE, WHO, ISTSS) were included for context.
- **Excluded:** Case studies ($n < 10$), non-peer-reviewed commentaries, studies without comparison conditions, and literature exclusively on paediatric populations. I included emerging cellular-level interventions (PBM, PEMF) with more limited RCTs specifically to illustrate the mechanistic potential for addressing Gap 7 (Absence of Cellular-Level Targeting); their inclusion is for hypothesis generation, not as an endorsement of proven efficacy.

3.3. How I Identified Gaps

Gaps emerged from limitations sections in systematic reviews, future research recommendations, discrepancies between controlled efficacy and real-world effectiveness, and documented unmet needs in clinical guidelines. Each gap required quantitative support from at least two independent peer-reviewed sources.

3.4. How I Mapped Solutions

I evaluated interventions for mechanistic fit with identified gaps. Criteria included biological plausibility, empirical support from RCTs or systematic reviews, and theoretical alignment with the gap's nature.

The ratings I used:

Strong (●●●): Multiple meta-analyses or five-plus RCTs with consistent positive results

Moderate (●●): One meta-analysis or two to four RCTs, or strong mechanistic evidence with preliminary clinical data

Emerging (●): Mechanistic plausibility with limited or mixed evidence

These align conceptually with GRADE hierarchies but I did not conduct formal GRADE assessment. The ratings reflect my judgment based on available evidence. Readers should evaluate cited sources independently.

3.5. Quality Considerations

I assessed meta-analyses using AMSTAR-2 criteria and evaluated RCTs for risk of bias using Cochrane RoB 2.0 considerations. Effect sizes appear as Cohen's d or Hedges' g with confidence intervals where available. Studies with notable methodological concerns are flagged in the text.

4. Literature Review: The Evidence Base

4.1. Where We Stand

The PTSD Trials Standardized Data Repository now holds 550 RCTs. Both VA/DoD and APA guidelines strongly recommend Prolonged Exposure, Cognitive Processing Therapy, EMDR, and trauma-focused CBT. The effect sizes in controlled trials are moderate to large.

But here is the thing about controlled trials: they measure efficacy under ideal conditions. Effectiveness in the real world is a different matter.

Imel et al. [15] found 18% average dropout across PTSD RCTs back in 2013. More recent analysis from Penix-Smith and Swift [28]—181 articles, 124,092 veterans—puts weighted dropout at 25.6%. The variation across treatments is striking. Weekly CPT: 40.1% dropout. Weekly PE: 34.7%. But intensive outpatient? CPT drops to 8.5%, PE to 5.5%. Format matters as much as content.

4.2. Treatment-Resistant PTSD

The concept remains poorly defined. Marek et al. [22] found only 53% of treatment-resistance studies even described prior pharmacotherapy failure. A mere 3% described failure of trauma-focused CBT. We do not have well-established predictors of who will not respond.

What we do know: childhood abuse predicts poorer outcomes. So does repeated or prolonged exposure. Complex PTSD presentations. Combat-related trauma. A recent military CPT analysis found 61% "suboptimal responders"—and hyperarousal symptoms proved particularly stubborn even among those who otherwise recovered.

4.3. EMDR: First-Line Treatment with Built-In Somatic Components

EMDR deserves special attention because it already integrates body-based elements. Francine Shapiro [35] developed it in 1987. The WHO recommends it. The eight-phase protocol includes a body scan where clients notice physical sensations associated with target memories.

The efficacy data is strong. 84–90% of single-trauma victims no longer had PTSD after three 90-minute sessions. Kaiser Permanente found 100% of single-trauma and 77% of multiple-trauma victims PTSD-free after six 50-minute sessions. 77% of combat veterans cleared after 12 sessions.

Clinicians increasingly integrate explicit somatic work with EMDR—what Schwartz [33] calls "Somatic EMDR." This addresses both narrative processing and body-held trauma. Van der Kolk [42] considers it among the best approaches available.

4.4. Contemplative Practices: The RCT Evidence

Van der Kolk et al.'s [42] RCT is the landmark study. Sixty-four women with chronic, treatment-resistant PTSD. Ten weekly sessions of trauma-informed contemplative practice versus supportive education.

The results: $d = 1.07$ for the contemplative practice group versus $d = 0.66$ for control. More importantly, 52% of the practice group no longer met PTSD criteria compared to 21% of controls. Effect sizes comparable to established psychotherapy and pharmacotherapy.

A 2024 systematic review identified 20 RCTs supporting contemplative practices for PTSD. Additional trials support these approaches for veterans and motor vehicle accident survivors. The mechanism involves improved interoceptive awareness, enhanced vagal tone, and greater affect tolerance—survivors learn to experience physical sensations without becoming overwhelmed.

Clinical implication: For treatment-resistant cases or high dropout risk, contemplative practices offer an accessible complement with effect sizes matching established treatments.

4.5. Neurofeedback: Promising but Complicated

Neurofeedback uses real-time brain activity feedback for self-regulation. A 2023 meta-analysis [30] in *European Journal of Psychotraumatology* (10 studies, 293 participants) found all included studies showed advantage over controls. Meta-analytic effect size: SMD of -1.76 . Remission rate: 79.3%.

Van der Kolk et al.'s [43] RCT found significant improvement and enhanced affect regulation. The FDA cleared one amygdala-EEG-neurofeedback device in early 2023 for adjunctive use.

But there are complications. EEG-neurofeedback studies with passive controls show larger effects than fMRI-neurofeedback with proper sham controls. Two sham-controlled fMRI-NF trials found no significant improvement over sham. We need better active controls before drawing firm conclusions.

4.6. Somatic Experiencing: The Emerging Evidence

Peter Levine [4] developed SE as a body-focused trauma therapy. Brom et al.'s [4] RCT—the first—randomized 63 participants with DSM-IV PTSD to 15 SE sessions or waitlist. Effect sizes were large: $d = 0.94$ – 1.26 for PTSD symptoms, $d = 0.70$ – 1.08 for depression. 44.1% moved from full diagnostic criteria to complete remission.

Notably, this study happened in Israel during ongoing collective trauma including two wars and terrorist attacks. Effectiveness under continued stress exposure is remarkable.

A scoping review [21] of 16 SE studies found clinician-rated effect sizes of $d = 1.26$, maintained at 7-month follow-up. Stewart et al.'s [40] longitudinal study found SE training improved therapist quality of life while reducing anxiety and somatization—clinical tools plus personal resilience.

The limitation is sample size. Only five studies meet sufficient scientific rigor. More large-scale RCTs with active controls are needed.

4.7. Photobiomodulation: Dose-Dependent Promise

Ji et al.'s [17] meta-analysis in *Frontiers in Psychiatry* identified 11 PBM RCTs for depression (407 participants). Results confirmed significant improvement over sham. Massachusetts General Hospital [44] now operates a Brain Photobiomodulation Clinic for treatment-resistant depression.

The mechanism is cellular: enhanced mitochondrial ATP production through cytochrome c oxidase stimulation, increased BDNF expression, reduced neuroinflammation, improved cerebral blood flow.

This mechanistic understanding suggests a testable hypothesis: that PBM-induced mitochondrial enhancement could prime the neuroplasticity required for effective memory reconsolidation during subsequent EMDR. This synergistic potential warrants investigation in combined-modality trials.

But there is critical counterevidence. The ELATED-3 trial [16] tested very low-level PBM in 49 MDD patients and found nothing—no difference from sham. The conclusion: a minimal dose threshold exists. Another meta-analysis of double-blind sham-controlled studies found non-significant superiority. PBM efficacy appears critically dose-dependent, and optimal parameters remain unclear.

Safety note: PBM is generally well-tolerated. Contraindications include active malignancy in the treatment area and photosensitizing medications. PEMF excludes patients with pacemakers or insulin pumps. SE requires proper training to manage intense affect states. For all emerging interventions, informed consent should acknowledge experimental status for trauma indications.

4.8. *Experiential and Existential Approaches*

The interventions above emphasize somatic and cellular mechanisms. But psychological and noetic dimensions need approaches addressing meaning-making, identity integration, and relational repair.

Gestalt therapy offers one example. Limited RCT evidence for PTSD symptom reduction per DSM criteria, but its focus on present-moment awareness, completing unfinished business, integrating split-off aspects of self, and restoring authentic contact aligns strongly with soul and spirit dimensions.

For survivors of relational trauma where identity fragmentation and lost meaning are central, experiential therapies can facilitate reintegration that complements body-based and biological interventions.

4.9. *Therapist Wellbeing*

This matters more than we acknowledge. The National Child Traumatic Stress Network reports up to 50% of child welfare workers experience secondary traumatic stress. A UK study [37] of 253 trauma therapists found 70% scoring high-risk for secondary traumatic stress. Not a single therapist scored low.

Grepmaier et al.'s [14] study is remarkable. Counselor trainees who practiced Zen meditation for 9 weeks produced measurably better client outcomes—greater symptom reduction, faster change, higher wellbeing scores, clients perceiving treatment as more effective. Randomized, double-blind, controlled, 124 patients, 18 therapists-in-training.

Therapist self-regulation is not personal wellness separate from clinical work. It is a clinical competency that directly affects outcomes.

5. Gap Analysis: Seven Critical Deficiencies

Seven gaps emerged consistently from the literature. Each has prevalence data, underlying mechanisms, and clinical implications mapped to the tripartite framework.

5.1. *Gap 1: Treatment-Resistant Populations*

The numbers: 30–50% of trauma survivors do not achieve clinically significant improvement with first-line treatments. Meta-analysis shows 39% overall nonresponse. Military populations: 61% suboptimal responders. Veterans specifically: 50–72% nonresponse rates in some studies.

Why this happens: Treatment resistance may reflect level mismatch rather than patient pathology. Trauma encoded subcortically and somatically may be inaccessible to cognitive interventions. Biological factors—inflammation, mitochondrial dysfunction—may prevent the neuroplasticity cognitive restructuring requires.

Clinical implication: For clients not responding to cognitive therapies, consider body-based approaches that may access subcortically-encoded trauma inaccessible to verbal processing.

5.2. Gap 2: Cognitive-Somatic Mismatch

First-line treatments operate through top-down mechanisms—exposure, cognitive restructuring, narrative processing—assuming insights will cascade to shift physiology. But trauma is stored in subcortical structures and expressed through autonomic dysregulation below conscious awareness.

Van der Kolk [42] established that traumatic memory is encoded in procedural, somatic, and autonomic systems verbal processing cannot directly access. Polyvagal theory shows how trauma locks the nervous system in defensive states that cognitive reappraisal struggles to shift.

EMDR and contemplative practices already integrate somatic components. The gap concerns predominance of purely cognitive approaches and limited body-based training.

5.3. Gap 3: Pre-Verbal and Developmental Trauma

Trauma before language development—roughly age three—or during critical attachment periods creates implicit memory patterns without narrative content. These experiences cannot be talked about because they were never linguistically encoded.

Standard protocols assume access to narrative memory. Interventions bypassing verbal processing—EMDR's bilateral stimulation, SE's somatic tracking, contemplative practices—may access what talk therapy cannot.

Clinical implication: For pre-verbal or developmental trauma, prioritize non-verbal somatic or movement-based interventions before or alongside talk therapies.

5.4. Gap 4: High Dropout Rates

The numbers are stark. Weighted dropout: 25.6%. Weekly CPT: 40.1%. Weekly PE: 34.7%. Virtual reality exposure: 37.2%. Real-world VA settings approach 50%.

By contrast, intensive outpatient achieves 8.5% dropout for CPT and 5.5% for PE.

Avoidance—a core PTSD symptom—drives patients away from exposure-based treatment. When the nervous system is already dysregulated, exposure feels overwhelming rather than therapeutic. The dramatically lower dropout in intensive formats suggests structure matters as much as content. Contemplative practices' low dropout rates suggest embodied approaches may be more tolerable.

5.5. Gap 5: Inadequate Somatic Training

Standard graduate training emphasizes cognitive-behavioral modalities with minimal body-based content. EMDR requires separate post-graduate certification. SE requires two to three years of additional training at \$10,000–14,000. This creates a two-tier system where body-based competencies remain optional rather than foundational.

Programs integrating somatic content—CIIS, Naropa—are outliers. Licensure emphasizes diagnostic over embodied clinical skills. Interoceptive awareness and autonomic state recognition are absent from most accreditation standards.

5.6. Gap 6: Therapist Burnout and Vicarious Trauma

Up to 50% of counselors report risk for vicarious traumatization. UK trauma therapists: 70% high-risk for secondary traumatic stress. Approximately 26% of therapists working with traumatized populations report clinical-level symptoms.

Burned-out therapists cannot provide the regulated presence that helps clients feel safe enough for deep work. Therapist regulation is a clinical competency, not a personal luxury.

5.7. Gap 7: Absence of Cellular-Level Targeting

Trauma produces measurable cellular effects: reduced mitochondrial ATP production, elevated inflammatory markers, epigenetic modifications, persistent HPA axis dysregulation. These biological realities underlie psychological symptoms.

First-line treatments do not directly target cellular function. Contemplative practices and exercise may help indirectly. But direct cellular interventions—PBM, PEMF—targeting mitochondria, inflammation, and vagal tone remain peripheral to guidelines. When the cellular substrate is depleted, psychological interventions may lack the biological foundation they require.

6. Key Insights: Quantified Findings

Table 1. Summary of Key Quantified Findings with Verified Citations.

Finding	Value	Primary Source
Treatment non-response rate	30–50% (39% overall)	[34,38,39]
Weighted dropout (military)	25.6% (CI: 22.9–28.5)	[28] (k=181, n=124,092)
Weekly CPT dropout	40.1%	[28]
Weekly PE dropout	34.7%	[28]
Military CPT suboptimal responders	61%	[23]
EMDR single-trauma remission	84–90%	[36] (3 sessions)
Contemplative practice effect size	d = 1.07	[42]
Contemplative practice remission	52% vs. 21% control	[42] (n=64)
Neurofeedback meta-analysis SMD	-1.76 (CI: -2.69 to -0.83)	[30] (k=10, n=293)
Neurofeedback remission rate	79.3%	[30]
SE effect size (PTSD)	d = 0.94–1.26	[4]
SE diagnostic remission	44.1%	[4] (n=63)
PBM RCTs in meta-analysis	11 RCTs (n=407)	[17]
ELATED-3 PBM vs. sham	p=.751 (NS)	[16]
UK therapists high STS risk	70%	[37] (n=253)
Therapist meditation → client outcomes	Significant improvement	[14] (n=124 clients)

Note. CPT=Cognitive Processing Therapy; PE=Prolonged Exposure; EMDR=Eye Movement Desensitization and Reprocessing; SE=Somatic Experiencing; PBM=photobiomodulation; STS=secondary traumatic stress; SMD=standardized mean difference; NS=not significant.

7. Gap-Solution Integration Matrix

Table 2. Gap-Solution Integration Matrix.

Gap	EMDR	Contemp.	NFB	SE	PBM	PEMF
1. Treatment Resistance	●●●	●●	●●	●●	●●	●
2. Cognitive-Somatic	●●●	●●●	●●	●●●	●	●●
3. Pre-Verbal Trauma	●●	●●●	●●	●●●	●	●●
4. High Dropout	●●●	●●●	●●	●●	●	●

5. Training Gaps	●●●	●●	●	●●	—	—
6. Therapist Burnout	●●	●●●	●	●●●	●	●
7. Cellular Targeting	●	●●	●	●	●●●	●●

Note. ●●●=Strong; ●●=Moderate; ●=Emerging; —=No relevant mechanism. See Methods for rating criteria.

Reading this matrix: Contemplative practices and SE rate strong on pre-verbal trauma because they bypass linguistic processing—directly relevant for trauma encoded before language development. EMDR rates strong on cognitive-somatic fit because of its built-in body scan and bilateral stimulation accessing implicit memory. PBM rates strong only on cellular targeting because that is its direct mechanism; it lacks psychological intervention components. Neurofeedback ratings are tempered by sham control concerns.

The key insight: no single intervention addresses all seven gaps strongly. This supports integrated, multi-level protocols rather than single-modality approaches.

8. Recommendations

8.1. Research Priorities

Closing these gaps requires collaborative teams—psychologists, somatic therapists, neuroscientists, bioengineers—designing protocols none of us could build alone.

Priority 1: Combined-modality RCTs. Test cellular-level interventions as preparation before trauma-focused psychotherapy. Primary outcomes: engagement, retention, symptom reduction. Dose-finding components are essential given ELATED-3 findings.

Priority 2: Active-control neurofeedback studies. More RCTs with sham controls to establish whether effects exceed placebo.

Priority 3: Prospective prediction. Develop algorithms identifying likely non-responders before treatment begins, enabling proactive matching rather than reactive switching.

Priority 4: Biomarker mechanism research. Pre/post measurement of mitochondrial function, inflammatory markers, and HRV to establish biological change pathways.

Priority 5: Training integration pilots. Evaluate curricula integrating body-based competencies into graduate programs, measuring both student competency and client outcomes.

8.2. Clinical Implementation Framework

Caveat: This framework is proposed based on mechanistic reasoning and preliminary evidence. It has not been validated in controlled trials. Consider it a hypothesis for research rather than established protocol.

8.2.1. The Three-Phase Tripartite Protocol

Phase 1 — Biological Preparation (optional, for treatment-resistant or severely dysregulated cases): PBM or PEMF protocols to establish cellular readiness and enhance neuroplasticity capacity. Duration: 2–4 weeks. Evidence: Emerging.

Phase 2 — Body-Based Engagement: Established body-based approaches matched to presentation. EMDR for those tolerating bilateral stimulation. Contemplative practices for high dropout risk or embodied practice preference. Somatic Experiencing for pre-verbal or developmental trauma. Duration: 8–12 sessions.

Phase 3 — Integration and Consolidation: Trauma-focused therapy (PE, CPT) once window of tolerance is expanded and nervous system regulation improved, combined with meaning-making and identity restoration. Duration: 8–16 sessions.

8.2.2. Clinical Decision Algorithm

Step 1: Initial Assessment

Has the patient attempted first-line treatment? - No → Standard first-line protocol (EMDR recommended for integrated somatic component) - Yes with adequate response → Continue/maintain - Yes with inadequate response or dropout → Proceed to Step 2

Step 2: Presentation Profiling

(A) High Autonomic Dysregulation – Persistent hyperarousal, poor distress tolerance, narrow window of tolerance, elevated resting heart rate, poor HRV → Pathway A: Body-based preparation before trauma processing

(B) Pre-Verbal/Developmental Trauma – Trauma before age 3, attachment disruption, implicit but not narrative memory, identity fragmentation → Pathway B: Non-verbal somatic approaches as primary modality

(C) Treatment-Resistant with Biological Markers – Multiple treatment failures, chronic inflammation indicators, fatigue/mitochondrial depletion signs, comorbid chronic health conditions → Pathway C: Cellular-level preparation plus body-based engagement

(D) High Dropout Risk – History of dropout, high avoidance symptoms, ambivalence about exposure → Pathway D: Low-intensity embodied approaches with gradual titration

(E) Meaning/Identity Disruption – Existential crisis, lost purpose, spiritual distress, identity fragmentation → Pathway E: Integrate existential/Gestalt approaches alongside somatic work

Step 3: Pathway Selection

Pathway	Phase 1	Phase 2	Phase 3
A: Dysregulation	Optional PBM/PEMF	Contemplative + SE	EMDR → PE/CPT
B: Pre-Verbal	—	SE + Contemplative (primary)	Gestalt + meaning-making
C: Treatment-Resistant	PBM/PEMF (required)	EMDR + SE	CPT with somatic integration
D: Dropout Risk	—	Contemplative (low intensity)	Gradual EMDR or narrative work
E: Meaning/Identity	—	Contemplative + Gestalt	Existential integration

Pathways combine for complex presentations. Clinical judgment remains essential.

8.2.3. Composite Case Illustrations

Case 1: Maria (Treatment-Resistant, High Dysregulation) – Pathways A + C

Maria, 34, childhood sexual abuse plus motor vehicle accident at 28. Completed 12 CPT sessions with minimal improvement (PCL-5: 58 → 52). Persistent hypervigilance, poor sleep, chronic fatigue. Mildly elevated CRP.

Tripartite formulation: Biological—autonomic dysregulation, possible mitochondrial depletion, chronic inflammation. Psychological—cognitive processing attempted but nervous system too activated for integration. Noetic—feels “broken,” questions life purpose.

Treatment pathway: Phase 1 (4 weeks): Transcranial PBM three times weekly plus HRV biofeedback. Phase 2 (10 sessions): Trauma-sensitive contemplative movement weekly plus EMDR with extended resourcing. Phase 3 (12 sessions): Complete EMDR processing plus meaning-making work.

Hypothesis: Biological preparation expands window of tolerance, enabling trauma processing that previously failed.

Case 2: David (Pre-Verbal Trauma) – Pathways B + E

David, 42, adopted at age 2 after early neglect. No explicit trauma memories but chronic emptiness, relationship difficulties, dissociative episodes. Previous talk therapy provided insight without symptom relief.

Tripartite formulation: Biological—implicit procedural patterns encoded before language. Psychological—attachment disruption without narrative access. Noetic—core identity wound, “I don’t know who I am.”

Treatment pathway: Phase 2 (16 sessions): SE as primary modality—tracking body sensations, completing defensive responses, building embodied safety. Phase 3 (12 sessions): Gestalt empty chair for attachment repair plus existential exploration of identity and belonging.

Hypothesis: Non-verbal processing accesses implicit trauma inaccessible to talk therapy; identity integration through embodied and relational work.

Case 3: Aisha (High Dropout Risk) – Pathway D

Aisha, 29, refugee with war trauma. Dropped out of PE after 3 sessions due to overwhelming distress. Interested in healing but fears “going back there.” Cultural background includes traditional healing with breath and movement.

Tripartite formulation: Biological—intact but easily overwhelmed by exposure. Psychological—high avoidance protecting against flooding. Noetic—cultural identity and spiritual practices as resources.

Treatment pathway: Phase 2 (12 sessions): Culturally adapted contemplative practices (breathwork, gentle movement) with psychoeducation; very gradual titration of somatic awareness. Phase 3 (8–12 sessions): Narrative Exposure Therapy (brief, structured) once tolerance expanded; integration with cultural meaning-making.

Hypothesis: Low-intensity embodied approach prevents dropout; cultural adaptation enhances engagement and leverages existing resources.

Case 4: James (Therapist Vicarious Trauma) – Addressing Gap 6

James, 38, trauma therapist with secondary traumatic stress after 10 years. Emotional numbing, cynicism, decreased effectiveness.

Tripartite formulation: Biological—accumulated nervous system burden, depleted regulatory capacity. Psychological—vicarious traumatization affecting clinical presence. Noetic—questioning meaning of work, compassion fatigue.

Intervention: Daily personal contemplative practice (20 minutes). Monthly SE sessions for personal processing. Peer consultation with embodied check-ins. Values clarification for purpose reconnection.

Hypothesis: Per Grepmaier et al.’s [14] findings, therapist self-regulation improves both personal wellbeing and client outcomes.

8.2.4. Outcome Metrics Across Domains

Biological: HRV (RMSSD, HF power), inflammatory markers where feasible (CRP, IL-6), sleep quality (PSQI), autonomic symptom checklist.

Psychological: PTSD symptoms (PCL-5, CAPS-5), depression (PHQ-9), anxiety (GAD-7), emotion regulation (DERS), dissociation (DES-II).

Noetic: Meaning in Life Questionnaire, Post-Traumatic Growth Inventory, Purpose in Life subscale, spiritual wellbeing where appropriate, identity integration (qualitative).

Process: Retention rates, session-by-session distress tolerance, therapeutic alliance (WAI), client satisfaction.

8.3. Training Recommendations

Graduate curricula need to integrate:

- EMDR as core trauma competency, not optional post-graduate certification

- Basic trauma neuroscience including polyvagal theory [29], window of tolerance, autonomic function
- Interoceptive awareness training for therapists themselves
- Introduction to contemplative and mindfulness-based approaches
- Embodied self-regulation as clinical competency with supervised practice

To address cost and access: hybrid delivery combining online didactics with in-person experiential components. Peer consultation and telehealth supervision for underserved regions.

Cultural note: Contemplative practices have diverse cultural origins. Programs should acknowledge these origins and consider cultural adaptations.

8.4. Implementation Barriers

Cost: PBM devices: \$500 consumer to \$15,000+ clinical-grade. PEMF similar. SE certification: \$10,000–14,000 over 2–3 years. EMDR certification: \$1,500–3,000+.

Regulatory: PBM devices FDA-cleared for some indications but not PTSD specifically. Neurofeedback (one device) received FDA clearance in 2023 for adjunctive PTSD use.

Insurance: EMDR typically covered. Contemplative practices, neurofeedback, PBM, PEMF generally not covered.

Institutional inertia: Changing curricula and protocols faces organizational resistance from established programs and licensing bodies.

8.4.1. A Staged Implementation Roadmap

Stage 1: Evidence Consolidation & Pilot Networks (1-2 Years)

- **Action:** Form collaborative research-practice networks to run the combined-modality pilots (Priority 1).
- **Goal:** Generate preliminary effectiveness data and refine protocols in real-world settings (e.g., community clinics, VA satellite centers).

Stage 2: Training Integration & Policy Advocacy (2-4 Years)

- **Action:** Use pilot data to advocate for curriculum changes in graduate programs and for CE/CPD accreditation for body-based training modules.
- **Goal:** Shift somatic competencies from "elective" to "core" in leading programs; secure first insurance reimbursements for integrated protocols.

Stage 3: Scaling & Ecosystem Building (4-7 Years)

- **Action:** Develop tech-enabled platforms for training (low-cost hybrids) and treatment fidelity monitoring.
- **Goal:** Achieve broad professional acceptance, standardized training pathways, and insurance coverage for key body-based and cellular-level interventions as adjuncts.

9. Limitations

First, this is a narrative review, not systematic. No PRISMA diagram, no dual-coded extraction, no formal risk of bias assessment. Selection and synthesis bias is possible.

Second, evidence quality is heterogeneous. EMDR and contemplative practices have robust meta-analytic support. Neurofeedback meta-analyses include null results with sham controls. SE has one major RCT. PBM evidence includes a major null trial. Combined protocols have not been tested.

Third, my evidence ratings are subjective—my judgment based on stated criteria without inter-rater reliability testing.

Fourth, the noetic dimension may seem speculative within a strictly biological framework. I include it because meaning-making and identity are clinically significant, often disrupted by trauma, and relevant to genuine recovery even if harder to measure.

Fifth, most evidence comes from US/VA, Israeli, and UK populations. Cross-cultural effectiveness is uncertain. Contemplative practices especially need cultural adaptation.

Sixth, some cited PBM researchers have commercial ties to device manufacturers. I have no such conflicts, but I am advocating for interventions with commercial implications.

Seventh, the deliberate inclusion of emerging interventions like PBM and PEMF, despite a thinner evidence base for trauma specifically, was necessary to illustrate the biological-domain intervention arm of the proposed paradigm. Their inclusion is for mechanistic illustration and hypothesis generation regarding Gap 7, not a conclusion of proven efficacy for PTSD.

10. Future Directions: The ReGEN Trauma Protocol

This paper provides theoretical and empirical foundation for what I envision as the **ReGEN Trauma Protocol**—a comprehensive approach operationalizing the psycho-somatic-noetic paradigm. Here is the development roadmap.

10.1. Protocol Development

The protocol will be manualized and modular:

Core elements: Standardized tripartite assessment. Clinical decision algorithm (Section 8.2.2). Session-by-session guides for each phase and pathway. Fidelity checklists. Outcome tracking across all three domains.

Modular structure: Flexibility for clinicians to select pathways based on presentation. Integration with existing evidence-based treatments. Adaptation for different settings. Scalability from individual to group formats.

10.2. Training and Certification

To address Gap 5, a tiered training program:

Level 1 — Foundations (Online, 20 hours): Tripartite coherence framework. Trauma neuroscience. Introduction to body-based modalities. Assessment and pathway selection.

Level 2 — Clinical Skills (Hybrid, 40 hours): Experiential training in contemplative practices and interoceptive awareness. Somatic tracking and co-regulation. Integration techniques. Supervised consultation.

Level 3 — Advanced Integration (In-person intensive, 24 hours plus supervision): Complex case formulation. Cellular-level intervention integration for qualified practitioners. Supervision competencies. Research participation.

Certification: Completion of all levels. Supervised case hours with fidelity review. Demonstrated competency. Continuing education for maintenance.

We will seek CE/CPD accreditation from APA, NASW, NBCC for accessibility and professional recognition.

10.3. Research Agenda

Phase 1 — Feasibility (Year 1–2): Pilot in 3–5 sites. Qualitative assessment of clinician and client experience. Protocol refinement. Training material development.

Phase 2 — Efficacy (Year 2–4): RCT comparing ReGEN pathways to treatment-as-usual. Primary outcomes: PTSD reduction, retention. Secondary: tripartite metrics, cost-effectiveness. Mechanism studies with biological markers.

Phase 3 — Effectiveness and Dissemination (Year 4–6): Multi-site effectiveness trial. Implementation science study. Technology-assisted delivery options. Policy advocacy for coverage and training integration.

Collaborative research network: I invite academic institutions, training programs, and healthcare systems to join. Contact me to explore collaboration.

10.4. Technology Platform

Planned features:

Client-facing: Symptom tracking across domains. HRV monitoring via wearables. Guided contemplative practice library. Progress visualization.

Clinician-facing: Assessment and pathway recommendation. Session planning and documentation. Outcome dashboards. Supervision scheduling.

Research-facing: Anonymized outcome database. Cross-site benchmarking. Continuous quality improvement analytics.

10.5. Ecosystem Vision

The full vision is an integrated ecosystem:

Clinical Protocol → Training & Certification → Research Network → Technology Platform → Policy Advocacy → Community Support → Global Access

Institutional partnerships: Academic (NTU, SMU, international partners). Clinical (healthcare systems, VA/military, community mental health). Professional (training organizations, certification bodies). Technology (digital health partners).

Social impact commitment: Sliding scale training for underserved settings. Open-access foundational resources. Pro bono consultation for community organizations. Global adaptation partnerships for low-resource contexts.

10.6. Call to Collaboration

The gaps affect millions worldwide. Closing them requires collaborative effort across disciplines, institutions, and sectors.

I invite **researchers** to join the collaborative network. **Clinicians** to participate in pilots and provide practice-based feedback. **Training programs** to explore curriculum integration. **Healthcare systems** to consider implementation pilots. **Funders** to support this public health priority. **Policymakers** to engage on coverage and training standards.

The foundation is established. The framework is proposed. The agenda is defined. What remains is collective will.

For collaboration: rachooi@hotmail.com

11. Conclusion: Toward Tripartite Coherence in Trauma Treatment

11.1. The Significance of What We Have Found

Let me be direct about what this review has established and why it matters.

We have documented, with quantified evidence, that current trauma treatment paradigms systematically fail thirty to fifty percent of patients. Not because our treatments are ineffective—they work remarkably well for many—but because they operate at the wrong level for certain presentations. When trauma is encoded in autonomic dysregulation, in mitochondrial depletion, in pre-verbal implicit memory, in shattered meaning systems, cognitive restructuring alone cannot reach it.

This is not a minor refinement to existing practice. It is a call for paradigm transformation.

For clinical practice: The decision algorithm and pathway framework offer immediate guidance for treatment-resistant cases. Stop cycling through cognitive protocols when the nervous system cannot support cognitive processing. Address the biological substrate first. Match modality to presentation.

For training programs: The documented gap in somatic competencies is not a nice-to-have but a critical deficit. Seventy percent of UK trauma therapists score high-risk for secondary traumatic stress. Our training produces technically skilled but somatically illiterate clinicians who burn out while their clients stall.

For research priorities: We need combined-modality trials, not more single-intervention studies. We need prospective non-responder identification, not post-hoc subgroup analyses. We need active-control neurofeedback studies to resolve the sham-control question definitively.

For policy: Insurance coverage for body-based approaches is not alternative medicine indulgence—it is evidence-informed care. EMDR is established first-line. Contemplative practices match psychotherapy effect sizes. The resistance to coverage reflects paradigm lag, not evidence gaps.

For the field as a whole: The psycho-somatic-noetic paradigm I am proposing is not abandonment of evidence-based treatment. It is expansion—integrating body-based and cellular-level approaches with what we already know works, matching intervention level to where trauma actually lives.

11.2. *Returning to Maria*

Return to Maria. What if the problem was not effort or technique but level? Nervous system too dysregulated. Mitochondria too depleted. Window of tolerance too narrow for cognitive processing to take hold. What if EMDR with its body scan, contemplative practices with embodied awareness, neurofeedback with neural self-regulation offer pathways purely cognitive approaches do not?

This paper documents seven gaps—affecting thirty to fifty percent of patients, forty percent of weekly CPT recipients, seventy percent of UK trauma therapists. Not small margins. An urgent call for paradigm transformation. Not abandoning evidence-based treatments but integrating body-based approaches addressing all three domains of human experience.

The good news: established treatments already bridge the cognitive-somatic divide. EMDR is first-line with somatic components. Contemplative practices match leading psychotherapy effect sizes. Neurofeedback has FDA clearance. The evidence base for body-based trauma treatment is not speculative—it is growing and robust.

The emerging frontier—SE, PBM, PEMF—shows promise but needs rigorous testing. Research priorities are clear: combined-modality RCTs, active-control studies, prospective non-responder identification, training integration pilots.

The most promising pathways: EMDR as first-line already bridging cognitive, somatic, and potentially noetic domains. Contemplative practices as accessible, low-dropout complements. Phased cellular preparation for severely dysregulated or treatment-resistant cases.

I am arguing for a **psycho-somatic-noetic paradigm**—healing across biological, psychological, and noetic domains. Within the ReGEN framework, this applies tripartite coherence to trauma recovery: restoring harmony across body, soul, and spirit.

This paper offers more than critique. The decision algorithm, case illustrations, and outcome metrics provide actionable guidance. The ReGEN Trauma Protocol vision charts a course from theory to practice, from individual treatment to ecosystem transformation.

Maria—and millions like her—deserve more than current paradigms offer. These gaps constitute not just research agenda but moral imperative. Body-based treatments must be accessible. Emerging interventions must be rigorously evaluated.

The foundation is established. The framework is proposed. The invitation is extended.

The question is no longer whether tripartite coherence is needed. The question is whether we will build it—together.

11.3. *Final Word on Significance*

If this review accomplishes one thing, let it be this: shifting the conversation from “Why do some patients fail treatment?” to “Why does treatment fail some patients?”

The difference is not semantic. The first question locates the problem in the patient—their resistance, their complexity, their failure to engage. The second locates it where it belongs: in paradigm limitations we have the power to address.

Maria did not fail treatment. Treatment failed Maria. This review explains why—and charts a path forward.

The psycho-somatic-noetic paradigm is not the final answer. It is an invitation to build something better than what we have. The millions of treatment-resistant survivors worldwide deserve nothing less than our willingness to question assumptions, integrate evidence across domains, and construct approaches that meet trauma where it actually lives.

That is the significance of this work. That is the opportunity before us.

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Abbreviations and Acronyms

Acronym	Definition
APA	American Psychological Association
ATP	Adenosine triphosphate
BDNF	Brain-derived neurotrophic factor
CAPS-5	Clinician-Administered PTSD Scale for DSM-5
CBT	Cognitive Behavioral Therapy
CI	Confidence interval
CPT	Cognitive Processing Therapy
CRP	C-reactive protein
DERS	Difficulties in Emotion Regulation Scale
DES-II	Dissociative Experiences Scale-II
DoD	Department of Defense (United States)
DSM	Diagnostic and Statistical Manual of Mental Disorders
EEG	Electroencephalography
EMDR	Eye Movement Desensitization and Reprocessing
FDA	Food and Drug Administration (United States)
fMRI	Functional magnetic resonance imaging
fMRI-NF	Functional MRI neurofeedback
GAD-7	Generalized Anxiety Disorder 7-item scale
GRADE	Grading of Recommendations, Assessment, Development and Evaluations

HPA	Hypothalamic-pituitary-adrenal (axis)
HRV	Heart rate variability
IL-6	Interleukin-6
ISTSS	International Society for Traumatic Stress Studies
MDD	Major Depressive Disorder
MLQ	Meaning in Life Questionnaire
NICE	National Institute for Health and Care Excellence (UK)
NS	Not significant
PBM	Photobiomodulation
PCL-5	PTSD Checklist for DSM-5
PE	Prolonged Exposure
PEMF	Pulsed Electromagnetic Field therapy
PHQ-9	Patient Health Questionnaire-9
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
PSQI	Pittsburgh Sleep Quality Index
PTGI	Post-Traumatic Growth Inventory
PTSD	Post-Traumatic Stress Disorder
RCT	Randomized Controlled Trial
RMSSD	Root mean square of successive differences (HRV metric)
SE	Somatic Experiencing
SMD	Standardized mean difference
STS	Secondary traumatic stress
VA	Veterans Affairs (United States Department of)
WAI	Working Alliance Inventory
WHO	World Health Organization

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